

# Health Care Workers' Knowledge, Attitude and Practice on COVID-19 in a Government Hospital, Biratnagar

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## Abstract

World Health Organization declared COVID-19 as a global pandemic on 11<sup>th</sup> March 2020 due to rapid transmission and severity of illness of this fatal virus from the country of origin. This study was conducted to assess the health care workers' knowledge, attitude and practice on COVID -19 in a government hospital at Biratnagar. A descriptive, cross-sectional research design was used. Census method was adopted for sampling, structured questionnaire was used to collect data among 115 healthcare workers over a period of two months. More than three fourth (78.3%) scored good knowledge, almost all possessed a positive attitude and more than half (62.6%) had good infection prevention practice on COVID-19. However, 52.2% reported that COVID-19 is contagious and only 13.9% identified as a zoonotic disease. Also, it revealed that only 35.7% practiced correct steps of donning PPE, only 27.8% reported proper sequence of doffing PPE and 40.0% followed standard duration for hand washing as per the WHO, CDC guideline. The study highlighted the gap in some specific aspects of knowledge and practice of the healthcare workers that need immediate concern. Adequate provision of periodically updated educational training programmes on COVID-19 and infection prevention practices focusing on PPE might help bridging the gap.

*Keywords:* COVID-19, health care workers, knowledge, practice, attitude

## 1. Introduction:

The World Health Organization (WHO, 2020) announced a global public health emergency at the beginning of a new decade, on 30<sup>th</sup> January 2020, against the epidemic of corona virus disease, which is known as Corona Virus Disease 2019 (COVID-19). It has since been dramatically spread and declared a pandemic on 11<sup>th</sup> March, 2020. According to WHO, the total number of confirmed cases has reached over 30.6 million with 9, 50,000 deaths across the world till 20<sup>th</sup> of September, 2020 Nepal was the first South Asian Nation to have a confirmed case of COVID-19 in a 32-year-old Wuhan returnee on 24<sup>th</sup> January, 2020 (Bastola et al., 2020). COVID-19 infection with flu-like symptoms has previously been documented in people who visited Huanan Seafood Wholesale Market in Wuhan, Hubei Province in China, in December 2019. Therefore, the virus is considered to be zoonotic in origin. The etiological agent responsible for this outbreak: Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2) is a member of the Nidovirales family of Corona viridians (Li & Xia, 2020). More than 88% of cases of COVID-19 experienced fever, 67.8% had cough, 33.4% had sputum production, 18.6 % of cases reported dyspnoea, 38.1% experienced fatigue, 13.6 % complained

of headache and 13.9 % had sore throat. Also, less than 5% had gastrointestinal symptoms such as diarrhea and vomiting. The risk of high mortality and morbidity has been established in the aging population with underlying chronic medical conditions. The primary mode of transmission from person to person is through respiratory droplets. It is also transmissible via close contact to the infected individual or through indirect transmission by touching contaminated surfaces. COVID-19 has a prolonged incubation period of 2-14 days (Guo et al., 2020).

A study in China demonstrated that the overall response to the survey was good; the participants possessing sufficient knowledge were recorded as 88.4%. More than 90.0% of the participants responded positively toward COVID-19. However, there were some negative attitudes, three-quarters of participants thought that they would probably get the illness (82.3%), one of their family members may get an infection (79.8%) but they will accept the isolation if suspected infection (97.9%). Regarding association of demographic characteristics and knowledge and attitude of HCWs, occupation was correlated with knowledge and attitude scores, according to which pharmacists who showed higher levels of knowledge also found significantly higher levels of a positive attitude about COVID-19 compared to those who were employed as physicians, nurses and technical staff (Zhang et al., 2020).

Health care workers: doctors, nurses, laboratory staff, paramedics and of all levels working normally and efficiently is integral to the effective pandemic response (Draper et al., 2020). They play a vital role in combating, preventing and managing COVID-19 infection across the globe. The occupational exposure of health care workers of all levels who are involved primarily in catering patients being at the front line of the COVID-19 pandemic puts them at an increased risk of infection which is a critical issue. Protection of Health care workers and prevention of intra-hospital as well as community transmission of infection are important aspects in pandemic outbreak and this requires health care workers to have updated knowledge regarding source, transmission, clinical features and prevention (Nemati, Ebrahimi & Nemati, 2020). This study was conducted to assess the health care workers' knowledge, attitude and practice on COVID -19 in a government hospital at Biratnagar. The result of the study would help the concerned authorities to emphasize and plan relevant educational and training programs during the pandemics to fulfill the existing gap between level of knowledge, attitude and practice on COVID-19 and help in combating, preventing and managing the pandemic in local and national level.

## **2. Materials & Methods**

### **2.1. Study design, setting and population:**

A descriptive, cross-sectional study was conducted among health care workers of Koshi COVID-19 Treatment Centre, Biratnagar, Nepal from June 2020 to December, 2020. The centre was established on 3rd April, 2020 for management and treatment of COVID-19 confirmed cases and has been functioning under Koshi Hospital in collaboration with the Ministry of Social Development of Province 1 since 18th May, 2020. The center has 50 general beds and 5 ICU beds with ventilator support. The study population were all the healthcare workers i.e. nurses, health assistants, auxiliary health workers and auxiliary nurse midwives

pooled from Koshi Hospital, laboratory technicians from Province Public health Laboratory of Province 1, school health nurses from different schools of Province 1 and nurses recruited by the Ministry of Social Development of Province 1 who had been appointed to work in Koshi Covid-19 treatment Centre. Doctors and the supporting staffs were excluded in the study.

## **2.2. Instrument**

The data collection was done among the inclusive healthcare workers using self-administered questionnaires to measure KAP on COVID-19. The respondents were explained the nature and purpose of the study. Self-administered questionnaire were provided to each respondent by the researcher, 15-20 minutes of time was given to each respondent for completion of the questionnaire. Collected data was checked for its completeness and coding was done for anonymity on the same day.

## **2.3. Study variables**

Demographic variables comprised of age, sex, education level, work experience, job category and training on COVID-19.

## **2.4. Measurement of Knowledge, Attitude and Practice**

Knowledge and practice variables were marked 1 point for each correct response to the test items in the self-administered structured knowledge and practice questionnaires, expressed in terms of scores and categorized as poor if respondent's total score  $<60\%$  and good if  $\geq 60\%$ . The total knowledge score ranged from 0 to 31 and practice score ranged from 0 to 21.

Each statement was rated on a five-point Likert scale to assess attitude towards COVID-19 where "1" indicated "Strongly disagree", "2" indicated "Disagree", "3" indicated "Neutral", "4" indicated "Agree", 5" indicated "Strongly agree". Total attitude score ranged from 7 to 35. Composite scores were calculated and considered to be negative attitudes if  $< 60\%$ , and positive attitudes if  $\geq 60\%$ . The cut off points for the dependent variables were set based on a similar previous study conducted at Dhulikhel, Nepal (Basnet et al., 2020).

## **2.5. Data Analysis**

Data processing was done by using computer Statistical Package for the Social Science (SPSS) version 22. Descriptive statistics were calculated such as frequency, percentage, mean, median and standard deviation to describe socio-demographic variables and the level of dependent variables. Inferential analysis (chi-square) was applied to measure the association between dependent and independent variables and among dependent variables. The findings were presented in tabular form. Statistical significance was set 0.05 levels (with confidence interval of 95%).

## **2.6. Ethical approval:**

Approval for data collection was obtained from the administrative department and research committee of Biratnagar Nursing Campus, TUIOM. Permission to conduct the study was granted from the Koshi Covid-19 Treatment Centre, Biratnagar administrative authority. Verbal and written informed consent was taken from each respondent before data collection. Confidentiality of information was maintained throughout the study.

### 3. Results

The findings of the current study revealed that 59.1% of respondents belong to the age group of 19-29 years. Concerning the sex distribution, three fourth (75.7%) of the respondents were female and only 24.3% were male. More than half (52.2%) of the respondents were under graduated and 47.8% were graduated, 47.0 % of the respondents had less than 5 years of work experience and 25.2% had worked for more than 10 years. Regarding the job category, more than half (69.6%) of the respondents were nurses and 30.4% were paramedics. Likewise, 69.6% of the respondents had attended training on COVID-19. With reference to sources of information on COVID-19, the majority of the respondents (87.8%) accessed the official government site i.e. The Ministry of Health, Nepal, 84.3% used news media and 78.3% followed social media. Meanwhile, 69.6% of the health care workers reported that they followed the WHO, CDC website and 42.6% also referred to journals to get updated about COVID-19 (Table 1).

The current study reflected that more than three fourth (78.3 %) of the respondents had good knowledge on COVID-19. Most of the respondents (93.0%) answered that COVID-19 is a viral disease, 73% recognized as respiratory, 52.2% reported contagious and only 13.9% identified as a zoonotic disease. Regarding the modes of transmission, 93.0% claimed droplets transmission, 81.7% reported closed contact with infected persons, 59.1% responded to touching contaminated surfaces and only 44.3 % answered airborne transmission. Almost all (99.1%) agreed that COVID-19 has no effective treatment but early and symptomatic treatment can help to cure. Moreover, 98.3% of the respondents admitted that asymptomatic patients can be isolated and provided supportive care at home (Table 2).

The study analyzed that almost all (99.1%) of the respondents possessed a positive attitude towards COVID-19 (Table 3) and 62.6% had good practice on COVID-19 (Table 4). The result of the study revealed the level of knowledge, attitude and practice on COVID-19 among the respondents (Table 5). Likewise, the findings depict that practice level is associated to sex, education level and job category of the respondents (Table 6). The current study stated that knowledge and practice of the respondents had statistically significant association (Table 7).

**TABLE 1***Socio-demographic Characteristics of Health Care Workers*

<b>Variables</b>	<b>n = 115</b>	
	<b>Frequency (f)</b>	<b>Percent (%)</b>
<b>Age group</b>		
19-29	68	59.1
30-39	31	27.0
>40	16	13.9
Mean $\pm$ SD (29.97 $\pm$ 7.516)		
<b>Sex</b>		
Female	87	75.7
Male	28	24.3
<b>Educational level</b>		
Undergraduate	60	52.1
Graduated and above	45	39.1
<b>Work experience (in years)</b>		
< 5	54	47.0
5-10	32	27.8
>10	29	25.2
<b>Job Category</b>		
Nurses	80	69.6
Paramedics	35	30.4
<b>Training on COVID-19</b>		
Yes	80	69.6
No	35	30.4
<b>Source of information *</b>		
Official government sites: MOH, Nepal	101	87.8
News Media e.g. TV, radio, magazines, newspaper	97	84.3
Social Media e.g. WhatsApp, Facebook, Twitter, Youtube	90	78.3
International health organization's official sites: WHO, CDC	80	69.6
Journals	49	42.6

**TABLE 2**  
*Health Care Workers' Knowledge on COVID-19*

<b>Variables</b>	<b>n =115</b> <b>Correct Response f (%)</b>
<b>The nature of COVID-19 *</b>	
viral	107 (93.0)
respiratory	84 (73.0)
contagious	60 (52.2)
zoonotic	16 (13.9)
<b>Causative agent of COVID-19</b>	
SARS-CoV-2	101 (87.8)
<b>Modes of transmission*</b>	
Droplets Transmission	94 (81.7)
Close contact with infected person	68 (59.1)
Touching contaminated surfaces	51 (44.3)
Airborne Transmission	81 (70.4)
<b>Symptoms of COVID-19 are found to be more severe</b>	
people with underlying chronic disease	110 (95.7)
<b>Incubation period of COVID-19</b>	
2 to 14 days	112 (97.4)
<b>Symptoms of COVID-19*</b>	
Fever	106 (92.2)
Anosmia	103 (89.6)
Cough	93 (80.9)
Shortness of Breath	87 (75.7)
Fatigue	101 (93.0)
Diarrhea, nausea and vomiting	55 (47.8)
<b>Diagnosis of COVID-19*</b>	
RT-PCR from upper or lower airway secretions	114 (99.1)
RDT of SARS-CoV <sub>2</sub> antibody	26 (22.6)
<b>Treatment of COVID-19</b>	
No effective but early symptomatic treatment can help cure	110 (95.7)
<b>Complications of COVID-19*</b>	
Acute Kidney Injury	95 (82.6)
Acute Respiratory Distress Syndrome	62 (53.9)
Pneumonia	45 (39.1)
Multiple Organ Failure	95 (82.5)
Septic Shock	
Death	

*Note: \*multiple responses, each response is considered as 100%.*

**TABLE 3***Health Care Workers' Attitude on COVID-19*

<b>Statements</b>	<b>n=115</b>				
	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>
	<b>f(%)</b>	<b>f(%)</b>	<b>f(%)</b>	<b>f(%)</b>	<b>f(%)</b>
Health care workers must update all the information about COVID-19.	-	1(0.9)	5(4.3)	21(18.3)	88(76.5)
Transmission of COVID-19 can be prevented by using universal precautions given by WHO, CDC.	-	1(0.9)	2(1.7)	46(40.0)	66(57.4)
Any related information about COVID-19 should be disseminated among HCW	1(0.9)	1(0.9)	6(5.2)	36(31.3)	71(61.7)
Prevalence of COVID-19 can be reduced by active participation of health care workers in the hospital infection control program.	1(0.9)	1(0.9)	3(2.6)	69(60.0)	41(35.7)
Intensive, emergency and symptomatic treatment should be given to diagnosed patients accordingly.	-	6(5.2)	6(13.9)	44(38.3)	9(42.6)
COVID-19 patients must be kept in isolation.	2(1.7)	1(0.9)	1(0.9)	20(17.4)	91(79.1)
Gowns, gloves, masks and goggles must be used when dealing with COVID-19 patients.	5(4.3)	1(0.9)	5(4.3)	14(12.2)	90(78.3)

*SD: Strongly Disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly Agree*

**TABLE 4**  
*Health Care Workers' Practice on COVID-19*

Variables	Correct Response f (%)
<b>n= 115</b>	
<b>Practice during coughing and sneezing*</b>	
Cover mouth and nose	112 (97.4)
Wash hands with soap and water	97 (84.3)
Throw tissue in closed bin	90 (78.3)
Use alcohol-based sanitizer	74 (64.3)
<b>Wash hands or use alcohol-based sanitizer*</b>	
After touching each patient	100 (87.0)
Touched contaminated surface and objects	99 (86.1)
At least every hour	40 (34.8)
<b>Duration of rubbing hands with alcohol sanitizer</b>	
20 to 30 seconds	67 (58.3)
<b>Duration of washing hands with soap and water</b>	
40 to 60 seconds	46 (40.0)
<b>Disinfectants used in workplace*</b>	
Ethanol 70 to 90%	82 (71.3)
0.1% sodium or calcium hypochlorite for surface	72 (62.6)
0.5 % sodium or calcium hypochlorite for body fluids & blood	60 (52.2)
Hydrogen peroxide>0.5%	29 (25.2)
<b>Practices regarding use of masks*</b>	
Avoid touching front of mask with hands	100 (87.0)
Perform hand wash after disposal of mask	97 (84.3)
Remove elastic straps from behind the ear	86 (74.8)
Dispose in a closed bin after removal	84 (73.3)
Single use of mask	74 (64.3)
Apply new mask after being moist	61 (53.0)
<b>Steps of donning( putting on) of PPE</b>	
Gown-mask-eyewear/face shield-gloves	41 (35.7)
<b>Steps of doffing (removal) of PPE</b>	
Gloves-gown-eyewear/face shield-mask	32 (27.8)

*Note: \*multiple responses, each response is 100%*



**TABLE 5***Level of Knowledge, Attitude and Practice on COVID-19 among Health Care Workers*

<b>n=115</b>		
<b>Variables</b>	<b>Frequency (f)</b>	<b>Percent (%)</b>
<b>Level of Knowledge</b>		
Good knowledge	90	78.3
Poor Knowledge	25	21.7
<b>Level of Attitude</b>		
Positive attitude	114	99.1
Negative attitude	1	0.9
<b>Level of Practice</b>		
Good practice	72	62.6
Poor practice	43	37.4

**TABLE 6***Association of Practice with Selected Demographic Variables among Health Care Workers*

<b>n= 115</b>			
<b>Variables</b>	<b>Level of Practice</b>		<b>p- value</b>
	<b>Poor f(%)</b>	<b>Good f(%)</b>	
<b>Age (in years)</b>			
<30	27(23.5%)	41(35.7%)	0.537
≥30	16(13.9%)	31(27.0%)	
<b>Sex</b>			
Male	16(13.9%)	12(10.4%)	<b>0.013*</b>
Female	27(23.5%)	60(52.2%)	
<b>Education Level</b>			
Undergraduate	29(25.2%)	31(27.0%)	<b>0.011*</b>
Graduate and above	14(12.2%)	31(27.0%)	
<b>Work Experience</b>			
<5 years	21(18.3%)	28(24.3%)	0.297
≥5 years	22(19.1%)	44(38.3%)	
<b>Job Category</b>			
Nurses	25(21.7%)	55(47.8%)	<b>0.040*</b>
Paramedics	18(15.7)	17(14.8)	
<b>Training on COVID-19</b>			
Yes	30(26.1%)	50(43.5%)	0.971
No	13(11.3%)	22(19.1%)	

\*Significant association p value&lt;.05

**TABLE 7***Association between Knowledge and Practice on COVID-19 among Respondents*

			<b>n=115</b>
<b>Variables</b>	<b>Level of knowledge</b>		
<b>Level of practice</b>	<b>Good</b>	<b>Poor</b>	<b>p-value</b>
	<b>f(%)</b>	<b>f(%)</b>	
<b>Good</b>	68(59.1%)	4(3.5%)	<b>0.000*</b>
<b>Poor</b>	22(19.1%)	21(18.3%)	

*\*Significant association p value<.05*

#### **4. DISCUSSION**

The current study revealed that the majority of health care workers updated themselves primarily through official governmental sites, news media and social media which are consistently similar with the findings of a global web-based study conducted at The United States of Emirates (Bhagavathula et al., 2020). Meanwhile, 69.6% of the health care workers reported that they followed the WHO, CDC website to get updated on COVID-19 whereas, 88% of the health care workers of Uganda used WHO, CDC information sites (Olum et al., 2020). However, health care workers should cautiously choose and get acquainted with factual, verified and updated information on COVID-19 as there is a surplus of invalid information on the internet that could mislead them.

This study reflects that more than three fourth (78.3%) of the respondents had good knowledge on COVID-19 which is in line with the findings of the study conducted among Italian health care workers that reported 71.6 % of respondents had good knowledge on COVID-19 (Moro et al., 2020). Also, a similar study conducted in Henan, China revealed 89 % of the health care workers had sufficient knowledge on COVID-19 (Zhang et al., 2020). It can be supposed to be the fact that COVID-19 is an ongoing global pandemic which is of grave concern, especially to the health care workers as they are in the frontline combating, preventing and managing the disease.

The study found that most of the respondents (93.0%) answered that COVID-19 is a viral disease and 52.2 % believed to be contagious in nature whereas, only 13.9% knew that COVID-19 is also a zoonotic disease. On the other hand, 96.4% of the health care workers from Pakistan (Ahmed et al., 2020) reported COVID-19 as a contagious disease while 70.8% of nurses from Pokhara, Nepal stated that COVID-19 is a zoonotic disease (Kafle et al., 2020). Majority (87.8%) were familiar with the causative agent of COVID-19 which is in line with findings of another study where 94.5 % knew the etiology of the disease. Regarding the modes of transmission, incubation period, symptoms and treatment, the findings are similar to another study done in Pakistan which reported that more than 90 % of health care workers were well known regarding nature, transmission, incubation period, symptoms and precautions against COVID-19 (Saqlain et al., 2020). The findings concluded that the overall knowledge is good

but it also signifies the gap regarding understanding of the nature of COVID-19 disease among health care workers as compared to findings of similar other studies mentioned above.

In regards to attitude, this study has declared that almost all, (99.1%) of the respondents possessed positive attitudes towards COVID-19. More than three fourth (76.5%) of the respondents strongly agreed that health care workers must update themselves about COVID-19, 57.4% strongly believed that WHO, CDC universal precautions could prevent COVID-19, 61.7% strongly agreed that information on COVID-19 should be disseminated among them, 60% agreed active participation of health workers can reduce the prevalence of COVID-19, 42.6% strongly responded that intensive, emergency and symptomatic treatment should be given accordingly to COVID-19 patients and 78.3% of the respondents answered that PPE must be used when dealing with COVID-19 patients. These findings are in line with the results of similar research done at Paropakar Maternity and Women's Hospital, Kathmandu, Nepal (Ansari et al., 2020) and Vietnam (Huynh et al., 2020) that showed the majority of the respondents had positive attitudes on COVID-19.

Concerning the practice level, the study demonstrated that more than half (62.6%) of the respondents had good practice on COVID-19. However, the result revealed that only 35.7% practiced correct steps of donning PPE, only 27.8% reported proper sequence of doffing PPE and 40.0% followed standard duration for hand washing as per the WHO, CDC guideline. This result can be compared to a study from Karachi, Pakistan that declared 58.9% followed appropriate practices on COVID-19 (Jawed et al., 2020). By contrast, a study done among Nigerian healthcare workers reported that 81.39% had good practice regarding COVID-19 (Ejeh et al., 2020). The discrepancies may be attributed to shortage of availability of PPE, lack of training on infection prevention practice regarding COVID-19, difference in work settings, protocol etc. This fact highlights that periodic education, training and update emphasizing on appropriate use of PPE and hand washing based on the WHO, CDC guidelines might be effective to improve the practice of health care workers on COVID-19.

The findings of this study indicated that knowledge on COVID-19 among the respondents shows no association with age, sex, education, work experience, job category and training which is supported by the study conducted at Bhairahawa, Nepal as it also reported the same findings (Limbu et al., 2020). Contrarily, the national survey among frontline health care workers of Nepal highlighted that knowledge on COVID-19 was associated with age, gender, education, profession and work experience (Tamang et al., 2020). The variance in findings of studies could be the newly discovered fatal COVID-19 pandemic that has been declared as a global public health emergency which is of grave concern and challenge for all, especially the healthcare workers need to be updated for self-protection and as the health care provider regardless of age, sex, education, work experience, job category and training.

The association between attitude and selected demographic variables was not computed as almost all of the respondents had positive attitudes regarding COVID-19. In the meanwhile, another similar research study from Dhulikhel, Nepal suggested that attitude varied significantly with clinical work experience (Basnet et al., 2020). Likewise, the attitude of South Nigerian health care workers shows association with age, work experience and designation

(Mbachu et al., 2020). Likewise, the attitude of Egyptian health care workers signified association with age and education level (Wahed et al., 2020).

In terms of association between practice and selected demographic variables, this study revealed that sex, education level and job category of the respondents were significantly associated to practice on COVID-19. Similarly, study of South India, proclaimed that age of respondents was significantly associated with practice on COVID-19 (Nallani et al., 2020). By contrast, another study from Maharashtra, India indicated that practice exhibited no association with demographic variables among healthcare workers (Arora et al., 2020).

In respect to the association between knowledge and practice, this study marked that knowledge and practice on COVID-19 among the health care workers were significantly associated. On the opposite side, a study of Bhairahawa, Nepal declared that knowledge and practice on COVID-19 has no significant association whereas, the study showed significant association between knowledge-attitude and attitude-practice (Limbu et al., 2020). Interestingly, the previous study of Chitwan, Nepal is contradictory with the current study as it marked that there is significant association among knowledge, attitude and practice on COVID-19 (Nepal et al., 2020). The findings computed the evidence that higher the knowledge, better the practice but it isn't imperative that knowledge, attitude practice are always associated with each other. Since the study was conducted among the health care workers of a single government hospital of Biratnagar, the findings may not be generalized to all the health care workers and hospitals in the country.

### **Conclusion**

The health care workers have relatively good knowledge, positive attitude and good practice towards COVID-19. Type of health professionals' job, sex and education determines the precautions practice they take in relation to COVID-19. There is significant association between the knowledge and practice of the health care workers on COVID-19. Moreover, the study highlighted the gap in some specific aspects of knowledge and practice of the healthcare workers that need immediate concern. Adequate provision of periodically updated educational training programmes on COVID-19 and infection prevention practices focusing on PPE might help bridging the gap.

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