

## ATTITUDE AND ACCEPTANCE OF COVID-19 VACCINE AMONGST MEDICAL AND DENTAL FRATERNITY – A QUESTIONNAIRE SURVEY

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### ABSTRACT

**Background.** The second wave of Novel Coronavirus disease (COVID-19, SARS-CoV-2) is proving more disastrous than the first because of the new mutant strains. Under these circumstances, vaccination is the only effective solution that can save millions of lives across the globe.

**Objectives.** The present study was conducted to assess the attitude and acceptance/willingness of health care professionals (medical and dental) towards COVID-19 vaccine.

**Materials and Methods.** An online questionnaire survey was conducted among medical and dental professionals working in different hospitals of two states of India. A total of 520 subjects constituted the final sample size. A self-constructed questionnaire (divided into 2 parts) containing 12 questions was administered to obtain information from the subjects regarding their attitude and willingness towards COVID 19 vaccine. Statistical analysis was done using chi-square test and multiple liner regression analysis. Odds ratio with 95% CI were also generated. Statistical significance was set at  $p \leq 0.05$ .

**Results.** Majority of the subjects (67% of dental and 73% of medical) had full confidence on the effectiveness of COVID-19 vaccine. Willingness to get vaccinated was shown by 63% of subjects and 65% had positive attitude towards vaccine. Some subjects (45.5% dental and 48.4% medical) showed concern regarding unforeseen effects of the vaccine. Willingness to get vaccinated was 3.45 higher in subjects who were involved in COVID duties. Subjects giving less preference to natural immunity over vaccine showed more willingness (OR: 2.98) towards getting the vaccine.

**Conclusion.** The findings of the study showed that acceptance and attitude of subjects regarding COVID 19 vaccine was suboptimal as there were various factors which contributed towards subjects' hesitancy to get vaccinated. There is an utmost need to address various issues regarding vaccine safety to promote high uptake.

**Key words:** COVID-19, safety, emergencies, health, vaccines

### INTRODUCTION

In December 2019, the Novel Coronavirus disease (COVID-19, SARS-CoV-2) emerged from China, Wuhan, and is currently claiming thousands of lives everyday across the globe. Its RNA structure resembles that of the SARS-CoV-1 that triggered the Severe Acute Respiratory Syndrome (SARS) epidemic [7, 24]. World Health Organization (WHO) on March 12, 2020 classified COVID-19 as a pandemic [24]. Currently, there are 141 million active cases and 3.01

million deaths have been reported globally. India has reported the 2<sup>nd</sup> maximum number of cases of COVID-19 with 15.6 million active cases and 1,83,000 deaths [21].

Self-quarantine and social distancing are effective measures that can decrease the Novel Coronavirus disease spread. Development of herd immunity among certain populations might have contributed towards lower morbidity [15]. However, widespread vaccination is the most active way of monitoring and lowering infectious diseases [17]. While immunization

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has effectively lessened the universal problem of morbidity and mortality, public assurance regarding vaccines is being exaggerated by numerous factors [8].

Maintaining assurance regarding the vaccine is subject to the interface between providers and patients [13, 14]. Application and attitude of vaccination by healthcare authorities is a main concern that is dependably related with adherence to vaccination schedules, patient acceptance and vaccination which decreases aversion/reluctance [19]. Furthermore, vaccinated health professionals (medical and dental practitioners) have a perceptible aftereffect on patients' acceptance towards taking a vaccine.

Health authorities' tenacity to utilize and approve the vaccine to their patients can be predisposed by attitudes and knowledge concerning vaccines. It is documented that healthcare specialists who have negative attitude, hatred or reluctance concerning vaccinations, convey these approaches towards vaccination to patients which inclines them to adopt a negative towards the vaccine [2]. Moreover, vaccine doubtfulness detected in the widespread public has been associated with the level of vaccine uncertainty among health care professionals [1]. Public assurance in vaccines universally should be the primary goal for public health authorities for maximum vaccination coverage [5].

The development of an effective vaccine against COVID-19 has been a challenging task for vaccine makers worldwide. Many companies are still developing COVID-19 vaccines and many are in the final stages of trial whereas others have already completed this phase. India has already rolled out two vaccines- 'Covishield' (ChAdOx1, Oxford-Astra Zeneca vaccine) (January 2021) advanced in the UK and manufactured by Serum Institute of India's (SII) has second one is 'Covaxin' (March 2021) which is developed by Bharat Biotech Pharma company, India [20]. First preference for vaccination is being given to front line workers and engaging in COVID 19 duties and next priority is given to all health care workers.

The caliber, content and distribution of educational data about vaccines by healthcare professionals are valuable in educating patients into accepting vaccinations [16]. Moreover, health care workers are directly exposed to the disease because in their working environment. Therefore, the objective of this questionnaire survey was to assess the attitude and willingness to accept the COVID-19 vaccine amongst medical and dental health professionals.

## MATERIALS AND METHOD

### *Ethical clearance*

Ethical clearance to conduct the present study was obtained from concerned health authorities.

Participation in the study was voluntary and informed consent was obtained from those study subjects who were willing to participate. Moreover, any type of information disclosing the identity of the patient was not collected. The study was conducted in January 2021.

### *Study population and study sample*

The present questionnaire based study was conducted among dental and medical professionals working in different hospitals of two states in India (Punjab & Uttar Pradesh). The following formula was used to calculate the required sample size:

$$n = \frac{Z^2 1 - (\alpha / 2) \times S^2}{d^2}$$

where: Z is the standard normal score with 95% confidence interval (CI) ( $\alpha=0.05$ ), S is the standard deviation of the variable, and d is maximum acceptable error. After applying the formula, 520 subjects constituted the final sample size after excluding the non-responders. Subjects from both the medical and dental specialties were enrolled in the study using systematic random sampling methodology.

### *Questionnaire/Research Instrument*

A self-designed close-ended questionnaire written in English was constructed specifically for the study. The content of the questionnaire was verified by infectious and communicable disease specialist and it was pre-tested for validity and reliability. The reliability of the questionnaire was good (0.82). The questionnaire was split into two sections- A 'General Section' (Section A) which was made to collect socio-demographic details of the subjects (gender, occupation, experience, working profile etc.). Section B comprised of 12 questions on knowledge, attitude and willingness regarding COVID-19 vaccine. The questionnaire was made available to study subjects via email and WhatsApp (Social Media Application) and not handed over personally in order to minimize any contact with the subjects to prevent the spread of the virus. The subjects were given one week time to fill the questionnaire and return it. The response of subjects' (positive or negative) towards the questionnaire was assessed for attitude and willingness towards the vaccine.

### *Statistical Analysis*

Data obtained from responses to the questionnaire was assessed using SPSS statistical package (SPSS, version 21.0, Chicago, IL, USA). Categorical measurements were done using number and percentages. Chi-square test as used to examine association between different variables. The significance level was set at  $<0.05$ . Multivariate

logistic regression analysis was also performed to assess the effect of various independent variables on willingness to get vaccinated. Odds ratio with 95% CI were also generated.

## RESULTS

### Socio-demographic characteristics

The analysis of the general demographic data (Table 1) revealed that the age of the subjects ranged from 24-55 years and majority of the study subjects were in the age-group of 25-35 years (208, 40%) and 65.6 % (340) were males. The study population comprised more of dental professionals (54.4%) as compared to

medical health professionals (45.6%). Subjects having experience of more than 10 years were comparatively less (41.6%) as compared to subjects having more than 10 years' experience (58.4%). Of the total subjects, 35% (182) were doing COVID related duties at their respective workplace.

### Response to the questionnaire on attitude regarding the vaccine

The responses of the subjects pertaining to attitude regarding vaccine are summarized in Figure 1. More than 85% of subjects were aware regarding the availability of COVID-19 vaccine in India by January end. Majority of the subjects (67% of dental and 73%

Table 1. Socio-demographic characteristics of the study population

Socio-demographic characteristic		Number	Percentage (%)
Age (in years)	25-35	208	40
	35-45	171	33.1
	45-55	141	26.9
Gender	Male	340	65.6
	Female	180	34.4
Type of health care worker	Medical	237	45.6
	Dental	283	54.4
Years of Experience	10	303	58.4
	More than 10	217	41.6
Working Profile	Governmental sector	192	37
	Private sector	328	63
Involved in Covid-19 duty	Yes	182	35
	No	338	65

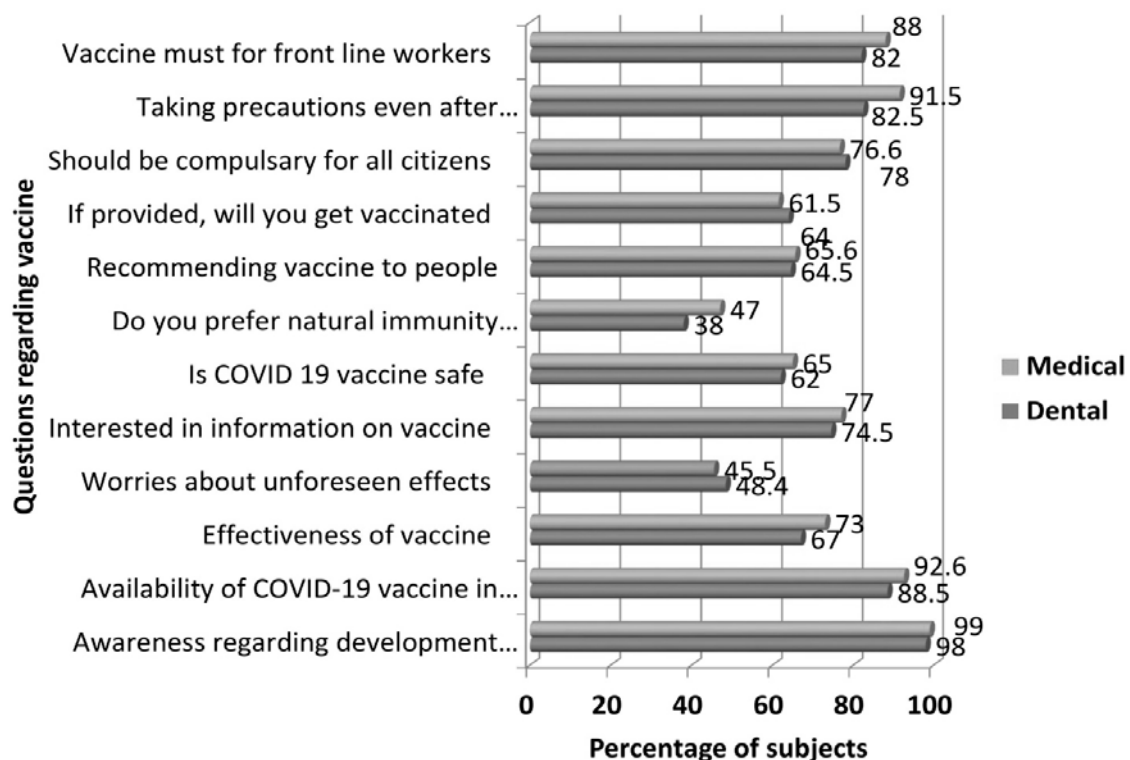


Figure 1. Subjects' response towards the questionnaire assessing attitude and willingness

of medical) had full confidence on the effectiveness of COVID-19 vaccine and more than 60% of subjects were of the opinion that it is safe. However, some of the subjects (45.5% dental and 48.4% medical) showed concern regarding unforeseen effects of the vaccine. More than 40% of the subjects preferred natural immunity over vaccines. When asked about their willingness to get vaccinated, 63% of subjects gave a positive response and 65% reported that they would recommend vaccine to others. Vaccine should be compulsory for all citizens of India were emphasized by 76.6% of medical and 78% of dental professionals. Overall, 65% of subjects (338) showed a positive attitude towards vaccination and the findings were significantly associated with the working profile of study subjects ( $p=0.024$ ) (Table 2).

### Multivariate logistic regression analysis

Multivariate logistic regression analysis was also performed to assess the effect of various independent variables on the willingness of subjects to get vaccinated (Table 3). Odds ratio with 95% CI were also generated. The odds of willingness to get vaccinated were 2.12 times greater in dental health professionals as compared to medical health professionals. Willingness to get vaccinated was 3.45 higher in subjects who were involved in COVID duties as well. Subjects giving less preference to natural immunity over vaccine showed more willingness (2.98 times) towards getting the vaccine. Odds of getting vaccinated were 2.78 times higher among those who were interested in gathering information about the vaccine. Moreover, subjects having perception that the vaccine should be

Table 2. Attitude towards Covid-19 vaccine

Attitude	Profile of subjects	No. (%)	p value
Positive	Medical	158 (66.7%)	0.024*
	Dental	180 (63.6%)	
Negative	Medical	79 (33.4%)	0.065
	Dental	123 (36.3%)	

\*Chi-square test,  $p \leq 0.05$  Statistically significant

Table 3. Multivariate logistic regression analysis on willingness to get vaccinated

Variable	OR (Odds Ratio)	95% CI	p value
Type of health worker			
Medical	1.00	0.54 - 3.56	0.023*
Dental	2.12		
Years of experience			
10	1.00	1.00 - 3.76	0.065
More than 10	2.65		
Working profile			
Government sector	1.32	0.67 - 2.87	0.071
Private sector	1.00		
Involved in COVID duties			
Yes	3.45	1.2 - 5.61	0.002*
No	1.00		
Do you prefer natural immunity over vaccine			
Yes	1.00	0.5 - 4.34	0.034*
No	2.98		
Is COVID 19 Vaccine safe			
Yes	2.46	0.72 - 3.78	0.045*
No	1.00		
Interested in information on vaccine			
Yes	2.78	1.45 - 3.23	0.045*
No	1.00		
Vaccine should be compulsory for all Indian citizens			
Yes	3.23	1.06 - 3.78	0.027*
No	1.00		

\* $p \leq 0.05$ , statistically significant

compulsory for all Indian citizens were more willing to get vaccinated (OR: 3.23).

## DISCUSSION

High rates of vaccination against diseases in a population have been one of the most important advances for maintenance of public health around the globe. Since the start of the current pandemic, scientists all over the world have been working tirelessly to develop new and effective vaccines that can guard people from COVID-19 and its new variants [12]. More than 100 vaccine candidates are being developed world widely by different pharmaceutical companies. Some of the companies have already introduced their vaccines while others are in their last stages of clinical trials. Recent evidence suggests that people who are fully vaccinated for COVID-19 are less likely to be infected without showing symptoms and therefore are less likely to spread infection to others [3].

Although more than 95% of subjects were aware regarding the development of vaccine against COVID-19, more than one-third of subjects (37%) were unwilling to get vaccinated. This acceptance rate is lower as compared to some study conducted in another part of the world [6] but high as compared to a recent study conducted among health care workers in Saudi Arabia [18]. A possible explanation for this could be due to concerns regarding possible substandard vaccine quality and misinformation conveyed by certain social and mass media sources which have spread rumors regarding the safety of COVID-19 vaccine in people belonging to some race/ethnicity [4]. Vaccine hesitancy developed among medical and dental practitioners can impact their own decision to get vaccinated and to endorse the vaccine to their patients. Social media influencers and celebrities can play a significant role to normalize uptake of the vaccine and combat misinformation.

The results of the study revealed that 35% of the subjects had negative attitude towards COVID-19 vaccine and the findings were statistically significant when compared with working profile of subjects (medical & dental). More than 40% of subjects had some concerns regarding unforeseen effects of the vaccine as it is developed during an emergency within a span of few months (fast-track). Similar finding is observed in some other study conducted among health care workers in another country [23].

Results of multivariate analysis showed higher rates of acceptance for vaccination among dental professionals compared to medical professionals. This could be due to higher exposure risks for dentists during oral examination and treatment procedures. However, contrasting findings were reported by some other study conducted on medical and dental students

[11]. Moreover, subjects engaged in COVID-19 duties (dealing with COVID-19 patients) at their respective health care facilities were more willing to get vaccinated as compared to others. Data gathered from a Turkish study conducted on health professionals reported similar findings [10]. This could be due to the fact that subjects dealing with COVID-19 patients have inherent fear of catching the infection which can be passed on to their family.

There is a natural tendency in human beings to gather all information before adopting a new idea that propels us to take a particular decision. It was observed in our study that subjects who were interested in gathering information regarding the COVID-19 vaccine were 2.78 times more willing to get vaccinated as compared to other subjects. Similar findings were observed in a recent study conducted in Democratic Republic of Congo where subjects used to attend lectures and discussions to gather new information regarding vaccine [9]. Subjects who thought that COVID-19 vaccine should be made compulsory for India citizens were more likely to get vaccinated as compared to others. Our findings were in congruence with the findings of another study [18].

Healthcare professional's approval plays a significant part in their patients' vaccination conduct. They can provide significant evidence to the general population and their opinion can be a key factor in patients' judgement to be vaccinated. In this situation and with the moderate positive response for vaccination in our study subjects, there is a substantial need for addressing worries and creating alertness to advance chances for a higher rate of acceptance of the COVID-19 vaccine. The present study has some limitations also. It is not nationally representative as it is conducted in only one state of the country and it is an online survey. Secondly, the study involved a limited sample size as most of the health care professionals were actively engaged in COVID-19 related duties and therefore had limited time to participate in a survey. Moreover, as the country is witnessing a high surge of COVID-19 cases in the second wave (300,000 per day) from the last couple of weeks because of the 'new mutant' strain [22], some subjects who were previously hesitant or unwilling to take the vaccine might consider to opt for the vaccine now (the study was conducted in January 2021). Therefore the actual number of subjects willing to take the vaccine could be somewhat more in the current situation. All these things might have impact on the study's generalisability.

## CONCLUSION

The study concluded that rate of acceptance (willingness) of COVID-19 vaccine among subjects was suboptimal though 65% of subjects showed

positive attitude towards the vaccine. Health care workers especially the front line workers are at greater risk of contracting the disease. It is because of this reason that Government of India gave utmost priority to front line workers to get vaccinated. While the expecting COVID-19 vaccine could be effective in protecting the healthcare workers, our data shows that uncertain attributes like safety, development of vaccine in an emergency, unforeseen effects are likely a hurdle for low acceptance.

### Recommendations

Vaccine hesitancy, as a global threat, is affecting all countries. Developing personalised policies to address concerns recognized in the study to decrease vaccine doubtfulness will be crucial to successful widespread vaccination against COVID-19. Interventional educational programs through webinars and seminars should be conducted among health care workers to eliminate fears concerning the vaccine. Health care workers should be made aware of the fact that existing vaccines provide reasonable protection and are effective against many variants (emerging in different nations) of interest and concern. Government can engage eminent personalities and celebrities (spokespersons) to combat any misinformation regarding the vaccine through mass media communication channels. Social media monitoring should be done and any type of erroneous claims regarding COVID vaccine should be refuted. Science has provided us the vaccines, but it is our responsibility to use them to protect ourselves and our world.

### Conflict of interest

*The Authors declare no conflict of interest.*

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