


Practice of Healthcare Workers during the COVID-19 pandemic at the Emergency Department of Nepal

Ritesh Chaudhary¹, Rabin Bhandari¹, Masum Poudel¹, Rajani Giri¹, Ajay Kumar Yadav¹, Bijaya Devi Aryal¹

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 **Ritesh Chaudhary**
ritesh948@yahoo.com

 <https://orcid.org/0000-0001-6450-7845>

¹ Department of General Practice and Emergency Medicine, B.P. Koirala Institute of Health Sciences, Dharan, Nepal

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Abstract

Background: The study intends to explore the effects and practice of healthcare workers during COVID-19 pandemic at the emergency department of BP Koirala Institute of Health Sciences.

Methods: A cross-sectional study was done among the healthcare workers of the Emergency Department of BP Koirala Institute of Health Sciences from August 2020 to Jan 2021. Data were collected by using a semi-structured interview among all the participants in the survey. A convenient sampling method was used and analysed using descriptive statistics. A p value < 0.05 was considered statistically significant.

Results: Majority of the healthcare workers (90%) stated that their role has increased during COVID 19 first wave pandemic. A similar percentage (71%) noticed change in their duty hours and subsequently Isolation/ Quarantine. More than half (53%) stated that efforts been undertaken to bring additional health care workers to emergency department on basis of safety and preservation of workforce. The institute was able to train (47%) health care workers regarding proper handling of personal protective equipment despite of its insufficient (70%) supply.

Conclusion: Health care workers experienced difficulties during COVID 19 pandemic due to insufficient supply of personal protective equipment, long-time exposure to large numbers of infected patients and insufficient care to quarantine..

Keywords: COVID-19; Healthcare workers; Nepal; Practice

Declarations

Ethics approval and consent to participate: This study was conducted with prior ethical approval from Ethical Review Board of BPKIHS and informed consent has been obtained from participants prior to the enrollment with (IRC Code No.: IRC/ 2051/ 020).

Consent for publication: Informed consent was obtained from the patient for the publication of identifying features along with the manuscript.

Availability of data and materials: The full data set supporting this research is available upon request by the readers.

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drafting, critical review of manuscript for intellectual contribution and final approval of the version to be published. RB, MP and RG: manuscript drafting, critical review of manuscript for intellectual contribution and final approval of the version to be published. AKY and BDA: literature search, data acquisition and gave approval to final version.

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BACKGROUND

Coronavirus disease 2019 (COVID-19), an emerging respiratory infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that had infected more than 227,466,562 individuals, caused more than 4,677,013 deaths and 204,163,039 recovered worldwide by September 16, 2021 [1, 2]. Knowledge about COVID-19 has been disseminated across all continents since the initial case was documented in Wuhan, located in the Hubei Province of China, towards the end of 2019 [3]. The Ministry of Health and Population (MoHP) Nepal had confirmed the country's first death of 29-year-old female on 16th May 2020 [4].

The health care workers (HCWs) play a vital role both locally, globally and are primarily the front-liners to combat the pandemic for caring the patients. Even with sufficient resources and best health care services in developed countries, however, all universal measures for Infection Prevention and Control (IPC) from COVID-19, reported futile [5 - 11]. Most of the literatures support practices of healthcare workers about infection prevention [12 - 14] and level of knowledge, attitude and practice (KAP) during COVID-19 surge. A study in Ethiopia showed that HCWs had good knowledge but lower prevention practice of COVID-19 [15]. In China [16] there were various issues regarding IPC practices amplifying the risk of COVID-19 infection. In Nepal, it was observed that those frontline healthcare workers who received IPC training and online courses had better KAP [17]. Thus, this research was conducted with an aim to explore the similar effects of current practices towards COVID-19 among the health care workers in the emergency department of a tertiary care facility in eastern Nepal.

METHODS

Study type

A cross-sectional study was done among the healthcare workers of emergency department of BPKIHS from March 2021 to August 2021.

Participants

All the Helpers, Nurses, Medical officers, Residents and Faculties of Emergency Ward of Department of General Practice and Emergency Medicine.

Sample size calculation

The required sample for this study was estimated by applying the formula $Z^2 pq / L^2$ where $Z = 1.96 \sim 2$ at 95% confidence interval. The sample size was based on the study conducted by (Asemahagn MA, 2020) [15] showed prevention practice among 50% Health care workers (HCWs), considering 95% confidence interval and power 80% to estimate the sample size. So, considering prevalence ($p = 50\%$, $q = 50\%$, $L = 10$ (20% of p) and adding 10% for the nonresponse rate, the final sample size was 100. A predesigned questionnaire was used for the interview and pretested in 10% of the sample until a satisfactory version was reached.

Sampling techniques

A semi-structured questionnaire was prepared both in English and Nepali and interviewed among all HCWs, containing 15 items. This survey was piloted by researcher (RC), a faculty working in the Emergency Department of BPKIHS in eastern Nepal. All the participants were invited voluntarily in the survey. A convenient sample of 100 individuals was chosen by using non-probability sampling methods.

Outcomes

Percentage using Personal Protective Equipment (PPE) was measured and changes in existing practices of HCWs were identified during COVID19 pandemics.

Statistical analysis

Collected data were entered at MS Excel 2007 and converted it into SPSS 11.5 for statistical analysis. Percentage, mean, SD, median, were calculated along with graphical and tabular presentation. An association between changes in practice and HCWs was analysed using Chi-square test with a p-value considered significant at 5%.

Ethical Clearance

Ethical clearance was obtained from Institutional Review Committee, BPKIHS (IRC Code No.: IRC/ 2051/ 020).

RESULTS

A Total number of hundred (100) health care workers (HCWs) were enrolled in the study. Forty-eight (48%) were male and 52% were female with mean age 30 ± 7.13 SD. The age and professional demographic data are shown in **Table 1**.

A 90% shift in roles was noted among the healthcare workers (HCWs). Thirty-Seven (37%) believed that the range of non-covid-19 conditions (community acquired pneumonia and acute exacerbation of chronic obstructive pulmonary disease, emphysema, bronchitis, lung abscess and pulmonary carcinoma) has increased as compared to COVID-19 (37% Vs. 33%, $p = 0.019$) (**Fig.1**). 64% of HCWs believed that Covid-19 cases was admitted based on communication rather than paper records (64%, 26%, $p = 0.46$). The hospital has shown tremendous efforts to bring up additional HCW to the emergency room (63%, 26%, $p = 0.48$). It seems the top priority to preserve and sustain HCWs' schedule whilst all the academic activities were lagged behind (71%, 3%, $p = 0.30$). In contrast nearly half (47%, 46%, $p = 0.46$) did not received training regarding proper handling of Personal Protective Equipment PPEs. The difference was similar concerning risk allowance made by the Ministry of Health and Population (12%, 81%, $p = 0.02$) (**Table 2**).

There were two questions directly related to practice of regarding PPE supply and quality care of HCWs at quarantine / isolation (**Table 3**).

Final question invited to health care workers to comment on current strategy and its response regarding Covid-19 laboratory testing (q13, 14), 36% responded that need for testing was acknowledged but failed to reach the test and reports on time (17%, 14%, $p = 0.17$) (**Figure 2**).

DISCUSSION

This study assessed the identification of prevention practices and changes noticed in all HCWs' practices among during COVID-19 pandemics. High index of clinical suspicion of COVID-19 was done in all patients who presented with a new continuous cough, fever, or altered sense of taste or smell. Symptoms also included dyspnoea, fatigue, myalgia/arthralgia, sore throat, headache, nasal congestion or rhinorrhoea, sputum

production, chest tightness, or gastrointestinal symptoms (e.g., nausea, vomiting, and diarrhoea) [18, 19]. At the same time the range of non- COVID-19 cases like community acquired pneumonia and acute exacerbation of chronic obstructive pulmonary disease, emphysema, bronchitis, lung abscess and pulmonary carcinoma has also been increased (37%, $p = 0.019$). As COVID-19 was a notifiable disease hence all the suspected or confirmed cases were reported to BPKIHS via communication through mobile

Table 1: Demographic profile of the Population:

Years	Male	Female	Mean age in years
20 - 29	18	43	32.7 ± 4.9
30 - 39	19	4	
40 - 49	9	5	
≥ 50	2	0	
Profession	Male	Female	
Faculty/ Senior Resident (SR)	8	3	
Junior Resident (JR)	16	8	
Duty Medical Officer (DMO)	13	3	
Nurse	2	24	
Helper	9	14	

Table 2: Changes observed in Emergency Department during COVID-19, n=100:

Questions	Faculty/ SR			DMO			JR			Nurse			Helper			p-value
	Y	N	DK	Y	N	DK	Y	N	DK	Y	N	DK	Y	N	DK	
Have efforts been undertaken to bring additional HCWs to the emergency sector?	6	4	1	10	5	1	14	9	1	16	5	5	17	3	3	0.48*
Has the roles of HCWs in the emergency department changed?	11	0	0	14	2	0	20	4	0	24	2	0	21	2	0	0.60*
Has the institute provided training regarding proper handling of PPEs including the N95 mask?	6	5	0	6	9	1	16	8	0	11	12	3	8	12	3	0.46*
Has the supply of ICU beds and ventilators in COVID hospital been adapted and mobilized to increase availability?	0	10	1	6	7	3	5	18	1	5	11	10	12	7	4	< 0.001*
Have frontline Health Care Workers received a risk allowance equal to their salary as announced by the Health Ministry?	1	9	1	3	12	1	1	23	0	2	24	0	5	13	5	0.02*

* = chi-square test, Y= yes, N= no, DK= don't know

Table 3: Practice observed in Emergency Department during COVID-19, n=100:

Questions	Faculty/ SR	JR	DMO	Nurse	Helper	p-value
Whose role changed the most?						
• Healthcare Workers	11	12	24	22	21	0.30*
• Pharmacists	0	1	0	1	0	
• Social Worker	0	3	0	3	2	
The changes noticed most in the emergency department:						
• Duty Hours	10	18	11	16	16	0.30*
• Academic activities	0	1	1	1	0	
• Isolation/ Quarantine	1	4	3	9	5	
• No changes	0	1	1	0	2	
The degree of patient level of suspected COVID-19 existed on:						
• Communication (Mobiles and landline phones)	10	14	12	15	13	0.46*
• Paper records	0	7	4	7	8	
• Patient own perception	1	3	0	3	2	
• No suspicion	0	0	0	1	0	
	Sufficient	Insufficient	Not available	Don't Know		
The supply of personal protective equipment at time of first documented COVID-19	6	70	19	5		0.44*
The care to HCWs at Quarantine at time of first documented COVID-19	20	60	3	17		0.11*

* = chi-square test

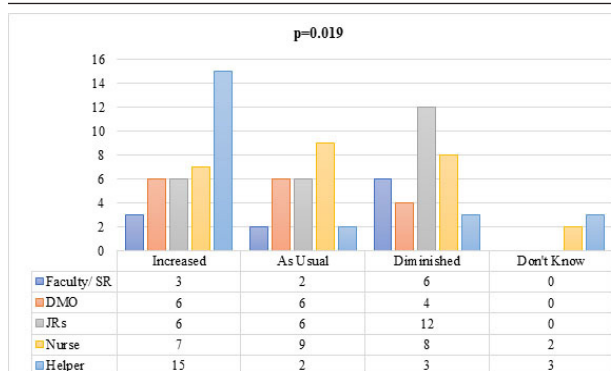


Figure 1: Range of non-COVID-19 conditions observed during COVID-19 surge, n=100

* Non-covid-19 conditions implies (community acquired pneumonia and acute exacerbation of chronic obstructive pulmonary disease, emphysema, bronchitis, lung abscess and pulmonary carcinoma).

phones or land lines (64%, $p = 0.46$) for earlier recognition and rapid diagnosis to prevent transmission and provide supportive care in a timely manner.

The impact of nationwide country's lockdown observed on 24th March 2020 [20], exacerbated further health risks and health care systems of Nepal [21]. The lockdown caused shut down of majorities of the hospital outpatients' services, operation theatres and academic activities with an effort to undertake additional health care resources (63%, $p = 0.48$) in the study, in the form of HCWs to emergency department itself to combat COVID-19 surge.

The study found that HCWs duty shifts were reshuffled and were schedule designed to longer shifts day and night in which teams of HCWs co-rotate every three days. The strategy of shift rescheduling of HCWs was planned to ensure backup for sufficient uninfected HCWs which was similar to the study done in USA [22]. It was important to determine that HCWs can return to work (RTW) without hampering the schedule on the basis of workforce safety as well as workforce preservation strategy [23]. On the contrary, majority of the HCWs working in the emergency department throughout the pandemic responded that the teaching - learning activities have been lagged behind which are similar in other medical school of Nepal (97%, $p = 0.30$) [24].

As COVID-19 introduced new challenges to health care system, it was foremost important for stakeholders to deploy HCWs from different departments in which the study showed positive results (63%). Admittedly, most of the tests for COVID-19 suspicion were acknowledged and available on time (36%, 9%, $p = 0.17$).

Despite increase in number of HCWs, the current study failed to reach the significance to COVID-19 outbreak in terms of personal protection and training (47%, $p = 0.46$) for IPC, insufficient care to quarantined (60%, $p = 0.11$), shortage of PPEs (70%, $p = 0.44$). The present study also observed that majority of HCWs (81%, $p = 0.02$) deprived of risk allowance after an announcement of 50-100 percent made by the Ministry of Health and Population. However, the frontline HCWs are yet to receive the allowances and still HCWs have been protesting also in other hospital of Nepal [25].

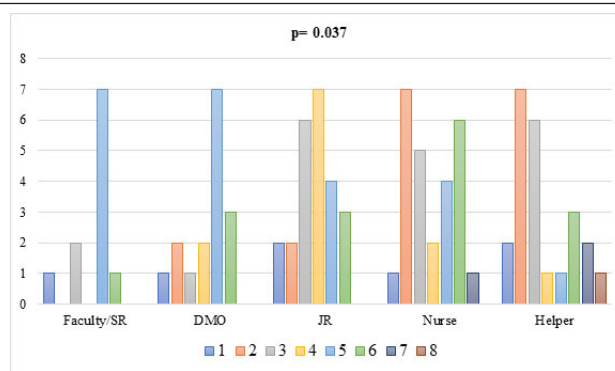


Figure 2: The strategy regarding COVID-19 testing at the time of first death, n=100

1. Need for testing ignored
2. Testing was not available
3. Testing conducted on incoming/border-crossing individuals
4. Testing conducted for at-risk populations
5. Testing conducted for those exhibiting symptoms
6. Testing conducted for those potentially exposed to COVID-19 positive individuals as identified through contact tracing
7. Testing readily available for everyone
8. Testing reports readily available for everyone

Study Limitations

There are some limitations to the study. Among all HCWs, helpers seem less familiar with surveys and necessitated oral interview to avoid medical jargons. There was only one interviewer, a male doctor as a faculty who himself revived from COVID-19 infection during the study period. It is not clear if this would skew responses, however HCWs may have been less likely to criticize emergency department in which he was seen as an authority figure. The study was carried out in a single tertiary hospital setting. The study may not represent all the health care workers of COVID-19 hospital as only 100 health care workers of emergency department were enrolled in the study. A convenience sampling method was used in study and this increased likelihood of selection bias which may have affected the results.

Recommendation

Further research is required to determine the validity of these results. However, these results challenge all the health care workers in a setting of significantly constrained facilities. The recommendation is that a proper local hospital-based protocol should be made in such manner that these shortcomings and hassles that were observed in first wave of COVID-19 surge can be minimized in future pandemics.

CONCLUSION

Health care workers experienced difficulties during current COVID-19 pandemic with limited resources in the hospital. Despite long-time exposure to large numbers of infected patients, shortage of personal protective equipment (PPE) and quality care in quarantine, majority of health care workers are under moral obligation working in COVID-19 hospital.

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