

Perceived risk, preventive behavior and enabling environment among health workers during COVID-19 pandemic in Nepal: an Online Survey

Bimala Sharma* , Nirmala Shrestha, Nisha Gurung, Sanju Banstola

Department of Community Medicine, Gandaki Medical College Teaching Hospital Research Center, Pokhara, Nepal

ABSTRACT

Introduction: Perceived risk, preventive behavior and enabling environment play vital role to prevent COVID-19 transmission in health care settings. The study aimed to assess perceived risk, preventive behavior and enabling environment among healthcare workers of different cadre during COVID-19 pandemic in Nepal. **Methods:** A cross sectional online survey was conducted among 427 health workers from April 25 to June 10, 2020. A structured questionnaire was prepared in Google form. Perceived risk was measured using 10 items scale, value ranging from 10 to 50. Descriptive and inferential statistics were computed at 5% level of significance. Ethical approval was taken from Nepal Health Research Council. **Results:** Of total, 49.6% respondents were male; 38.4% were from government organizations and 48.0% were doctors. Mean perceived risk was 31.8, 32.8, 31.3 among doctors, nursing professionals and others respectively; and it did not have significant difference among them. However, significant differences were observed in different items of perceived risk across difference cadre of health workers. Most of the health workers reported practice of preventive behavior always or most of the time. Of total, 5.4% doctors and 6.9% other health workers reported they had sometimes access to soap and water. 11.7% doctors, 7.5% nursing professionals and 7.8% other health workers had sometimes access to hand sanitizer; 18.0% doctors, 10.4% nursing professionals and 12.1% other health workers had sometimes access to face mask. **Conclusion:** Perceived risk of COVID-19 was high, preventive behavior was satisfactory; but access to enabling environment was poor. Therefore, adequate attention should be given to ensure the availability of protective equipment at work place.

Key words: Enabling environment, health workers, perceived risk, preventive behavior.

Correspondence to:

Dr. Bimala Sharma, Ph.D
Associate Professor, Department of Community
Medicine,
Gandaki Medical College Teaching Hospital and
Research Center, Pokhara, Nepal
E-mail: bimalasharma@gmail.com

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INTRODUCTION

The 2019 coronavirus disease (COVID-19) pandemic started from Wuhan, China has created a global immense threat to all people in the world¹. The World Health Organization (WHO) confirmed the outbreak of a new coronavirus disease, COVID-19, as a public health emergency of international concern in January and considered it as a pandemic in March 2020.² The COVID 19 created challenges in all aspects of life including mental health and psychological resilience.^{3,4} The emergence of the COVID-19 and its consequences has led to fears, worries, and anxiety among individuals worldwide.⁵ Most of the health workers who work in the frontline against the COVID-19 pandemic are at increased risk of its infection, and perceive higher risk of transmission. Additionally, healthcare workers unfortunately are facing isolation, avoidance and neglect by their family or community owing to stigma or fear. This can make an already challenging situation far more difficult.^{6,7} COVID prevention at hospital and health care setting is associated with risk perception, adoption of public health preventive

practices and accessibility to the enabling environment for health workers to practice those behaviors.^{6,7} Previous study reports that risk perception significantly associated with reported adoption of preventative health behaviors.⁸ The risk perception of COVID-19 also differs significantly across populations and places, indicating that risk perception is potentially a significant factor of the pandemic and as it can influence the number of new positive cases.⁹

Adoption of preventive public health measures is most vital for prevention of COVID-19 in health care and community settings. The adoption of such behaviors is influenced by many factors such as knowledge of the facts, positive attitude toward the facts, availability and accessibility of basic facilities and equipment essential to practice them.¹⁰ Government of Nepal has also envisioned ensuring adequate availability of personal protective gears to all health workers as per protocol.¹¹ In addition, perceived risk of the situation motivates willingness to adopt those measures.

A little information is known about perceived risk of COVID-19, adoption of public health preventive behaviors and enabling environment of the organization to adopt the behavior among the health workers of different cadre during the emergency of the COVID-19 Pandemic. Thus, assessment and quantification of such aspects is essential to prevent COVID-19 transmission at health care settings and to fight COVID-19 in long turn in the community. Therefore, the study aimed to assess perceived risk, preventive behavior and enabling environment among healthcare workers of different cadre during COVID-19 Pandemic in Nepal.

METHODS

Study design, setting and population: A cross sectional online survey was conducted among the health workers currently working in Nepal. The study is a part of a study entitled perceived risk of covid-19 and psychological distress among health workers during covid-19 pandemic in Nepal: an online survey. The information was collected from April 25 to June 10, 2020.

Sample size and sampling technique

Sample Size: Sample size was calculated based on the formula recommended by Naing et al. (2006), for the prevalence study,¹² where Z value at confidence interval 95% (Z) = 1.96, prevalence (p) = 0.50 and permissible error (d) = 0.05. Calculated sample size was 384. After adding non response rate of 10%, total sample size was 422. Through online survey, 432 samples were collected, 5 samples were excluded from analysis because they were not health workers or were not paid workers. A convenient sampling method was applied to select the respondents. Online

survey questionnaire was sent to the respondents through email and social media (messenger, viber, whatsapp).

Measurement of variables: Age, sex, marital status, ethnicity, religion, educational level, number of family members, type of organizations involved, job cadre, department, years of work experience, current working province were assessed through structured questionnaire. Preventive practices of COVID-19 were asked in the past 14 days. Five questions were asked to assess enabling environments related to preventive behaviors. Perceived risk was measured using 10 items scale developed by Chong, et al, 2004 for SARS.¹³ The participants indicated their level of agreement with the statements using a five-item Likert type scale such as “strongly disagree,” “disagree,” “neither agree nor disagree,” “agree,” and “strongly agree”. The minimum score possible for each question is 1, and the maximum is 5. A total score was calculated by adding up each item score (ranging from 10 to 50) indicating the higher the score, the greater the risk perception of COVID-19. For the analysis purpose, “strongly disagree,” “disagree,” “neither agree nor disagree” were grouped into one category and “agree,” and “strongly agree” into another.

Data collection tool and techniques: Data was collected through Google forms using online survey questionnaire. Five preventive practices against COVID-19 in the past 14 days were included. They were: covering mouth when coughing and sneezing; washing hands immediately after coughing, rubbing nose, or sneezing; wearing mask regardless of the presence or absence of symptoms; washing hands before examining or touching patients; washing hands after touching contaminated objects. Enabling Environments were measured in term of adequate supply of appropriate personal protective equipment ; access to soap and water ; access to hand sanitizer ; access to face masks ; and emotional support from your organization to work against COVID-19. Options provided were always, most of the time, sometime, rarely, never. Perceived risk was measured using 10 items scale developed by Chong, et al, 2004 for SARS.¹³ Link was sent to study population using email and social media. Google forms provide security and anonymity to respondents.

Data analysis: Statistical package for social science (SPSS) version 22.0 was used for data editing and data analysis. Descriptive and inferential statistics was computed. Chi-square test and Anova test were applied. The significance level was set at 5% for all analysis.

Ethical consideration: Ethical approval was taken from ethical review board of Nepal Health Research Council (Reference number 2191; ERB number 310/2020). Informed consent form was placed at the first page of the

online questionnaire form. Objective of the study, statement of confidentiality and autonomy was declared before starting the survey. Written digital consent was taken from participants prior to starting the survey. Health worker agreed to participate by ticking the agreed option could proceed to reply the questions included in the survey.

RESULTS

Almost half, (49.6%) respondents were male; 58.8% respondents were in the age group of 19 to 29 years; 63.5% were from nuclear family; and 92.0% were Hindu. Of the total respondents, 38.4% participants were from government organization and 29.7% were from medical college. Nearly half of the respondents (48.0%) were doctors and about one fourth (24.8%) were nursing professionals. Regarding education, 31.6% respondents had education bachelor or above (Table 1).

Table 1: Characteristics of the study population (n=427)

Characteristics	Number	Percentage (%)
Sex		
Male	212	49.6
Female	215	50.4
Age group (in years)		
19-29	248	58.1
30-39	143	33.5
≥40	31	7.2
Missing	5	1.2
Religion		
Hindu	393	92.0
Buddhist and others	34	8.0
Educational level		
Bachelor and below	292	68.4
Masters and above	135	31.6
Job cadre		
Doctors	205	48.0
Nursing professionals	106	24.8
Health assistant and axillary health workers	65	15.2
Laboratory workers	30	7.0
Pharmacy and public health workers	21	4.9
Types of organization		
Government	164	38.4
Medical College	127	29.7
Other non-governmental organization	136	31.9

Table 2 shows perceived risk of COVID-19 among different health workers of different job cadre. Majority of health workers of all cadre believed that their job was putting them

at risk of COVID-19. Although the proportion of this belief was slightly higher among nursing professional, there was no statistically significant association among different group of health workers. More than half of the health workers felt more stress at work, and the level was not statistically significant among different job cadre. About 80% health workers in all cadres accepted the risk of caring for COVID-19 patients.

There was significant difference in the fear of falling ill with COVID-19 among type of health workers. Doctors and nurses had high proportion of reporting of fear of falling ill with COVID-19 (p=0.017). There was also significant difference in the feeling that they had little control over if they would get infected or not. Nursing professionals had high proportion of reporting the feeling that they had little control over if they would get infected or not (p=0.026). Similarly, there was also significant difference in their thinking they would be unlikely to survive if they got COVID-19 among different cadre of health workers (p<0.001). Nursing professionals had high proportion of reporting the thinking they would be unlikely to survive if they got COVID-19. In addition, 7.8% of doctors and 14.2% nursing professional also thought about resigning because of COVID; there was no significant difference in such feeling among difference cadre of health workers. Doctors had higher proportions of reporting fear that they would pass COVID on to others (72.2%); and there was significant difference in such feeling among difference cadre of health workers. Nursing professional had higher proportions of their family and friends were worried that they might get infected through them; however this reporting proportion did not significantly vary across difference cadre of health workers (Table 2).

Higher proportions of doctors reported that people avoid their family because of their job; and this reporting proportion significantly vary across difference cadre of health workers. Significant differences were observed in different items of perceived risk across difference cadre of health workers. However, there was no significant difference in mean risk which was 31.8 among doctors, 32.8 among nursing professional and 31.3 among other health workers (Table 2).

Table 3 shows the practices of preventive behavior among health workers during COVID-19 pandemic. Among health workers, 99.5% of doctors, 98.1% nursing professionals and 96.6% other health workers covered their mouth when coughing and sneezing.

Table 2: Perceived risk of COVID-19 among health workers of different cadres during COVID-19 pandemic

Item No.	Items of perceived risk	Doctors	Nursing professional	Other health workers	Chi-square value	P value
1	Believing that my job is putting me at great risk.					
	Strongly disagree/disagree/neutral	59 (28.8)	25 (23.6)	38 (32.8)	2.292	0.318
	Agree/strongly agree	146 (71.2)	81 (76.4)	78 (67.2)		
2.	Feeling more stress at work					
	Strongly disagree/disagree/neutral	84 (41.0)	41 (38.7)	55 (47.4)	1.958	0.376
	Agree/strongly agree	121 (59.0)	65 (61.3)	61 (52.6)		
3.	Accepting the risk of caring for COVID-19 patients					
	Strongly disagree/disagree/neutral	35 (17.1)	21 (19.8)	25 (21.6)	1.032	0.597
	Agree/strongly agree	170 (82.9)	85 (80.2)	91 (78.4)		
4	Afraid of falling ill with COVID-19					
	Strongly disagree/disagree/neutral	63 (30.7)	37 (34.9)	54 (46.6)	8.123	0.017
	Agree/strongly agree	142 (69.3)	69 (65.1)	62 (53.4)		
5.	Feeling I have little control over whether I will get infected or not					
	Strongly disagree/disagree/neutral	74 (36.1)	24 (22.6)	44 (37.9)	7.269	0.026
	Agree/Strongly agree	131 (63.9)	82 (77.4)	72 (62.1)		
6	I think I will be unlikely to survive if I am to get COVID					
	Strongly disagree/disagree/neutral	188 (91.7)	80 (75.5)	91 (78.4)	17.52	<0.001
	Agree/Strongly agree	17 (8.3)	26 (24.5)	25 (21.6)		
7	I think about resigning because of COVID					
	Strongly disagree/disagree/neutral	189 (92.2)	91 (85.8)	100 (86.2)	4.135	0.127
	Agree/Strongly agree	16 (7.8)	15 (14.2)	16 (13.8)		
8	I am afraid I will pass COVID on to others.					
	Strongly disagree/disagree/neutral	57 (27.8)	38 (35.8)	55 (47.4)	12.532	0.002
	Agree/Strongly agree	148 (72.2)	68 (64.2)	61 (52.6)		
9	My family and friends are worried that they might get infected through me					
	Strongly disagree/disagree/neutral	73 (35.6)	27 (25.5)	45 (38.8)	4.863	0.088
	Agree/Strongly agree	132 (64.4)	79 (74.5)	71 (61.2)		
10.	People avoid my family because of my work					
	Strongly disagree/disagree/neutral	171 (83.4)	77 (72.6)	81 (69.8)	9.283	0.010
	Agree/strongly agree	34 (16.6)	29 (27.4)	35 (30.2)		
	Mean (SD)	Mean (SD)	Mean (SD)	F value		
	Average perceived risk, (Range: 10 to 50)	31.8 (±5.55)	32.8 (±6.09)	31.3 (±6.95)	1.882	0.154

Similarly, 90.7% doctors, 93.4% nurses and 92.2% other health workers washed their hands immediately after coughing, rubbing nose, or sneezing. Regarding mask use, 94.1% of doctors, 95.3% nurses, and 94.0% other health workers reported that they wore mask most of the time

regardless of the presence or absence of in last 14 days. In addition, 92.2% doctors, 97.2% nurses and 94.0% other health workers washed their hands before examining or touching patients/suspected always or most of the time. Almost all health workers of all cadres washed their hands after touching contaminated objects always or most of the time. None of the behaviors were significantly associated with difference cadre of health workers (P>0.05)

Table 3: Preventive behavior among health workers of different cadres during COVID-19 pandemic

S.N	Preventive behavior	Doctors	Nursing professional	Other health workers	Chi-square value	P value
		n (%)	n (%)	n (%)		
1	Covering mouth when coughing and sneezing					
	Always/most of the time	204 (99.5)	104 (98.1)	112 (96.6)	NA	NA
	Sometime/rarely/never	1 (0.5)	2 (1.9)	4 (3.4)		
2.	Washing hands immediately after coughing, rubbing nose, or sneezing					
	Always/most of the time	186 (90.7)	99 (93.4)	107 (92.2)	0.700	0.705
	Sometime/rarely/never	19 (9.3)	7 (6.6)	9 (7.8)		
3.	Wearing mask regardless of the presence or absence of symptoms					
	Always/Most of the time	193 (94.1)	101 (95.3)	109 (94.0)	0.222	0.895
	Sometime/rarely/never	12 (5.9)	5 (4.7)	7 (6.0)		
4.	Washing hands before examining or touching patients/suspected					
	Always/most of the time	189 (92.2)	103 (97.2)	109 (94.0)	3.02	0.220
	Sometime/rarely/never	16 (7.8)	3 (2.8)	7 (6.0)		
5.	Washing hands after touching contaminated objects					
	Always/Most of the time	203 (99.0)	106(100)	114 (98.3)	1.78	0.411
	Sometime/rarely/never	2 (1.0)	0 (0.0)	2 (1.7)		

Table 4 shows the enabling environment reported by health workers during COVID-19 pandemic. More than three fourth health workers of all cadre reported that supply of appropriate personal protective devices was rare or never when they were at work; and there was a significant association between the health workers' reporting about the availability of appropriate personal protective and health workers group. Only 5.4% doctors and 6.9% other health workers reported that they had sometimes access to soap and water when they need. None of the nursing professionals reported that they had access to soap and water when they need them. Similarly, 11.7% doctors, 7.5% nursing professionals and 7.8% other health workers reported that they had sometimes access to hand sanitizer when they

need them. Regarding mask, 18.0% doctors, 10.4% nursing professionals and 12.1% other health workers mentioned that they had sometimes access to face mask when they need them; there was a significant association between this reporting and health workers group. Similarly, 29.8% doctors, 24.5% nursing professionals and 24.1% other health workers reported that they sometimes got emotional support from the organization, there was a significant association between getting emotional support and health workers group (Table 4).

Table 4: Enabling environment reported by health workers of different cadre during COVID-19 pandemic

CADRE OF HEALTH WORKERS							
S.N	Enabling environment	Doctors	Nursing professional	Other health workers	Chi-square value	P value	
1.	Adequate supply of appropriate personal protective devices when you are at work	Sometimes	55 (26.8)	20 (18.9)	25 (21.6)	15.02	0.005
		Rarely	106 (51.7)	50 (47.2)	44 (37.9)		
		Never	44 (21.5)	36 (34.0)	47 (40.5)		
2.	Having access to soap and water when you need	Sometimes	11 (5.4)	0 (0.0)	8 (6.9)	NA	NA
		Rarely	62 (30.2)	18 (17.0)	24 (20.7)		
		Never	132 (64.4)	88 (83.0)	84 (72.4)		
3.	Having access to hand sanitizer when you need it	Sometimes	24 (11.7)	8 (7.5)	9 (7.8)	6.713	0.152
		Rarely	81 (39.5)	31 (29.2)	41 (35.3)		
		Never	100 (48.8)	67 (63.2)	66 (56.9)		
4.	Having access to face mask when you need it	Sometimes	37 (18.0)	11 (10.4)	14 (12.1)	11.056	0.026
		Rarely	94 (45.9)	41 (38.7)	42 (36.2)		
		Never	74 (36.1)	54 (50.9)	60 (51.7)		
5.	Getting emotional support from your organization to work against COVID-19	Sometimes	61 (29.8)	26 (24.5)	28 (24.1)	14.751	0.005
		Rarely	93 (45.4)	36 (34.0)	38 (32.8)		
		Never	51 (24.9)	44 (41.5)	50 (43.1)		

DISCUSSION

The study revealed high perceived risk of COVID-19 and satisfactory preventive behavior among health workers of all cadres, and poor enabling environment at the organizations they worked. Mean risk perception level was found 31.8 among doctors, 32.8 among nursing professional and 31.3 among other health workers. The risk perception might influence the adoption of preventive public health measures and case management at the hospital and health care settings. It is reported that the spread of the COVID-19 is influenced by people’s willingness to adopt preventive behaviors, which in turn are associated with risk perception of the diseases.⁸ Study reports that risk perception of COVID-19 varies significantly across populations and places, indicating that risk perception is potentially a significant determinant of the pandemic evolution, as it can influence the number of new positive cases.⁹

In the study, five types of preventive practices were measured for last 14 days. Preventive measures were applied most of the time or always by more than 90% health workers during COVID-19 pandemic. For example, 99.5% of doctors, 98.1% nursing professionals and 96.6% other health workers covered their mouth when coughing and sneezing. A study conducted in Nepal reported that participants with a medical degree had statistically significant better practice against COVID 19 compared with the general population.¹⁴ Health worker had good knowledge as compared to the previous study.¹⁴ Similarly, majority of respondents had adequate knowledge and high-performance in preventive behaviors towards COVID-19.¹⁵ It is also reported by a study conducted in Bangladesh that participants with adequate knowledge of COVID-19 had higher likelihood of good practices to prevent it.¹⁶

Most of the health workers of all cadre reported that accessibility of basic facilities such as soap and water, hand sanitizer, face mask was also very limited; 5.4% doctors and 6.9% other health workers agreed that they had sometimes access to soap and water when they need and none of the nursing professionals reported that they had access to soap and water when they need them. Regarding hand sanitizer, 11.7% doctors, 7.5% nursing professionals and 7.8% other health workers reported that they had sometimes access to hand sanitizer when they need them. Such situation may hamper the adoption of public health preventive behavior at the hospital and health care setting. In Health Sector Emergency Response Plan of COVID-19, government has provisioned ensuring adequate availability of personal protective gears to all health workers.¹¹ In addition, to fight for the COVID-19; another important aspect is providing emotional support to health workers. The study revealed

that only one fourth of the health workers agreed that they sometimes got emotional support from your organization, and there was a significant association between getting emotional support and health workers group. This might hamper the prevention and management of COVID-19 in long run in Nepal.

One of the limitations of the study is that, as there were a few studies reported regarding enabling environment and risk perception of COVID-19 in Nepal, we could not compare result with other similar findings. Second, number of cases ranged from 49 in April 25 to 4085 in June 10 including 15 deaths during the data collection period.¹⁷ Therefore, this fact should be considered while interpreting the results. It is also found that initial emotional concerns and trust can play an essential role in improving the perceived risk of a pandemic and increasing public participation in adopting preventive measures.¹⁸

CONCLUSION

Mean perceived risk ranged from 31.3 to 32.8 out of 50 maximum among health workers. Most of the health workers of all cadre reported practice of preventive behavior most of the time in last 14 days preceding the survey. Enabling environment was found poor: very few health workers reported that they had sometimes access to soap and water; only about one in ten health workers had sometimes access to hand sanitizer; and 18.0% doctors, 10.4% nursing professionals and 12.1% other health workers had sometimes access to face mask when they need. Only one fourth of the health workers agreed that they sometimes got emotional support from your organization. Perceived risk of COVID-19 was high, preventive behavior was satisfactory; but access to enabling environment was poor. Adequate attention should be given to ensure availability of soap and water, sanitizer, masks and others to practice preventive behavior at work place.

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CONFLICT OF INTEREST

Authors declare no conflict of interest.

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