Knowledge, Attitude and Perception among CoWin Registered Healthcare Professionals towards COVID -19 Vaccines in Southern India

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ABSTRACT

The world free of COVID 19 is the earliest covet yet requires constant effort to accomplish. There are massive vaccination drives across the globe to control the pandemic. Awareness towards vaccination program was meant for promoting the general public to administer the nationally available vaccines. The main aim of the study was to gain knowledge and feedback from the healthcare team on the COVID 19 vaccination program and to educate and counsel the participants on the essentiality of immunization. Methods: A prospective observational study conducted by means of a validated structured questionnaire. The survey tool composed of total 23 closed ended questions divided into four sections i.e., socio-demographic, knowledge, attitude, and perception. Excluding the dropouts during the survey, we obtained 568 respondents willing to participate and were directly interviewed. Among the respondents, 97.4% had good knowledge and 78.7% had a positive attitude towards COVID 19 vaccination. Medical professions were with supreme knowledge ($\chi2$=13.411, p value= 0.001); however, the positive attitude ($\chi2$=5.376, p value = 0.02) was much more among supporting staffs of the hospital. The participants aged between 35 to 49 years had appreciable awareness ($\chi2$=8.022, p value =0.018) and were optimistic ($\chi2$=12.523, p value = 0.002) towards the immunization program. The confidence of health workers on the efficacy and safety of vaccines can exclusively benefit the immunization campaign.

INTRODUCTION

The new strain of Corona virus SARS-CoV 2 (COVID-19) infection isa super spreader that imparts health and economic threat for many countries. The World Health Organization (WHO) proclaimed the COVID-19 outbreak as a pandemic on March 2020,calling to take immediate actions against the spread of the virus. It reached more than 35 million and has caused more than 1 million mortalities, particularly among high risk population, especially smokers, patients with diabetes, cancer, chronic kidney disease, heart disorder, and those with excess weight [1]. Countries and territories around the world have enforced lockdowns of varying stringency. Beginning with the first lockdown in China in January 2020 followed by several other countries like Spain, Iran, Italy, Denmark, Nepal, Germany, UK and still continuing in many. About ten millions of people are at risk of falling into extreme poverty due to lockdown.

Transmission is more fatal than the virulence of the infection; hence, the adoption of prophylactic strategies is essential. There are limitation concerning wearing single, double masks and usage of topical sterilization agents. One of the strategies to overcome this situation was developing and administering vaccines with proven efficacy and safety [2]. There were variable responses in the level of acceptance, students in a Chinese college had adopted the vaccines but a set of the population in Greece portrayed the least satisfaction towards it [3-4].

Multiple researches are being carried out to generate the globe free of COVID 19. The authorized categories of vaccines currently under considerations are Pfizer- BioNTechCovid -19, Moderna'sCovid -19 and Covishield, Janssen's Covid-19, Novavax's Covid-19, Bharat Biotech's COVAXIN and Zydus Cadilla'sZyCov-D [5]

India has already launched an extensive coronavirus

vaccination drive utilizing two vaccines; Covishield and Covaxin. They are locally developed vaccine that got emergency approval to use in the context of infection by mutant strains. Covishield was developed by Oxford University and manufactured by the Serum Institute of India. The course of the vaccine is extended over two doses, the second dose should be taken between 28 days to 42 days after the first dose and former guideline for the booster dose was revised recently and the gap of 12-16 weeks from 6-8 weeks is recommended as per directives of Union Government [6].Meanwhile, Covaxin is an indigenous vaccine erupted by Bharat Biotech in alliance with the Indian Council of Medical Research.

The government employed the vast immunization programme in order to shut down the rapid spread of the infection.Initially, health care workers were vaccinated in the first phase and are currently extended over to the general population. Vaccination against COVID-19 is voluntary in most of countries so, in order to implement the most effective vaccination strategy, we need to assess the knowledge, attitude and perceptions of health care workers towards COVID 19 vaccination. Itis essential for the government and policy makers to update regarding the barriers to vaccine distribution in such a scenario. There is no research conducted in this aspect among the southern Indian population. The main objectives of this study were to gain knowledge and feedback of the healthcare team on the COVID 19 vaccination program and to provide education and counseling to the participants on the essentiality of immunization in this current pandemic.

MATERIALS AND METHODS

A prospective observational study was conducted in KIMS Al Shifa Hospital for 4 months (January 2021 to April 2021) to assess apprehensions and initiate awareness among healthcare personnel towards COVID-19 vaccine in southern India.The study was approved by Institutional Ethics Committee with letter No. KAS:ADM:IEC:0205:21. The sample size was calculated by using the formula:-

$$N = \frac{Z^2_{\alpha/2} \times P \times (1- P) \times D}{E^2}$$

Where, Z α/2 = Normal deviate for two tailed hypothesis, D=precision, P= anticipated proportion., E = Margin of errorProvide sufficient detail to allow the work to be reproduced. Methods already published should be indicated by a reference: only relevant modifications should be described. (Times New Roman- 8.5) Number all the equations and mention them in the text as follows:

Conduct of study

Informed consent was obtained from each participant with an affirmation of confidentiality prior to their enrollment into the survey. Respondents were given the right to refuse to continue the survey at any point. Participation in the survey was made voluntary, without any form of compulsion. All data were stored in a protected file with access to information limited only to the researchers in charge of the survey. The study was conducted in compliance with the World Medical Association Declaration of Helsinki. The questionnaire used in this study was coined upon literature review, discussion within the research team, and prior modification from experts in the survey for face validity. This work was homogeneous to a study proposed by Michel Kabamba.

et al, which aimed to estimate the acceptability of COVID-19 vaccine among healthcare workers[7].

All the healthcare personnel who consented to participate and had registered in the Government's CoWin portal for vaccination were eligible for this study. Furthermore, each participant had to be above 18 years of age as WHO does not recommend vaccine below this age; should be in good general health and not previously diagnosed with COVID -19 in the past two months, were enrolled. The exclusion criteria included pregnant or lactating (limited efficacy evidences), allergic to a penicillin antibiotic.

The COVID -19 vaccine drive was initiated for administration throughout India on 16th January 2021. Accordingly, 602 respondents were selected for our study. Of these, 568 respondents completed the entire survey, whereas, 34 participants dropped out, as they were unwilling to proceed due to lack of time. The subjects recruited were interviewed face to face, questions were asked and their information was documented.

Questionnaire

A structured questionnaire containing informed consent along and four sections i.e., Participants' sociodemographic details, knowledge, attitude, the perception, was developed for data (Fig 1). There were 23 total closed-ended questions, which included 10 questions for knowledge, 6 questions for attitude and 7 questions for perception. Cronbach's alpha coefficient established reliability of the questionnaire and it was 0.754 for knowledge questions, 0.706 for attitude questions and 0.755 for perception questions, suggesting a good internal consistency.

Participants were asked to respond to series of questions about the COVID 19 vaccine trial which includes: identifying the name of the vaccine being administered, the number of doses, when is the second dose scheduled, antibody production after the second dose, signs and symptoms, risk factors and preventive measures of COVID-19, approach towards wearing a mask after vaccination, options available other than a vaccine to prevent COVID-19, vaccine development to curb the pandemic, site for vaccination trial, and whether the vaccine is safe for subjects with co-morbidities like hypertension, diabetes mellitus. We had also enquired whether they were prior infected or had been in contact with COVID-19 patients. The questionnaire survey took about 8-10 minutes to be completed.

Statistical Analysis

The knowledge questions had two possible responses, the correct answer was coded as 1, while the wrong and "Don't know" where coded as 0. The total score was obtained by summating the raw scores of 10 questions, with the higher score indicating the greater level of knowledge towards COVID-19 vaccinations. The attitude towards COVID-19 vaccine was measured through a set of 6 questions, whereas the participants' perceptions were inferred with 7 questions, and the responses of each item was indicated on a three- point likert scale (i.e., 1 = No, 2= Maybe, and 3 = Yes). The total score was calculated by summating the raw scores, with an overall high score indicating more positive attitudes and perception towards the COVID-19 vaccine.The collected information was coined to frequency and percentage. Data analysis was performed by using the SPSS software version 26.0. The Inferential Statistics, Chi-square test was used to find the association between the variables. p-value < 0.05 was considered as significant

RESULTS

In total of 568 respondents recruited in the survey, 58.3% (n= 331) were female and 41.7% (n=237) were males. Health care workers and supporting staffs constituted 64.6% (n=367) and 35.4% (n=201), respectively. The mean age of participants was 39.55 years (SD = 11.250).

Among the respondents, 97.4% (n=553) had good knowledge of COVID 19 vaccines whereas it was average among 15 participants (Figure 1). A major proportion (86.3%, n=490) were aware of the vaccine name administered and 86.6% (n=78) knew when the second dose was scheduled. Enquiring about their contact with COVID 19 patients, 86.6%(n=492) responded it as "No". On assessing the knowledge regarding signs and

Table 1 : Respondent's knowledge, attitude and perception towards COVID vaccines.

Knowledge			Attitude			Perception		
Questions	R	F (%)	Questions	R	F (%)	Questions	R	F (%)
My willingness to get vaccinated is my own decision	Wrong Answer	78(13.7)	My willingness to get vaccinated is my own decision	No	28(4.9)	Is it necessary to continue wearing mask during and after vaccination?	No	9(1.6)
	Correct Answer	490(86.3)		Maybe	29(5.1)		Maybe	25(4.4)
When is the second dose scheduled ?	Wrong Answer	76(13.4)		Yes	511(90)		Yes	534(94)
	Correct Answer	492(86.6)	If you came to know COVID 19 vaccine can affect your daily life activities(Post vaccination),will you still make yourself available for it?	No	72(12.7)	Do you believe that there are options available other than vaccines to prevent COVID 19?	No	217(38.2)
Have you been in contact with any COVID 19 patients?	Wrong Answer	325(57.2)		Maybe	28(4.9)		Maybe	52(9.2)
	Correct Answer	243(42.8)		Yes	468(82.4)		Yes	299(52.6)
Are you aware of the COVID 19 signs and symptoms?	Wrong Answer	14(2.5)	I do worry about the unforeseen impacts and ineffectiveness of COVID 19 vaccine ?	No	143(25.2)	Do you think development of vaccine could be beneficial to curb the pandemic?	No	205(36.1)
	Correct Answer	554(97.5)		Maybe	41(7.2)		Maybe	43(7.6)
Are you aware of the risk factors and preventive measures for COVID 19?	Wrong Answer	34(6)		Yes	384(67.6)		Yes	320(56.3)
	Correct Answer	534(94)	Are you confident that the vaccine in India is in par with international vaccines available?	No	55(9.7)	Do you think the vaccine developed within short span are effective?	No	36(6.3)
Are you aware of the number of doses of vaccine administered?	Wrong Answer	17(3)		Maybe	43(7.6)		Maybe	94(16.5)
	Correct Answer	551(97)		Yes	470(82.7)		Yes	438(77.1)
Are you aware that the antibody production takes place 2 weeks after the second dose ?	Wrong Answer	130(22.9)	Do you think The Government of India will make the vaccine available to all the citizens for free?	No	127(22.4)	Do you think the COVID-19 vaccine will be provided to all the individuals within a short period of time?	No	99(17.4)
	Correct Answer	438(77.1)		Maybe	79(13.9)		Maybe	87(15.3)
Do you think it is possible for post COVID patients to get vaccinated?	Wrong Answer	71(12.5)		Yes	362(63.7)		Yes	382(67.3)
	Correct Answer	497(87.5)	Do you prefer natural immunity over vaccination?	No	175(30.8)	The vaccinations programme should be conducted only under the supervision of health staffs?	No	25(4.4)
If yes, when should the patients tested positive get vaccinated?	Wrong Answer	95(16.7)		Maybe	29(5.1)		Maybe	3(0.5)
	Correct Answer	473(83.3)		Yes	364(64.1)		Yes	540(95.1)
Do you think is it compulsory to take the vaccine?	Wrong Answer	180(31.7)				Is it safe for patients with comorbidities like HTN, cancer, DM to be vaccinated?	No	60(10.6)
	Correct Answer	388(66.3)					Maybe	27(4.8)
							Yes	481(84.7)

R= Response, F= frequency

symptoms, risk factors and preventive measures of COVID-19, a major proportion were aware of it. 97% (n=551) of them had the information on the number of shots. When they were asked about antibody production, 77.1% (n=438) responded with the correct answer. There were 12.5% (n=71) participants who did not know whether post COVID patients can be vaccinated. 68.3% (n=388) of respondents suggested that everyone should take vaccine compulsorily and 31.7% (n=180) said it depends on each individual's interest. The distribution of each of the knowledge, attitude and perception items towards the COVID-19 vaccine are presented in Table 1.

A higher proportion of respondents (78.7%, n= 447) had good attitude (score>14) towards COVID 19 vaccination. A large

subjects (90%, n= 551) had decided themselves to get immunized and 82.4% (n=468) were optimistic regarding their second dose. The worries on the unforeseen impact and the ineffectiveness had influenced 67.6% (n=384) of the participants. Furthermore, 82.7% (n=470) were confident that the vaccine produced in India is of international standards.

63.7% (n=362) of the population in our study desires the Indian Central Government would initiate immunization subsidies, especially for the citizen.

Many interviewees (94%, n=534) agreed to continue wearing mask even after vaccination. Also, 36.1% (n=205) of the total participants believed that the vaccine could not curb the pandemic. Moreover, 52.6% (n=299) were surfing for alternative
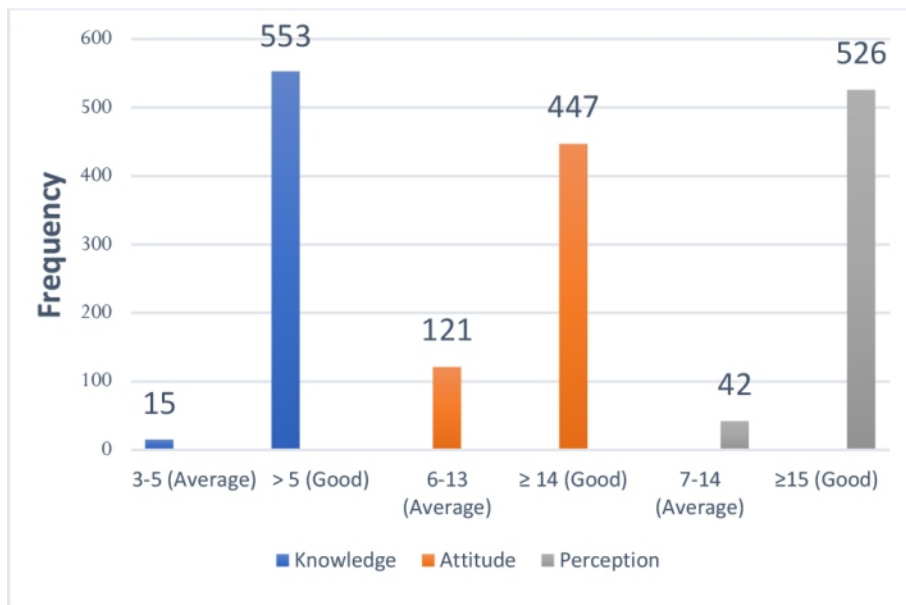

Fig 1: Respondents' knowledge, perception and attitude towards COVID-19 vaccine.
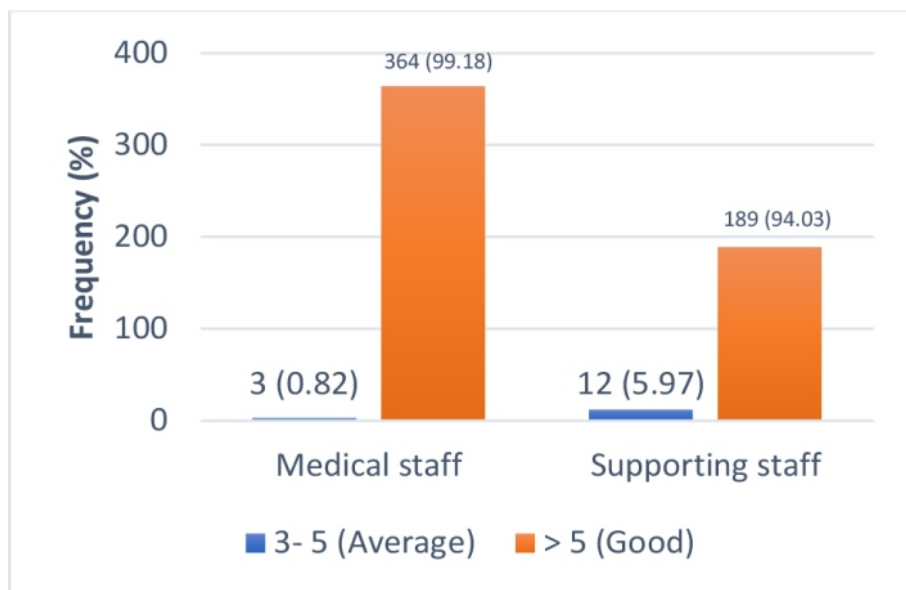

Fig 2: A bar chart showing the distribution of knowledge based on occupation status of the respondents.

remedies and strategies for getting rid of COVID-19. Despite the short span of the vaccine development, there was no hesitance among 77.1% (n=438) for the dose. A vast majority (95.1%, n=540) want health care employees to supervise COVID 19 vaccination program. There were 67.3% (n=382) of the participants who thought that the vaccine would be available for everyone within a limited period. 84.7% (n=481) stated the vaccine would not harm patients with hypertension, cancer and/or diabetes mellitus.

Figure 2 depicted that the knowledge concerning COVID 19 vaccine was higher (99.18%, n=364) among healthcare professionals than other staffs (94.03%, n=189). This was in contrast to the non medical staff's attitude and perception, which dominated over the medical staff (Figure 4, Figure 5).

The knowledge ($\chi2$=13.411, p-value= 0.001) and attitude ($\chi2$=5.376, p-value = 0.02) of the professionals was significantly associated with their job, whereas their perception ($\chi2$=1.678, p-value = 0.195) was not.

The professionals with age between 35 to 49 years had good knowledge (43.58%, n=247) and positive attitude (46.09%, n=206) regarding the vaccination program. However, those greater than 50 years had limited awareness and attitude. Table 2 portrayed the association between age with professionals' knowledge ($\chi2$=8.022, p-value =0.018) and strong relation with respect to their attitude ($\chi2$=12.523, p-value = 0.002). No relation was observed between professionals' age and their perception on vaccines.

Discussion

T The current survey deals with the knowledge, attitude and perception among health care professionals towards COVID- 19 vaccine. Among these 568 participants, sizeable professionals who were well aware with positive attitude and perception on the immunization program. As the pandemic engendered a decline in physical and mental welfare, the concern for preventive strategies had furnished in local and international magnitude [8].

We preferred health care workers to general public because physicians, nurses, pharmacists, and other medical professions are closely involved in administration, dispensing and suggestion of drugs, would be updated with the latest information on vaccines [9]. Our study depicted the knowledge about COVID 19 vaccine was higher among medical professionals than supporting staffs in the medical sector. However, low grade, unauthorized

Table 2 : Association between participants' age with their knowledge and attitude towards COVID 19 vaccines

		Knowledge		Attitude	
		3 -5↓ (Average)	>5↓ (Good)	6-14↓ (Average)	>14↓ (Good)
		Frequency (%)			
Age (years)	18-34	2(13.33)	207(37.43)	43(35.54)	166(37.14)
	35-49	6(40)	241(43.38)	41(33.88)	206(46.09)
	≥50	7(46.67)	105(18.99)	37(30.58)	75(16.78)
		Chi Square= 8.02, p-value=0.018*		Chi Square= 12.523, p-value=0.002*	

↓Score, *p < 0.05, **p<0.01
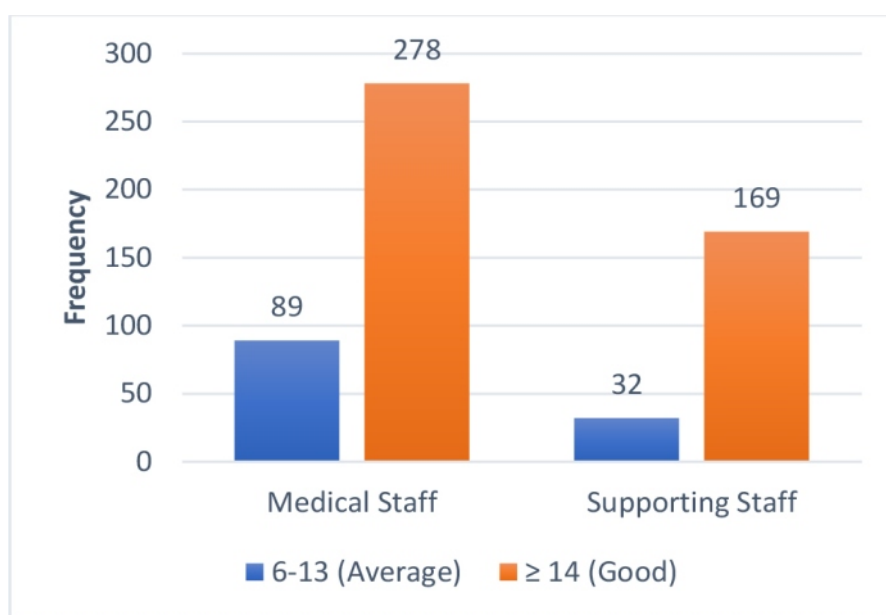
Fig 3: A bar chart showing the influence of attitude of the respondents based on occupation status.
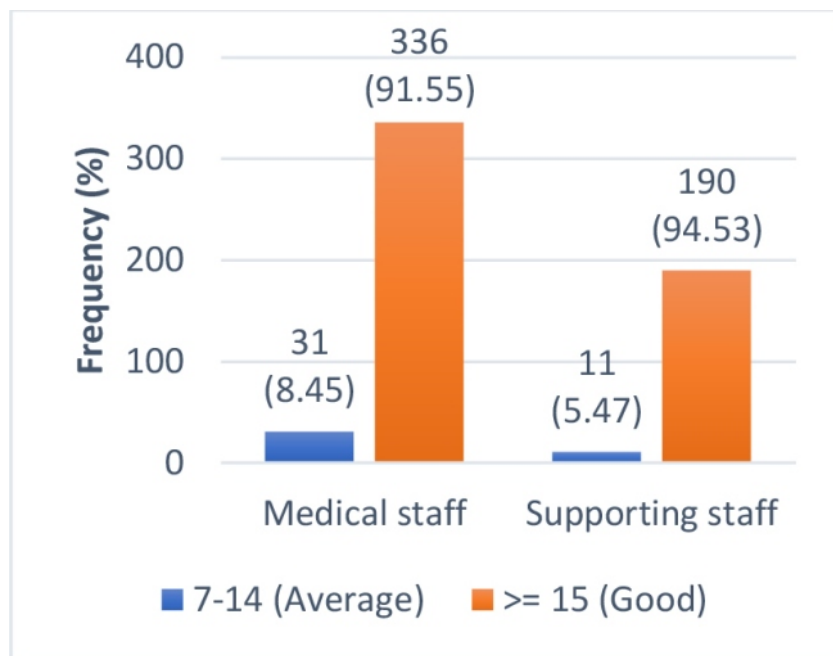
Fig 4: A bar chart showing the distribution of perception of the respondents based on occupation status.

news and posts circulating through social media are adversely affecting the level of understanding the fact and impart dilemma among the laymen. These kind of social stigma can only be superimposed by the vaccine acceptance and recommendation of health care workers that would play a dominant effect in patient's vaccination behavior. The justifications from Schneeberg et al. in this aspect was complying to our statement, were they illustrated that the strongest predictor of the vaccine studied was the recommendation from healthcare workers [10].

The attitude of many respondents was quite appreciable and it was their own decision to get vaccinated. Michel et al., depicted that only 27.7% of medical professionals working at different Hospital at Congo were ready to accept vaccines if available [7], a much lower acceptance rate when compared to ours.

Despite various health concerns pointed out by researchers, medical professionals had steered a decline in their attitude and perception compared to the supporting staff. They are muddled of the contradictory finding primarily related to coagulopathies and infertility [11-12]. Still, few states, the prophylactic agent can't be categorized to vaccines as it does not cover full fledge protection and further, the need to wear mask still persists [13]. The long-term scrutinization of different vaccines still requires years of observations. However, still, there were many professionals irrespective of medical or non medical, whom were quite enthusiastic in administering and promoting their families for the shot.

Researches performed in other developing countries stated inadequate knowledge but good attitude of the general public on COVID vaccines [14,18-19]. The eagerness of the general population to accept the vaccine is not static. It depends on the information and sentiment, so Government can engage health care workers with good knowledge and perception to conduct health education campaigns throughout the nation. This was also the prime suggestion from Kumari et al. after performing an explorative descriptive study in New Delhi at All India Institute of Medical Sciences [15]. Moreover, Archana Kumari et al. found out there are mixed perceptions about the vaccines in the Indian population [16]. It is certain that the negative opinion from a few would scavenge the positive attitude of many. So, the awareness programme could be an asset for the nation to channelize toward getting vaccinated. The increase in number of new COVID cases, the mutant strains, the safety of excipients in the vaccines and the difference in the efficacy and which one to choose should also be conveyed to the people. Our study revealed that the healthcare workers in Kerala are suitable to conduct such education campaigns and would tend to increase the acceptance rate among the general public [17]. The professionals who registered for vaccination constituted to be our survey population, was the study limitation. However, through this article we were able to exhibit the medical professionals who registered for vaccination had good knowledge of vaccines but showed slightly reduced attitude compared to other staffs in the hospital settings. Further observations should be performed in this perspective to get a detailed picture and people's view on newest vaccines.

Conclusion

Knowledge, attitude and perception of vaccination by healthcare workers play a crucial role that is inevitably associated with public adherence to vaccination and reduced hesitation. Maintaining confidence in vaccination by Health workers can exclusively benefit the vaccination campaign. High acceptance of COVID-19 vaccine was found by assessing the respondents' knowledge, attitude and perceptions. However, vaccine uptake may be reduced by vaccine safety issues and efficacy among the public.To maintain the benefits of vaccination programs, understanding and addressing vaccine hesitancy will be essential to their successful implementation.

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