



## Original Article

# Acceptability of coronavirus disease 2019 vaccination among Indian health-care professionals: A cross-sectional survey

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## ABSTRACT

**Objective:** The epidemic of novel coronavirus disease 2019 (COVID-19) has led to the development of several vaccine candidates which has been progressing at an unprecedented rate. Health-care professionals are somewhere standing between their professional commitments and personal well-being, amid concerns about the safety and efficacy of the vaccine. The present survey was conducted to analyze their approach toward vaccination. **Materials and Methods:** An online questionnaire-based cross-sectional survey was conducted among 250 health-care professionals comprised of Medical, Dental, Ayurveda, Physiotherapy doctors, and nursing staff working at a tertiary care hospital in Gurugram city. A self-administered 10-item questionnaire in the Google document format was developed to assess their perception and attitude toward vaccination. The present survey was carried out for 2 months from November to December 2020. The responses recorded were subjected to the statistical analysis using the Chi-square test and the level of statistical significance was set at  $P \leq 0.05$ . **Results:** Among all participants, 72 (28.8%) were male and 178 (72.2%) were female. Of all, 60.4% of the health-care professionals somewhat or completely agreed to accept a vaccine as soon as it is available. Nursing staff reported more likely to accept COVID-19 vaccination than the other health-care professionals. Majority of the HPs (44%) were found to be concerned about the rapidity in the development of vaccine. **Conclusion:** The overall attitude toward vaccination was positive but specific concerns regarding COVID-19 vaccine are prevalent. Thus, to maintain the benefits of vaccination programs and for its successful implementation, understanding and addressing their vaccine hesitancy will be crucial.

**KEYWORDS:** *Acceptability, Coronavirus disease 2019, Health-care professionals, Vaccine*

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## INTRODUCTION

Coronavirus disease 2019 (COVID-19) has been declared a global pandemic by the World Health Organization [1]. India has so far reported more than 10 million confirmed COVID-19-positive cases and over 1.5 lakh people have died of the disease in the country. The Indian government has started nationwide COVID-19 vaccination program on January 16. The Central Drugs Standard Control Organization, India's drugs regulatory authority, has approved two coronavirus vaccines – Covishield, developed by AstraZeneca and Oxford University, and the locally developed vaccine COVAXIN, produced by Bharat Biotech for emergency use to fight COVID-19 pandemic in the country [2]. The first group to be vaccinated includes health care and frontline workers.

Although immunization will successfully reduce the global burden of illness and death, public confidence in vaccines can

be affected by various concerns. Health professionals' (HPs) intention to use and to recommend the vaccine to their patients depends on their perceptions and attitudes about vaccines. Attitude and utilization of vaccination by HPs are a major factor that is consistently associated with public acceptance of vaccination, adherence to vaccination schedules, and reduced hesitation/aversion [3].


It is well reported that HPs with an unfavorable attitude or hesitation toward vaccine transmit the hostile attitude toward vaccination to patients and tend to recommend vaccination less frequently [4]. Furthermore, vaccine hesitancy observed in the general population has been consistently linked to the

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level of vaccine hesitancy among HPs [5]. In addition, the quality, content, and dissemination of educational information about vaccines by health-care professionals have been shown to be useful in improving patient acceptance of vaccinations, reducing reluctance, and guiding informed decisions about vaccination [5]. Indeed, patients often trust and rely on health-care professionals for information about vaccines and vaccine preventable diseases, as well as the therapeutic and public health benefits associated with immunization [3-5].

This study was thus aimed at evaluating the acceptance of COVID-19 vaccination among HPs which included medical doctors, dental surgeons, nursing staff, physiotherapists, and Ayurveda practitioners at a tertiary care hospital in Gurugram city, Haryana. At present, the designated hospital for survey (SGT University, Gurugram) is running vaccination drive successfully as per the instructions given by the Ministry of Health and Family Welfare, Government of India.

## MATERIALS AND METHODS

### Study design, study setting, and study population

A descriptive cross-sectional web-based survey was conducted among health-care professionals at a tertiary care hospital of Gurugram city to assess their perception and attitude toward COVID-19 vaccine. The pool of health-care professionals was comprised of registered Medical, Dental, Ayurveda, Physiotherapy Doctors, and Nursing staff. A pilot survey was conducted on 30 professionals whom responses were not included in the final assessment to check that the statement of each question was clear and understandable.

Purposive sampling was employed wherein the list of all chosen HPs along with their E-mail ids were retrieved from the respective human resources department of the hospital. The survey questionnaires were sent to 600 HPs and were asked to submit their responses within 4 weeks and reminders sent if required.

### Study questionnaire

A self-administered, 10-item online questionnaire was designed in the English language and made in the form of Google documents. The test-retest reliability was performed to test the reliability of the questionnaire, and reliability analysis revealed an intra-class correlation of 0.85 indicating good reliability. The comprehensiveness of the questionnaire was optimized using content and face validity with the help of a team of experts before the survey. Five-point Likert-scale was used to document the perspective of HPs towards vaccination, and later classified into two categories as Category 1 (Completely agree and Somewhat Agree) and Category 2 (Neutral, Somewhat Disagree and Completely Disagree) to summarize the results. The survey was estimated to take around 10 min to complete and included questions on demographic data, acceptance, and anxiety toward vaccination.

### Ethical considerations

Ethical approval was obtained before conducting the survey from the ethical committee of SGT University, Gurugram, Haryana, on October 10, 2020 (SGTU/FDS/25/1/519). Informed consent was obtained from all the health-care professionals and

confidentiality was assured. The online survey was carried out for 2 months from November to December 2020.

### Statistical analysis

The collected data were entered into Microsoft Excel 2007 and subjected to the statistical analysis using the Statistical Package for the Social Sciences software version 20.0 (IBM Statistics Inc., Chicago, Illinois, USA). Descriptive analysis along with Chi-square statistical test was done to assess the significance of the association between COVID-19 vaccine acceptance and demographic variables.  $P \leq 0.05$  was considered statistically significant.

## RESULTS

In the present survey with the response rate of around 41.6%, a total of 250 HPs participated and completed the questionnaire. Females (71.2%) represented a larger proportion of the study population. Majority of the participants (70%) were aged between 18 and 35 years followed by 18% aged between 36 and 55 years and 12% were aged more than 55 years. The participants of the survey included hospital care team in the designated hospital in Gurugram city and included practitioners from different fields. Among the total HPs 39.6% were dental surgeons, 21.2% were nursing professionals, 17.6% were physiotherapists, 11.6% were medical physicians, and 10% ayurveda doctors [Table 1].

All the HPs when asked whether “You would accept a vaccine as soon as it is available,” majority (60.4%) completely or somewhat agreed, whereas 22.4% somewhat or completely disagreed and 17% were neutral, whereas on the basis of gender, 62.5% males and 59.5% females expressed intention to accept vaccine readily [Table 2].

In the present study, 68.4% of HPs somewhat to totally agreed that vaccination was the best way to avoid the complications of COVID-19. Overall 10% participants felt COVID-19 vaccination would be safe from any side effects. Majority of the respondents were neutral (31.2%) to somewhat agree about the probable safety and side effects of COVID-19 vaccine. Slightly more than a quarter of all HPs thought that the vaccine could be somewhat unsafe (26.4%), whereas only 1.2% thought it to be completely unsafe [Table 2].

**Table 1: Demographic characteristics of health professions (n=250)**

Variable	n (%)
Gender	
Male	72 (28.8)
Female	178 (71.2)
Age (years)	
Group 1 (180-35)	175 (70)
Group 2 (36-55)	45 (18)
Group 3 (>55)	30 (12)
Educational background	
Medical	29 (11.6)
Dental	99 (39.6)
Ayurveda	25 (10)
Nursing	53 (21.2)
Physiotherapy	44 (17.6)

**Table 2: Acceptance to corona virus disease-2019 vaccination among health professionals based on gender (n=250)**

Question	Options	Health professionals, n (%)			P
		Males	Females	Total	
Do you think you would accept COVID-19 vaccination as soon as it is available	Completely agree	29 (40.2)	59 (33.1)	88 (35.2)	0.31
	Somewhat agree	16 (22.2)	47 (25.8)	63 (25.2)	
	Neutral	8 (11.1)	35 (19.6)	43 (17.2)	
Do you think vaccination is a best way to avoid the complications of COVID-19	Somewhat disagree	17 (23.6)	30 (16.8)	47 (18.8)	0.32
	Completely disagree	2 (2.7)	7 (3.9)	9 (3.6)	
	Completely agree	31 (43.0)	61 (34.2)	92 (36.8)	
Do you think COVID-19 vaccination would be safe from any side effects	Somewhat agree	20 (27.7)	59 (33.1)	79 (31.6)	0.74
	Neutral	8 (11.1)	34 (19.1)	42 (16.8)	
	Somewhat disagree	10 (13.8)	16 (8.9)	26 (10.4)	
What would be your most appropriate barrier to feel hesitant towards taking COVID-19 vaccine	Completely disagree	3 (4.1)	8 (4.4)	11 (4.4)	0.27
	Somewhat safe	8 (11.1)	17 (9.5)	25 (10)	
	Neutral	21 (29.1)	57 (32)	78 (31.2)	
What would be your main reason for getting the vaccination	Somewhat unsafe	25 (34.7)	53 (29.7)	78 (31.2)	0.03*
	Completely unsafe	18 (25)	48 (26.9)	66 (26.4)	
	Not hesitant at all	0	3 (1.6)	3 (1.2)	
What do you think it is preferable to continue taking the preventive measures over vaccination as of now	Not hesitant at all	8 (11.1)	18 (10.1)	26 (10.4)	0.45
	Rapidity in development of vaccine	30 (41.6)	80 (44.9)	110 (44)	
	Side effects and Genuineness of vaccine	31 (43)	62 (34.8)	93 (37.2)	
What do you think how long COVID vaccine would be effective to prevent infection	Vaccine convenience (method, storage, transport, competency of Immunization staff)	0	10 (5.6)	10 (4)	0.34
	Already exposed to COVID-19 and not in the risk group	3 (4.1)	8 (4.4)	11 (4.4)	
	To protect ourselves against COVID-19	13 (18)	18 (10.1)	31 (12.4)	
What do you think it is preferable to continue taking the preventive measures over vaccination as of now	To protect others in the community against COVID-19	12 (16.6)	21 (11.7)	33 (13.2)	0.45
	To stay safe to look after their family	4 (5.5)	14 (7.8)	18 (7.2)	
	To stop the need of social distancing and other precautionary measures	2 (2.7)	0	2 (0.8)	
What do you think how long COVID vaccine would be effective to prevent infection	All of the above	41 (56.9)	125 (70.2)	166 (66.4)	0.45
	Completely agree	46 (63.8)	92 (51.6)	138 (55.2)	
	Somewhat agree	16 (22.2)	52 (29.2)	68 (27.2)	
What do you think how long COVID vaccine would be effective to prevent infection	Neutral	7 (9.7)	20 (11.2)	27 (10.8)	0.34
	Somewhat disagree	2 (2.7)	7 (3.9)	9 (3.6)	
	Completely disagree	1 (1.3)	7 (3.9)	8 (3.2)	
What do you think how long COVID vaccine would be effective to prevent infection	6 months	19 (26.3)	29 (16.2)	48 (19.2)	0.34
	1 year	11 (15.2)	22 (12.3)	33 (13.2)	
	5 years	4 (5.5)	10 (5.6)	14 (5.6)	
What do you think how long COVID vaccine would be effective to prevent infection	Life time	6 (8.3)	18 (10.1)	24 (9.6)	0.34
	No idea	32 (44.4)	99 (55.6)	131 (52.4)	

Chisquare test; \*P<0.05 (significant). COVID-19: Corona virus disease-2019

While analyzing the barriers that made the HPs hesitant toward taking COVID-19 vaccine, it was found that majority of the HPs (44%) were concerned about the rapidity in the development of vaccine. Approximately 37.2% lack confidence in the genuineness of vaccine and side effects, 10.4% were not hesitant at all to receive the vaccine, 4% of all HPs were perturbed about vaccine convenience, whereas the remainder 4.4% believed that vaccines are unnecessary because they are already exposed to COVID 19 and not in risk group [Table 2].

Analysis for the factors potentially associated with the intention to receive the COVID-19 vaccine among respondents it was found that for majority HPs the main reason for getting the vaccine to protect themselves, their families and other in the community against the virus and only 0.8% intent to take it as a measure to stop social distancing and other precautionary measures. It was also found that more than half HPs had no idea for how long the vaccination would be effective and think that it is preferable to continue taking the preventive measures over vaccination as of now [Table 2].

The perceived risk from vaccination was almost equal among both the genders and no significant results came out [Table 2]. The acceptance of COVID-19 vaccine was maximum (76.6%) in the age group of more than 55 years followed by young age group 18–35 years (61.7%) and middle aged (44.4%) 36–55 years which came out to be statistically significant [Table 3]. In particular, nurses (75.4%) followed by physiotherapists (75%) and dental professionals (61.6%) were more likely to accept COVID-19 vaccination than medical (34.4%) and Ayurveda (28%) doctors [Table 4].

On running a binary logistic regression analysis, with three predictor independent variables, age groups, and educational background came out to be significantly associated with intention to accept vaccine [Table 5].

## DISCUSSION

Knowing that social distancing and quarantine may slow the spread of the virus and flatten the epidemic curve; it may not be sufficient to completely halt the spread of COVID-19, herd

**Table 3: Acceptance to corona virus disease-2019 vaccination among health professionals based on age groups (n=250)**

Question	Options	Health professionals, n (%)			P
		Group 1	Group 2	Group 3	
Do you think you would accept COVID-19 vaccination as soon as it is available	Completely agree	62 (35.4)	12 (8.2)	14 (46.6)	0.05*
	Somewhat agree	46 (26.2)	8 (17.7)	9 (30)	
	Neutral	29 (16.5)	11 (24.4)	3 (10)	
Do you think vaccination is the best way to avoid the complications of COVID-19	Somewhat disagree	31 (17.7)	12 (26.6)	4 (13.3)	0.03*
	Completely disagree	7 (4)	2 (4.4)	0	
	Completely agree	58 (33.1)	15 (33.3)	19 (63.3)	
Do you think COVID-19 vaccination would be safe from any side effects	Somewhat agree	63 (36)	14 (31.1)	2 (6.6)	0.11
	Neutral	29 (16.5)	7 (15.5)	6 (20)	
	Somewhat disagree	18 (10.2)	6 (13.3)	2 (6.6)	
What would be your most appropriate barrier to feel hesitant towards taking COVID-19 vaccine	Completely disagree	7 (4)	3 (6.6)	1 (3.3)	0.26
	Somewhat unsafe	16 (9.1)	2 (4.4)	7 (23.3)	
	Completely unsafe	50 (28.5)	17 (37.7)	11 (36.6)	
	Not hesitant at all	57 (32.5)	12 (26.6)	9 (30)	
	Rapidity in development of vaccine	50 (28.5)	13 (28.8)	3 (10)	
What would be your main reason for getting the vaccination	Side effects and genuineness of vaccine	2 (1.1)	1 (2.2)	0	0.69
	Vaccine convenience (method, storage, transport, competency of Immunization staff)	16 (9.1)	3 (6.6)	7 (23.3)	
	Already exposed to COVID-19 and not in the risk group	79 (45.1)	18 (40)	13 (43.3)	
	To protect ourselves against COVID-19	63 (36)	21 (46.6)	9 (30)	
	To protect others in the community against COVID-19	7 (4)	2 (4.4)	1 (3.3)	
What do you think it is preferable to continue taking the preventive measures over vaccination as of now	To stay safe to look after their family	10 (5.7)	1 (2.2)	0	0.31
	To stop the need of social distancing and other precautionary measures	22 (12.5)	6 (13.3)	3 (10)	
	All of the above	21 (12)	6 (13.3)	6 (20)	
	Completely agree	13 (7.4)	2 (4.4)	3 (10)	
	Completely disagree	1 (0.5)	0	1 (3.3)	
What do you think how long COVID vaccine would be effective to prevent infection	Completely agree	118 (67.4)	31 (68.8)	17 (56.6)	0.58
	Somewhat agree	100 (57.1)	21 (46.6)	17 (56.6)	
	Neutral	42 (24)	17 (37.7)	9 (30)	
	Somewhat disagree	21 (12)	4 (8.8)	2 (6.6)	
	Completely disagree	7 (4)	0	2 (6.6)	
What do you think how long COVID vaccine would be effective to prevent infection	6 months	5 (2.8)	3 (6.6)	0	0.58
	1 year	32 (18.2)	11 (24.4)	5 (16.6)	
	5 years	19 (10.8)	7 (15.5)	7 (23.3)	
	Life time	9 (5.1)	3 (6.6)	2 (6.6)	
	No idea	19 (10.8)	2 (4.4)	3 (10)	
		96 (54.8)	22 (48.8)	13 (43.3)	

Chisquare test; \* $P \leq 0.05$  (significant). COVID-19: Corona virus disease-2019

immunity gained by infection or vaccination will need to be well established within the population. The most effective way of controlling infectious diseases is often vaccination [6,7].

Acceptability of vaccination against COVID-19 among HPs is crucial because HPs can positively influence vaccination decisions of peers, patients, friends, and family. Studies have shown that there is a strong relationship between the knowledge and attitudes of health-care providers about vaccines and their vaccine recommendations for their patients [8]. Health workers who are hesitant about vaccination can somewhat weaken trust and have a strong impact on vaccine hesitancy in the general population [9].

Our study results showed 60.4% HPs expressed willingness to accept the vaccine as soon as it is available during the data collection period of survey (November-December 2020). Within 15 days of commencement of vaccination drive (January 16, 2021) in the hospital, majority of HPs (69.2%) who participated in the survey got vaccinated which shows

few HPs who were neutral earlier in response to get vaccine got their vaccination done too.

The results of our survey found to be similar with the CDC web survey of health-care providers [10]. Slightly more percentage has been found by Kose *et al.* where 68.6% of the health-care workers were willing to get the COVID-19 vaccine [11]. Similar results were found in studies done in Romania in which 69% agreed with the COVID-19 vaccine [12] and Beijing where 67.1% reported that they would get vaccinated [13].

Low acceptance of COVID-19 vaccine was reported among health workers in the USA, in Democratic republic of Congo, and Malta. In the USA only 36%, in Democratic Republic of Congo only 25% and Malta, only half of the respondents were willing to take the vaccine as soon as it became available [14,15].

In our study, among those who would accept vaccination, male respondents above 55 years of age were more likely



**Table 4: Acceptance to corona virus disease-2019 vaccination among health professionals based on educational background (n=250)**

Question	Options	Health professionals, n (%)					P
		Medical	Dental	Ayurveda	Nursing	Physiotherapy	
Do you think you would accept COVID-19 vaccination as soon as it is available	Completely agree	7 (24.1)	31 (31.3)	4 (16)	26 (49.05)	20 (45.4)	<0.001*
	Somewhat agree	3 (10.3)	30 (30.3)	3 (12)	14 (26.4)	13 (29.5)	
Do you think vaccination is the best way to avoid the complications of COVID-19	Neutral	10 (34.4)	13 (13.1)	4 (16)	7 (13.2)	9 (20.4)	<0.001*
	Somewhat disagree	9 (31)	23 (23.2)	10 (40)	4 (7.5)	1 (2.2)	
Do you think COVID-19 vaccination would be safe from any side effects	Completely disagree	0	2 (2.02)	4 (16)	2 (3.7)	1 (2.2)	<0.001*
	Completely agree	14 (48.2)	29 (29.2)	4 (16)	23 (43.3)	22 (50)	
What would be your most appropriate barrier to feel hesitant towards taking COVID-19 vaccine	Somewhat agree	2 (6.8)	42 (42.4)	4 (16)	20 (37.7)	11 (25)	0.02*
	Neutral	6 (20.6)	15 (15.1)	3 (12)	8 (15.09)	10 (22.7)	
What would be your main reason for getting the vaccination	Somewhat disagree	5 (17.2)	11 (11.1)	10 (40)	0	0	0.62
	Completely disagree	2 (6.8)	2 (2)	4 (16)	2 (3.7)	1 (2.2)	
What do you think it is preferable to continue taking the preventive measures over vaccination as of now	Completely safe	4 (13.7)	5 (5)	1 (4)	10 (18.8)	5 (11.3)	<0.001*
	Somewhat safe	8 (27.5)	30 (30.3)	5 (20)	23 (43.3)	12 (27.2)	
What do you think how long COVID Vaccine would be effective to prevent infection	Neutral	9 (31)	30 (30.3)	5 (20)	14 (26.4)	20 (45.4)	0.77
	Somewhat unsafe	8 (27.5)	34 (34.3)	12 (48)	6 (11.3)	6 (13.6)	
What do you think it is preferable to continue taking the preventive measures over vaccination as of now	Completely unsafe	0	0	2 (8)	0	1 (2.2)	0.11
	Not hesitant at all	5 (17.2)	5 (5)	1 (4)	10 (18.8)	5 (11.3)	
What do you think how long COVID Vaccine would be effective to prevent infection	Rapidity in development of vaccine	14 (48.2)	44 (44.4)	8 (32)	24 (45.2)	20 (45.4)	0.11
	Side effects and Genuineness of vaccine	8 (27.5)	44 (44.4)	14 (56)	13 (24.5)	14 (31.8)	
What do you think how long COVID Vaccine would be effective to prevent infection	Vaccine convenience (method, storage, transport, competency of Immunization staff)	2 (6.8)	4 (4)	1 (4)	0	3 (6.8)	0.11
	Already exposed to COVID-19 and not in the risk group	0	2 (2.02)	1 (4)	6 (11.3)	2 (4.5)	
What do you think how long COVID Vaccine would be effective to prevent infection	To protect ourselves against COVID-19	3 (10.3)	10 (10.1)	4 (16)	8 (15.09)	6 (13.6)	0.62
	To protect others in the community against COVID-19	2 (6.8)	10 (10.1)	2 (8)	8 (15.09)	11 (25)	
What do you think how long COVID Vaccine would be effective to prevent infection	To stay safe to look after their family	2 (6.8)	9 (9.09)	2 (8)	3 (5.6)	2 (4.5)	0.11
	To stop the need of social distancing and other precautionary measures	1 (3.4)	1 (1.01)	0	0	0	
What do you think how long COVID Vaccine would be effective to prevent infection	All of the above	21 (72.4)	69 (69.6)	17 (68)	34 (64.1)	25 (56.8)	0.11
	Completely agree	14 (48.2)	54 (54.5)	17 (68)	33 (62.2)	20 (45.4)	
What do you think how long COVID Vaccine would be effective to prevent infection	Somewhat agree	12 (41.3)	25 (25.2)	7 (28)	14 (26.4)	10 (22.7)	0.77
	Neutral	3 (10.3)	10 (10.1)	0	5 (9.4)	9 (20.4)	
What do you think how long COVID Vaccine would be effective to prevent infection	Somewhat disagree	0	4 (4.04)	1 (4)	0	4 (9.09)	0.77
	Completely disagree	0	6 (6.06)	0	1 (1.8)	1 (2.2)	
What do you think how long COVID Vaccine would be effective to prevent infection	6 months	8 (27.5)	19 (19.1)	6 (24)	7 (13.2)	8 (18.1)	0.77
	1 year	4 (13.7)	16 (16.1)	3 (12)	5 (9.4)	5 (11.3)	
What do you think how long COVID Vaccine would be effective to prevent infection	5 years	2 (6.8)	8 (8.08)	0	2 (3.7)	2 (4.5)	0.77
	Life time	2 (6.8)	11 (11.1)	1 (4)	7 (13.2)	3 (6.8)	
What do you think how long COVID Vaccine would be effective to prevent infection	No idea	13 (44.8)	45 (45.4)	15 (60)	32 (60.3)	26 (59.09)	0.77

Chisquare test; \*P≤0.05 (significant). COVID-19: Corona virus disease-2019

to accept COVID-19 vaccination as soon as possible. The significant factors influencing their vaccination acceptance were their risk perception, belief in vaccine efficacy, and safety. They also believed that COVID-19 vaccination was an effective way to avoid the complications of COVID-19.

In our study, nurses were more willing to take the vaccine than any other HP. In recent years, nurses were slightly more likely to take the influenza vaccine than the general population in Hong Kong [16-18]. Nurses perceived themselves to be at increased risk of being infected with the virus as they are more likely to be in close and prolonged patient contact, and thus they were willing to accept than refuse the vaccine [18].

In the present study, participants who were hesitant about the COVID-19 vaccine declared that their main barriers were that they were concerned about the rapidity in the development

of vaccine and lack the confidence in the genuineness of vaccine and its side effects. This result confirms previous studies that show health-care workers' concern about new vaccines [11]. More than half HPs had no idea about the duration of effectiveness of vaccine.

A major strength of our study is diverse with representation from different gender, age groups and role in health care. We recognize limitations of our study that in our study we have used Likert scale and many participants have a tendency to choose neutral option. Another possibility is that was conducted the study when India was at peak of COVID infection and now with very less number of cases reported vaccine acceptance and attitude toward COVID-19 vaccines might have changed. Along with that approaching all HPs working in same hospital due to convenience might have led to selection bias in the study.

**Table 5: Distribution of variables associated with intention to accept corona virus disease-2019 vaccination among health professionals (binary logistic regression analysis)**

Independent variable	Adjusted OR (95% CI)	P
Gender		
Males	1.15 (0.6-2.1)	0.66
Females	1 (reference)	
Age group (years)		
Group 1 (18-35)	4.1 (1.7-9.8)	0.001*
Group 2 (36-55)	1 (reference)	
Group 3 (>55)	7.7 (3.2-18.6)	<0.001*
Education background		
Medical	3.4 (1.4-8.2)	0.02*
Dental	6.2 (2.2-15.4)	0.001*
Ayurveda	1 (reference)	
Nursing	7.5 (3.1-17.6)	<0.001*
Physiotherapy	7.1 (2.8-16.9)	<0.001*

\* $P \leq 0.05$  statistically significant. OR: Odds ratio, CI: Confidence interval

## CONCLUSION

This survey reflected a moderate level of acceptability to COVID-19 vaccination among the health-care professionals. To maintain the benefits of vaccination programs and for its successful implementation, understanding and addressing the vaccine hesitancy and safety concerns is important. A strong recommendation from health-care personnel is one of the most influential factors to persuade the other population to become vaccinated and enhancing COVID-19 vaccine uptake.

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## Conflicts of interest

There are no conflicts of interest.

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