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## Knowledge on COVID 19 among the healthcare professionals in South Indian states

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### ABSTRACT

As the COVID-19 has become a pandemic across the globe, the knowledge of healthcare workers (HCWs) about the diseases and its management is very vital to have a better control over the infection. This study was carried out to assess the knowledge of HCWs of the 5 south Indian states with higher rates of COVID-19 infection. An online survey with 25 validated questions about COVID-19 was administered to 385 HCWs across the study region. Prior to the administration, the questionnaire was validated for various standard parameters using Cronbach's alpha score greater than 0.7. The responses were analyzed using descriptive statistics and statistical significance was assessed using one-way ANOVA. p value of less than 0.05 was considered to be statistically significant. The overall knowledge about COVID-19 was found to be greater among the medical doctors, pharmacists and nurses from higher to lower scores with a mean value of  $78.81 \pm 13.45$  compared to the other healthcare workers  $63.6 \pm 24.3$ . The one-way ANOVA revealed that the difference in the knowledge levels among the HCWs significantly differed ( $p=0.0012$ ). The answers to few of the questions were found to be highly dynamic as the advisory guidelines are highly dynamic. The present knowledge level of HCWs in south India about COVID-19 is relatively high. However, there is a need for continuous education about COVID-19 to the HCWs and the national organizations and authorities should provide a structured and reliable information to the HCWs in order to have a better control over the COVID-19 infection.



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### INTRODUCTION

Novel Coronavirus Disease (COVID-19) was declared as a pandemic in the mid of March,

2020 and insisted the countries across the world to take immediate actions for the detection, treatment and reduce the transmission of the infection to safeguard the lives of their people (Sohrabi *et al.*, 2020). As on 2<sup>nd</sup> May, 2020, the total number of COVID-19 confirmed cases in India was about 37776 out of which about 6212 (16%) cases were reported by the 5 states and one union territory in the south India viz. Tamil Nadu, Andhra Pradesh, Telangana, Karnataka, Kerala and Puducherry respectively. Thus, out of the 32 states and union territories reported positive cases of COVID-19 in India, as on the said date, 3 southern states were in the top 10 and the remaining 2 states were in top 15 stature (COVID-19, 2020). With such a high incidence of the COVID-19 infection in these states, the roles of healthcare workers (HCWs)

**Table 1: Professional designation and experience of all the HCWs**

Sl. No.	Question	Number of Responses (%)		
		Yes	No	Don't know
1	COVID-19 is the infectious disease caused by the most recently discovered Coronavirus Strain 7	304 (79)	35 (9)	46 (12)
2	The most common symptoms of COVID-19 are fever, tiredness, and dry cough	358 (93)	19 (5)	8 (2)
3	COVID-19 is mainly transmitted through contact with respiratory droplets rather than through the air	343(89)	31(8)	12(3)
4	The risk of spread of COVID-19 from the feces of an infected person appears to be low	219(57)	119(31)	46(12)
5	In majority of the individuals, the COVID-19 is a self-limiting infection based on their immune level	335(87)	39(10)	12(3)
6	Elderly people and persons with pre-existing medical conditions (such as high blood pressure, heart disease, lung disease, cancer or diabetes) appear to develop serious signs and symptoms of COVID-19 than others	362(94)	8(2)	15(4)
7	Antibiotics will be effective in treating COVID-19	104(27)	262(68)	19(5)
8	Antibiotics will be effective as prophylactic	150(39)	204(53)	31(8)
9	Medical treatment can cure COVID-19	231(60)	116(30)	39(10)
10	Vaccine is available for prevention of COVID-19	8(2)	358(93)	19(5)
11	The incubation period for COVID-19 range from 1-14 days	354(92)	23(6)	8(2)
12	Individuals may remain normal without any signs and symptoms of COVID-19 infection	335(87)	27(7)	23(6)
13	Administering the drug Hydroxychloroquine is recommended in COVID-19 infected patients	316(82)	42(11)	27(7)
14	You know about the protocol for the healthcare professionals and using PPEs while treating COVID-19 patients	331(86)	39(10)	15(4)

*Continued on next page*

Table 1 continued

Sl. No.	Question	Number of Responses (%)		
		Yes	No	Don't know
15	To declare a patient as cured from COVID-19 at least one culture tests to be negative	166(43)	193(50)	27(7)
16	Even after the cure from COVID-19, the individuals can be carriers and have the risk of spreading the infection	243(63)	108(28)	35(9)
17	Even after the cure from COVID-19, the individuals have the risk of remission of infection	293(76)	54(14)	39(10)
18	The COVID-19 patients can be given non-vegetarian food during the treatment period	200(52)	135(35)	50(13)
19	Do you regularly go through the COVID-19 updates from official resources like WHO, ICMR, etc.	327(85)	50(13)	8(2)
20	Do all the patients diagnosed for COVID-19 positive require hospitalization?	208(54)	166(43)	12(3)
21	Do all the patients hospitalized for COVID-19 positive require ventilation?	50(13)	327(85)	8(2)
22	Are pregnant healthcare workers at increased risk of getting infection with COVID-19?	296(77)	65(17)	23(6)
23	Do you know whether the non-respiratory body fluids of an infected person including vomit, urine, breast milk, or semen can contain viable, infectious COVID-19?	166(43)	162(42)	58(15)
24	Is the medical waste (trash) coming from healthcare facilities treating COVID-19 patients different than waste coming from facilities without COVID-19 patients	266(69)	77(20)	42(11)
25	If respiratory infection is identified with one virus, then the COVID-19 virus infection can be ruled-out.	193(50)	127(33)	65(17)

are inevitable in preventing the community spread of the pandemic. At the same time, the HCWs will be highly prone to get infection and subsequently the source of transmission to the community not only because of the highly contagious nature of the COVID-19 virus, but also due to the excessive workload, physical & mental stress, burnout and fatigue (Langade *et al.*, 2016). Thus, it is very vital that these HCWs have adequate knowledge about the infection, organism, treatment options, etc. But few studies reported that the HCWs had lack of knowledge and attitude about the major infections threatened the world in the past such as Search Results.

### Web results

Middle East respiratory syndrome (MERS) Corona Virus (CoV) and Severe acute respiratory syndrome (SARS) (Huynh *et al.*, 2020; Alshafi and Cheng, 2016; Deng *et al.*, 2006), In these contexts, the present study was conducted to assess the knowledge on COVID-19 disease and its related aspects among the HCWs in south India.

## METHODS

### Study design

This was a cross-sectional study conducted in the month of April 2020 as an online survey among the health care professionals of the 5 major south Indian states viz. Tamil Nadu, Andhra Pradesh, Telangana, Karnataka, Kerala and one union territory of Puducherry.

### Materials and/or Subjects

The required sample size of 385 was calculated based on the population size (N) of about 2 million front line healthcare workers including medical doctors, nurses and pharmacists, confidence level (z) of 95 % and margin of error (e) of 5 % using the online software (Sample size calculator, 2020). By considering at least about 80 % of response rate, more than about 482 HCWs were targeted to approach.

An online survey questionnaire was designed with 25 questions framed using the resources on COVID-19 available in the literature and official websites of professional organizations (Sohrabi *et al.*, 2020). The survey included questions to capture basic demography and professional aspects of the HCWs such as their profession, qualification, years of experience, work place, etc. The survey questionnaire along with the evidences as citations was first shared with 10 HCWs of top cadres and requested to assess the scientific contents of the questionnaire. The readability and difficulty level of the questionnaire was assessed by another group of 10 HCWs

using the scale ranging from 0-10; zero being very difficult and confusing and 10 as very easy and clear. Further validation of the questionnaire for was done through a pilot study conducted with 20 HCW sand the Cronbach's alpha score of 0.7 and above was considered as the positive out come of validation. There sponses from these HCWs responded for the validation of the questionnaire were not included into the data analysis of this study. The online link of the validated survey questionnaire along with the request to participate in the survey was sent through the personal contacts of the authors to the various healthcare professionals across the study regions. The first response was captured on 4<sup>th</sup> of April 2020 and the total responses on par with the calculated sample size was attained in about 25 days.

### Statistics

Descriptive statistics was used for the demographic analysis of the study participants and the data were presented with numbers, percentages, mean value as central tendency and standard deviation as deviation from the mean. Unpaired t-test and ANOVA were used to compare the means of the responses received from different HCWs. p-value of less than 0.05 was considered to be statistically significant and the statistical tests were performed using the software SPSS v.21.

## RESULTS

A total of 392 responses were received and due to incomplete responses, the data of 7 respondents were excluded and thus the data from 385 HCWs were included for the analysis. Out of the 385, 41.2 % (n=159) were male and the mean age was 32.94 ± 8.70 years with the range of 22 to 56. Among the HCWs, 239 (62%) responded from Government healthcare settings followed by private healthcare settings (n=79; 20.4%) and private practice (n=68; 17.6%). About 44 % (n=169) Nurses and 26.9% (n=104) Medical Doctors participated in the survey followed by Pharmacists and other HCWs like Microbiologists and Biochemists. The professional designation and experience of all the HCWs participated in the study is given in (Table 1).

About one fourth of the HCWs (26.9%; n=104) in this study claimed that they are directly involved in the clinical care of COVID-19 patients. Among these HCWs about 52.3% (n=54) opined that their commitment in the treatment of COVID-19 patients did not create any pressure personally, socially and psychologically.

79% (n=304) and 93% (n=358) of the respondents knew the etiology and classic signs and symptoms

**Table 2: Data Summary**

Groups	N	Mean	Std. Dev.	Std. Error
Medical Doctors	25	85.28	15.5524	3.1105
Nurses	25	73.4	20.6357	4.1271
Pharmacists	25	77.76	13.1949	2.639
Other HCWs	25	63.6	24.3465	4.8693

**Table 3: ANOVA Summary**

Source	Degrees of Freedom DF	Sum of Squares SS	Mean Square MS	F-Stat	P-Value
Between Groups	3	6145.39	2048.4633	5.7117	0.0012
Within Groups	96	34429.601	358.6417	-	-
Total:	99	40574.991	-	-	-

of COVID-19 respectively while the rest said they do not know the answers. 89% (n=343) knew that the infection is transmitted through the respiratory droplets and not air-borne, and the rest of them did not know this information. 335 respondents (87%) knew that COVID-19 is a self-limiting infection in majority of the individuals based upon their immunity levels and vast majority of them (94%; n=362) knew the patients with pre-existing comorbidities such as hypertension, diabetes, cancer, cardiovascular diseases and lung diseases. About 50% (n=193) had an opinion that to declare a patient as cured from COVID-19, more than one culture test to be negative, means that the remaining 50% of HCWs participated in this study either did not know about this or what they knew is wrong. About 208 respondents (54%) admitted that all the patients diagnosed with COVID-19 positive require hospitalization. Only 33% of the respondents (n=127) expressed that if respiratory infection is identified with one virus, then the COVID-19 virus infection cannot be ruled-out, that is, the remaining section of the study participants either do not know the answer or agreed that we can rule-out COVID-19 if any one virus is identified in case of respiratory infection. The responses of the different categories of HCWs participated in this study for all the 25 questions are presented in (Table 2).

The knowledge level was compared between the HCWs using one-way ANOVA and found that the knowledge level of Medical Doctors was high than the Pharmacists followed by Nurses and Other HCWs; these differences were found statistically significant ( $p=0.0012$ ). The mean percentage of knowledge of different professionals and the ANOVA data

are shown in (Table 3).

## DISCUSSION

COVID-19 has become the pandemic across the world and the first case was reported in India on 30<sup>th</sup> January at one of the southern states Kerala. It is evident that both the spread and impact of COVID-19 pandemic in India are much less than the rate as that of Europe and US, since even after about 70 days after the first case reported, the number of cases reached about 62,938 among which 19357 (30.75%) were cured and discharged while 2109 patients died (3.35%) (Covid 19, 2020).

However, it is very important that the HCWs have adequate knowledge about the COVID-19 infection and its treatment aspects to have better control on the pandemic and outcomes of treatment. As it is known that the professional knowledge of the various HCWs will vary depending on the professional education, and this survey is carried out commonly among different HCWs the survey questionnaire was designed with 25 very basic questions about COVID-19 which might be known to all the HCWs. This study revealed that the top 3 HCWs of the world viz. doctors, nurses and pharmacists had very good percentage of knowledge ( $78.81 \pm 13.45$ ) about the COVID-19. It is also observed in the present study that the level of knowledge about COVID-19 of these three categories of HCWs is comparable as the co-efficient of variation (CV) among their knowledge score is just 17.06%.

However, the other HCWs such as biochemists, pathologists, etc. showed comparatively less percentage of knowledge about COVID-19 ( $63.6 \pm 24.3$ )



and inter-individual difference was also very high (CV=38.2%). This was the knowledge level of these HCWs after about 8 weeks from the first case reported in India. The knowledge levels after the similar period from the first case reported at China and USA, the knowledge levels among general public were reported as about 90% and 80% respectively (Clements, 2020) and the higher knowledge among Chinese citizens is due to their prior exposure to the other severe acute respiratory syndrome outbreaks. These findings suggest that the medical educational programs about COVID-19 should be inclusive with all the categories of HCWs. Though it is encouraging to know that about 85% (n=327) of HCWs participated in the study tend to upgrade their knowledge about COVID-19 from the data bases of World Health Organization (WHO) and Indian Council for Medical Research (ICMR), it is also vital to understand that about 37% (n=142) did not know that even after the symptomatic recovery from COVID-19, the individuals can be carriers and have the risk of spreading the infection. Such lack of knowledge among COVID-19 might result in the ineffective patient advice and increased risk of community spread of COVID-19. Such lack of knowledge about the COVID-19 was also reported in a survey conducted among HCWs across the globe (srikanth bhagavathula et al., 2020).

As it is widely believed that the COVID-19 emerged from the wet market at Wuhan, China and the etiology of other viral infections such as SARS, MERS and Ebola are also known to have link with animal origin (Zhu et al., 2019; Webster, 2004) about 48% (n=185) of HCWs participated in this study opined that non-vegetarian cannot be given to the COVID-19 patients who are under treatment. About 82% (n=316) of the respondents believed the drug Hydroxychloroquine is recommended for the treatment of COVID-19 as at the time of survey, it was the recommendation by ICMR to use the said drug for the both positive patients and high-risk individuals including HCWs as prophylactic (Rathi et al., 2020).

But, now the clinical effectiveness of this drug for COVID-19 treatment is questioned and discouraged by both National Institute of Health (NIH) and USFDA in the guidelines (National Institutes of Health, 2019). Thus, it is imperative that the HCWs update their knowledge about COVID-19 and its treatment options as the recommendations are highly dynamic in nature. As this study was designed for the HCWs in general, the questions were chosen to assess the basic pathological, clinical knowledge of the participants and thus, more technical knowledge could not be included in the survey.

## CONCLUSION

This study concludes that the present level of knowledge of HCWs in south Indian states where the pandemic of COVID-19 is comparatively more is relatively high. However, as the facts and figures about COVID-19 and its treatment options / management are highly dynamic, the HCWs to be continuously educated through a structured mechanism by a reliable national wide organization like ICMR.

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## Conflict of interest

No potential conflict of interest relevant to this article was reported.

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