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Assessment of Knowledge of COVID-19 among health care workers: Cross-sectional study

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ABSTRACT

COVID-19 is spread by human-to-human transmission through many modes. To date, no antiviral treatment or vaccine has been explicitly recommended for COVID-19. Therefore, applying preventive measures to control COVID-19 infection is the most critical intervention. The rate of disease spread is high in hospitals, and hence the health care workers (HCWs) are at most risk of getting infected. This is an online observational, cross-sectional survey carried out in Tamil Nadu state of South India using a snowball sampling technique during April 2020. Medical, nursing, physiotherapy and allied health science's staff from various hospitals are included in the survey. Using Google forms, the willing participants were encountered with 30 multiple choice questions related to clinical knowledge of COVID-19. By the end of the month, we have received 162 responses from various HCWs; among them are medical, nursing, physiotherapy and other paramedical staff. Most of the respondents were nurses (29.6%) and physician's (23.4%). The average knowledge score of all the respondents in regards to COVID-19 was moderate at a correct overall rate of 62.1%. The study results say physicians showed the highest knowledge score on COVID-19, followed by nurses and other paramedics. There is a gap between the knowledge and information regarding the clinical aspects of COVID-19 among health care workers.

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INTRODUCTION

COVID-19 emerged in December 2019 as a viral outbreak detected in people having a connection with a big seafood and animal market in Wuhan city of central Hubei province of China. The patients presented symptoms of pneumonia of unknown aetiology (Emergency.cdc.gov, 2021).

World health organization (WHO), along with other Chinese health care authorities worked together, and found Novel coronavirus (2019-nCov)and named it COVID-19. The first death reported in china on 11 January 2020 and over a while, the infection has spread from China to other parts of the globe. On 30 January, WHO declared this outbreak as a Public Health Emergency of International Concern (WHO, 2020a, 2019).

On 11 February 2020, WHO announced a name for the new coronavirus disease: COVID-19 (WHO, 2020b). On 11 March, WHO declared COVID-19 - a pandemic as by then, about 114 countries were affected (WHO, 2020b).

Coronaviruses (CoV) are a large group of viruses discovered in the 1960s. The name of the coronaviruses is due to envelop of proteins to the outer fringe of the virus resembles a crown ('corona' in

Latin). They usually cause mild to moderate upper respiratory tract infections in humans and are generally pathogenic to mammals and birds (Roy *et al.*, 2020).

Occasionally few CoV transmitted from animals to humans and caused severe respiratory illness in recent years include the first severe respiratory syndrome (SARS- CoV) pandemic in 2002 (~800 deaths), Middle East respiratory syndrome (MERS-CoV) in 2012 (860 deaths) and the recent novel coronavirus (2019-nCoV) (Bhagavathula and Shehab, 2019).

COVID-19 is spread by human-to-human transmission through the droplet, feco-oral, and direct contact and has an incubation period of 2-14 days. To date, no antiviral treatment or vaccine has been explicitly recommended for COVID-19.

Therefore, applying preventive measures to control COVID-19 infection is the most critical intervention (Bhagavathula and Shehab, 2019). The rate of disease spread is high in hospitals, and hence the health care workers (HCWs) are at most risk of getting infected. The WHO and Centers for Disease Control and Prevention (CDC) had published recommendations for the prevention and control of COVID-19 for HCWs in the month of January 2020 (Tinyurl.com, 2021; Emergency.cdc.gov., 2021). India is an epidemic country, and there is no information on the knowledge of HCWs in regard to clinical manifestation, diagnosis, transmission modes, treatment strategies and preventive measures. Our present web-based survey gives a general picture of the knowledge of health care workers (HCWs) towards aspects of COVID-19. The results of this study may guide in developing the preparedness of HCWs in this pandemic situations.

MATERIALS AND METHODS

Study settings and design

This is an online observational, cross-sectional survey carried out in Tamil Nadu state of South India using a snowball sampling technique during April 2020. By the end of the month, we have received 162 responses from various HCWs.

Inclusion criteria

Medical, nursing, physiotherapy and allied health science's staff from various hospitals are included in the survey.

Exclusion criteria

Participants who took less than 5 minutes to complete the questionnaire will be excluded from the analysis because this indicates random clicking.

Incorrect socio-demographic details entered will also be excluded from our analysis.

Ethical approval

The Ethics Committee of Aarupadai Veedu Medical College and Hospital Kirumampakkam, Puducherry, Tamil Nadu, India, approved our study protocol, procedures, and information sheet and consent statement. Participants who gave consent to willingly participate in the survey would click the 'Continue' button and would then be directed to complete the self-administered questionnaire.

Recruitment

This is an online survey conducted among health care professionals. They are using google forms and an online semi-structured questionnaire developed concerning knowledge on the COVID-19 pandemic. There are 30 questions with four multiple choices related to clinical knowledge of COVID-19. The investigators sent the link of the survey questioner along with appended consent form through e-mails and various social media networks like Whatsapp, Facebook. The participants were requested to roll out the survey to as many people as possible. Thus the survey was extended from the first point of contact to many people by forwarding the link. The link auto directs the participants towards questions in the google form. Initially, the patients asked for the willingness to participate in the study. Only after the acceptance, they directed to fill the demographics followed by 30 questions with multiple choices to be answered. We can include participants from various parts of the Tamilnadu state. The collected data is analysed using descriptive statistics. Mean, and standard deviation and proportions have analysed to estimate the results of the study by using SPSS version 20.

RESULTS

In the online survey conducted among HCWs, a total of 162 responses recorded. Among the participants, 44.4% were males, and 55.5% were females. The mean age of the participants is 40.5 ± 25.2 years old. The participants belong to Medical, nursing, physiotherapy and other paramedical staff. Most of the respondents were nurses (29.6%) and physician's (23.4%) (Table 1).

The detailed results on answering the questioner were depicted in Table 2. We identified significant knowledge gaps between doctors and other HCWs. For instance, 32 doctors (84.2%) and 72 allied health workers (62.9%) knows COVID-19 is a Single-stranded RNA. COVID-19 mode of transmission was aware in 35 (92.1%) doctors and 98(79.0%) other

Table 1: Demographic details of the participants in the study

Parameters		Frequency	Percentage (%)
Age	21-30	31	19.1
	31-40	78	48.1
	41-50	30	18.5
	51-60	23	14.1
	Mean±SD	40.5± 25.2	
Gender	Male	72	44.4
	Female	90	55.5
Occupation	Physician	38	23.4
	Nurses	48	29.6
	Pharmacists	9	5.5
	Physiotherapists	14	8.6
	CRRI	23	14.1
	Paramedicals	30	18.5
	Total	162	100

HCWs. Most doctors said that COVID-19 window period for covid-19 (81.5%) and early symptoms of covid-19 (78.9%). However, allied health workers knowledge of questions related to the incubation period and early symptoms of COVID-19 was poor.

Question asking significant risk factor for the development of acute respiratory distress syndrome and death in patients with COVID-19 answered correctly as elevated D-dimer levels by 23(60.5%) doctors and 65(52.4) others.

Real-time reverse transcription-polymerase chain reaction (RRT-PCR) assay has been a more accurate diagnostic test in the diagnosis of COVID-19 was known by only 94(58%) HCWs, whereas the levels of ferritin raise high in COVID-19 infected patients was known by 111(68.5%). 124(76.5%) answered the ideal SPO2 % for referral of COVID-19 suspected patients from fever OPD is 90%.

Ground glass appearance is the most common CT chest finding observed in COVID 19 infection patients was known by 73.6% doctors and 55.6% others.

There is a huge gap of knowledge in all HCWs regarding nasopharyngeal swab collection from a COVID-19 suspect patient, offering PPE to the patients, about quarantine, and regarding precaution is most accurate regarding the treatment and prevention of COVID-19. Knowledge of treatment with drugs is high in doctors when compared to others.

DISCUSSION

Since the first confirmed case has been announced in India on 30 January 2020, extreme fear and anxiety extended to the other states from the possibility of COVID-19 outbreak.

The government of India announced a lockdown in March 2020. Since then, the HCWs turned as front line armour to protect the people infected and are the most vulnerable to catch Covid-19.

The novelty and uncertainty of the virus make it critical for health authorities to prepare appropriate plans for the treatment as well as prevention of the infection.

It is, therefore, of utmost importance for health professionals to update their knowledge of Covid-19.

The average knowledge score of all the respondents in regards to COVID-19 was moderate at a correct overall rate of 62.1%.

Knowledge is the prerequisite for building up a positive attitude and confidence in an individual towards the behavior of a disease and effective treatment strategies.

This investigation showed knowledge of directly affected attitudes (McEachan et al., 2016). The study results say physicians showed the highest knowledge score on COVID-19, followed by nurses and other paramedics. This result scenario is similar to a study done in China (Zhang et al., 2020).

In our study, most of them have knowledge on the mode and route of transmission, which was a good sign for the prevention of the disease.

A previous study done at the early period of infection breakout reported most of the medical staff in the emergency and ICU departments were infected, assuming the virus outbreak as a non-communicable disease (Wang et al., 2020).

Table 2: Detailed responses of HCWs to questionnaire on COVID-19

S. No.	Questions	Physician's (N=38)	Allied health workers (N=124)	Total correct responses
		n (%)	n (%)	n (%)
1.	Which virus is responsible for COVID-19 disease?	38 (100)	124 (100)	162(100)
2.	What type of virus is Coronavirus?	32 (84.2)	78(62.9)	110(67.9)
3.	MERS coronavirus was first identified in which country	19 (50)	41(33.0)	60(37.0)
4.	Novel coronavirus causing COVID-19 disease enters into a human host though	35 (92.1)	98(79.0)	133(82.0)
5.	How does Coronavirus transmit?	35(92.1)	98(79.0)	133(82.0)
6.	What is the window period for covid-19?	31(81.5)	84(67.7)	115(70.9)
7.	What are the early symptoms of covid-19?	30(78.9)	73(58.8)	103(63.5)
8.	Which of the following most accurately reflects the estimated incubation period of COVID-19?	23(60.5)	65(52.4)	88(54.3)
9.	Which of the following is the most commonly reported clinical finding in patients with COVID-19?	26(68.4)	68(54.8)	94(58.0)
10.	Which of the following has been recognized as a significant risk factor for the development of acute respiratory distress syndrome and death in patients with COVID-19?	16(42.1)	57(45.9)	73(45.0)
11.	Of the following, which diagnostic test has been more accurate in the diagnosis of COVID-19?	23(60.5)	71(57.2)	94(58.0)
12.	What is the levels of ferritin in covid-19 infected patients ?	29(76.3)	82(66.1)	111(68.5)
13.	What is the ideal SPO2 % for referral of covid-19 suspected patients from fever OPD to the special covid centre is below what level	30(78.9)	94(75.8)	124(76.5)
14.	What is the most common CT chest finding observed in covid-19 infection ?	28(73.6)	69(55.6)	97(59.8)
15.	Nasopharyngeal swab collected from a COVID-19 suspect patient should be transported to a laboratory (that takes 24 hours to reach) in viral transport medium (VTM) maintaining at what temperature	26(68.4)	84(67.7)	110(67.9)
16.	Attack of RBC by Covid-19 mimics the poisoning of what gas	13(34.2)	54(43.5)	67(41.3)
17.	What is an epidemic disease?	30(78.9)	76(61.2)	106(65.4)
18.	Which vaccine is postulated to provide protection against covid-19 infection?	26(68.4)	68(54.8)	94(58.0)

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Table 2 continued

S. No.	Questions	Physician's (N=38) n (%)	Allied health workers (N=124) n (%)	Total correct responses n (%)
19.	Separation of individuals who are not yet ill but have been exposed to covid-19 and potential to become ill is referred as	27(71.0)	74(59.6)	101(62.3)
20.	What precaution is most accurate regarding the treatment and prevention of COVID-19?	26(68.4)	85(68.5)	111(68.5)
21.	Which is NOT an appropriate measure while transferring a highly suspected COVID-19 patient to Isolation Ward from Fever Clinic in your hospital?	24(63.1)	59(47.5)	83(51.2)
22.	What is the median time from onset to clinical recovery for patients with severe or critical COVID-19 disease is approximately?	20(52.6)	75(60.4)	95(58.6)
23.	What is the potential mechanism of Chloroquine against SARS-CoV 2?	29(76.3)	71(57.2)	100(61.7)
24.	Which drug showed 5000 fold decrease in the viral load within 48 hrs in the in-vitro studies of covid-19 culture?	31(81.5)	86(69.3)	117(72.2)
25.	Which of the following drug can be withheld in the initial stage of covid-19 infected diabetic patients?	23(60.5)	65(52.4)	88(54.3)
26.	What are the contraindications on the usage of Protease inhibitors in covid 19 infected patients?	16(42.1)	49(39.5)	65(40.1)
27.	Which of the following is the vasopressor of the first choice in a shocked COVID-19 patient?	27(71.0)	63(50.8)	90(55.5)
28.	What is the most common comorbidity seen in severely ill covid -19 patients?	25(65.7)	81(65.3)	106(65.4)
29.	What is the most common cause of death due to covid-19 infection?	29(76.3)	76(61.2)	105(64.8)
30.	What is the most commonly observed postmortem finding in covid -19 infected patients?	23(60.5)	61(49.1)	84(51.8)

However, as time runs, many observational studies built the knowledge on transmission behavior of the virus and the same shared to the HCWs and the general public. The window period of the diseases was well known by the doctors in our study, which lines with a similar web-based survey on knowledge and perceptions of health care workers (Bhagavathula *et al.*, 2020). There is a huge diversity in the data available on the internet and social media, including unverified malious information that can spread easily and misguide the HCWs and the general public. Health authorities and scientists have warned about the misinformation of COVID-19 and suggest careful evaluation for scientific and authentic content as information sources.

In our study, we found a wide gap between the knowledge and information regarding the diagnosis and clinical aspects of COVID-19, which is a top priority for the front line health care team. The possible explanation for this may because the infection is a sudden outbreak that left no time for education and training of the health care team and is initially treated as an infection as any other. Our study suggests health authorities to make reach the updated -19-related knowledge to all categories of HCWs. This is unfortunate because the surge of COVID-19 is globally devastating, and a large number of resources are provided by health care authorities to educate HCWs and improve their knowledge of COVID-19. One possible explanation for these differences in knowledge is that doctors are more educated in infectious diseases and pharmacotherapy because of their continuous professional development. Therefore, our findings suggest that greater encouragement from health authorities is needed to distribute COVID-19 related knowledge to all categories of health care workers.

Limitations

The current study is limited to the health care students and faculty's who have access to answer questions in google forms send through e-mail and social media sites and have the ability to understand the questions. This is a web-based study and is not conducted face to face; hence the data may be less reliable. Another limitation of this study was its exclusiveness to healthcare providers. Therefore, further research should involve different community-population, and when possible used a community-based studies design are recommended.

CONCLUSION

Our study revealed that most have insufficient knowledge about COVID-19 but showed positive perceptions of COVID-19 transmission prevention.

As the COVID-19 is a global threat to humanity that continues to spread with time, health care authorities should effort in continuing the educational camping's about the infection.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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