

Original research article

## COVID-19 Vaccination: The Extent of Knowledge and Perception in Health Care Workers of Rural Tertiary Health Center in India.

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### Abstract

**BACKGROUND:** Mass vaccination is a key preventive approach against COVID-19 pandemic and governments have prioritized health care workers (HCWs) for vaccination. HCWs are the frontline army of the COVID-19 pandemic and are at a high risk of infection. Some studies have documented that not the entire HCWS are ready to accept COVID-19 vaccines, when offered in their country. HCW acceptance or rejection, can influence the general population's perception towards COVID-19 vaccines. Thus the study was planned to determine the COVID-19 vaccine perception and to improve vaccine awareness among HCWS of Maharashtra, India

**MATERIAL AND METHODS:** This cross-sectional study was conducted among HCWS of Noor hospital from 1 June – 14 June 2021 through self-reported, structured questionnaire prepared from prior evidence from studies on vaccine perception among HCWS and general population.

**RESULTS:** Out of 392, 300 HCWS (response rate 76.53%) had completely filled the online survey questionnaire. In present study 87% of the participant were agreed to take COVID-19 vaccine and 13% were reluctant to take it. Acceptance for vaccine was more in doctors (94.80%) and nurses (89.92%) than pharmacist (80.76%) and laboratory technicians (75%).

**CONCLUSION:** Vaccine acceptance is more in doctors and nurses as compared to pharmacist and technical staff. Vaccine acceptance is influenced by academic level, exposure to infection in family and inadequate information regarding vaccine.

**KEY WORDS:** COVID-19 vaccination, health care workers

## Introduction

The novel coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was originated in Wuhan city, Hubei province, China In December 2019, Subsequently, the outbreak was declared as a COVID-19 pandemic by WHO on March 11, 2020, owing to the outrageous contagious spread of the infection.<sup>1</sup> Since 2 years world has fought the COVID-19 pandemic and creating havoc. Ever since the pandemic set off numerous solutions have been tested for controlling the pandemic globally and in India; government have imposed various measures and protocol to halt the COVID-19 pandemic such as quarantine of infective individuals, travel restriction , social distancing, nose mask wearing , lockdowns, and frequent hand washing with soap and water. However, it is acknowledged that such preventive measures were neither enough nor satisfactory to halt the spread of COVID-19, but both pharmacological and non-pharmacological measures were of limited benefits.<sup>2</sup>

Consequently with the rationale of slowing down the further progression in spread of COVID-19 infection and deaths associated; researchers and pharmaceutical companies had developed safe and effective vaccines. Mass vaccination has come into view as a key preventive approach against COVID-19.<sup>3</sup> Globally, numerous vaccines have been claimed effective and safe in favor of human use, these includes ;Pfizer, Oxford/AstraZeneca, Moderna, Janssen, Sputnik V, Sinovac, and Sinopharm .<sup>4-5</sup> Thus As a component of preventive strategy, government of india had launched COVID-19 vaccine from 16 January 2021.<sup>6</sup>

India has approved two vaccines – Covishield and Covaxin. Covishield is adenovirus vectored (ChAdOx1 nCoV-19 vaccine – AZD1222) manufactured by Serum Institute of India under license from Astra Zeneca.<sup>3,7</sup> Whilst the Covaxin is manufactured in India by Bharat Biotech in coalition with Indian Council of Medical Research. Covaxin is inactivated severe acute Respiratory syndrome-coronavirus-2 (SARS-CoV-2) vaccine (BBV152).<sup>7,8</sup>

In the first phase, governments have prioritized high-risk groups including health care workers (HCWs) for vaccination with either of the two vaccines. Since HCWs the frontline army of the COVID-19 pandemic response system are more vigorously exposed in a densely populated country and are thus at a high risk of contracting infection as they are directly involved in diagnosing, treating, and taking care of patients.<sup>9</sup>

However, the success of any immunization plan depends not only on sufficient and adequate availability of vaccine but also on high vaccine acceptance and uptake.<sup>10</sup> Indeed, some studies have documented that not the entire health care workers are ready to accept COVID-19 vaccines, when offered in their country.<sup>11-13</sup> For example, study conducted in Ghana showed that approximately 39% of HCWs in Ghana intended to receive the COVID-19 vaccines if available in the country.<sup>14</sup>

Since HCW acceptance or rejection, can influence the general population's perception towards COVID-19 vaccines as public commonly rely and trust the information provided by health care workers regarding vaccine. Thus HCWs play vital role in guiding and encouraging people in their decision making; For example, studies have found that counseling by HCWs regarding exclusive breastfeeding and complementary feeding had markedly influenced the attitude and practice of exclusive breastfeeding among mothers.<sup>15-16</sup>

With this background, this study was planned study to identify the perception of COVID-19 vaccine and its acceptance and hesitancy among HCWs in Maharashtra, India the findings of study might be helpful to researchers and government advocacy for designing, planning and programming appropriate interventions to augment vaccine acceptance among HCWs and general public as well.

### **Objectives of study**

1. To Determine the COVID-19 vaccine perception; acceptance, hesitancy, beliefs and barriers among health care workers of Maharashtra, India
2. To improve awareness among health care workers, educate and motivate the hesitant group to get vaccinated.

### **MATERIAL AND METHOD**

This cross-sectional study was conducted among health care workers of JIIU'S Indian Institute of Medical Science and Research and Noor hospital from 1 June – 14 June 2021. Being a descriptive survey, the sample size was calculated as per Cochran's formula which yielded a sample size of 384 individuals corresponding to the 50% prevalence, relative precision of 25% and alpha value of 5%. To avoid this inconvenience we take sample size + 10% drop out. Data tool utilized was a self-reported, structured questionnaire prepared using evidence from prior studies on vaccine perception among HCWs and general population<sup>17, 18</sup> Procedure and purpose of the study was informed and explained to participants and informed consent was taken for filling the online survey questionnaire.

Data was collected via an online Google forms through social media platform of what's app mainly. Students who completed the survey were not offered any financial or other kind of rewards. The identity and information of the participant was assured high confidentiality. The study was approved by institutional ethical committee.

### **DATA ANALYSIS**

Data through online Google forms was extracted, transferred and analyzed by using Microsoft excel. All the categorical variables (gender, professional year, vaccine acceptance etc) were described as frequencies and percentages. Chi square test was performed as test of significance with  $p \leq 0.05$  considered significance.

### **RESULTS:**

Out of 392, 300 health care workers (response rate 76.53%) had completely filled the online survey questionnaire. Maximum participants were from nursing staff they were 43% of the study population followed by doctors which were 25.67% of the participants. In present study male participants (57.33%) were more than female participants (42.66%). Similarly more participant were from urban population. Most of the participant had age between 26 to 50 years. In present study 87% of the participant were agreed to take the vaccine for COVID-19 and 13% were reluctant to take it. Acceptance was more in doctors and nurses than pharmacist and technicians. 78.16% participant in acceptant group and 58.97% participant in reluctant group experienced the symptoms of COVID-19. In acceptant group 83.90% participant and 79.69% of their family members tested positive for COVID-19. In reluctant group 53.84% participant and 51.28% of their family members tested positive for COVID-19.

**Table 1: Demographic profile of participant**

Variables		Number of participants n=300	Percentage
<b>Age (In years)</b>	18-20	12	4.33%
	21-25	29	9.66%
	26-30	66	21.66%
	30-35	78	26.33%
	36-40	63	20.66%
	>40	52	17.33%
<b>Gender</b>	Male	171	57.33%
	female	129	42.66%
<b>Category of Health care worker</b>	Doctors	77	25.67%
	Nurses	129	43%
	Pharmacist	26	8.66%
	Technicians	68	22.66%
<b>Residence</b>	Urban	177	56.33%
	Rural	123	43.66%

**Table 2: Academic wise acceptance among health care workers**

Sr. No	Academic level	Acceptance Level		P Value <sup>†</sup>
		Yes	No	
	Doctors	73 (94.80%)	4 (5.19%)	0.0021*
	Nurses	116 (89.92%)	13 (10.07%)	
	Pharmacist	21 (80.76%)	5 (19.23%)	
	Technicians	51 (75%)	17 (25%)	

(P value <0.05 considered significant; \*: statistically significant, †: using Fisher exact test)

**Table 3: Study Questionnaire along with responses**

Sr. No	Variables	Response	Acceptance level (300)		P value <sup>†</sup>
			Yes =261 (87%)	No =39 (13%)	
<b>1</b>	Did you ever experienced symptoms of COVID-19?	Yes	204 (78.16%)	23 (58.97%)	0.0151*
		No	57 (21.83%)	16 (41.02%)	
<b>2</b>	Did you tested positive for COVID-19?	Yes	219 (83.90%)	21 (53.84%)	0.0001*
		No	42 (16.09%)	18 (46.15%)	
<b>3</b>	Did your family members tested positive for COVID-19?	Yes	208 (79.69%)	20 (51.28%)	0.0004*
		No	53 (20.30%)	19 (48.72%)	
<b>4</b>	Do you think that you are at greater risk of COVID-19 infection than other people?	Yes	250 (95.78%)	31 (79.49%)	0.0010*
		No	11 (4.21%)	08 (20.51%)	
<b>5</b>	If you got a COVID-19 infection, do you think you will suffer from more serious symptoms than others?	Yes	244 (93.48%)	30 (76.92%)	0.0026*
		No	17 (6.51%)	09 (23.08%)	
<b>6</b>	Do you believe that the vaccine can stop the disease spread?	Yes	241 (92.33%)	22 (56.41%)	0.0001*
		No	20 (7.66%)	17 (43.59%)	

7	Do you think COVID-19 can be prevented by vaccination?	Yes	242 (92.72%)	22 (56.41%)	0.0001*
		No	19 (7.27%)	17 (43.59%)	
8	Do you think the COVID-19 vaccine is safe?	Yes	233 (89.27%)	21 (53.85%)	0.0001*
		No	28 (10.72%)	18 (46.15%)	
9	Do you think the COVID-19 vaccine is effective	Yes	247 (94.63%)	20 (51.28%)	0.0001*
		No	14 (5.36%)	19 (48.72%)	
10	Do you believe vaccination prevents COVID-19 related complications?	Yes	237 (90.80%)	21 (53.85%)	0.0001*
		No	24 (9.19%)	18 (46.15%)	
11	Do you think COVID-19 vaccine could help to reduce severe COVID-19 disease?	Yes	239 (91.57%)	22 (56.41%)	0.0001*
		No	22 (8.43%)	17 (43.59%)	
12	Would you like to get COVID-19 vaccination in government set up?	Yes	252 (96.55%)	15 (38.46%)	0.0001*
		No	09 (3.44%)	24 (61.54%)	
13	Will you advise your family members to get COVID-19 vaccination?	Yes	246 (94.25%)	13 (33.33%)	0.0001*
		No	15 (5.75%)	26 (66.67%)	
14	Will you take your children to get COVID-19 vaccination??	Yes	226 (86.59%)	12 (30.77%)	0.0001*
		No	35 (13.41%)	27 (69.23%)	
15	Do you believe that COVID-19 vaccine approved for license has been fully evaluated in clinical trials?	Yes	201 (77.01%)	17 (43.59%)	0.0001*
		No	60 (22.99%)	22 (56.41%)	

(P value <0.05 considered significant; \*: statistically significant, †: using Fisher exact test)

#### DISCUSSION:

In the present study, we estimated approach of health care worker with regards to COVID-19 vaccination in medical college of Maharashtra. The findings can be employed for projection of vaccination drive in future. In present study most of the participant (87%) were agreed to take the vaccine for COVID-19 and only some participant were reluctant to take it. Acceptance for vaccine was more in doctors (94.80%) and nurses (89.92%) than pharmacist (80.76%) and laboratory technicians (75%). It shows the importance of health education in the behavior of the participants.

In order to improve the acceptance for vaccination, these health care workers need further reassurance about vaccine. In the present study we observed that the hesitant groups were more concerned of vaccine's safety, efficacy and adverse reactions which result into vaccine refusal. Rational and realistic vaccine information must be passed on to them to improve the acceptance of vaccine.

Those participant agreed to take vaccination, majority of them (83.90%) or their family members (79.69%) were tested positive for COVID-19. They also thought that they were at higher risk of developing COVID-19 infection or serious complications related to it. In reluctant group 79.49% and 76.92% participants thought that they were at higher risk of COVID-19 infection or complications related to it.

Similar studies were performed in various parts of the world on the healthcare workers. The findings of these studies suggested that the acceptance rate of COVID-19 vaccine is different

in each country. Shaw et al<sup>11</sup> performed similar study in the United States and found that about 58% of health care workers had the intention to receive COVID-19 vaccines. Qattan et al<sup>19</sup> done similar study in healthcare workers of Saudi Arabia. In their study total 736 healthcare workers began the online questionnaire and 673 completed it (91.44% completion rate). Among the study participants, 50.52% were willing to have the COVID-19 vaccine, of which 49.71% intended to have the vaccine as soon as it becomes available in the country, while 50.29% would delay until the vaccine's safety is confirmed.

Wang et al<sup>20</sup> found that about 40% of nurses in Hong Kong had the intention to accepting the COVID-19 vaccine. In the multi-country study of Verger et al<sup>13</sup>, which also assessed health care workers' attitudes towards COVID-19 vaccination in France, Belgium, and Canada, it was found that approximately 40% of health care workers in Belgium (Wallonia and Brussels) were willing to vaccinate themselves if COVID-19 vaccines were available.

More than 92% of the participant in acceptant group were agreed on that vaccination could stop the spread of disease or prevent the individuals from infection. But in reluctant group around 56% were agreed. In acceptant group 94.63% and 89.27 participant believed that vaccine would effective and safe respectively. And 53.85% and 51.28% in reluctant group thought that vaccine would effective and safe respectively. More than 90% of the participant in acceptant group were agreed on that vaccination could reduce the disease severity and prevent the complications related to it. But in reluctant group around 53-56% participants had the similar response. In acceptant group 94.25% participant were agreed to take the vaccination for their families but their response reduce to 86.59% for their children's vaccination. In reluctant group only 33.33% participant were agreed to take the vaccination for their families but their response reduce to 30.77 for their children's vaccination. In acceptant group 77% participant believed that COVID-19 vaccines were fully evaluated in clinical trials before their approval.

In the study of Sou et al<sup>21</sup> they recruited total 8040 HCWs, 54.5% of the participant thought that they will get infected ( $P < 0.001$ ). 57.5% and 59.2% participants agreed on that they have greater risk of infection and will suffer from serious disease respectively. 67.6% participants confirmed that the COVID-19 can be prevented by vaccine and 61.3% and 62.5% of the responders thought that COVID-19 vaccine will be safe and effective respectively. 80% of the participants thought that vaccine is fully evaluated in clinical trials ( $P < 0.001$ ). 68.2% of the participant were agreed to advice the family members ( $P < 0.001$ ) and 61.9% participant were ready to give the vaccine to their children ( $P = 0.02$ ). In present study also the responses were similar to previous studies.<sup>21</sup>

## CONCLUSION

Vaccine acceptance is more in doctors and nurses as compared to pharmacist and technical staff. Vaccine acceptance is influenced by academic level, exposure to infection in family and inadequate information regarding vaccine. Evidence-based strategies should be used to encourage and motivate health care workers to improve the vaccine acceptance among them.

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