

KNOWLEDGE AND ATTITUDES TOWARDS COVID-19 VACCINE AMONG INDIAN DENTISTS

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ABSTRACT

 [https://doi.org/10.25241/stomaedu.2020.8\(4\).art.2](https://doi.org/10.25241/stomaedu.2020.8(4).art.2)

Background Dental care workers are considered a susceptible group for Severe Acute Respiratory Coronavirus 2 infection (SARS-CoV-2). Although efficacious vaccines are now available for the prevention of the Coronavirus Disease 2019 (COVID-19), their knowledge and attitude towards these vaccines are not clear.

Aim To assess the knowledge, perception, and attitudes of Indian dental professionals towards COVID-19 vaccines.

Methods An anonymous web-based survey of Indian dental practitioners and clinical dental students was conducted using a pre-tested self-administered questionnaire, to elicit data on the COVID-19 vaccine uptake, attitudes to the vaccine, and the general knowledge related to vaccination.

Results A total of 350 dental practitioners and clinical dental students/undergraduates participated in the study. The vast majority (90%) of the respondents' perceived that they have adequate knowledge of the vaccine. There is a statistically significant association in the probability of uptake of the COVID-19 vaccine related to the level of knowledge on COVID-19 vaccine perceived by the dental practitioners in India.

Conclusions In general, the knowledge, perception and attitudes of Indian dental professionals on COVID-19 vaccines appear satisfactory, but there dental students appear to be hesitant in taking the vaccine. Data on the efficacy and the effectiveness of the COVID-19 vaccines should be continuously promoted by the dental professional bodies to protect their fraternity.

KEYWORDS

Community Dentistry; COVID-19; Dental Students; Indian Dentists; Knowledge.

1. INTRODUCTION

The coronavirus disease 2019 (COVID-19) became a pandemic, due to the severe acute respiratory syndrome virus 2 (SARS-CoV-2) that was declared a public health emergency by the World Health Organization in January 2020 [1]. This global pandemic lead to variable lockdown periods across the world, including India [2]. Dental professionals are likely to be at a higher risk of contracting COVID-19 particularly due to the frequent aerosol generating procedures in routine dental treatments [3,4]. Previous reports indicated that, in general, Indian dental professionals were inadequately prepared for the provision of patient care during COVID-19 pandemic, due to professional and/or medico-legal concerns [5,6].

The COVID-19 vaccines developed within a short period of nine months since the pandemic began, a first in the annals of human history, which is a tribute to human ingenuity and technical prowess [7]. The consensus is that up to 70 to 80 per cent of the population should be successfully vaccinated to achieve herd immunity of a community to prevent further diseases spread [8]. However, there are a number of major obstacles for this elusive goal, one of which is the relatively widespread vaccine hesitancy and the associated antivaccination movements as well as the poor global vaccine supply, and distribution [9]. Indeed, the World Health Organization (WHO) had recently declared that vaccine hesitancy is one of ten major threats to global health [10]. Hence, the knowledge, acceptance and the attitudes to COVID-19 vaccine amongst various

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Peer-Reviewed Article

Citation: Kinariwala N, Udayamalee I, Samaranayake LP, Patel Z. Knowledge and attitudes towards COVID-19 vaccine among Indian dentists. *Stoma Edu J.* 2021;8(4): 241-245

Received: December 13, 2021; **Revised:** December 28, 2021; **Accepted:** December 30, 2021; **Published:** December 31, 2021

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cohorts had been studied in some previous studies [11,12]. As the studies attributed to the dental professionals of India is not well known, the current study was conducted based on a web - questionnaire survey to assess the knowledge, perception, and attitudes of Indian dental professionals towards COVID-19 vaccines.

2. MATERIAL AND METHOD

A cross-sectional, web-based questionnaire survey (approved by the Research Unit, Karnavati School of Dentistry, Karnavati University, India) was conducted during the time period of May 2021 to June 2021. The target group comprised dental undergraduates and dentists in the private and group practices and academic institutes, regardless of their specialization. The questionnaire was aimed to assess the participants' knowledge and attitudes towards the vaccine and the vaccination programme for COVID-19 in India. A self-administered pre-tested Google form was used as the study instrument. The questionnaire distributed via email was comprised of close-ended questions with focus on the demography of the participants, knowledge of vaccines and attitude and acceptance towards covid vaccination program. The collected data were analysed using SPSS 21.0 (IBM Corp.). Frequency distributions and logistic regression analyses were used.

3. RESULTS

The response rate for the study was 31.8% (350). The participants comprised dental students 67.1% (235), private dental practitioners 15.7% (55), academics 11.4% (40) and government practitioners 5.7% (20). Most respondents were females 74.3% (260). Almost two thirds of the participants 71% (250) were in the age category of 20 to 30 years [Table 1].

Table 1. Socio-demographic characteristics of the 350 respondents.

Attribute	Number	Percentage (%)
Age distribution		
20 -30 yrs	250	71.4
20 -30 yrs	15	4.3
40 -50 yrs	35	10.0
51 and above	30	8.6
Unstated	20	5.7
Gender		
Male	90	25.7
Female	260	74.3
Total	350	100

Interestingly, 18.5% (65) of the participants were previously infected with COVID-19 of whom 11.4% (40) had symptomatic infection. COVID-19 infection control protocols promulgated by the Government of India, were followed in most instances by approximately one half of the respondents (45.7%; 160) while only 38.6% (135) respondents strictly followed the protocols [Table 2].

Table 2. Following infection control protocols promulgated by the Government of India by the dental practitioners in India (N = 350).

	Frequency	Percent
Not following	5	1.4
Somewhat	15	4.3
Certain extent	35	10.0
Mostly	160	45.7
Strictly	135	38.6
Total	350	100.0

There was a significant association in the probability of uptake of COVID-19 vaccine related to the type of professional category [Table 3] ($X^2 = 42.11$, $df = 12$, $p = 0.000$).

Table 3. The likelihood of Uptake of COVID-19 Vaccine by the dental professionals in India by their professional category (N=350).

	Dental students (%)	Academics (%)	Private practitioners (%)	Government practitioners (%)	95% CI
Likely	180 76.5%	30 75%	40 72.7%	10 50%	260 74.3%
Sceptical	15 6.4%	05 12.5%	05 9.1%	05 25%	30 8.6%
Neutral	20 8.5%	0	05 9.1%	0	25 7.1%
Unlikely	10 4.25%	0	05 9.1%	05 25%	20 5.7%
Very Unlikely	10 4.25%	05 12.5%	0	0	15 4.3%
Total	235 100%	40 100%	55 100%	20 100%	350 100%

Dental academics and government practitioners, were the most likely to take the vaccine, followed by dental students. A significant proportion of dental practitioners were aware that a post vaccination serological verification will be required to ascertain their immunity (i.e., antibody level) [Table 4] ($X^2 = 22.22$, $df = 4$, $p = 0.000$).

Table 4. Level of Knowledge on COVID-19 Vaccine as perceived by the dental practitioners in India by their awareness of the need of a serological test to ascertain immunity (N=350).

Level of Knowledge/ Serology awareness	Serology test YES (%)	Serology test NO (%)	95% CI
Basic	05 (1.4)	05 (1.4)	10 (2.9)
Average	15 (4.3)	10 (2.9)	25 (7.1)
Better	95 (27.1)	50 (14.3)	145 (41.4)
Very good	80 (22.9)	55 (15.7)	135 (38.6)
Excellent	35 (10.0)	0	35 (10.0)
Total	230 (65.7)	120 (34.3)	350 (100.0)

A significant proportion of dental practitioners trusted the government managed supply and the distribution of COVID-19 vaccines [Table 5] ($X^2 = 23.67, df = 8, p = 0.006$).

Table 3. Level of Knowledge on COVID-19 Vaccine perceived by the dental practitioners in India by their trust on government managed supply and distribution of COVID-19 vaccines (N=350).

Level of Knowledge in Govt. Vaccine programme	Vaccine distribution & supply is unbiased and well managed		
	Yes	No	Don't know
Basic	05 (1.4)	0	05 (1.4)
Average	15 (4.3)	05 (1.4)	05 (1.4)
Reasonable	90 (25.7)	20 (5.7)	35 (10.0)
Very good	80 (22.9)	40 (11.4)	15 (4.3)
Excellent	20(5.7)	10 (2.9)	05 (1.4)
Total	210 (60.0)	75(21.4)	65 (18.6)

4. DISCUSSION

The COVID-19 vaccination program for health care workers in India was initiated in the spring of 2021. At the time of writing, approximately 22.28% of the Indian population (292 million) had received one dose of the vaccine and approximately 36% (472 million) two doses. This could be considered as a reasonable success but there is a long way to travel before the 70-80 per cent goal of vaccination of the total populace is reached to attain herd immunity. Although local manufacture of vaccines and well managed distribution logistics have contributed to better acceptance of vaccines against COVID-19, misinformation and vaccine hesitancy are the biggest road blocks in the Indian COVID-19 vaccination program. The uptake of the vaccine by health care workers appears to be high, but the exact figures are unclear. Faced with this scenario, the assessment of knowledge and attitudes of dental professionals towards COVID-19 vaccines is apposite and important. As far as we are aware the current report is the first survey on this subject.

We noted that approximately three quarters of the respondents (74.3%) were likely to take the vaccine, and believed in the efficacy of the vaccines. This satisfactory result is almost identical to similar studies in Europe and the United States of America [8,9]. Previous studies have also shown that approximately 67% Indian dentists were likely to opt for vaccination against COVID-19 [13]. It is critical that the Indian health authorities and Indian Dental Association take a lead in popularising vaccine acceptance by the health care professionals, not only for the protection of the health care workers and the public they attend to, but also because health professionals are the conduits through which information on COVID-19 vaccines and their developments could be disseminated to the public. Last but not least health professionals should be fully convinced and knowledgeable of the efficacy

of vaccines as they are in general the most trusted individuals in the community from whom people seek information on disease prevention. This is particularly so in underserved rural India where health networks are poorly established, and health information percolates erratically and slowly at best. One encouraging sign amongst the dental professionals in this context was that the overwhelming 90 percent of the respondents perceived their knowledge of COVID-19 vaccines to be good or above average implying that they are in touch with developments in this critical area. Our study also showed a significant association between the level of knowledge on COVID-19 vaccine and their awareness of the need for verification of adequate seroconversion to confer immunity to COVID-19 once the vaccine course is completed. While ascertaining the antibody levels and optimal seroconversion after vaccines such as hepatitis B is routinely required [14], this appears not to be the case for COVID-19, at least for the time being. Indeed, the Food and Drugs Administration (FDA), of USA has declared that post-vaccination antibody testing to evaluate seroconversion (i.e., immunological correlates of vaccine sufficiency) as dispensable [15]. Clearly, this is still an area of controversy as it is now known that antibody levels rapidly wane after two doses of the COVID-19 vaccine and hence the necessity of a third booster dose for all health care workers [16]. Moreover, the emergence of the new Omicron variant of SARS-CoV-2 has reminded the community the need for booster doses, and the critical importance of maintaining an optimal antibody level against this dreaded illness.

Another noteworthy finding of this study is the significant association between the probability of uptake of COVID-19 vaccine and the type of professional category of the participants. We noted that the acceptance of COVID-19 vaccines by dental students was suboptimal in comparison to the fully fledged demists. Our results concur with the results of the study by Riad et al [17], who found a similar response in a global survey of dental students. They concluded that there is a worrisome level of vaccine hesitancy among dental students and this may be an impact of the socioeconomic and geopolitical factors related to where the dental students live and study.

5. CONCLUSION

This study has some limitations. First, it was a cross-sectional study that provided a quick snapshot view and hence cause-effect relationship of knowledge, and awareness could not be ascertained. Second, the response rate, though theoretically acceptable for a web based survey, was relatively low.

In conclusion, the knowledge, perception and attitudes of Indian dental professionals on COVID-19 vaccination appear highly satisfactory, but more targeted and focused steps are needed to reduce vaccine hesitancy, particularly amongst the dental students.

AUTHOR CONTRIBUTIONS

NK: created the questionnaire, disseminated and collated the data and drafted and edited the final manuscript. LPS: conceptualized the study, wrote the original draft, vetted and approved the final

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draft. IU: curated and analysed the data, performed the statistical analysis. ZP: collated the data and also drafted and edited the final manuscript. All four authors read and approved the final version of the manuscript.

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Questions

1. Which of the following statement is TRUE?

- a. The consensus is that up to 40-50% of the population should be successfully vaccinated to achieve herd immunity of a community;
- b. The consensus is that up to 50-60% of the population should be successfully vaccinated to achieve herd immunity of a community;
- c. The consensus is that up to 60-70% of the population should be successfully vaccinated to achieve herd immunity of a community;
- d. The consensus is that up to 70-80% of the population should be successfully vaccinated to achieve herd immunity of a community.

2. Which of the following is NOT a major obstacle in achieving herd immunity of a community?

- a. Vaccine hesitancy;
- b. Poor vaccine supply and distribution;
- c. Quality of the vaccines;
- d. Antivaccine movements.

3. In this study, how many respondents had good knowledge of COVID-19 vaccines?

- a. 90%;
- b. 60%;
- c. 75%;
- d. 50%.

4. What was the response rate for this study?

- a. 50.8%;
- b. 31.8%;
- c. 20.8%;
- d. 41.8%.



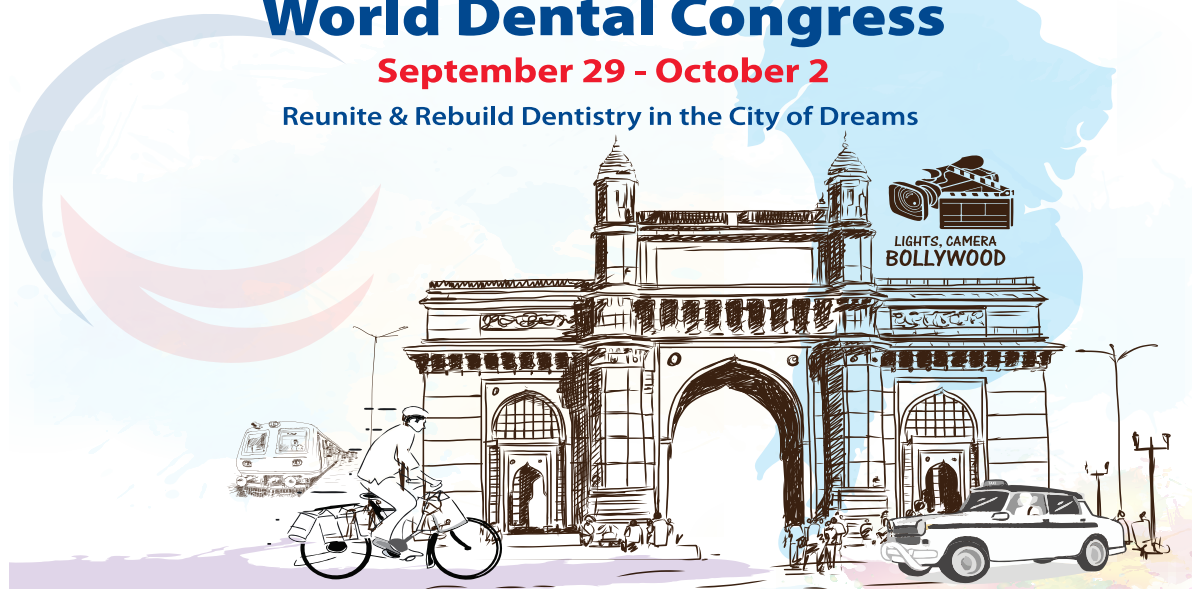
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