

Original Research Article

Pattern of hygiene practices among health care workers during the COVID-19 pandemic: a tertiary health care experience from Central Kerala

Susan John^{1*}, Suremya A. Subrahmanian¹, Rina T. Xavier²

¹Department of Clinical Epidemiology, ²Department of Information Technology, Rajagiri Hospital, Aluva, Kerala, India

Received: 05 April 2021

Accepted: 04 May 2021

***Correspondence:**

Dr. Susan John,

E-mail: Susan.John@rajagirihospital.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: The recent COVID-19 pandemic has highlighted the relevance of following hygiene practices across all sectors of healthcare workers. Disparities in the correct practices among clinical and para clinical cadres of HCWs predispose to increased risk of infection. A survey was conducted to assess the hand and respiratory hygiene practices across the hospital.

Methods: A cross sectional survey was conducted through a self-administered questionnaire across an online platform with questions on hand hygiene, mask and surface contamination related practices. Staff were grouped as clinical and para clinical for comparison of these practices.

Results: Among the 501 respondents, 83.4% were females with a mean age of 30.78±8.48 years. Nursing staff were the majority (57.88%) followed by nonclinical and para clinical staff (20.77%). Of the study population, 96.6% performed hand wash and 97.2% refrained from giving handshakes in the previous hour. Over 60% maintained proper face mask practices. Undoing the lower tie of the mask first, was answered by 76.67% while 7.2% felt the sequence was irrelevant. Touching common surfaces were avoided by 46.3% of them, while 95% immersed their hospital attire in soap and water for 15 minutes. It was seen that a greater proportion of clinical staff had better practices when compared to para clinical and the difference statistically significant. There was no significant variation of practices with age.

Conclusions: Focussed monitoring and motivation can help in improving hygiene practices among all cadres of HCWs.

Keywords: Hygiene practices, Health care workers, COVID-19

INTRODUCTION

Standard precautions for patient care are a set of practices that have been advocated and cultivated for providing protection to health care workers (HCWs) and to prevent transmission from patient to patient within an institution of medical care.¹ Increased knowledge and advanced technology have instilled a sense of confidence against the pathology that are prevalent in our surroundings. Health care providers now, do not work with a constant sense of fear of contracting a disease, but in a state of caution,

following practices as and when required depending on infectiousness, mode of transmission and virulence of the causative organism. The ongoing COVID-19 pandemic shifted infectiousness from a patient to population perspective. The presence of asymptomatic carriers in the population emphasizes that those who are admitted as COVID-19 positive patients need not be the only source of infection, but anyone around us may act as a possible source.² HCWs are said to have a 11 fold higher risk of getting infected than general population.³ Frequent pathogen exposure, long working hours, stressful work

environment and fatigue are few factors implicated in this. Consequently, it is seen that hand hygiene, an essential component of infection prevention and control (IPC), is often neglected by HCWs both in developed and developing countries, with compliance rates sometimes dipping below 20%.⁴ Hence, sensitization and training on hand hygiene, personal protective equipments, respiratory hygiene and proper use of masks were given to all health care workers irrespective of their role in the hospital. Nevertheless, a continuous and rigorous application of these measures by all are essential to halt the spread of transmission. To assess these hygienic practices and knowledge in combating the pandemic, a survey was done across the hospital and different groups of health care providers were compared with regard to these practices.

METHODS

A cross sectional survey was conducted across the hospital in the period April 2020 to June 2020 to assess the standard practices that were followed by health care providers at a tertiary health care centre. In a study by Agarwal et al titled “Are health care workers following preventive practices in the COVID-19 pandemic properly? A cross-sectional survey from India”, the proportion of HCWs who touched outer surface of the mask was 35.98%.³ Applying this into the formula,

$$N = \frac{Z^2(1-\alpha/2)P(1-P)}{d^2}$$

with an alpha error of 5% and absolute precision at 5%, the minimum sample to be studied was 368. Convenient sampling was done. A semi-structured self-administered questionnaire was provided through an online platform with aid from the IT department. Questions were subclassified under 3 categories (a) hand hygiene; (b) face mask related practices and (c) surface contamination related practices. Questions on touching outer surface of the mask and hand to face contact were asked to be filled by the respondent on independently observing a nearby colleague in the next 15 minutes. On completion of the survey, the correct answers were also displayed such that the staff were immediately informed of the appropriateness of the mentioned practices in accordance with the existent guidelines. The staff were categorized broadly into two categories-clinical and para-clinical. The former group comprising of doctors and nurses while all the other categories of health care workers were grouped under para clinical. All the responses were entered in Microsoft excel and analysed using IBM SPSS version 25. Qualitative data were expressed as proportion or percentage and quantitative as mean±standard deviation. All the responses clubbed into 2 groups (clinical & para-clinical) were observed for any significant difference between them using chi square test. A p value of less than 0.05 was considered statistically significant. There were 501 respondents in the survey and the results are as follows.

RESULTS

Demographics of the study population

Of the 501 respondents, 418 (83.4%) were females and 83 (16.6%) were males. The mean age of the respondents was 30.78±8.48 years. Majority of the respondents were nursing staff (57.88%) followed by non-clinical staff (20.76 %). On grouping, it was seen that clinical and para clinical were 61.3% and 38.7% respectively.

Table 1: Demographics of the study population.

Category	Mean	Standard deviation	Minimum, maximum
Age	30.78	8.48	21, 70
Category	Sub categories	Frequency (N=501)	Percentage (%)
Age (years)	20-45	474	94.6
	46 and above	27	5.4
Gender	Female	418	83.4
	Male	83	16.6
HCWs categories	Doctors	17	3.39
	Nurses	290	57.88
	Para-clinical	90	17.96
	Non-clinical	104	20.77

Hygiene practices

Of the study population, 96.6% performed hand wash with soap and water atleast once in the last hour. The respondents independently on observing a nearby colleague reported that 39.7% accidentally touched outer surface of their mask and 36.3% had hand to face contact atleast once in the last 15 minutes of work. In the previous hour, 33.7% admitted that they pulled down their mask below their nose while working. When enquired regarding placing their mask while on temporary breaks during work, 39.9% replied that it is placed in an open box, while 28.3% place it in a plastic cover, 22.8% just leave it hanging by their chin with 8.78% leaving it in their bag and 3.4% kept it on the table. It was seen that while undoing their face mask, 76.6% undid the lower tie first, while 16.2% removed the upper tie and 7.2% did not consider the sequence relevant. With regard to surface contamination and transmission, it was seen that 97.2% did not give a handshake in the previous hour and 46.3% avoided touching surfaces of common contact such as door handles, railings, lift buttons.

Majority (95%) of our staff, immersed their hospital clothes separately in soap and water for atleast 15 minutes prior to washing them at home. Overall, there is a high sensitivity and increased adherence to good hygiene practices with regard to COVID-19 transmission.

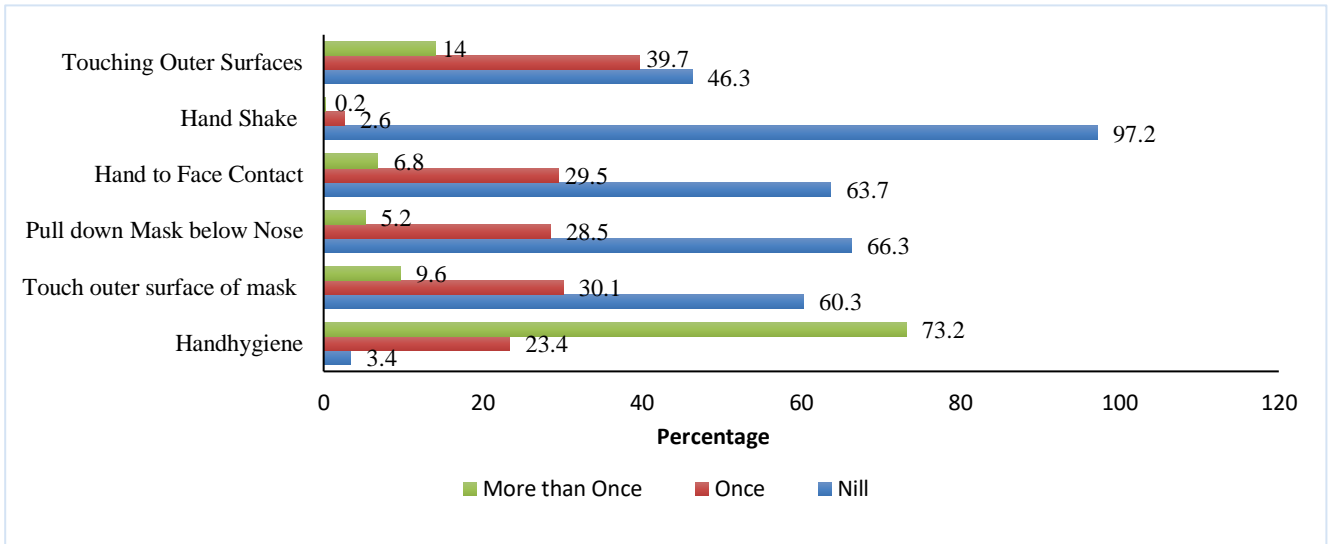


Figure 1: The distribution of hygiene practices among HCW with regard to COVID-19.

Comparison between different groups of HCWs

Though the overall practices seem satisfactory, the above-mentioned practices were observed carefully for variation among the clinical and para clinical groups as well as with age. The observance of the hygienic moments did not vary significantly with age. However, it was noticed that there was a significant rise in the appropriate practices among clinical staff when compared to non-clinical staff. This may be due to the higher concern among clinical staff with regard to patient exposure and an increased attention to their training on personal protection and standard precautions.

Hand hygiene

Majority of the members in the clinical group (67.6%) performed hand hygiene more than once in the past one hour while only 32.4% in the para clinical group did the same in the previous hour. This may be once again due to increased direct patient contact in the clinical group when compared to para clinical. The difference was statistically significant.

Face mask related practices

In the previous 15 minutes, 66.7% and 77.5% amongst para clinicals had touched outer surface of mask and had hand to face contact respectively. The difference with the clinical group where it was lower, was also statistically significant. Regarding storage of the face mask during use for a temporary period (mostly while having food), while 76% among clinical staff placed it in an open container, only 24% among para clinical staff did the same. Among the para clinicals, 62.8% and in the clinical group 37.2%, hung it by their chin. The difference in both the observations were statistically significant in both the groups.

Surface contamination related practices

Over 60% of the clinical staff avoided handshakes and touching of surfaces frequently touched by many (eg: door handles). Clothes worn in the hospital were immersed separately from other household members in soap and water by 62.6% of health care workers in the clinical group. These safe practices were higher than the para clinical group (35.8%, 37.4% respectively) and statistically significant.

Table 2: Distribution of the hygiene practices in the different groups of HCWs.

Questions	Sub-categories	Clinical (%) N=307	Para-clinical (%) N=194	Chi square	P value
Hand hygiene					
Perform handwash with soap and water in the past one hour	Nil	8 (47.1)	9 (52.9)	12.321	0.000
	Once	51 (43.6)	66 (56.4)		
	More than once	248 (67.6)	119 (32.4)		
Face mask related practices					
	Nil	208 (68.9)	94 (31.1)	25.129	0.000
	1-2 times	83 (55)	68 (45)		

Continued.

Questions	Sub-categories	Clinical (%) N=307	Para-clinical (%) N=194	Chi square	P value
Frequency of touching the outer surface of the mask in the past 15 minutes	>2	16 (33.3)	32 (66.7)		
Frequency of pulling down the face mask below nose in the past hour	Nil	224 (68.3)	104 (31.7)	24.678	0.000
	1-2 times	75 (51.7)	70 (48.3)		
	>2	8 (28.6)	20 (71.4)		
Frequency of hand to face contact in the past 15 minutes	Nil	223 (69.9)	96 (30.1)	35.893	0.000
	1-2 times	76 (51.4)	72 (48.6)		
	>2	8 (23.5)	26 (76.5)		
Method of temporary storage of mask for re use during work hours	On the table	7 (41.2)	10 (58.8)	33.534	0.000
	In your bag	18 (62.1)	11 (37.9)		
	In a plastic cover	85 (66.9)	42 (33.1)		
	In an open box	152(76)	48 (24)		
	Hang by your chin or neck	42 (37.2)	71 (62.8)		
vi. Which string is removed first while undoing your mask?	Lower tie	258 (67.2)	126 (32.8)	14.507	0.000
	Upper tie	41 (50.6)	40 (49.4)		
	Not relevant	8 (22.2)	28 (77.8)		
Surface contamination related practices					
Frequency of giving a handshake in the past 2 hours	Nil	299 (61.4)	188 (38.6)	0.361	0.548
	1-2 times	8 (61.5)	5 (38.5)		
	> 2	0 (0)	1 (100)		
Frequency of touching outer surfaces (eg:door handles)	Nil	149 (64.2)	83 (35.8)	1.595	0.207
	1-2 times	118 (59.3)	81 (40.7)		
	>2	40 (57.1)	30 (42.9)		
Practice of keeping the clothes used in the hospital	Along with other household clothes	2 (20)	8 (80)	8.735	0.003
	Allow to dry on a rack	7 (46.7)	8 (53.3)		
	Immerse separately in soap and water	298 (62.6)	178(37.4)		

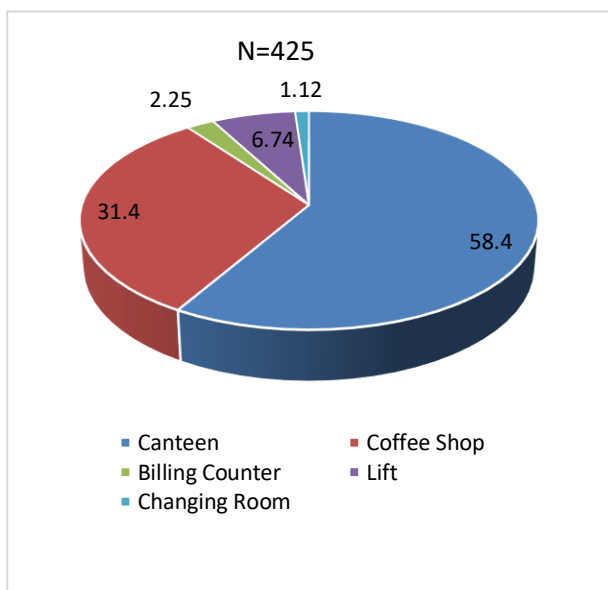


Figure 2: Places of overcrowding experienced in the hospital by HCWs.

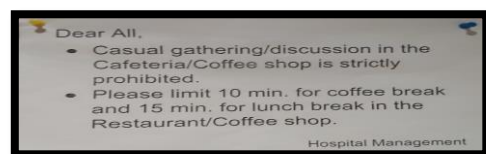


Figure 3: The single person table pattern in the canteen to reduce crowding and sign board on entry.

Majority of the staff (84.83%), when enquired if they experienced difficulty in maintaining social distancing in hospital premises, responded affirmative and mentioned the following areas. In response, corrective action was instilled in these areas.

DISCUSSION

Though there are several studies on practice of hand hygiene, there are limited studies only that reflect the hygiene practices with regard to COVID-19 transmission. According to the WHO, prevalence of COVID-19 amongst health care workers was found to be up-to 20% in worst affected regions.⁵ A study by Niraj et al found prevalence of 11% among health care workers in India.⁶ This highlights the need that health care providers need to be well equipped to protect themselves from the pandemic. Though hand sanitizers, face mask and personal protective equipments are provided in adequate amounts, at times it is the lack of proper practices that can lead to infection.⁷ To the best of our knowledge, there are no studies that focus on respiratory and hand hygiene from South India during the COVID-19 outbreak.

In our study, 96.6 % have washed their hands with soap and water atleast once in the last one hour. This is at par with the hand washing practices in a study by Anargh et al (90%) among health care workers in Pune and Rozina et al.^{8,9} In a study by Olum et al among 136 health care providers in Nepal, 74% and 22% washed hands always and occasionally after seeing a patient respectively, while 4% responded that they never did that.¹⁰ In the current study, 3.4% admitted that they had not washed hands in the previous hour.

In a study by Limbu et al 96.1% of the hospital staff wear gloves and mask, while 84.5% follow infection control protocols during patient care.¹¹ There is emphasis on following correct practices during patient care, but it must be continued with equal care during all interactions due to the presence of asymptomatic carriers and undetected cases, within the hospital premises and in the community. Touching the outer surface of the mask in the previous 15 minutes were observed in 39.7%, which is similar to the finding in the study by Agarwal et al (35.98%). In the same study on 956 HCWs across India, 62.76% did not have hand to face contact, which is similar to our study (63.70%).³ While in the study in Uganda, about 17% occasionally gave a handshake, in this study only 2.8% did so and 97.2% refrained from it.¹¹ Proper coverage of nose and mouth were reported in 86.92% among HCWs.³

There has been noticed a significant difference in the following of hygienic practices, being higher in the clinical group than the para clinical group. This is in concordance with a study by Ashnyio et al among 328 health care providers in Ghana.¹² All health care staff have to be essentially trained and monitored to assure proper adherence to hygienic practices. A lack in this regard can lead to weighted rise in cases among HCWs of the para

clinical and non-clinical sectors and this can adversely affect the smooth functioning of the hospital. Motivating staff with regard to self-protection, professional responsibility adequate mandatory training with regard to the infection and PPE are essential.¹³

There was no significant difference in the observance of practices with regard to age which is contradictory to the results obtained in the study in Olum et al which showed a significant improvement in practices in those over 40 years of age and Desta et al.^{10,14} However, in the study by Limbu et al similar to our study, on 103 HCWs, age was not found to have a significant role in the adherence to good practices.¹¹ In the study by Agarwal et al paramedicals, male gender and younger age were significant factors associated with lower adherence.³

CONCLUSION

Despite multiple advertisements and educational boards, messages being transmitted regarding safe practices during COVID-19, there is a greater adherence in following the correct practices amongst clinical HCWs in comparison to para clinical staff. Focussed monitoring and motivation can help in improving hygiene practices among all cadres of HCWs and reduce incidence of COVID-19 infection among them.

ACKNOWLEDGEMENTS

Authors wish to acknowledge Dr. Sunitha Mary John, Dr. Sunny P. Orathel, Fr. Issac Chackalaparambil and Fr. Jose Paul, Rajagiri Hospital for their guidance and support throughout the course of this study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

1. CDC. Standard Precautions for All Patient Care, 2019. Available at: <https://www.cdc.gov/infectioncontrol/basics/standard-precautions.html>. Accessed on 20 March 2021.
2. CDC. Healthcare Workers, 2020. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance>. Accessed on 29 March 2021.
3. Agarwal A, Ranjan P, Saraswat A, Kasi K, Bharadiya V, Vikram N, et al. Are health care workers following preventive practices in the COVID-19 pandemic properly? - A cross-sectional survey from India. *Diabetes Metab Syndr*. 2021;15(1):69-75.
4. Lotfinejad N, Peters A, Pittet D. Hand hygiene and the novel coronavirus pandemic: the role of healthcare workers. *J Hosp Infect*. 2020;105(4):776-7.
5. WHO. Risk assessment and management of healthcare workers in the context of COVID-19,

2020. Available at: <https://www.who.int/westernpacific/internalpublications-detail/risk-assessment-and-management-of>. Accessed on 23 March 2021.
6. Mahajan NN, Mathe A, Patokar GA, Bahirat S, Lokhande PD, Rakh V, et al. Prevalence and Clinical Presentation of COVID-19 among Healthcare Workers at a Dedicated Hospital in India. *J Assoc Physicians India*. 2020;68(12):16-21.
 7. Angrup A, Kanaujia R, Ray P, Biswal M. Healthcare facilities in low- and middle-income countries affected by COVID-19: Time to upgrade basic infection control and prevention practices. *Indian J Med Microbiol*. 2020;38(2):139-43.
 8. Anargh V, Singh H, Kulkarni A, Kotwal A, Mahen A. Hand hygiene practices among health care workers (HCWs) in a tertiary care facility in Pune. *Med J Armed Forces India*. 2013;69(1):54-6.
 9. Roshan R, Feroz AS, Rafique Z, Virani N. Rigorous Hand Hygiene Practices Among Health Care Workers Reduce Hospital-Associated Infections During the COVID-19 Pandemic. *J Prim Care Community Health*. 2020;11:31.
 10. Olum R, Chekwech G, Wekha G, Nassozi DR, Bongomin F. Coronavirus Disease-2019: Knowledge, Attitude, and Practices of Health Care Workers at Makerere University Teaching Hospitals, Uganda. *Front Public Health*. 2020;8:181.
 11. Limbu DK, Piryani RM, Sunny AK. Healthcare workers' knowledge, attitude and practices during the COVID-19 pandemic response in a tertiary care hospital of Nepal. *PLoS One*. 2020;15(11):242126.
 12. Ashinyo ME, Dubik SD, Duti V, Amegah KE, Ashinyo A, Asare BA, Ackon AA, et al. Infection prevention and control compliance among exposed healthcare workers in COVID-19 treatment centers in Ghana: A descriptive cross-sectional study. *PLoS One*. 2021;16(3):248282.
 13. Cooper S, Wiyeh A, Schmidt BM, Wiysonge CS. Cochrane corner: factors that influence compliance by healthcare workers with infection prevention and control guidelines for COVID-19 and other respiratory infections. *Pan Afr Med J*. 2020;35(2):23.
 14. Desta M, Ayenew T, Sitotaw N, Tegegne N, Dires M, Getie M. Knowledge, practice and associated factors of infection prevention among healthcare workers in Debre Markos referral hospital, Northwest Ethiopia. *BMC Health Serv Res*. 2018;18(1):465.

Cite this article as: John S, Subrahmanian SA, Xavier RT. Pattern of hygiene practices among health care workers during the COVID-19 pandemic: a tertiary health care experience from Central Kerala. *Int J Community Med Public Health* 2021;8:2952-7.