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Original Article

Analyzing Lessons from Previous COVID-19 Outbreaks for Future Preparedness: A Cross-Sectional Study

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ABSTRACT

Background: The present research examines how prepared healthcare and non-healthcare professionals are to deal with the next wave of the COVID 19 pandemic outbreak and what we can take away from previous outbreaks of the pandemic. **Materials and Methods:** Using a World Health Organization (WHO) Survey Tool and Guidance for Monitoring Knowledge, Risk Perception, Preventive Behaviour and Trust to Inform Pandemic Outbreak Response, a web-based cross-sectional survey was carried out among healthcare and non-healthcare workers from May to July 2022 (three months). SPSS 26.0 was used to analyse the data. **Results:** A total of 432 participants gave their consent to participate in the study. Of these, 202 (46.8%) men, 225 (52.1%) women and 5 (1.2%) preferred not to disclose. 95% of the participants were younger than the age range of 18 to 25 and 307 (71.1%) of the participants were healthcare workers. The majority of the study participants believed they had a lower chance of contracting COVID-19. Half of the participants indicated they were able to fight against COVID-19 through their actions and self-precautions, whereas 36% of participants said that it's extremely difficult for them to stay away from COVID-19. **Conclusion:** Participants are well-informed about COVID-19 and well-prepared for the next wave of COVID-19. However, few participants do not follow the preventive steps to protect themselves from the infection. Maintaining high vaccination rates, practicing effective public health measures such as mask-wearing and physical distancing, implementing robust testing and contact tracing systems and prioritizing early detection and containment of emerging variants are crucial steps to prevent from next wave of the Pandemic.

Keywords: COVID-19, World Health Organization, Testing and Tracing, Vaccination, Health Literacy.

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INTRODUCTION

Based on a World Health Organization (WHO) report, the International Committee on Taxonomy of Viruses (ICTV) identified the virus that infected people on December 31, 2019, as the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) that causes the Coronavirus illness (COVID-19). The World Health Organization (WHO) declared COVID-19 a major public health emergency of global concern on January 30, 2020, due to the disease's severe consequences for human health and the high rates of death and morbidity it has caused. Acute respiratory distress syndrome, septic shock, severe metabolic acidosis, hemorrhages and coagulation abnormalities are among the signs of COVID-19. The majority of people infected with SARS-CoV-2 showed either no symptom at all or mild ones, such as fever, myalgia, dyspepsia, fatigue and dry cough.[1]

However, some patients particularly the elderly and those with a history of illness have been identified as possible risk factors for fatalities and major illnesses (such as hypertension, heart disease, lung disease, cancer, or diabetes).[2] Airborne droplets and close contact with infected people, particularly through mucous membrane secretions from the mouth, nose, or eyes, contaminated surfaces and digestive system transmission, are the main ways that COVID-19 infection spreads.[3] Furthermore, it has been observed that each infected individual can infect up to three additional individuals.[4] Based on WHO data; there were 639,572,819 confirmed cases and 6,615,258 fatalities globally. India reported 44,672,638 confirmed cases of COVID-19, with 530,622 fatalities.[5]

To efficiently promote and maintain preventive behaviours in the general population, non-pharmacological public health interventions need to be backed by data on the social, cognitive and psychological factors associated with the behaviours. Previous studies on infectious disease epidemics indicates that people's decisions to engage in preventive behaviours are affected by a number of factors, including efficacy belief, awareness

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and understanding of the risks and their views on those risks.[6] Similar to this, recent COVID-19 research has demonstrated that people's decision to take action may be determined by a number of factors, such as information, perceived management, positive perspectives, emotion and risk perception.[7]

The respiratory disease known as COVID-19 is caused by the SARS-CoV-2 virus. Its symptoms can range from being asymptomatic to having mild or severe consequences include pneumonia, respiratory distress and even death. Non-pharmacological interventions such as facemask use, quarantines and social isolation have demonstrated some effectiveness in limiting the spread of diseases.[8] On the other hand, when implemented globally, a safe vaccination strategy with broad clinical advantages is believed to be a feasible long-term answer. India launched the largest-ever COVID-19 immunization campaign in the world on January 16, 2021, with the goal of immunizing its 900 million population.[9] In India, 2,199,182,955 vaccine doses have been given as of November 29th, 2022. Even though there are now multiple COVID-19 vaccines available and vaccination rates are on the rise globally, some people are still doubtful about the vaccine's safety, efficacy and dosage.[10] The acceptance and desire for vaccination is greatly affected by how risks and diseases are seen, as well as by culture, religion and other external variables, as well as place and time.[11] The information that is now available suggests that the COVID-19 illness vaccinations are long-lasting protection against it.[12] A COVID-19 Booster Dose (CBD) is required when vaccination protection against symptomatic disease gradually decreases over time. The administration of a subsequent booster dose significantly increases protection against symptomatic COVID-19 disease.[13] Those who received the immunization possessed a decrease in SARS-CoV-2 testing and a 92-97% reduction in disease severity.[14] The best time to administer a booster dose to prevent SARS-CoV-2-related complications is yet unknown, however it has been seen that effectiveness begins to manifest seven days after the booster dose, which is likely because of elevated antibody levels. It has been found that a booster dosage reduces infection rates in receivers by a factor of 10, which means that recipients are less susceptible to infection than uninfected people by 5%.[15] Compared to other professions, healthcare workers have higher infection rates. The Center for Disease Control and Prevention report that COVID-19 has claimed the lives of over 1600 healthcare professionals in the US.[16] Mandates for vaccinations are intended to safeguard healthcare professionals, wherever they may be employed, from infections, grave illnesses and even death. Healthcare workers are essential to the effectiveness of immunization campaigns. Studies show that vaccine knowledge and attitude are critical to immunization efforts. It has been demonstrated that their vaccination attitudes and knowledge affect their intents of recommending vaccination to bigger groups.[17]

But the real concern is whether we have plans established in case there is a future worldwide outbreak or epidemic. Healthcare systems need to improve contact tracking, community mobilization, detection, containment and treatment. To respond to epidemics around the globe, we need to make sure that teams of highly qualified and prepared global health surge capacity members are always on hand. In order to determine how well-prepared health and non-health science workers are for the upcoming COVID-19 wave, this survey was designed.

MATERIALS AND METHODS

A cross-sectional survey was carried out online using a "Google Form" over the course of three months, from May 2022 to July 2022, to gather responses from medical and non-medical personnel working at a tertiary care hospital in Belagavi, Karnataka, India. We decided to use a uniform sample size for our purposes. In our study, interviews with persons above the age of eighteen were conducted. The study was given approval by the KLE College of Pharmacy's institutional ethics committee for research involving human participants, which is situated in KAHER, Belagavi.

Development, validation and distribution of the survey questionnaire

In our survey we have adapted modified form of the World Health Organisation (WHO) Survey Tool and Guidance for Monitoring Knowledge, Risk Perception, Preventive Behaviour and Trust to Inform Pandemic Outbreak Response 2020.[18] Before being pretested among ten randomly selected healthcare and non-healthcare professionals for clarity, significance and acceptability, the developed questionnaire was validated by five selected faculty members using the face and content validation method to assess its readability and validity. In response to the feedback received, changes and improvements were made to increase understanding and organize the question sequence. The survey questionnaire consists of sociodemographic details, COVID personal experience, probability and severity, Health literacy and perceived self-efficacy, Trust in source of information, Fairness and resilience, Testing and tracing, Vaccination and Confidence on who can handle COVID-19 Situation. The final survey link was distributed to students via various media platforms such as WhatsApp, Gmail and Face book in the form of a Google Form.

Statistical Analysis

The participants' responses were downloaded from Google sheets and then duplicates were removed. The collected data of the responses were coded and imported into the SPSS Version 26.0 and then expressed in percentage wise.

RESULTS

Socio-demographics details

In this survey, we received 449 responses and after excluding those with missing data, we had 432 participants in the study. The majority of the 432 participants were female, 225 (52.1%) and male, 202 (46.2%) and 5 (1.2%) prefer not to disclose their gender. This study included 307 (71.1%) health professionals, with approximately half of the total participants being undergraduates 244 (56.4%), 186 (43.1%) post-graduates and 02 (0.5%) PhD scholars. There were 418 (96.8%) participants with no chronic illness and 10 (2.3%) participants had chronic illness. Only 125 (28.9%) lived in rural areas, while nearly 307 (71.1%) lived in urban areas. The socio-demographics profile of the participants is characterised in Table 1.

COVID personal experience, probability and severity

The frequency of people who were aware of being infected was 109 (25.2%) among 432 participants in our study, with 261 (60.4%) confirmed and 171 (39.6%) not confirmed. 273 (63.2%) of the 432 participants said members of their immediate circle were infected, while 159 (36.8%) said they were not. 234 (54.2%) of the 432 respondents reported that many of their immediate contacts had died as a result of COVID-19. According to the rating that was given, the majority of the participants thought they were less likely to become infected with COVID-19 "165 (38.2%)", because the majority of the study participants were health professionals who had been vaccinated in the first phase, they believed their susceptibility to becoming infected was very low.

Health literacy and Perceived self-efficacy

Because of advanced technology and applications such as Arogya Setu, COWIN and others, 238 (55.1%) participants thought it was simple to find information about COVID-19. Because the majority of the participants were graduates, 242 (56%) found it simple to understand the information about what to do if they tested positive for COVID. We could see in this study that the participants were still unprepared for the upcoming wake. 165 (38.2%) said they didn't know how to protect themselves from COVID-19 and 158 (36.6%) said avoiding COVID-19 was extremely difficult for them. The health literacy profile of the participants is characterised in Table 2.

Trust in source of information

This study revealed that 198 (45.9%) participants were looking for information about COVID-19 several times per day. They sought information from a variety of sources, including television, newspapers, health workers, radio, social media, the Ministry of Health and family welfare, celebrities, the World Health Organization and the AROGYA SETU application. The WHO was the most reliable for the participants, followed by health workers, the Ministry of Health and family welfare, the AROGYA SETU application and the newspaper. 295 (64.3%) participants believed hospitals could handle the COVID-19 outbreak appropriately, while 284 (64.1%) believed their family doctor could handle the pandemic properly and 245 (55.4%) believed the Ministry of Health and family welfare could handle it more effectively. The trust in source of information of the participants is characterised in Figure 1.

Fairness and resilience

Each participant's experience during the last three waves of COVID-19 was unique. 201 (46.5%) had difficulty surviving

Table 1: Socio-Demographics.

Questions	Frequency	Percentage
Age (Years)		
18-25	410	95%
26-36	22	05%
Sex		
Male	202	46.8%
Female	225	52.1%
Other	05	1.2%
Education Status		
Undergraduate	244	56.5%
Postgraduate	186	43.1%
PhD.	02	0.5%
Health Professional		
Yes	307	71.1%
No	125	28.9%
Chronic Illness		
Yes	10	2.3%
No	418	96.8%
Maybe	04	0.9%
Residence		
Urban	307	71.1%
Rural	125	28.9%
Total	432	100%
Who lives in household besides yourself?		
I live alone	67	15.5%
I live with children under 18	18	4.2%
I live with people in COVID-19 risk group	24	6.3%
None of the above	323	76%
Total	**432**	**100%**

Table 2: Health Literacy and perceived self-efficacy.

	1.0	2.0	3.0	4.0	5.0
	Count (N %)	Count (N %)	Count (N %)	Count (N %)	Count (N %)
How easy or difficult would you say it is to find the information you need related to COVID-19.	15 (3.5%)	23 (5.4%)	156 (36.1%)	142 (32.9%)	96 (22.2%)
How easy or difficult would you say it is to understand information about what to do if you think if you have COVID-19?	11 (2.5%)	34 (7.9%)	145 (33.6%)	138 (31.9%)	104 (24.1%)
How easy or difficult would you say it is to judge if the information about COVID-19 in the media is reliable?	25 (5.8%)	47 (10.9%)	213 (49.3%)	90 (20.8%)	57 (13.2%)
How easy or difficult would you say it is to understand the restrictions and recommendations of authorities regarding COVID-19?	09 (2.21%)	24 (5.6%)	171 (39.6%)	140 (32.4%)	88 (20.4%)
How easy or difficult would you say it is to follow the recommendations on how to protect yourself from COVID-19?	13(03%)	29(6.7%)	140(32.4%)	145(33.6%)	105(24.3%)
How easy or difficult would you say it is to understand recommendation about when to stay at home from work/school, and when not to?	12 (2.78%)	42 (9.72%)	164 (37.96%)	126 (29.17%)	88 (20.83%)
How easy or difficult would you say it is to understand recommendation about when to engage in social activities, and when not to?	07 (1.62%)	43 (9.95%)	168 (38.89%)	124 (28.7%)	90 (20.83%)

1-Very easy, 2-Easy, 3-Neutral, 4-Difficult, 5-Very difficult.

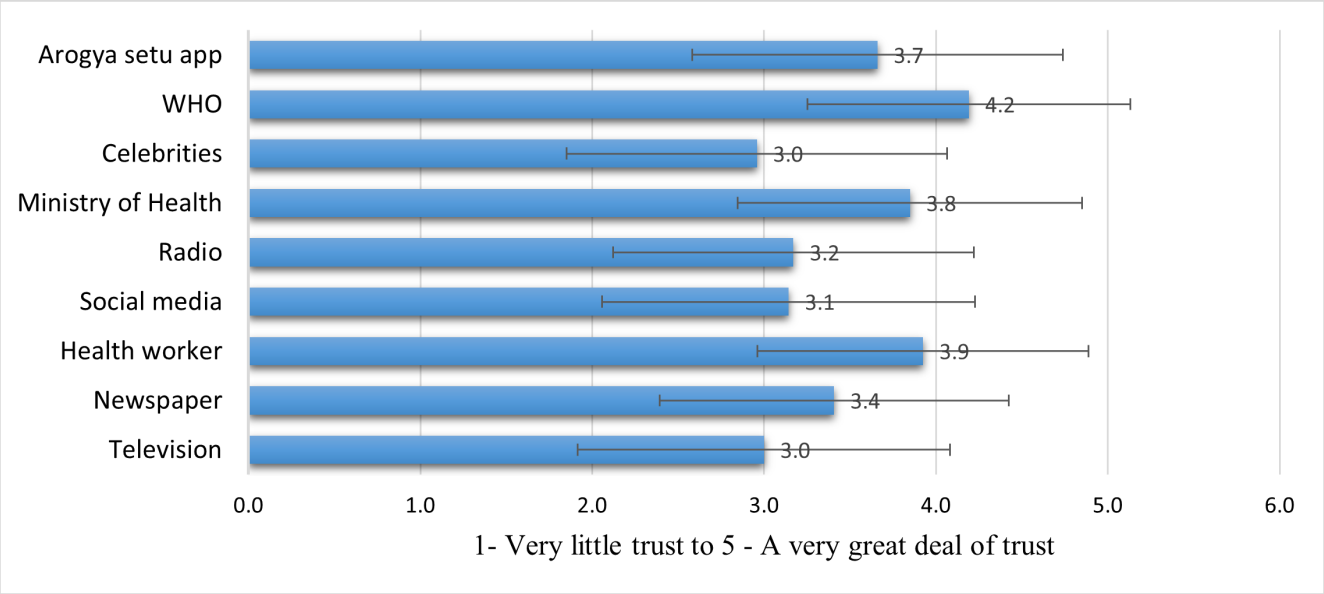

Figure 1: Trust in source of information.

stressful events, primarily due to the extremely high infection rate, followed by increased deaths. There were also many steps taken by the government to reduce the spread of COVID-19 and among 432 of our participants, the majority, 224 (51.8%), felt that the government's decisions were fair and 208 (48.1%) were ready to convince that the decisions were correct, because many of our study participants were health professionals who had worked on the frontline during the previous three COVID-19 waves. The fairness and resilience of the participants is characterised in Table 3.

Testing and tracing

The total number of participants who agreed to be tested despite not having symptoms but having come into contact with someone who had been tested positive was 308 (71.3%). Because of the increased stress felt by participants as a result of an increase in

Table 3: Fairness and resilience.

Please consider the decision made in India to reduce the spread of COVID-19	1.0	2.0	3.0	4.0	5.0
	Count (N %)	Count (N %)	Count (N %)	Count (N %)	Count (N%)
I think the decisions are fair.	12 (2.8%)	25 (5.8%)	171 (39.6%)	134 (31.0%)	90 (20.8%)
I would convince others that the decisions are right.	12 (2.8%)	23 (5.3%)	189 (43.8%)	122 (28.2%)	86 (19.9%)
Please consider you experience during last 3 waves of COVID-19 Pandemic?	1.0	2.0	3.0	4.0	5.0
	Count (N %)	Count (N %)	Count (N %)	Count (N %)	Count (N%)
I have had a hard time making it through stressful events.	13 (3.0%)	29 (6.7%)	189 (43.8%)	125 (28.9%)	76 (17.6%)
It does not take me long to recover from stressful events.	11 (2.5%)	41 (9.5%)	189 (43.8%)	120 (27.8%)	71 (16.4%)
It is hard for me to snap back if something bad happens.	22 (5.1%)	39 (9%)	192 (44.4%)	119 (27.5%0	60 (13.9%)

Table 4: Testing and Tracing.

If you be in contact with someone who is tested positive for COVID-19 and have no symptoms yourself-will you get tested if you have an opportunity?	Frequency (N%)
Yes	308 (71.3%)
No	124 (28.7%)
Total	432 (100.0%)
I would get tested for sure because	Frequency (N%)
I want to receive the appropriate care in case of a positive test.	216 (50.0%)
This is my responsibility as a citizen.	262 (65.1%)
I would face penalties if i did not.	28 (18.7%)
I believe this helps stop the spread of COVID-19.	233 (53.9%)
This way I can protect other people.	239 (55.3%)
My friends and family would expect me to get tested.	142 (32.8%)

infection rates and deaths, the participants were prepared to take the COVID 19 detection test. The number of people willing to be tested was high because 262 (65.1%) of them believed it was their responsibility as citizens. 216 (50%) believed they would receive appropriate care if tested positive, 233 (53.9%) believed it would help to stop the spread of COVID-19 and 239 believed it would protect others from being tested positive. 59 (13.4%) of the 140 participants who did not want to be tested believed that if they tested positive, they would be treated poorly. 47 (10.9%) thought the test would take too much time and 46 (10.7%) thought the tests were unreliable. The testing and tracing of the participants is characterised in Table 4.

Vaccination

The effectiveness of the COVID-19 vaccination received a mixed response of 331 (76.6%) anything about its efficacy. Because the majority of our participants were health professionals, they were well aware of vaccination. COVISHIELD was an indigenously developed vaccine in India that was approved earlier than most vaccines. The majority of the participants 313 (72.5%) felt that COVISHIELD was more effective.

The Government of India launched a booster dose in January 2022 for healthcare workers. The majority 259 (60%) of our study participants were health professionals who had received two doses of vaccination and were ready to receive a booster dose. The vaccination details of the participants is characterised in Table 5.

Confidence on who can handle COVID-19 Situation

The confidence of handling COVID-19 situation was seen more with family doctors and hospital followed by Primary Healthcare Centers (PHCs). The confidence on who can handle COVID-19 Situation of the participants is characterised in Figure 2.

Table 5: Vaccination.

Do you think vaccination is effective?	Frequency (N%)
Yes	331 (76.6%)
No	37 (8.6%)
I don't know	64 (14.8%)
If 'Yes' which vaccine, do you feel is effective	**Frequency (N%)**
Covisheild	313 (72.5%)
Covaxin	76 (17.6%)
Moderna COVID-19 Vaccine	29 (6.7%)
Sputnik V	14 (3.2%)
Are you ready to take the booster dose	**Frequency (N%)**
Yes	259 (60%)
No	84 (19.4%)
Maybe	89 (20.4%)
Do you think vaccine is 100% effective against the COVID 19	**Frequency (N%)**
Yes	145 (33.6%)
No	104 (24.1%)
Maybe	183 (42.4%)
I would not get tested because	**Frequency (N%)**
I don't know where to get tested.	28 (6.5%)
It is too time consuming to get tested.	47 (10.9%)
This will result in loss of income for me if I get tested positive.	29 (6.7%)
People might blame me for my actions if I get a positive test.	35 (8.1%)
I might face fines or other penalties if I had violated COVID-19 restrictions.	29 (6.7%)
I do not trust authorities with my personal data.	25 (5.7%)
I do not believe COVID-19 exists.	23 (5.4%)
There is nothing I can do, if i get a positive test.	25 (5.7%)
I am not able to self-isolate if i get a positive test.	33 (7.7%)
I do not think tests are reliable.	46 (10.7%)
I am worried people will treat me badly if i get a positive test.	59 (13.4%)
I am worried if I get positive at the testing site.	34 (7.6%)
I think testing will be painful.	25 (5.7%)

DISCUSSION

At this point in the pandemic, a number of factors have affected whether the number of new COVID-19 cases in a given location is increasing or decreasing. These factors include the vaccine's long-term efficacy, human behaviour, infection control methods and the population at risk of developing immune deficiencies as a result of vaccination or naturally occurring infections. The coronavirus that causes COVID-19, SARS-CoV-2, has undergone mutations (changes) since the start of the pandemic, resulting in new virus variants. The delta version is one of these. The delta variant of the coronavirus has been found to be one of its most infectious variances as far.

People with lower health literacy had more trouble finding information and understanding government messaging about COVID-19 than those with adequate health literacy, according to a study by Kirsten J. McCaffery, Rachel H. Dodd, *et al.* on health literacy and disparities in knowledge, attitudes, beliefs and behaviours related to COVID-19 in Australia.[19] Given that healthcare professionals made up the majority of our study participants, we found that people had no issue understanding or obtaining information from government entities. This result suggests that research participants' health literacy was resilient.

The most priority preventive actions during the COVID-19 pandemic in Iran, according to another study on preventive behaviours, were wearing a mask and washing your hands for at least 20 sec.[20] We found similar results because most of the study participants kept social distance, washed their hands frequently and wore masks in public. However, we discovered that very few individuals used antibiotics to prevent or cure COVID-19. Raluca Buturoiu *et al.* examined people's levels of confidence in four main sources of information during the COVID-19 pandemic: official websites, legacy media, information from family and friends and social media.[21] They found that while social media was less credible, individuals trusted legitimate government websites that were followed by healthcare professionals.

The majority of respondents to our study reported they trusted official government websites and those from the World Health Organization. As with the previous study, we discovered that inflated and inaccurate information from multiple anonymous and dishonest sources contributed to the decline in trust in social media news. According to our poll, patients have confidence in their primary care physician to manage the COVID-19 pandemic. Several research emphasized the social stigma as a barrier to COVID-19 testing. Participants in an online poll claimed that stigma kept them from wanting to get tested since it could be thought that they disregarded advice related to public health (such wearing personal protective equipment or physically separating themselves).[22]

A study conducted by Kissam *et al.* found there may be fear about testing among colored Californians because to the potential

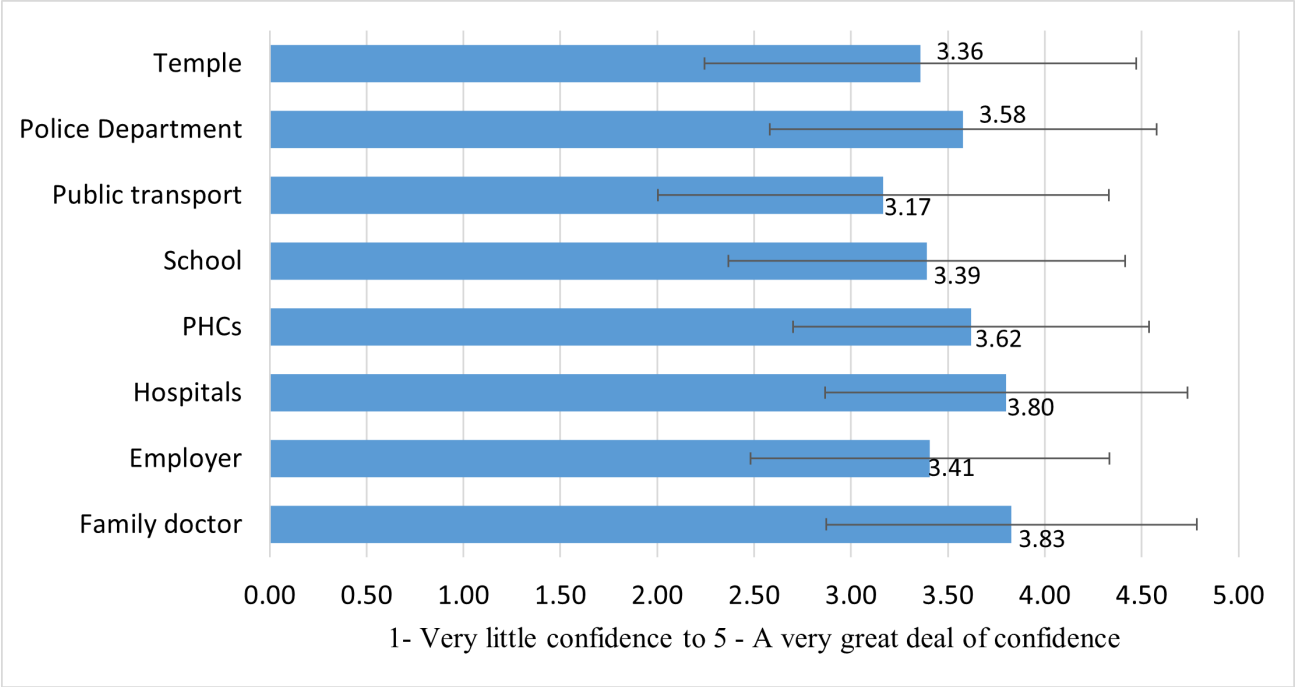

Figure 2: Confidence on who can handle COVID-19 Situation.

implications of testing positive, such as inferior or stigmatized healthcare.[23] Finally, sex workers in Africa endure stigma and prejudice, which may limit their access to contact tracing and COVID-19 testing, according to one source.[24] Similarly, in our study, we noticed that the primary barrier to getting tested was social stigma. Sajith Vellappally *et al.* reported in their study that 84% of Indian healthcare personnel were eager to get the booster dose vaccine.[25] Another cross-sectional study comparing vaccination reluctance and preferences in the US and China discovered that both nations had high vaccination acceptability; in our study, 60% of participants were willing to take the booster dose.[26]

CONCLUSION

The chain of COVID-19 transmission was broken in large part through vaccination. The knowledge of transmission, diagnosis and prevention of COVID-19 among healthcare professionals was adequate. The containment of the pandemic through standards of care can benefit from efforts to boost the competence of healthcare professionals. For healthcare providers to be better able to cope with COVID-19, the stakeholders must set up educational programs and training.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

WHO: World Health Organization; **ICTC:** International Committee on Taxonomy of Viruses; **SARS CoV2:** Severe Acute Respiratory Syndrome Coronavirus 2; **COVID-19:** Corona Virus Disease of 2019; **CBD:** COVID-19 Booster Disease; **SPSS:** Statistical Package for Social Sciences; **CoWIN:** COVID Vaccine Intelligence Network; **PHC:** Primary Healthcare Centre.

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