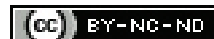


# Potential Risk Factors for COVID-19 Infection among Healthcare Workers in a Tertiary Care Centre, Kerala, India

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## ABSTRACT

**Introduction:** Understanding the virus transmission patterns and routes of transmission among Healthcare Workers (HCWs) is limiting the amplification events in healthcare facilities.

**Aim:** To estimate the secondary infection rate and to describe the clinical presentation of infection and the risk factors for infection among healthcare worker contacts of Coronavirus Disease-2019 (COVID-19) cases.

**Materials and Methods:** A descriptive cross-sectional study was conducted from June 2020 to July 2021, at a tertiary care centre, in central Kerala, India, among all the healthcare workers with exposure to a COVID-19 confirmed cases within the institution, between 15<sup>th</sup> July 2020 to 15<sup>th</sup> August 2020. Data including demographic details, information on contact and possible exposure with the COVID-19 infected patient was obtained using a questionnaire adapted from the World Health Organisation (WHO).

Data was entered into Microsoft Excel and analysed using International Business Machines (IBM) Statistical Package for Social Sciences (SPSS) version 22.0.

**Results:** A total of 433 healthcare workers (382 females and 51 males, mean age: 34.33±10.79 years) were found to be exposed to COVID-19 confirmed cases in the institution. The 21% of the healthcare worker contacts were exposed while working in non COVID Intensive Care Unit (ICU) setting. Out of the 433 HCWs who were exposed to COVID-19 patients, 9 tested positive for COVID-19 [secondary infection rate was 2.07% with a Confidence Interval (CI) of 0.7-3.4%]. All nine of the positive HCWs were females, of which 88.89% were symptomatic.

**Conclusion:** Healthcare workers are at risk of transmission of COVID-19 while providing care, hence further explorative studies, including serologic studies are recommended to further understand the epidemiology.

**Keywords:** Coronavirus disease-2019, Healthcare setting, Secondary infection rate

## INTRODUCTION

Coronavirus Disease-2019 (COVID-19) is a novel viral disease with over 182,319,261 confirmed cases worldwide and the total global deaths has surpassed 3,954,324 [1] by July 2021. Knowledge regarding the epidemiology of the disease and clinical presentation has been evolving since the initial identification of the virus.

Other coronaviruses which have caused pandemics like the Middle East respiratory syndrome-Coronavirus (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS) are known to have caused outbreaks in healthcare settings [2]. Similarly, SARS CoV-2 also has the potential for grave impact on healthcare settings [3]. Systematic reviews have reported SARS CoV-2 test positivity among healthcare workers as high as 51% [4]. This high incidence is alarming as healthcare workers are not only critical for the clinical management of patients, but they are also important links in the chain of transmission [4]. They are both vulnerable to infection while providing care, due to their close interaction with the patients, and they are at the highest risk of transmission to others both within the institution and outside the institution [5,6]. Moreover, infection among healthcare workers will lead to depletion of the work force and inturn have an adverse effect on patient care [6].

Understanding the virus transmission patterns and routes of transmission among healthcare workers will be an important step in limiting the amplification events in healthcare facilities [2]. To better understand the transmission dynamics, and an overall risk of infection among healthcare worker contacts, secondary infection rate which is a measure of the frequency of new cases of COVID-19 among the contacts of a confirmed case in a defined period may be explored [2]. Since the studies regarding same are lesser in number [7-9] with pretty limitations, hence this study was conducted in a tertiary care setting, to estimate the secondary infection rate

and to describe the clinical presentation of infection and the risk factors for infection among the healthcare worker contacts of COVID-19 cases.

## MATERIALS AND METHODS

This cross-sectional descriptive study was conducted at a tertiary care centre, in the central part of Kerala, after obtaining approval from the Institutional Review Board (No:16/2020 dated 28.06.2020) between June 2020 and July 2021. All the healthcare workers who were involved in care of COVID-19 confirmed cases between 15<sup>th</sup> July 2020 to 15<sup>th</sup> August 2020 were enlisted. From the list, all those involved in the care, those who disclosed a history of exposure to COVID-19 positive patients, either due to breach of Personal Protective Equipment (PPE), or because the status of the patient was unknown at the time of exposure was contacted through telephone and information was gathered. After assessment, they were classified as those with high risk exposure and low risk exposure. A total of 433 healthcare workers at Government Medical College, Kottayam, Kerala, India, were found to be exposed to 15 COVID-19 confirmed cases in the institution.

**Inclusion criteria:** All healthcare workers with exposure to a COVID-19 confirmed case, including those with direct exposure and those with exposure to the patient's blood, body fluids, and to contaminated materials or devices and equipment linked to the patient were included in the study.

**Exclusion criteria:** Healthcare workers who have been exposed to another implicated source of confirmed COVID-19, for example a COVID-19 positive case among his/her household/close contacts/occupational contacts working in the same or outside institutions, or any other outside source were excluded from the study.

### Operational Definition

**Healthcare worker** was defined as all staff in the healthcare facility involved in the provision of care for a coronavirus infected patient, including those who have been present in the same area as the patient, as well as those who may not have provided direct care to the patient, but who have had contact with the patient’s body fluids, potentially contaminated items, or environmental surfaces. This includes healthcare professionals, allied health workers, auxiliary health workers (e.g., cleaning and laundry personnel, x-ray physicians and technicians, clerks, phlebotomists, respiratory therapist, social workers, physical therapists, laboratory personnel, cleaners, admission/reception clerks, patient transporters etc) [2].

**Secondary infection rate** was defined as the proportion of healthcare worker contacts of a primary case who tested positive for Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) by Reverse Transcriptase Polymerase Chain Reaction (RT PCR) or rapid antigen test [2].

$$\text{Secondary infection rate} = \frac{\text{Number of healthcare workers confirmed to have COVID-19}}{\text{Total number of healthcare workers enrolled as contacts of the case}}$$

**High risk exposure:** The details of exposure among the healthcare worker contacts of COVID-19 confirmed cases, including the duration of exposure, history of close contact and use of personal protective equipment were assessed and the risk of exposure was classified as ‘high-risk exposure’ in cases where there was close contact for a duration of more than 15 minutes and appropriate personal protective equipment was not used [10,11]. Otherwise classified as, low risk exposure.

### Procedure

Once a case of COVID-19 infection was identified in the institution, all healthcare workers with any exposure to COVID-19 patient was listed. This was done in consultation with supervisors and colleagues, duty rosters and the medical file of the patient to understand all the areas of the healthcare facility the patient has visited. From the list, all those involved in the care, those who disclosed a history of exposure to COVID-19 positive patients, either due to breach of PPE, or because the status of the patient was unknown at the time of exposure was contacted through telephone and information was gathered. Telephonic interview was conducted, and the purpose of the investigation was explained to all known healthcare worker contacts. Data including demographic details, information on contact and possible exposure with the COVID-19 infected patient as well as laboratory results of respiratory specimen was obtained using a questionnaire. [Annexure-1] adapted from WHO questionnaire for the assessment of potential risk factors for COVID-19 infection among healthcare workers in a healthcare setting [2] and was translated into the native language Malayalam and back translated. The content validation was done by subject experts. Data was collected within a week of exposure to avoid recall bias. After assessment, they were classified as those with high risk exposure and low risk exposure.

### STATISTICAL ANALYSIS

Data was entered using Microsoft Excel and analysed using Statistical Package for Social Sciences (SPSS) version 22.0. The variables were summarised as mean with standard deviation and frequency with percentage.

### RESULTS

The mean age of the healthcare worker contacts was 34.33±10.79 years, ranging between 19 to 61 years. Among them 382 (88.22%) were females and 51 (11.78%) were males. The department wise

distribution and category of healthcare workers is depicted [Table/Fig-1]. On enquiring regarding the adherence to infection prevention and control measures, invariably all the healthcare staff reported that they adhered to infection prevention control measures while caring for patients routinely [Table/Fig-2]. It was observed that 91 (21%) of the healthcare worker were exposed while working in non COVID-Intensive Care Unit (ICU) setting and 79% (n=342) were exposed while working in non COVID wards.

Department	HCW contacts	
	Number	Percentage
Obstetrics and Gynaecology	205	47.3%
General Surgery	71	16.4%
Orthopaedics	37	8.5%
Ophthalmology	29	6.7%
Paediatrics	20	4.6%
Radiotherapy	18	4.1%
Casualty	15	3.5%
General Medicine	15	3.5%
Ear Nose Throat (ENT)	10	2.3%
Dermatology	7	1.6%
Respiratory Medicine	6	1.4%
Total	433	100%

Category of HCW	HCW contacts	
	Number	Percentage
Nursing staff	176	40.6%
Junior Residents	84	19.4%
Interns	63	14.5%
Nursing assistant/Attenders	41	9.5%
Faculty	32	7.4%
Cleaning personnel	29	6.7%
Technicians (ECG, Lab, OT etc) and Security staff	8	1.8%
Total	433	100%

[Table/Fig-1]: Distribution of Healthcare Worker (HCW) contacts according to their department and category of work. ECG: Electrocardiography; Lab: Laboratory; OT: Operation theatre

Questions	Variables	n	%
How much cumulative IPC training (standard precautions, additional precautions) have you had at this healthcare facility?	Less than 2 hours	0	0
	More than 2 hours	433	100%
Do you follow recommended hand hygiene practices?	Always, as recommended	433	100%
Do you use alcohol-based hand rub or soap and water before touching a patient?	Always, as recommended	433	100%
Do you use alcohol-based hand rub or soap and water before cleaning/aseptic procedures?	Always, as recommended	433	100%
Do you use alcohol-based hand rub or soap and water after (risk of) body fluid exposure?	Always, as recommended	433	100%
Do you use alcohol-based hand rub or soap and water after touching a patient?	Always, as recommended	433	100%
Do you use alcohol-based hand rub or soap and water after touching a patient’s surroundings?	Always, as recommended	433	100%
Do you follow IPC standard precautions when in contact with any patient?	Always, as recommended	433	100%
Do you wear PPE when indicated?	Always, as recommended	433	100%
Is PPE available in sufficient quantity in the healthcare facility?	Yes	406	93.8%
	No	21	4.8%
	Unknown	6	1.4%

[Table/Fig-2]: Adherence to infection prevention and control measures information. IPC: Infection prevention and control; PPE: Personal protective equipment

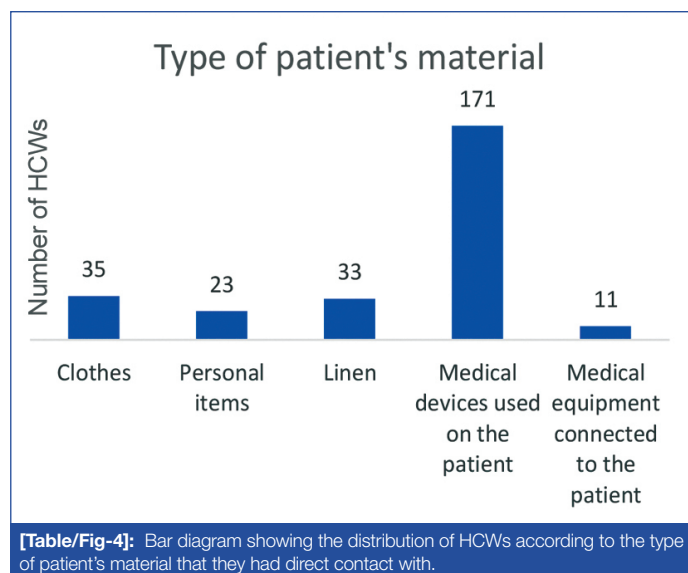
On exploring the details of exposure, 81.9% of the healthcare workers (n=355) reported close contact with a COVID-19 patient, 45.7% (n=198) reported direct contact with the patient's materials like personal belongings, linen and medical equipment (that the patient may have had contact with) and 89.3% (n=387) reported direct contact with the surfaces around the patient (bed, bathroom, ward corridor, patient table, bedside table, dining table, medical gas panel etc) [Table/Fig-3].

Analysis of HCWs reporting close contact with a COVID-19 patient (n=355)		Frequency (n)	Percentage (%)
Number of times	Single	338	95.2%
	Multiple	17	4.8%
Duration of contact	Duration >15 mins	189	53.2%
	Duration <15 mins	166	46.8%
Wearing appropriate PPE during the contact	Yes	232	65.3%
	No	123	34.6%
Hand hygiene before contact with the patient	Yes	342	96.3%
	No	13	3.7%
Hand Hygiene after contact with the patient	Yes	355	100%
	No	0	0
Any direct contact with patient's body fluids	Yes	23	6.5%
	No	332	93.5%
Present for any aerosolizing procedures performed on the patient	Yes	0	0
	No	355	100%
HCWs who reported direct contact with the patient's materials (n=198)		Frequency (n)	Percentage (%)
Contact with the patient's body fluids through the patient's materials	Yes	4	2%
	No	65	32.8%
	Unknown	129	65.2%
Wearing appropriate Personal Protective Equipment (PPE) during the contact	Yes	171	86.3%
	No	27	13.6%
Hand hygiene before contact with the patient's materials	Yes	198	100%
	No	0	0%
Hand hygiene after contact with the patient's materials	Yes	198	100%
	No	0	0
HCWs who reported direct contact with the surfaces around the patient (n=387)		Frequency (n)	Percentage (%)
Contact with the patient's body fluids through the surfaces around the patient	Yes	0	0
	No	5	1.3%
	Unknown	382	98.7%
Wearing appropriate PPE during the contact	Yes	11	2.8%
	No	217	56.1%
	Unknown	159	41.1%
Hand hygiene after contact with these surfaces	Yes	33	8.5%
	No	0	0
	Unknown	354	91.5%

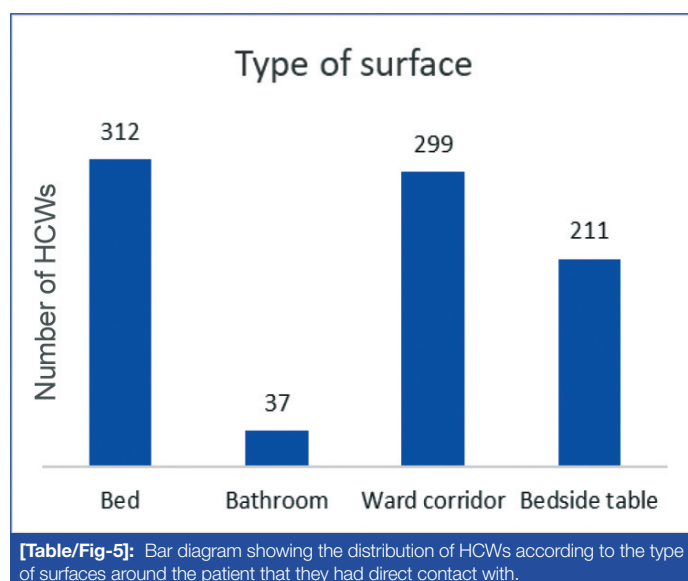
[Table/Fig-3]: Details of exposure to Coronavirus Disease-2019 (COVID-19) patient.

After assessing the details of exposure, 123 (34.6%) were found to have high risk exposure to COVID-19 confirmed cases (close contact of duration above 15 minutes without wearing PPE appropriate to the setting).

[Table/Fig-4,5] gives details of the distribution of HCWs according to the type of patient's material that they had direct contact with and the type of surfaces around the patient that they had direct contact with. Details regarding symptom development in the period since patient admission and pre-existing co-morbidities of the healthcare workers were also assessed as part of the WHO questionnaire [Table/Fig-6].



[Table/Fig-4]: Bar diagram showing the distribution of HCWs according to the type of patient's material that they had direct contact with.



[Table/Fig-5]: Bar diagram showing the distribution of HCWs according to the type of surfaces around the patient that they had direct contact with.

Experienced any respiratory symptoms in the period since the patient had been admitted		Frequency (n)	Percentage (%)
Yes		137	31.6%
No		296	68.4%
Total		433	100%
Among those who were symptomatic (n=137)	Fever	29	21.2%
	Sore throat	27	19.7%
	Cough	44	32.1%
	Runny nose	37	27%
Healthcare worker pre-existing condition(s)			
Yes		97	22.4%
No		336	77.6%
Total		433	100%
Among those who have pre-existing conditions (n=97)	Diabetes	31	31.9%
	Hypertension	37	38.1%
	Dyslipidaemia	12	12.3%
	Heart disease	4	4.1%
	Asthma (requiring medication)	7	7.2%
	Pregnancy	6	6.2%
	Chronic kidney disease	1	1%
	Other pre-existing condition(s)	3	3%

[Table/Fig-6]: Healthcare worker symptoms and pre-existing co-morbidities; one patient might report more than one co-morbidity.

**Secondary infection rate:** Out of the 433 HCWs who were exposed to COVID-19 patients, 9 tested positive for COVID-19. The secondary infection rate was 2.07% (CI-0.7-3.4%). All 9 of the positive HCWs were females with a mean age 31 years (SD of 10.72 years). All were exposed while providing care in a ward setting to COVID-19 cases whose status was unknown at the time of exposure. On evaluating the details, it was found that all 9 had high risk exposure to the COVID-19 case, and in 7 (77.78%) of them, HCW was exposed to multiple COVID-19 patients. A total of 6 of the healthcare workers (66.67%) were not using PPE appropriate for the setting at the time of exposure. Three HCWs were using PPE appropriate to the setting but reported breach of PPE (2 reported that they were wearing N95 masks in ward, but had removed the mask while attending phone calls, 1 reported that her mask was wet). A total of 8 positive HCW contacts i.e., 88.89% were symptomatic i.e., fever reported by 3, sore throat by 2, cough by 2, nasal symptoms by 2 and abdominal symptoms by 1. Except 1 (11.1%) who had history of bronchial asthma, no other positive HCW contacts gave history of co-morbidities. None had ICU admission.

On exploring the secondary infection rate according to the department of work [Table/Fig 7], it was seen that 2 among the 20 HCW contacts (Secondary infection rate of 10%) in the Department of Paediatrics and 7 among the 205 HCWs (secondary infection rate of 3.4%) in the Department of Obstetrics and Gynaecology became COVID-19 positive.

On assessing the category of staff, secondary infection rate was highest among technicians, security staff etc., [Table/Fig-8].

Department	Number of HCW contacts	Number of HCWs who developed COVID-19	Secondary infection rate (%)
Obstetrics and Gynaecology	205	7	3.4%
General Surgery	71	0	0
Orthopaedics	37	0	0
Ophthalmology	29	0	0
Paediatrics	20	2	10%
ENT	10	0	0
Radiotherapy	18	0	0
Casualty	15	0	0
Dermatology	7	0	0
General Medicine	15	0	0
Respiratory Medicine	6	0	0
Total	433	9	2.07%

[Table/Fig-7]: Distribution of Healthcare Worker (HCW) contacts and Secondary infection rate according to department.

Category of HCW	Number of HCWs who were exposed	Number of HCWs who developed COVID-19	Secondary infection rate (%)
Nursing staff	176	1	0.57%
Postgraduate students	84	4	4.76%
Interns	63	3	4.76%
Nursing assistant/Attenders	41	0	0
Doctors	32	0	0
Cleaning personnel	29	0	0
Technicians (ECG, Lab, OT etc) and Security staff	8	1	12.5%
Total	433	9	2.07%

[Table/Fig-8]: Distribution of Healthcare Worker (HCW) contacts and Secondary infection rate according to category of healthcare worker.

## DISCUSSION

In the present study, 433 healthcare workers were found to be exposed to COVID-19 confirmed patients in the institution during

the study period. They were exposed while providing care in a non COVID setting, where patient status was unknown at the time of exposure or had history of use of breach of PPE or was not using PPE appropriate for the setting [10]. This may be explained by the fact that, as recommended in the WHO assessment protocol [2], the study was conducted within the early phases of the epidemic, before widespread transmission or nosocomial outbreaks occurred, when stringent infection prevention and control measures were yet to be instigated.

On assessing the details of adherence to infection prevention and control measures by healthcare workers routinely, invariably all the healthcare staff reported that they adhered to all the routine infection prevention control measures. This data may be biased, especially in the current COVID-19 scenario, healthcare workers may not be ready to commit to the fact that they do not adhere to COVID-19 practice routinely. Out of the 433 healthcare workers who were exposed, 9 were found to be COVID positive. Those COVID positive healthcare workers, who had another implicated source of COVID-19 infection like a positive family member, a colleague, or a source from a different setting, were excluded from the study.

In the present study, the most exposed category of healthcare workers was nursing staff 176 (40.6%). Nursing staff being exposed the most may be explained by the longer duration that they involved in direct patient care, bedside tasks, drug administration etc., as well as being the first line of response in case of any patient complaints [5]. Whereas the secondary infection rate among nursing staff in the present study was only 0.57%. Contrasting finding was seen in the study by Alajmi J et al., [6], where the highest number of infected healthcare workers were nurses and midwives (33.2%), and Gómez-Ochoa SA et al., [5] also reported upto 48% of infection among nursing staff.

The current study revealed that the exposure of healthcare workers occurred in a non COVID setting (21.1% in non COVID ICU and 78.9% in non COVID wards). Alajmi J et al., also reported a very similar picture where 95% of the infected healthcare workers reported acquiring the virus while working in a non COVID-designated setting [6]. This may be possibly because of unknown status of the infected, lower adherence to prescribed personal protective equipment, lesser observance of infection prevention and control measures in non COVID settings as compared to COVID-19 setting, especially in the initial phase of the pandemic [6].

In the present study, secondary infection rate among healthcare worker contacts was 2.07% (0.7-3.4%). Similar to these findings, Huang YT et al., reported secondary attack rate in a hospital setting as 1.56% with CI of 0.73-2.93% [12]. Most of the available literature explores the prevalence of SARS-CoV-2 among healthcare workers, and Indian studies have reported upto 11% prevalence among healthcare workers [Table/Fig-9] [6,8,9,12,13].

Study	Place and year of study	Sample size	Secondary attack rate in a hospital setting
Mahajan NN et al., [8]	Mumbai, India (2020)	3711	11%
Alajmi J et al., [6]	Qatar (2020)	16912	10.6%
Sabetian G et al., [9]	Iran (2021)	4854	5.62 %
Huang YT et al., [12]	Taiwan (2021)	455	1.56% (0.73-2.93%)
Nguyen LH et al., [13]	UK, US (2020)	99795	0.027 %
Present study	Kerala, India (2020)	433	2.07% (0.7-3.4%)

[Table/Fig-9]: Secondary attack rate of COVID-19 among healthcare workers in different settings.

The mean age of the infected healthcare workers in the current study was 31 years (SD of 10.72 years) and all were females. Similarly studies by Mandana G et al., [4] Jeremias A et al., [14] and Sabetian G et al., [9] reported a higher female proportion of 78.6%, 70% and 53.5% respectively, but a higher mean age of 38.37 years,

42.8 years and 35 years respectively. It could be due to the socio-demographic difference in the sample.

The current study showed that 8 (88.89%) of the infected health care workers were symptomatic and the most common symptom was fever. These findings are in line with the findings of Mahajan NN et al., [8] who reported that 85% of the infected healthcare workers were symptomatic and Nguyen LH et al., [13] who reported that 93.5% as symptomatic. Also fever was documented as the most prevalent symptom in studies by Jeremias A et al., [14] and Ran L et al., [15].

In the present study, all the positive healthcare workers had high risk exposure and 7 (77.7%) had multiple exposure, i.e., either was exposed multiple times or to multiple confirmed cases. These figures were higher than the findings of Mansoor S et al., who reported 40% multiple exposure and 20% of the high risk exposure healthcare workers tested positive in his study [16]. This difference could be explained by the fact that there was a positive cluster of mothers and babies in the Obstetrics and Gynaecology (OBG) Department and Neonatal unit during the period that this study was conducted, as opposed to scattered cases in other departments. In [Table/Fig-7] 205 HCWs in the Department of OBG were exposed and 7 were positive, and in the Department of Paediatrics 20 of the healthcare workers were exposed and 2 were positive. Hence the healthcare workers in these departments were exposed to multiple cases and since the infection status of the patients were unknown at the time of exposure, the staff were exposed multiple times to the same case while providing care. There could have been asymptomatic or pre-symptomatic transmission of SARS-CoV-2 virus through respiratory droplets [17].

### Limitation(s)

Some healthcare workers included in the study might have contracted the infection from an unknown asymptomatic source outside the institution and not necessarily from a patient within the institution. Not being able to exclude them was a drawback of the study.

### CONCLUSION(S)

The present study concluded that the secondary infection rate among healthcare workers from COVID-19 patients was 2.07%. High risk exposure and exposure in non COVID setting and not using PPE appropriate for the setting was seen among the infected. More seroepidemiological studies and studies including more than one centre are recommended to validate the results of this study.

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#### AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. NA

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**[Annexure-1]****Potential risk factors for COVID-19 infection among healthcare workers in a tertiary healthcare setting**

<b>Name</b>	<b>Age</b>	<b>Gender</b>
Category of staff		
1. IPC training received- Yes/No		
2. Cumulative training- <2 hours/>2 hours		
3. Do you follow hand hygiene practices- Yes/No		
4. Hand hygiene before touching patient- Yes/No		
5. Hand hygiene before cleaning/aseptic procedure- Yes/No		
6. Hand hygiene after body fluid exposure- Yes/No		
7. Hand hygiene after touching a patient- Yes/No		
8. Hand hygiene after touching patient's surroundings- Yes/No		
9. IPC when in contact with a patient- Yes/No		
10. Do you wear PPE when indicated- Yes/No		
11. PPE available in sufficient quantity in the healthcare facility- Yes/No		
12. <b>Close contact with COVID-19 positive patient- Yes/No</b>		
• If yes- Setting of exposure		- Ward/ICU - COVID/Non COVID setting
• Exposure- Single/Multiple		
• Time >15 min <15 min		
• With PPE- Yes/No		
• Was appropriate PPE worn- Yes/No		
• Hand hygiene before contact		
• Hand hygiene after contact		
• Type of exposure- <b>a. High risk exposure</b>		- Close contact <1 m - Duration >15 mins - Not wearing appropriate PPE
		<b>b. Low risk exposure</b>
• Aerosol generating procedure- Yes/No		
• If yes was appropriate PPE worn- Yes/No		
• Body fluid contact- Yes/No		
• Body fluid contact with PPE- Yes/No		
13. <b>Contact with patient's materials- Yes/No</b>		
• Type of material		
• Body fluid contact via material- Yes/No		
• Body fluid contact via material with PPE- Yes/No		
• Hand hygiene before contact- Yes/No		
• Hand hygiene after contact- Yes/No		
14. <b>Direct contact with surfaces</b>		
• Type of surface		
• Body fluid contact via surface?- Yes/No		
• PPE worn?- Yes/No		
• Hand hygiene after contact?- Yes/No		
15. <b>Initially symptomatic- Yes/No Any respiratory symptom— Yes/No</b>		
<b>Type of symptom-</b> Fever/Headache/Myalgia/Sore throat/Cough/Runny Nose/Others		
16. <b>Pre-existing conditions- Yes/No</b>		
Type of pre-existing condition- Diabetes/hypertension/Dyslipidaemia/heart disease/Asthma (requiring medication)/Chronic lung disease (non-asthma), chronic kidney disease/Chronic haematological disorder/Chronic neurological impairment or disease/pregnancy/others		
17. <b>Outcome-</b> Hospitalisation/ICU admission/None		
18. <b>Baseline testing report</b>		