Knowledge and Perception of COVID-19 Pandemic during the First Wave: a Cross-Sectional Study among Nepalese Healthcare Workers

Biplav Aryal[1]†, Kamal Ranabhat[1, 2]†, Kiran Paudel[1] Bhoj Raj Kalauni[1], Sunil Shrestha[3], Data Ram Adhikari[2], Achyut Raj Karki[2], Anil Bhattarai[1]*

[1]Institute of Medicine, Tribhuvan University, Kathmandu, Nepal

[2]Ministry of Health and Population, Ram Shah Path, Kathmandu, Nepal

[3]Department of Pharmaceutical and Health Service Research, Nepal Health Research and Innovation Foundation, Lalitpur, Nepal

†These authors contributed equally.

***Corresponding author:** Anil Bhattarai, Manmohan Cardiothoracic Vascular and Transplant Center, Institute of Medicine Tribhuvan University, 44600, Kathmandu, Nepal Email: anbh10000@yahoo.com

ABSTRACT

Objectives: This study aimed to assess knowledge and perception of COVID 19 among frontline health care workers in Nepal.

Methods: A web-based cross-sectional study was conducted among frontline healthcare workers involved in managing and treating COVID-19 in Nepal by adapting the questionnaire from the World Health Organization. Data were analyzed using the Statistical Package for Social Science version 26.0. A chi-square test was used to investigate the association level among variables at 95% level of significance.

Results: A total of 285 health professionals participated in this study, among them male (50.5%), and female (49.5%). The mean (± SD) age of participants was 27.21 ± 5.42 years old. Most of the participants got information on COVID-19 from social media (50.5%) and online news/newspapers (40.3%). On the other hand, a significant proportion of Health care workers (HCWs) had poor knowledge about its transmission (n=170, 59.6%) and an incubation period (n=129, 45.3%).

Conclusion: There was a significant gap in knowledge and perception, particularly about the transmission and incubation period. A concerned national initiative to respond the pandemic could help better compliance with behavioral guidelines to respond to this public health emergency.

Keywords: COVID-19, knowledge, perception, pandemic, Nepal

INTRODUCTION

Health Care Workers (HCWs) are in primary contact with the patient and are an essential source of exposure to others in a health care setting. HCWs were anticipating being at high risk of infection and the inception of transmission in the community. Some prior studies found a lack of knowledge and attitude of HCWs towards MERS CoV (Alsahafi & Cheng, 2016; Althomairy et al., 2018) and SARS (Deng et al., 2006). Inadequate knowledge and perception among HCWs can directly impact behaviors, resulting in delayed diagnosis, poor infection control, and disease transmission (Omrani & Shalhoub, 2015; Wixom et al., 1971).

The World Health Organization (WHO) has also implemented multiple workshops and COVID-19 materials in dozens of languages to improve safety precautions, including awareness-raising and web-based training of HCWs in preparedness activities (COVID-19, 2021). Misunderstanding among HCWs has resulted in delayed control efforts to provide the appropriate care in many instances (Hoffman & Silverberg, 2018), which ultimately contributed to the rapid spread of infection in hospitals and places where they live (McCloskey & Heymann, 2020.; Selvaraj et al., 2018).

Based on their experience and values, knowledge may affect the perception of HCWs (Oppenheim et al., 2019.; Piltch-Loeb et al., 2019). The knowledge and perception regarding pandemic among healthcare workers have been reported differently in different studies (Abdel Wahed et al., 2020; Amin et al., 2020; Upadhyaya et al., 2020).

Due to its novel origin and rapid spread all over the world, healthcare workers must be well informed about COVID-19 to protect themselves and their patients. Therefore, the study was conducted to evaluate the knowledge and perception of COVID-19 among HCWs in Nepal.

METHODS

Study design and setting

A cross-sectional web-based -study was conducted, and a convenience sampling method was adopted. Data were obtained by taking the help of HCWs (Health Care workers) at various COVID-19 dedicated health centers in all seven provinces of Nepal, including private hospitals, government hospitals, and others, using a self-administered questionnaire.

Study participants

The study population included in this study was all registered HCWs (doctors, nurses, pharmacist, paramedics, diagnostic personnel, and public health professionals). All HCWs were working in the health sector of Nepal. Health care workers of all professions directly or indirectly involved in the screening, diagnosis, and management of COVID-19 infection was included in the study.

Sample size

The sample size was calculated using the formula.

Sample size (n) = $\frac{Z^2 pq}{d^2}$

Where, n= sample size z= reliability level (1.96) p= estimated proportion in population= 0.78 q=1-p= 1-0.78= 0.22, d=maximum tolerable error (0.05) Nepal. Reference taken from a similar study on COVID-19 done in Iran (Bhagavathula et al., 2020). From the above formula, the minimum required sample size (n) calculated was 285.

Variables

Independent variables

The independent variables comprised of socio-demographic characteristics (age, gender) and work

profile (working experience- in years, working province, working sector, educational qualification) of HCWs.

Dependent variables

The dependent variables included knowledge, perception regarding COVID-19 pandemic among health care workers working in Nepal. Based on previous research conducted in other countries, we picked knowledge and perception as the dependent variables. Therefore, this study will generate a reference point of information on HCWs' knowledge and perception of COVID-19, which will aid in the development of future interventional studies that will eventually assist HCWs in preparing for COVID-19 and other infectious diseases.

Data collection tool

The questionnaire included questions on knowledge and perception about COVID-19. There were questions and statements in three sections (demographics, knowledge and perception).

The questionnaire was divided into three-part, section 1 including 12 items related to socio-demographic, awareness items and source of information: age, gender, profession, working place, types of job, work experience, heard about COVID-19, attended any of the lectures/discussions about Novel Coronavirus disease. Source of information was assessed by using 4 statement/4 point, Likert scale 1 is least used and 4 is most used.

Section 2 included 7 items of knowledge about symptoms of COVID-19-affected patients (2 items), different modes of transmission (2 items), precautions and risk prevention (3 items). A score of '1' was given a 'correct' response and a score of '0' for a 'wrong' response. Section 3 included 7 items perceptions of COVID-19 (7 items/true or false questions). A score of '1' was given for response 'good' and a score of '0' was given for responses 'poor' (Bhagavathula et al., 2020).

Ethical approval

Ethical approval was obtained from the Ethical Review Board of Nepal Health Research Council (NHRC) (IRB reference number 2883). The objective of the study was mentioned and the consent for participation was also obtained from the participants to participate in the survey and they were allowed to leave the study form anytime during the study if they don't want to continue.

Data collection procedure

A Web-based, cross-sectional study was conducted from 19 June to 16 August, 2020 (One month and twenty-eight days), among frontline health workers. Validated 23-item survey instrument was used from WHO course material on an emerging respiratory virus, including COVID-19

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(Bhagavathula et al., 2020). Unfortunately, the Nepali language version of this tool has not yet been prepared. A total of 310 responses 25 were redundant.

The questionnaire was developed using Google form and sent to the health workers via different messenger groups and other social media including Facebook, Twitter and Viber. Only the core study member has access to the data archive to protect data privacy.

Content of the survey instrument and scoring system

Knowledge was assessed by the questions focusing on COVID-19 etiology, signs and symptoms, transmission, and risk prevention. Each response was scored as "1" (correct) and "0" (wrong), with scores ranging from 1 to 7. A cutoff level of ≤4 was considered to indicate poor knowledge about COVID-19 whereas >4 was considered adequate knowledge about COVID-19 (Bhagavathula et al., 2020).

Perceptions towards COVID-19 were assessed using 7 items, and each question was labelled as good (scored as "1") or poor perception (scored as "0"). Scores ranged from 0 to 7. The participants' perceptions are classified as good (score >5) or poor (score ≤5) (Bhagavathula et al., 2020).

Statistical analysis

The obtained data were checked, coded and exported to Microsoft Excel and then imported in Statistical Package for Social Sciences (SPSS) version 26 statistical software for cleaning and analysis. Descriptive statistics were applied to compute frequency, standard deviation and percentage with a 95% confidence interval. The chi-square test was performed to investigate the association level among variables.

RESULTS

Demographic characteristics of the participants

A total of 285 HCWs were involved in this study. Almost half of the participants (50.5%) were males. Mean (±) SD age of participants was 27.21 ± 5.42 years and ranged from 18 to 50 years (Table 1).

Table 1. Socio-demographic characteristics of health care workers (n=285)

Characteristics	Participants, n (%)
Sex	
Male	144 (50.5)
Female	141 (49.5)
Age in year	
< 20	17 (6.0)
20-25	108 (37.9)
25-30	113 (39.6)
30-35	18 (6.3)
35-40	20 (7.0)
> 40	9 (3.2)
Profession	
Allied Health workers	190 (66.7)
Doctor	73 (25.6)
Public health	22 (7.7)
Working Province	
Province 1	29 (10.2)
Province 2	14 (4.9)
Bagmati	175 (61.4)
Gandaki	21 (7.4)
Lumbini	29 (10.2)
Karnali	3(1.1)
Sudhur paschim	14 (4.9)
Working Sector	
Private	173 (60.7)
Government	112 (39.5)

Source of knowledge

In this study, the source of knowledge on COVID-19, the primary source of information, was obtained from the official website of the Government (n= 56 19.6 %) and family members and colleague (n= 34 11.9%). The source of information was more often from a family member and colleague (n=91 31.9%). Among the study participants most of the participants reported that we mostly used social media for the source of knowledge 50.5% and only 11.6% of the participants used social media least for the source of knowledge of COVID-19 (Table 2).

Knowledge of COVID-19

The level of knowledge regarding COVID-19 among HCWs is shown in Table 3. For instance, 73 doctors (82.2%) and 141 allied health workers (66.5%), thought that COVID-19 derived from bats which was reported to be significantly associated at 95% level of significance. Majority of the participants correctly responded that hand hygiene, covering nose and mouth while coughing, and avoiding sick contacts can help in the prevention of COVID-19

Perception of COVID-19

Table 4 lists the perception about COVID-19, Majority of the respondants (88.4%) (health workers) has a positive perception regarding COVID-19.

The majority of participants (88.8%) thought COVID -19 is not fatal, and the flu vaccine is not adequate against COVID-19 85.6%. The Flu vaccine was not sufficient against COVID-19 85.6%. Over 90.9% of the HCWs knew that properly cooked meat products are acceptable for consumption.

Association between sex, age and profession

Items related to perceptions of COVID-19 among HCWs were analyzed separately using a chi-square test to examine their association with age and sex and across different professions. (Table 5)

The majority of the participant <25 years old (n=114, 91.2%) and 84.9% (n=62) of the doctors believed that the symptoms of the COVID-19 appear 2-14 days. Many doctors correctly believed that sick patients should share their travel history (n=71, 97.3%). Nurses were found to perceive that flu vaccination is insufficient to prevent COVID-19 transmission (n=60, 90.9%). The false perception that washing hands with soap and water can help prevent COVID-19 transmission was 18.5% in other health workers than doctors and nurses. Flu vaccinated is sufficient for preventing COVID-19 was reported to be significantly associated with the age group categorized in table 5".

Table 2. Participants Source of knowledge about (COVID-19) (n=285).

Response	Source of knowledge about COVID 19			
	News media, n (%)	Social Media, n (%)	Government website, n (%)	Family member and colleague, n (%)
Least used	34 (11.9)	33 (11.6)	56 (19.6)	34 (11.9)
Sometimes	61 (21.4)	35 (12.3)	71 (24.9)	73 (25.6)
More often	75 (26.3)	73 (25.6)	85 (29.8)	91 (31.9)
Most used	115 (40.3)	144 (50.5)	73 (25.6)	87 (30.5)

Table 1.Knowledge about coronavirus disease 2019 (COVID-19) among health care worker (n=285)

Questions	Doctors (n=73), n (%)	Allied health workers/ Public health Profession (n=212), n (%)	Total correct responses, (n=285) n (%)	p value
COVID-19 is thought to originate from bat	60 (82.2)	141 (66.5)	201 (70.5)	**0.01**
COVID-19 transmitted through air, contact, feco-oral route	26 (35.6)	89 (42)	115 (40.4)	0.4
Headache, fever, cough, sore throat, and flu are symptoms of COVID-19	46 (63)	145 (68.4)	191 (67)	0.5
The incubation period of COVID-19 (2-14 days)	30 (41.1)	99 (46.7)	129 (45.3)	0.4
COVID-19 leads to pneumonia respiratory failure, and death	56 (76.7)	166 (78.3)	222 (77.9)	0.8
Supportive care is the current treatment for COVID-19	50 (68.5)	158 (74.5)	208 (73.0)	0.4
Hand hygiene, covering nose and mouth while coughing, and avoiding sick contacts can help in the prevention of COVID-19 transmission	63 (86.3)	192 (90.6)	255 (89.5)	0.4

Table 2. Health care worker's perceptions toward coronavirus disease 2019 (COVID-19) (n=285).

Statement	Yes, n %	No, n %
COVID-19 symptoms appear in 2-14 days	252 (88.4)	33 (11.6)
COVID-19 is fatal	32 (11.2)	253 (88.8)
Flu vaccination is sufficient for preventing COVID-19	41 (14.4)	244 (85.6)
During the outbreak, eating well-cooked and safely handled meat is safe	259 (90.9)	26 (9.1)
Sick patients should share their recent travel history with health care providers	275 (96.5)	10 (3.5)
Disinfect equipment and working area in wet markets at least once a day	253 (88.8)	32 (11.2)
Washing hands with soap and water can help in the prevention of COVID-19 transmission	37 (13.0)	248 (87.0)

Table 3. Association between Sex, Age and Profession

Question and response	Sex			Age in years			Profession			
	Male (n=144), n (%)	Female (n=141 n (%)	P value	<25 (n=125), n (%)	25-50 (160), n (%)	P value	Doctor (n=73), n (%)	Nurse (n=66), n (%)	Other health worker(n=146), n (%)	P value
COVID-19 symptoms appear in 2-14 days			0.1			0.2				0.4
Yes [a]	123 (85.4)	129 (91.5)		114 (91.2)	138 (86.3)		62 (84.9)	61 (92.4)	129 (88.4)	
No	21 (14.6)	12 (8.5)		18 (14.8)	22 (13.8)		11 (15.1)	5 (7.6)	17 (11.6)	
COVID-19 is fatal			0.7			0.1				0.4
Yes	15 (10.4)	17 (12.1)		18 (14.4)	14 (8.8)		5 (6.8)	9 (13.6)	18 (12.3)	
No [a]	129 (89.6)	124 (87.9)		107 (85.6)	146 (91.3)		68 (93.2)	57 (86.4)	128 (87.7)	
Flu vaccinated is sufficient for preventing COVID-19			0.2			0.01				0.3
Yes	25 (17.4)	16 (11.3)		25 (20)	16 (10)		10 (13.7)	6 (9.1)	25 (17.1)	
No [a]	119 (82.6)	125 (88.7)		100 (80)	144 (90)		63 (86.3)	60 (90.9)	121 (82.9)	
During the outbreak, eating well-cooked and safely handled meat is safe			0.7			0.3				0.8
Yes [a]	132 (91.7)	127 (90.1)		116 (92.8)	143 (89.4)		66 (90.4)	59 (89.4)	134 (91.8)	
No	12 (8.3)	14 (9.9)		9 (7.2)	17 (10.6)		7 (9.6)	7 (10.6)	12 (8.2)	
Sick patients should share their recent travel history with health care providers			0.7			0.7				0.8
Yes [a]	138 (95.8)	137 (97.2)		120 (96)	193(87.3)		71 (97.3)	64 (97.0)	140 (95.9)	
No	6 (4.2)	4 (2.8)		5 (4)	28 (12.7)		2 (2.7)	2 (3.0)	6 (4.1)	
Disinfect equipment's and working area in wet markets at least once a day			0.3			0.08				0.4
Yes [a]	125 (86.8)	128 (90.8)		104(83.2)	149(93.1)		66 (90.4)	61 (92.4)	126 (86.3)	
No	19 (13.2)	13 (9.2)		21(16.8)	11(6.9)		7 (9.6)	5 (7.6)	20 (13.7)	
Washing hands with soap and water can help in prevention of COVID-19 transmission			0.2			0.5				0.2
Yes [a]	23 (16.0)	14 (9.9)		18 (14.4)	19 (11.9)		5 (6.8)	5 (7.6)	27 (18.5)	
No	121 (84)	127 (90.1)		107 (85.6)	141 (88.1)		68 (93.2)	51 (92.4)	119 (81.5)	

[a] Insicates correct answer

DISCUSSION

This study provides evidence of the knowledge and perception of COVID-19 among individual health workers working in Nepal. Currently rapidly growing COVID-19 transmission for everyone and health workers, a crucial question arises how we manage information to help health workers in public health crises. The findings of this study suggest a significant gap between the amount of information available on COVID-19 and the depth of knowledge among HCWs, particularly about the mode of transmission and the incubation period of COVID-19.

In this study, the level of knowledge of HCWs about COVID-19 was low, but perceptions of COVID-19 transmission prevention were reported positive, which was similar to the Bhagavathula et al. finding (Bhagavathula et al., 2020). A similar cross-sectional study from China recorded that 90% of the health profession had a strong knowledge of COVID-19 and that 70% of the participants had adequate knowledge in the Uganda study (Olum et al., 2020; Zhong et al., 2020). This study reported that 25.6 % (n=73) of HCWs used the official government website as the primary source of knowledge on COVID-19.

This suggests that COVID-19 related information posted online by official government authorities had a significant effect on improving the level of awareness of HCWs. More than half (50.5%) of HCWs use social media as a source of knowledge. Currently, there is a wide range of information available via the internet that leads to debunk information that can spread rapidly and misguide HCWs. The World Health Organization warns of a potential "infodemic" of fraudulent news ("WHO Says Fake Coronavirus Claims Causing 'Infodemic,'" 2020). HCWs should be proactive in selecting the source of information about COVID-19 related information and should use a more scientific and authentic source of information. Similarly, virtual (online) seminars, online training, and courses can help educate and raise awareness about COVID-19 and other emerging infectious diseases (Shrestha et al., 2020).

The outcomes of this study indicate that lower-level knowledge of COVID-19, in particular, the mode of transmission and the incubation period of COVID-19, less than 50 % of the participants only gave an accurate answer to the question. We found significant knowledge gaps between doctors and other HCWs. Knowledge of healthcare worker's is more valuable than the public.

HCWs are one of the critical sources of information about COVID-19 and their role in treating the disease and prevention. If HCWs do not have sufficient knowledge of COVID-19, they also contribute to the spread of COVID-19 to the general population because they are more likely to be exposed to the virus.

Educational status is a powerful indicator of knowledge and perception. The literacy rate in Nepal is only 66 per cent, which is even lower in rural areas (Central Bureau of Statistics – CBS, 2011). Our findings indicate that greater support from health authorities is required to spread COVID-19-related information across all categories of HCWs.

The majority of HCWs had a positive perception of COVID-19 as a preventable disease. Although, discordance was identified in the perceptions of different kinds of HCWs. Concerning perception related to the symptoms, the possibility of survival and vaccination was more than 80% of participants' found to respond to these items correctly. Most of HCWs aged 25-50 years (n=149, 93.1%) recommended that disinfect the equipment at least once a day. More than 95% of HCWs had agreed that a sick person should share their travel history. More than a quarter of the doctors thought that eating meat during the outbreak was unsafe. That could be because COVID-19 was closely linked to a wet market in China, and other viral infections such as SARS, MERS, and Ebola emerged from zoonotic pathogenic agents (Carnero et al., 2018; Zhu et al., 2020). Primary cases were reported in 58 districts, even during the lockdown. The government of Nepal approved the import of everyday most important goods such as gasoline, LP gas, food items, and grocery items from India, which resulted in a major spike in COVID-19 instances, primarily in bordering regions with India. India had the highest number of COVID-19 cases and CFR in South Asia; COVID-19 infection among Indian drivers and car owners who travelled to Nepal could have spread the virus to other parts of Nepal (Paudel et al., 2020). Finally, a vast majority of HCWs fully agreed that maintaining hygiene practice, reporting recent travel history when individuals are sick and cleaning the equipment used in wet markets are strongly recommended. Until date, many new SARS-CoV-2 variants (alpha, beta, delta etc.) were emerging in the world with change in disease pattern, severity, nature and symptoms of COVID 19 in compare to original SARS-CoV-2. Therefore, this study unable to measure the knowledge and perception of COVID 19 caused by new variants of SARS-CoV-2. A newer study on knowledge and perception level of HCWs of COVID 19 caused by new emerging variants at present context should be carried out for in depth understanding of the changing pattern of COVID 19.

CONCLUSIONS

The knowledge of the study participant regarding preventive strategies or techniques in this study found insufficient knowledge level, a significant gap in information and different perception of COVID -19 among participant.

Data presented in this study are self-reported and partly dependent on the participant's honesty and recall ability. Participants not using the internet could not participate in this study, so it cannot be generalized for all the health workers. Despite the limitation, the study was conducted using the WHO developed the questionnaire and which was already used. Our findings provide valuable information about the knowledge and perceptions of HCWs during peak period of the pandemic.

CONFLICT OF INTEREST

The authors declare that there is no potential conflict of interest with respect to this paper.

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