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Original Research Article

Perception and Practice on Different COVID-19 Vaccines and Precautionary Dose: A Study among Health Care Workers

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Abstract

Background: Health care workers (HCW's) belong to high-risk group and at the same time being the role model to the general population**.** Current study was undertaken to assess the general level of trust, acceptance and fear on different COVID-19 vaccines among them.

Materials and methods: An online questionnaire were distributed to all the HCW's through WhatsApp link between 1 March 2022 and 30 April 2022 to evaluate the perception and practices on different COVID 19 vaccines and precautionary dose using a snowball sampling method using self-designed structured questionnaire.

Results: A total of 434 HCWs participated, with doctors (38.5%) and nursing staff (44.30%) nursing students (9.50%), medical students (6%) and others (1.70%). 96% were vaccinated for both first and second dose with only 32.3% for precautionary dose. The main reason for not receiving second dose is that 30 were recently positive for COVID infection and 17 respondents were not convinced with study results. Only 2% took different vaccine for second dose due to non-availability of first vaccine, doubt regarding the efficacy of the vaccine, belief in taking two different vaccines for stronger immunity. Participants took different vaccine for precautionary dose due to non-availability of the vaccine (15.4%), belief in taking two different vaccines provides stronger immunity (76.9%) and shift of residence (7.7%).

Conclusion: Majority of the HCW's in our study have a modest acceptance towards second dose and precautionary dose. Institutions and other health care set up should scale up educational efforts to disseminate reliable information about different COVID vaccine and provide recommendations about receiving a vaccine booster to promote herd immunity.

Keywords: Health care workers (HCW's), Vaccines, COVID-19, Precautionary COVID vaccine, healthcare professionals

Introduction

Since March 2019 the coronavirus disease 2019 (COVID-19) pandemic has become a major global health issue affecting millions of world population [1]. It has become a threat to mankind. After initial setback, doctors and research scientist all over the world pitched into develop or discover a cure for COVID infection as well as to develop an effective vaccine against it. Many pharmaceutical companies succeeded in producing COVID 19 vaccines in a short time period and many of such vaccines were approved in different countries for emergency usage.

However, one of the major threats to the COVID-19 vaccines rollout and successful mitigation of the pandemic is vaccine hesitancy [2]. There are several factors influencing the reluctance to vaccination. Firstly, the speed at which the candidates were developed and approved within less

than one year has raised some public concerns over their safety. Secondly, the number of questions regarding the durability of the immune response following the vaccination and vaccines' effectiveness to limit the asymptomatic spread remained unanswered in the clinical trials [3]. Thirdly, the first COVID-19 vaccines' approval was counteracted with an enormous range of scientifically unsupported claims, spread and amplified using online social media, potentially deteriorating the willingness to vaccinate among various groups of individuals [4-8].

Since these vaccines were approved only for emergency usage, there were concerns regarding its safety and efficacy among medical fraternity as well as general public [9]. A few vaccines related side effects and fatalities were reported and many fully vaccinated people got infected with COIVD-19 doubting its efficacy. Different school of thoughts and opinions started prevailing over social media and till today there is no consensus among medical fraternity regarding best choice of vaccine. With a surge of third wave of COIVD -19 pandemic in December 2021, WHO in association with ICMR has advised for a precautionary booster dose starting with health care workers (HCW's), frontline workers (FLW's) and 60+ aged population with comorbidities after a gap of 9 months from second dose with same vaccine type as that of previous one [10]. This has created further confusion and anxiety among health care workers regarding efficacy and safety of different COIVD-19 vaccines and precautionary dose.

HCW's as one of the major high-risk populations and prioritized as one of the first groups to receive the vaccine as per recommendations by the Advisory Council on Immunization

Practices [11]. HCW are also important sources of medical information and role modelling for the general population. Hence, we have undertaken a study to understand the perception and practice of health care workers about different COVID-19 vaccines and precautionary dose.

Aims and objectives

- To study the perception and practice of Health care workers on different COVID vaccines
- To study the perception of Health care workers on precautionary COVID vaccine
- To assess the vaccine hesitancy among HCW's towards precautionary COVID vaccine

Methodology

Study centre: BGS Global Institute of Medical Sciences, Kengeri, Bangalore

Study design: Cross sectional study

After the approval of Institutional ethics committee and explaining the purpose of the study, study participants were given a set of anonymous, self-designed, and structured online questionnaire modified and approved by colleagues in the Department of Pharmacology, BGS Global Institute of Medical Sciences, Bengaluru. Questionnaire were sent through a link to their WhatsApp or email to the health care workers in BGS GIMS and subsequently shared by other fellow colleagues, friends and other Health care workers of different medical institutions and Hospitals leading to snowball effect. The duration of the study was two months from 1st March 2022 to 30th April 2022.

Specifically, the questionnaire employed in the study aimed to assess:

- The general level of trust in vaccines
- The level of acceptance of the COVID-19 vaccines already approved and in use in India during the time of the study
- The level of fear prior to the vaccination against COVID-19 and primary reasons behind this fear
- The primary reasons behind the willingness to vaccinate against COVID-19

- The primary sources of information on the COVID-19 vaccines in the surveyed group.
- The level of acceptance or hesitancy for precautionary COVID vaccine

Inclusion criteria: Doctors, Nurses, Pharmacists and Community health workers

Exclusion criteria: Health care workers who are not willing to enroll in the study

Data Analysis

The data will be entered in Microsoft excel and analysed by using statistical software and descriptive statistics will be done and significance test will be conducted to test the perception and practice of different vaccines and precautionary dose. P <0.05 will be considered statistically significant.

Results

Out of 434 participants 64.3% were among 18-28yrs, 22.6% were among 29-38yrs, 10.1% were among 39-48yrs and 3% were more than 48yrs old. Females (72.6%) were enrolled in majority compared to males (27.4%). By profession doctors (38.5%) and nursing staff (44.30%) responded well followed by nursing (9.50%) and medical students (6%) and others (1.70%). Many participants were from private medical college (80.6%) followed by corporate hospital (12.9%) and government medical college (6%). Only 3.8% of the participants were suffering comorbidities like diabetes, asthma, peripheral vascular disease and renal disease.

A total of 36.9% of the participants have been previously tested RTPCR positive for COVID-19 infection. Among these 29.52% of the participants were infected once, 6.64% twice and 0.7% three. 74% of the participants were infected in wave 1 and commonly experienced symptoms include fever, cough, throat pain, loss of taste, loss of smell, fatigue and only one patient had conjunctivitis. In wave 2, 72% of patients were experienced fever, cough, headache, myalgia, throat pain, loss of smell, fatigue, loss of taste and to a lesser extent diarrhoea and one patient had dyspnoea, whereas 57% of the participants were infected in wave 3 developed symptoms like fever, headache, cough, myalgia, throat pain, fatigue and to a lesser extent loss of taste and smell and one patient had loss of speech and chest pain.

In wave 1, 85.1% of participants were suffering from mild degree of COVID infection and 14.9% of moderate degree. In wave 2, 86.1% of the participants were having mild degree, 11.1% with moderate degree and 2.8% of severe degree COVID infection. Whereas in wave 3, 87.7% of the participants were having mild degree and 12.3% of moderate degree COVID infection.

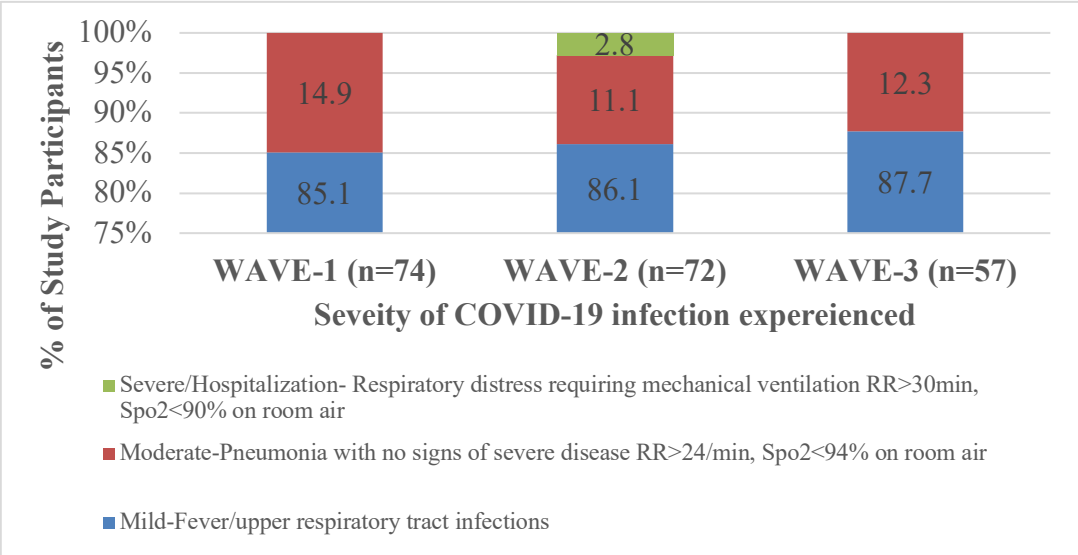

Figure 1: Percentage of degree of severity of COVID 19 infection

A total 97.7% of the participants were vaccinated for COVID 19 infection in our study. Single most factor which promoted to take COVID 19 vaccine include belief in the efficacy of the vaccine (69.6%), fear of COVID infection (22.9%), undue pressure from the Govt authorities (3.5%), peer pressure (1.9%) and mandatory rules made by college to attend classes (0.5%), Compulsory for Health care Workers (0.5%), to protect themselves and family (0.5%), for a secure society (0.5%).

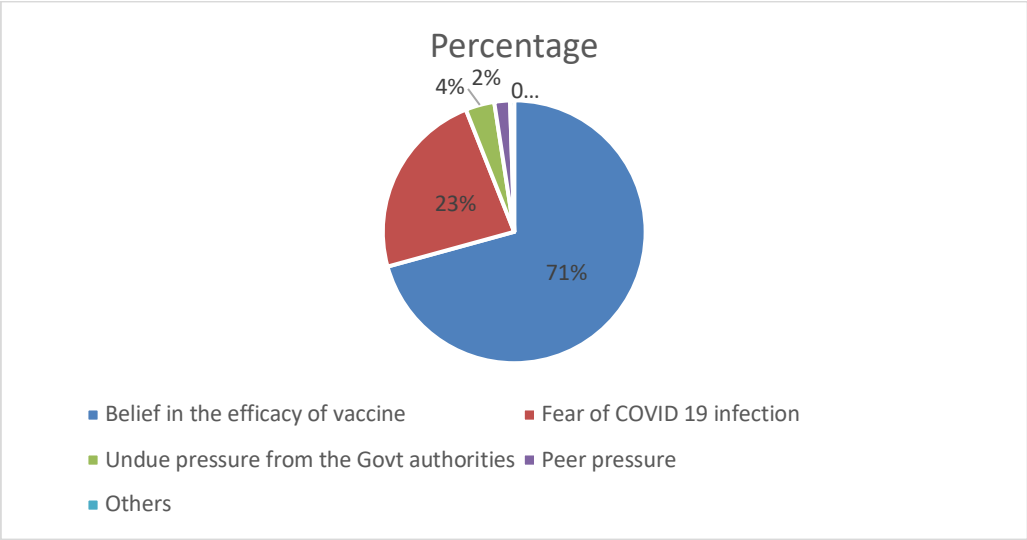

Figure 2: Single most factor which promoted to take COVID 19 vaccine

Reasons for not taking the vaccine for COVID 19 infection include emergency approval and uncertainty of the safety (1), doubt in the safety and efficacy of vaccine (1), fear of tolerable adverse effects (1), distrust on Government authorities (1), presence of COVID-19 infection at the time of vaccination (1). In our study 424(100%) participants have received first dose, 410(96.7%) participants have received second dose and 137 participants (32.3%) have received the precautionary dose. Among vaccinated individuals 88% of them have received Covishield and 12% of them have received Covaxin for first dose. For second dose 85.1% of them received Covishield and 11.5% of them received Covaxin. 86.9% of them received Covishield and 12.4% of them received Covaxin and 0.07% received Pfizer as precautionary dose.

Table 1: COVID 19 vaccination profile

COVID-19 Vaccinated Profile	**First Dose**		**Second Dose**		**Precautionary Dose**	
Received COVID-19 vaccine	**n**	**%**	**n**	**%**	**n**	**%**
Yes	424	100.0	410	96.7	137	32.3
No	0	0.0	14	3.3	287	67.7
Type of Vaccine received						
Covishield	373	87.9	361	85.1	119	86.9
Covaxin	51	12.0	49	11.5	17	12.4
Pfizer	0	0.0	0	0.0	1	0.7
Experienced adverse effect following COVID-19 vaccine						
Yes	153	36.1	80	19.5	24	17.5
No	271	63.9	330	80.5	113	82.5

The reasons for not taking the second dose vaccines include nonavailability of the vaccine (4), recent vaccination of first dose (3), recent COVID 19 infection (1), out of station during the time of vaccination (1), fear of adverse effects (1), long term side effects (2), due to emergency of approval and uncertainty of the safety (1) and doubt in safety and efficacy of vaccine (1).

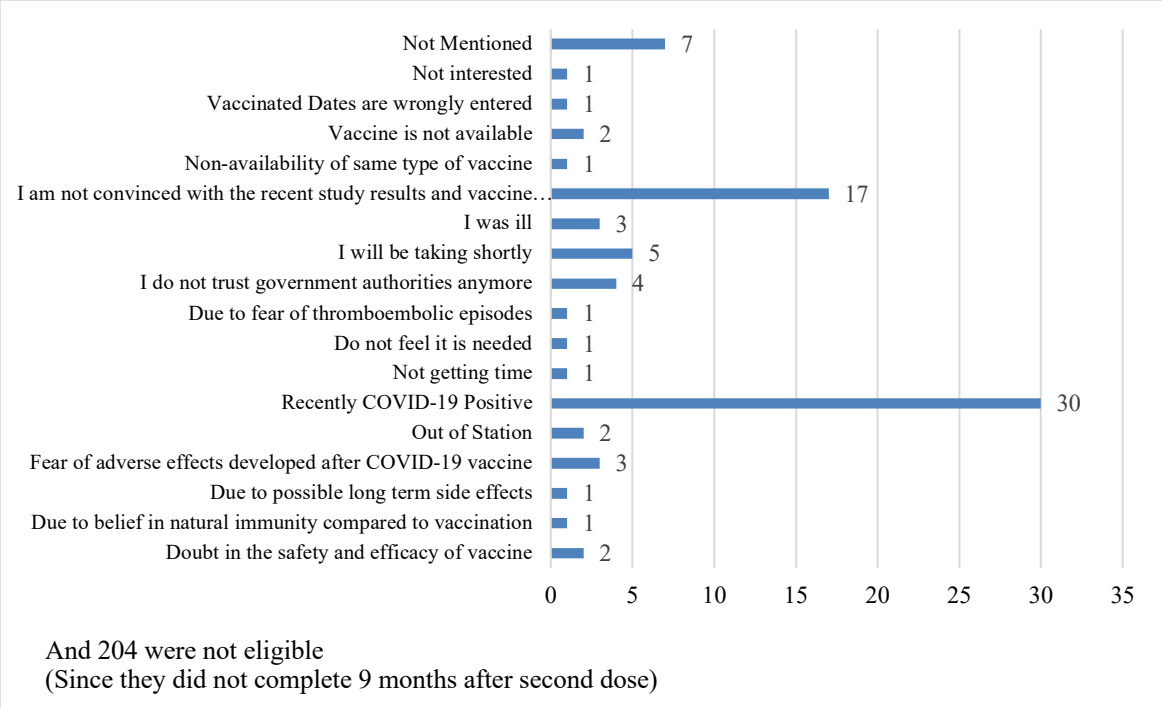

Figure 3: Reasons for not taking COVID 19 vaccine

Most of them (98%) received same vaccine type for both first and second dose. Only 2% took different vaccine for second dose due to non-availability of first vaccine (62.5%), doubt regarding the efficacy of the vaccine (12.5%), belief in taking two different vaccines for stronger immunity (25%). Participants took different vaccine for precautionary dose due to non-availability of the vaccine (15.4%), belief in taking two different vaccines provides stronger immunity (76.9%) and shift of residence (7.7%).

Table 2: Reason for receiving different vaccine as second dose

Parameter	**Second Dose**		**Precautionary Dose**	
Did you receive same vaccine for next dose	n(410)	%	n(137)	**%**
Yes	402	98.0	124	90.5
No	8	2.0	13	9.5
The reason for receiving different vaccine as second dose	n(8)	%	n(13)	**%**
Because of non-availability of first vaccine	5	62.5	2	15.4
Doubt regarding the efficacy of first vaccine	1	12.5	-	-
Belief in taking two different vaccines for stronger immunity	2	25.0	10	76.9
Shifted place of residence	-	-	1	7.7

Majority of the patients experienced fever (13.3%), pain at the injection site (19.5%) and headache (15.5%) in first dose and some with throat pain (2.8%), giddiness (3%)), rashes (1.1%), myalgia (1.1%) and vomiting (0.2%). In second dose again most of them experienced fever (12.6%), pain at the injection site (11.2%), headache (7%) and with few cases of giddiness

(4.2%), sore throat (1.2%), skin rashes (0.2%), myalgia (0.2%) and only 1 case of conjunctivitis with rhinorrhoea (0.2%) is seen. In patients with precautionary dose only 13% of them experienced fever, (7.2%) pain at the injection site, (4.3%) headache, (2.1%) sore throat and (0.7%) myalgia.

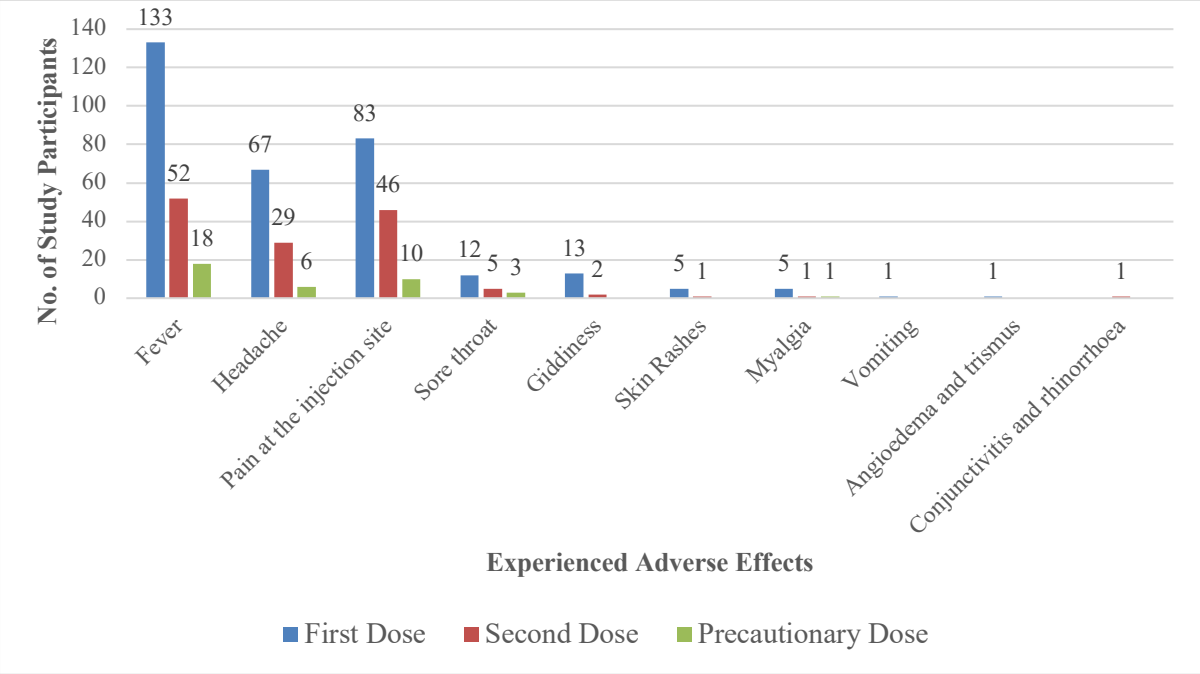

Figure 4: Adverse effects experienced following COVID 19 vaccinations

95% of the participants acknowledge that they will attend the social gathering with mask and social distancing. 35.4% would like to attend the CME's online only, 59.2% offline with mask and social distancing and 5.4% without mask and social distancing. 98.8% of participants have used mask whenever attending patients,71.9% have refrained from shaking their hands and 96.5% still practices hand sanitization measures. Among clinicians 96.7% recommend to take COVID 19 vaccination to their patients and family members who are eligible. 89.4% of them recommend same precautionary dose as that of previous two doses. About 60.8% still recommend to take an alternative COVID-19 vaccine brand if same vaccine type of previous dose is not available.

Discussion

The perceptions, attitude and practice of HCW's significantly affect public interest in accepting the vaccination. The purpose of this study is to convey health authorities and public health professionals regarding the current status of COVID-19 vaccination in part of the Bengaluru, India. While most of our study respondents (72.6%) were female, this is in line with other studies that showed a predominance of the female frontline COVID-19 HCWs [12-14]. About 36.9% of the participants have been previously tested RTPCR positive for

COVID 19 infection in this study which is in par with the study done by Alhasan K *et al*, where 23 % of them were previously positive for COVID 19. In our study 36.9% of the participants

have been previously tested positive for COVID 19 infection, out of these 29.52% were infected once, 6.64% twice and 0.7% thrice. Participants who were infected twice were partially vaccinated with only first dose of COVID 19 vaccine and half of the participants who infected thrice have not received both second dose and booster dose. This finding suggests that vaccination provides improved neutralization of SARS-

CoV-2 variants and also full vaccination is associated with reduced likelihood of reinfection, and, conversely, being unvaccinated is associated with higher likelihood of being reinfected [15]. Most of the patients experienced fever, cough, throat pain, loss of taste, loss of smell, fatigue, headache and to a lesser extent diarrhoea in all waves with mild to moderate degree of severity, except in second wave some participants were of severe degree (2.8%) with hospitalization. These results are in par with the results of the study done by Li M *et al* [16]. which suggests less incidence of pneumonia and hospitalization in participants who have received 2 doses of vaccination or with booster doses.

In our study the acceptance towards COVID 19 vaccination is 97% which is similar to a study done by Alhasan K *et al* [12]. where 99% were vaccinated. This shows positive attitude of participants towards preventive measures. The main reason for willingness in our study is belief in the efficacy of the vaccine (69.6%) and fear of COVID infection (22.9%) which is similar to many studies [17-20]. This gives a good message from healthcare professionals to the community regarding vaccine acceptance. In our study only a countable number of participants were reluctant to receive vaccine due to emergency approval, fear of tolerable adverse effects, distrust on Government authorities, presence of COVID-19 infection at the time of vaccination which is in contrary to other studies where 22.7% of the health care workers were reluctant and hesitant to receive COVID 19 vaccine worldwide [21,22].

An appreciative response can be seen in this study with a vaccine acceptance of 96% for both first and second vaccine, which is similar to a study done by Bassi S *et al* [23]. where 93% of the participants have received both doses of COVID vaccines. But eventually the willingness and acceptance towards the precautionary COVID 19 vaccine was declined to 32.3% which is contrast to a study which shows 84% of the individuals received precautionary dose [24]. Reason behind not receiving precautionary dose include not satisfied with study results and were positive for COVID 19 infection recently, this shows adequate knowledge among health care professionals regarding COVID 19 vaccines. Whereas the reasons in other studies include fear of short- and long-term adverse reactions like fever, myalgia, arthralgia, deep vein thrombosis and thromboembolic episodes [25,26].

Only 2% of the participants for second dose and 76.9% of the participants took different vaccine compared to first dose as they believed mixing two different vaccine type would improve vaccine efficacy and immunity. Several studies have shown that mixing vaccines of different platforms can result in higher IgG and neutralizing antibodies as well as stronger cellular immune response [27-29].

As of May 18, India had reported more than 26·4 million confirmed cases and over 274 000 deaths from COVID-19. During second wave of COVID 19 pandemic there was a surge of COVID infections and simultaneously awareness regarding vaccine efficacy was seen among Indian population, hence there was a huge crisis and scarcity of medicines and vaccines[30]. In our study almost 65% of the participants received different vaccine for second dose and 15.4% for precautionary dose due to non-availability of the vaccine.

Most of the respondents were found to have tolerable adverse effects like fever, headache and pain at the injection site which lasted for 24 hrs post vaccination and were self-medicated. The results of our study were consistent with finding of a study by Sharma A *et al* [31,32]. who concluded that most of the healthcare professionals who took the vaccine reported mild and short-lived post-vaccination symptoms.

Most of the respondents were having positive response towards wearing a mask

at conference, classes, during practice, social gatherings and practice sanitization procedure. Health care workers in our study are emphasizing on practicing hand sanitization procedures and recommending their patients to receive COVID 19 vaccines in the future. Since there is a decline in uptake of second dose of COVID vaccine, especially precautionary dose, more awareness programme has to be inculcated in each medical institutions to curb the pandemic, protect against severe disease and drive herd immunity [33].

Some of the healthcare workers in our study advise patients to take different COVID vaccine as second dose or as precautionary dose, which is not beneficial. According to CDC if you received Pfizer-BioNTech, Moderna, or Novavax for the first dose of your primary series, you should get the same product for the 2nd dose in the primary series. People who are moderately or severely immunocompromised and receive a 3-dose primary series should also get the same vaccine brand for all 3 doses [34]. This coincides with a study done by Similar study done Shaw R H *et al* where people who received the mRNA vaccine just 4 weeks after AstraZeneca's suffered significantly more side effects than those who received two doses of the same vaccine [35]. Whereas other similar study says heterologous immunisation regimen with 10–12-week vaccine intervals is well tolerated and slightly more immunogenic compared to homologous vaccination with three-week vaccine intervals [36]. These study results may concern the health care workers to recommend COVID vaccine to the patients and general public.

Health care professionals being a role should conduct more programmes and activities and spread the reliable information regarding COVID 19 vaccination to the general public thereby promote vaccination and herd immunity [37,38].

Limitations

As we utilized snowball sampling, our study population may not be representative of all HCW in India, which limits the generalizability of our findings. Social desirability bias may also affect the interpretation of our study, although the responses were anonymized to minimize this factor.

Conclusion

The study assessed the general trust and acceptance of COVID 19 vaccines among HCW's population. The results appear to support that vaccinated people are less likely to harbour the COVID 19 infection or with less degree of infections which is ideal for increasing general awareness of vaccines. The study also showed the positive attitude in informing the general public regarding wearing mask in crowded area, practice hand sanitization measures and recommend to take vaccine of same type. Each Medical Institution/ Health care set up should conduct activities continuously pursued in various world regions to address vaccine hesitancy, tackle the false claims, and promote acceptance of CVOID 19 vaccination.

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