

# Managing COVID-19 pandemic; Knowledge and practices of Community Healthcare Workers in Sri Lanka

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## Abstract

**Background:** Coronavirus disease-2019 (COVID-19) is a public health problem where the world's 3.3 billion global workforces are at risk of losing their livelihoods. The present study sought to determine the knowledge, and practices of community health care workers (HCWs) toward COVID-19 in the Regional Director of Health Services in Galle District, Sri Lanka.

**Methods:** A descriptive cross-sectional study was conducted with the objective of knowledge, and practices among healthcare workers at the Regional Director of Health Services in Galle district, Sri Lanka, during August 2020. A self-administered questionnaire was used as the study instrument. The sample consisted of 20 -Medical Officers of Health, 18 - Additional Medical Officers of Health, 14-Senior Public Health Inspectors, and 101- Public Health Inspectors, who are directly involved in the management of the COVID-19 pandemic. Knowledge and practices towards COVID-19 were assessed by using a pre-tested questionnaire. A cut-off of 60% was used to determine sufficient knowledge ( $\geq 60\%$ ), and good practice ( $\geq 60\%$ ). All analyses were performed using SPSS version 21, chi-square and binary logistic regression were performed for the significance of the data.

**Results:** Of the 153 healthcare workers, approached, 118(77%) responded. A majority of the participant were male (76.7%, n=90). Overall, 83.1%(n=98) had a sufficient level of knowledge, and 87.3%(n=103) had high to moderate level preventive practices toward COVID-19. Univariate and multivariate analysis showed: Female health care workers had high knowledge level than male health care workers (OR=6.86, 95% CI:1.07-235.6; p=0.05) and junior health care workers had good preventive practices than senior workers (OR: 3.63; 95%CI: 1.01-120.3; p=0.05).

**Conclusion:** Continued professional education on Covid-19 is advised among healthcare workers in Sri Lanka to improve knowledge, hence averting negative attitudes and promoting positive preventive and therapeutic practices.

**Keywords:** COVID-19, Community Healthcare workers, Knowledge, Practices

## **INTRODUCTION**

Coronavirus Disease 2019 also known as COVID -19 is a rapidly expanding pandemic caused by a novel human coronavirus (SARS-COV-2) which is earlier identified as 2019-n-COV [1]. Since December 2019, the COVID-19 has spread from Wuhan city to other cities of China and ultimately around the whole world [2]. The World Health Organization (WHO) has declared the COVID-19 outbreak a Public Health Emergency of International Concern (PHEIC) on 30th January 2020 and a pandemic on 11th March 2020 [3].

Healthcare workers have a crucial role in lowering morbidity and mortality but in doing so they are directly exposed to patients and the causative agents. Preventing nosocomial infections and protecting healthcare workers posed great challenges to the healthcare system during the initial COVID-19 outbreak in China [4]. In China, 2050 cases of COVID-19 were reported in healthcare workers as of 20 February 2020; the majority of the cases were due to lower awareness and experience of handling the disease [5]. Knowledge of disease may influence health care workers, practices, and incorrect attitudes and practices directly increase the risk of infection [6].

A poor understanding of the disease among healthcare workers (HCWs) can result in delayed identification and treatment translating into a rapid spread of infections and putting the patients' lives at risk. A great number of media houses and websites are publishing unverified and false information on the disease. Healthcare workers must therefore be well equipped with the right information and possess a positive attitude towards COVID-19 and prevention practices [7]. Lack of information and discrepancy in the level of knowledge among the general public and healthcare workers facilitate the spread of contagious diseases; eventually leading to epidemics and pandemics [8]. Thus, to facilitate outbreak management of Covid-19, there is an urgent need to understand the awareness of Covid-19 among healthcare workers [9].

To view the severity of the outbreak of this virus and the importance of health care professionals working with scares resources to combat COVID -19 as well as deliver the best practice to control the COVID-19 disease, it is a mandate to evaluate the knowledge and practices among health care workers in Sri Lanka as well. Therefore, a study was carried out to determine the level of knowledge and preventive practices for reducing the spread of COVID-19 among community healthcare workers in the Regional Directorate of Health Services in Galle District, Sri Lanka.

## **METHODS**

Study design and study population and study tool: An observational descriptive cross-sectional study was conducted from August 2020 to January 2021 at the Regional Directorate of Health Services (RDHS) in Galle

district Sri Lanka. The sample consists of 20 –Medical Officers of Health 18- Additional Medical Officers of Health, 14- Senior Public Health Inspectors, and 101- Public Health Inspectors who are directly involved in the management of the COVID-19 pandemic in Sri Lanka after informed written consent. HCWs who were too ill to participate were excluded.

Data was collected using a self-administered questionnaire which was prepared in Sinhala, Tamil, and English languages using a pre-tested questionnaire. An extensive literature search was done and experts in the subject area were consulted during the preparation of the questionnaire. The draft questionnaire was re-circulated among the panel of experts and necessary modifications were made to incorporate suggestions of the experts. This ensured the face and content validity of the study instrument.

Study procedure: The Principal Investigator (PI) administered the questionnaire. PI attended the Medical Officer of Health (MOH) conference which was held in the RDHS office and briefed the MOH's and public health inspectors (PHI) regarding the aim of the study and request support for data collection at the MOH Offices. Data collection was time to time interrupted due to the lockdown of some gramaniadari divisions as well as the high workload of the staff due to the prevailing COVID-19 pandemic situation.

### **Operational definition**

Healthcare workers are defined as all people involved in activities whose primary goal is to improve the health of the patient [10]. For this study, community healthcare professionals in primary contact with patients who were involved in community care were enrolled. These included medical officers of Health and Public Health Inspectors.

### **Dependent variables**

Knowledge, and practices toward COVID-19.

Knowledge was assessed using a 08-item questionnaire modified from Zhong et al. [2] and adapted to suit health care workers. The questions were about clinical presentations, transmission, prevention, and control of COVID-19. Each correct response weighs 1 point and 0 for incorrect responses. The higher the points, the more knowledgeable the healthcare workers are.

Practices were assessed using Likert-item questions that have been developed from the WHO and Ministry of Health Sri Lanka recommended practices for prevention of COVID-19 infection. Avoiding touching of the face, hand washing with soap and water and sanitizer, keeping a social distance (1 meter apart), avoiding crowded

places, and avoiding handshakes were some of the assessed practices. The responses were no, yes, sometimes, yes, all the times, each weighing 0, 1, and 2 points respectively for good practice in the question of 1,2,4,5,6 and vice versa in question number 7. Question number 3 was scaled as: not washing, occasionally, 1 to 2 times/day, more than 3 times a day in the field, and weighted as 0,1,2,3 respectively.

Data analysis: Completed questionnaires were entered into the SPSS version 21 statistical software package. Numerical data were summarized as means and standard deviations or median and range as appropriate. Categorical data was briefed as frequencies and proportions. Bloom's cut-off of 60% was used to determine sufficient knowledge ( $\geq 60\%$ ), good practice ( $\geq 60\%$ ) (11). Associations between independent variables and dependent variables were assessed using the chi-square test and multivariate analysis in SPSS software.  $p < 0.05$  is considered statistically significant.

Ethical aspect: There is no conflict of interest in this study. Ethical approval was obtained from the Ethical Review Committee of the Post Graduate Institute of Medicine.

## RESULTS

### Socio-demographic characteristics

Of the 156 healthcare workers approached, a total of 118 HCWs responded (response rate 77%). A majority of the participants were males [77.1% (n=91)]. 66% (n=40) were below 45 years old. 28 (13.7%) were doctors and 86.3% (n=90) were public healthcare inspectors (Table 1).

**Table 1: Socio-demographic characteristics of the participant (n=118)**

Characteristics	Frequency (n)	Percentage (%)
<b>Age Group</b>		
<35 years	47	39.8
35 to 45 years	31	26.3
>45 years	40	33.9
<b>Gender</b>		
Male	91	77.1
Female	27	22.9
<b>Marital status</b>		
Single	37	31.4
Married	81	68.6
<b>Highest level of education</b>		
G.C.E. (Advanced Level)	21	17.8
Completed diploma	69	58.5
Completed degree	26	22
Postgraduate	2	1.7

<b>Occupation</b>		
MOH	28	23.7
SPHI	12	10.2
PHI	78	66.1
<b>Service period in Galle</b>		
1 to 3 years	34	28.8
4 to 6 years	32	27.1
7 to 10 years	10	8.5
11 to 15 years	18	15.3
More than 15 years	24	20.3

### Assessment of knowledge

The majority were knowledgeable of the causative organism of COVID-19 [117(99%)]. 81.3%(n=98) of the participants scored 60% or more and were considered to have sufficient knowledge. (Table 2).

**Table 2: Knowledge on COVID-19 (n=118)**

Question	Knowledge Level		Total
	Good	Lower	
	No (%)	No (%)	
1. What is the causative organism of COVID-19?	117(99.6)	1(0.4)	118(100%)
2. What is/is the source of infection?	90(76%)	25(23%)	115(99%)
3. What is the possible mode of transmission of Corvid-19? (Multiple answers possible)	82(70%)	36(29%)	115(99%)
4. What is the incubation period of COVID-19?	83(70.1%)	30(25.9%)	113(96%)
5. What are the symptoms of COVID-19? (Multiple answers possible)	99(83%)	18(16%)	117(99%)
6. What are the complications of COVID-19	60(51%)	57(48%)	117(99%)
7. Can asymptomatic carriers spread the disease?	110(93%)	6(5%)	116(98%)
8. Can COVID-19 cases be treated at home?	24(21%)	90(76%)	114(97%)
<b>Overall</b>	<b>98(83.1%)</b>	<b>20((16.9%)</b>	<b>(100) %</b>

### Preventive practices

A majority of the HCWS 115(97. 4%) wore a mask when coming into contact with the patient when attending duty at the field level and 55(46.6%) used gloves for the prevention of COVID-19 infection at the field level (Table 3).

**Table 3: Preventive practices on COVID-19(n=118)**

Question	Practice level			Total
	Good No (%)	Moderate No (%)	Inadequate No (%)	
1. Are you using a face mask throughout when attending duty at the field level for the prevention of Covid 19 infection?	115(97%)	2(1.7%)	0(0%)	117(98.7%)
2. Are you using gloves for the prevention of COVID 19 infection throughout your practices at the field level?	55(46.7%)	61(51.7%)	0(0%)	116(98.4)
3. How Frequently you are washing hands per day when working in the field?	84(71.2%)	20(11.7%)	5(4.2%)	109(87.1%)
4. Are you using soap to wash hands when working at field level?	96(81%)	18(15.2)	1(0.8)	115(97.5)
5. Are you using antiseptic/sanitizer to sanitize your hands when working in the field?	59(50%)	51(43%)	6(5)	116(98.5)
6. Are you practicing social distancing when working in the field?	100(84.7%)	8(6.8%)	6(5%)	114(96.5%)
7. Do you physically contact patients without gloves while working in the clinic?	110(93.2%)	0(0%)	7(6%)	117(99.2%)
Overall	71(60.2%)	32(27.1%)	15(12.7%)	

### Association of sociodemographic factors and knowledge

The knowledge score of male participants was higher than those of female participants (p<0.05). Age, marital status, educational level, illness status, service period, did not have any significant association with knowledge level. Being a Medical officer of the Health and Public Health Inspector did not have any effect on the knowledge. (Table 4).

**Table 4: Association between socio-demographic characteristic and knowledge (n=118)**

Variable	Sufficient knowledge	Insufficient knowledge	Total	chi-square, df, p-value, OR (95%CI)
Sex				4.364
Male	72(79.1)	19(20.9)	91	1
Female	26(96.3)	1(3.7)	27	<b>&lt;0.050</b>
				6.861(1.07-235.6)
Age				2.07
Up to 45 years	62(79.5)	16(20.5)	78	1
More than 45 years	36(90.0)	4(10.0)	40	0.15
				0.43(0.13-1.37)
Marital status				1.443
Single	33(89.2)	04(10.8)	37	1
Currently married	65(80.2)	16(19.8)	81	0.23
				0.49(0.15-1.59)
Educational level				0.85
Less than diploma	16(76.2)	05(23.8)	21	1
More than diploma	82(84.5)	15(15.5)	97	0.35
				0.59(0.18-1.84)
Service period in RDHS				
Galle				0.8
Upto 6 years	53(80.3)	13(19.7)	66	1
More than 6 years	45(86.5)	07(13.5)	52	0.37
				0.63(0.23-1.72)
Category				2.51
MOH	26(92.9)	2(7.1)	90	1
PHI	72(80.0)	18(20.0)	28	0.113
				0.31(0.07-1.42)

**Association of sociodemographic factors and practices**

Overall, up to 87% (n=103) of the participant had good practices. Preventive practices among COVID-19 were associated with the service period in RDHS, Galle district. The participant who has up to 6 years of service experience had good preventive practices compared to the participants with more than 6 years of experience which was statistically significant. (Table 5).

**Table 5: Association between socio-demographic characteristics and preventive practices (n=118)**

Variables	Good practices	Fewer practices	Total	chi-squared-value, OR (95%CI)
Sex				1.06
Male	81(89.0)	10(11.0)	91	1
Female	22(81.5)	05(18.5)	27	0.3
				0.54(0.75-1.11)
Age				2.89
Less than 45 years	71(91.0)	01(9.0)	78	1
More than 45 years	32(80.0)	08(20.0)	40	0.08
				2.53(0.96-1.35)
Marital status				1.87
Single	30(81.1)	07(18.9)	37	1
married	73(90.1)	08(9.9)	81	0.17
				2.13(0.79-6.39)
Educational level				3.87
Less than diploma	17(81.0)	04(19.0)	21	1
More than diploma	86(88.7)	11(11.3)	97	0.06
				6.31(0.96-1.30)
Service period				4.04
Less than 6 years in hospital	62(94.0)	04(6.0)	66	1
More than 6 years in RDHS	41(78.8)	11 (21.2)	52	<0.05
				3.63(1.01-120.3)
Category				2.51
MOH	22(78.6)	06(21.4)	28	1
PHI	81(90.0)	09(10.0)	90	0.113
				2.46(0.93-1.40)

## DISCUSSION

COVID-19 is an emerging, speedily fluctuating global health challenge affecting all sectors [12]. HCWs are not only at the forefront of the fight against this highly contagious infectious disease but are also directly or indirectly affected by it and the probability of attaining this illness is higher among HCWs compared to the general population [13].

This study was exclusively targeted to the healthcare staff that directly or indirectly in contact with suspected or confirmed COVID-19 patients. HCWs throughout the world must have satisfactory knowledge about all aspects of the COVID-19 disease from clinical appearance, diagnosis, proposed treatment, and recognized prevention strategies. This study is the first study conducted to assess the knowledge, and practices among community healthcare workers in Sri Lanka.



The present study revealed that about eight in 10 of the HCWs had adequate knowledge about COVID-19. The level of knowledge did not have a significant association with factors; age, academic qualification, or profession of the HCW. This high percentage of knowledge about COVID-19 among healthcare workers in Sri Lanka may be due to information being disseminated through the Ministry of Health to healthcare staff as well as the inputs from the media where main attention was given to COVID-19. However, in contrast, the study by Bhagavathula et al. [14]. showed poor knowledge among HCW's.

The results showed that the females had statistically significantly better knowledge related to COVID-19, compared to males ( $p < 0.05$ ). A similar result was found in the study of Assad et al (2020) where females had higher knowledge of COVID-19 [15].

About 97% of HCW believed that wearing general medical masks was protective against COVID-19 determine to conclusions by Ng et al. which showed acceptable defense [16]. However, an ideal mask for the prevention of the spread of SARS-CoV-2 is an area of current research. Further education and training through continuous professional education and journal clubs, needed for improving the knowledge of HCW about COVID-19 in this setting.

Of the study participants, 87% (n=103) followed high to moderate level preventive practices to prevent the spread of the COVID-19. A majority of the HCWs were following infection prevention and control practices recommended by the Ministry of Health in Sri Lanka and the WHO. These include regular hand hygiene, social distancing, and wearing a face mask when in high-risk situations. 97% (n=117) of HCWs reported wearing a face mask when in contact with patients and 83% (n=104) washing hands before/after handling patients. Similar findings were seen in the study by Olum et al [7] and Alfahan et al [17].

It is important to adhere to recommended preventive practices to prevent the transfer of COVID-19 from patients to patients and among the HCWs. themselves. Further, the present study showed that the younger HCW (service period less than 6 years) were more likely to have good preventive practices about COVID-19 and that was statistically significant by multivariate analysis.

### **Limitation of the study**

A validated tool was not available to assess the knowledge, attitude, and practices on COVID-19, Moreover, the cross-sectional nature of the study did not allow assessing the cause-effect relationship.

## CONCLUSION AND RECOMMENDATION

More than two-thirds of community HCWs in the RDHS area in Galle have sufficient knowledge on COVID-19 and female workers had more knowledge levels than male healthcare workers. Over 80% of the HCWs had good practices toward COVID-19 especially those working experience less than 6 years in the working sector. Knowledge and practices were not affected by professions and qualifications. Continued professional education is recommended for HCWs in Sri Lanka to improve and maintain the knowledge and practices of HCWs.

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