Perceived Risk of COVID-19 among Nurses Working in a Tertiary Level Hospital of Kathmandu: A Cross-Sectional Descriptive Study

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ABSTRACT

Introduction: Nurses are at higher risk of contracting and transmitting the novel coronavirus because of their work exposure. Perceived risk plays a major role in controlling COVID-19 propagation in a healthcare setting. The objective of this study was to find out the perceived risk of COVID-19 among nurses working in a tertiary-level hospital.

Methods: A cross-sectional descriptive design was adopted. One hundred forty-four nurses were selected through a simple random sampling technique. A self-administered structured questionnaire was used for data collection. Collected data were entered into Epi-data version 3.1 and transported into Statistical Package for Social Science (SPSS) version 16 for further analysis.

Results: One hundred forty-four nurses participated in the study. The age group ranged from 21-54 years (mean ± SD = 28.12 ± 5.045). More than half [76 (52.8%)] were unmarried. Almost all respondents [135(93.7%)] were staff nurses. One-hundred twenty (83.3%) had not taken infection prevention and control training. Almost all respondents [139(96.5%)] had no chronic illness. Only, twenty respondents (3.5%) had maternal-related health conditions. Half of the respondents [75(52.1%)] were living with vulnerable family members. Most of the respondents [125(86.8%)] had a high level of perceived risk of COVID-19.

Conclusions: The study highlights the high level of the perceived risk of COVID-19 among nurses. Most of the nurses were worried about getting COVID-19 and transmission to their loved one's health. High levels of perceived risks lead to less effective healthcare services therefore, there is a need for appropriate intervention to address nurses' problems in crisis time.

Keywords: Perceived risk, COVID-19, nurse, hospital.

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INTRODUCTION

Globally, the COVID-19 pandemic has resulted in a significant burden. There were more than 600 million cases infected with COVID-19 and more than 6 million people lost their lives around the globe (1). In Nepal, the first case was detected in January 2020 (2).

Among healthcare workers (HCWs), nurses were most commonly infected (3). Frontline health workers are at 12 times higher risk of testing COVID positive than the general population (4). HCWs because of their profession, are perceived as high risk for contagion disease, and factors such as social, emotional, and cognitive affect their perception (5). HCWs working at the frontline of COVID-19 had higher risk perceptions due to fear of getting infected (6)COVID-19 is a topic of concern among the populace and especially with the health care workers. Recent report by NCDC showed that globally as at August 2020, the world had witnessed

17,396,943 cases with 675,060 deaths presenting a case fatality rate of 3.89%. This study assessed the knowledge, perception and safety practices of COVID-19 infection among healthcare workers. Methods: It was a descriptive cross-sectional study. Both qualitative and quantitative methods were used. 410 participants drawn across most units in the hospital. Data analysis was done using SPSS software version 20. Responses were summarized using percentages, and frequencies. Test of association done using chi-square, and level of significance set at 5% ($p<0.05$. The key elements of perceived risk among HCWs consist of personal health risk, risk to others, social isolation, and acceptance of risk (7)for instance, in terms of conceptualizing risk perception as an exclusively cognitive or as a cognitive and emotional phenomenon or whether the concept was dominated by expectancy or expectancy and value components. Similarly, the majority of studies investigating risk perceptions and protective behaviors were not model-based. Conclusions: The current body of knowledge can only provide preliminary insights. Unlike the reviewed studies, which were mostly launched as a rapid response to outbreak situations, future research will have to invest more strongly into theoretical work to provide sounder evidence. © 2009 International Society of Behavioral Medicine. They felt nervous when in close contact with the patients as well and they were afraid of getting quarantined and suffering from sleep disturbances during the COVID pandemic(6,8) due to the coronavirus disease 2019 (COVID-19. There is a high risk of infection among front-line healthcare workers in Nepal which further leads to an increase in the risk of infection among the patients (9)attitude and practice (KAP. In addition, nurses unluckily were facing isolation, avoidance, and neglect by their families or society due to fear.

Behaviors of nurses at the workplace in response to their perceived risk have a major effect on themselves, individual patient care, and the wider community. Various factors play part in risk perception and vary from individual to individual (10). Hence, there is a need to understand how individual nurses perceive risk in this devastating situation. Nurses' confidence levels and feelings regarding COVID-19 were under-addressed, and there are limited studies were found in developing countries such as Nepal regarding the perceived risk of COVID-19. The main objective of this study was to find out the perceived risk of COVID-19 among the nurses working in a tertiary-level hospital. The secondary objectives were to assess the level of the perceived risk of COVID-19 and measure the association between the level of perceived risk and selected variables.

METHODS

A cross-sectional descriptive design was used to find out the perceived risk of COVID-19 among nurses. The research setting of the study was Manmohan Cardiothoracic Vascular and Transplant Center (MCVTC). The study population was registered nurses working in different inpatient departments, operation theatre and outpatient departments of MCVTC and total number of nurses were 202. Sample size was calculated using standard Cochran's formula considering that 61.3% of nurses had perceived risk in Nepal (14). Based on this prevalence with 95% confidence interval and 5% allowable error (d), sample size estimation was calculated as:

$n = Z^2 pq/d^2$

Where, Z = 1.96 for 95% confidence interval

d = 5% i.e. 0.05, p = 61.3% = 0.613 and q=1-p (1-0.613=0.387)

Substituting the formula,

Sample size (n) = $(Z^2 pq)/d^2$ = $[(1.96)^2 \times 0.613 \times 0.387)]/0.0025 = 364.538$

Hence, n~365

Above sample size was adjusted for finite population. For the finite population,

$n = [n_0/ (1+ (n_0-1/N)]$ (Cochran, 1977)

Where, n = desired sample size

n_o= required return sample size according to Cochran's formula

N = estimated population size = 202

Then, sample size required =130.36

Hence, n~131

Considering 10% as non- response rate of 131, the total of 131= 144 nurses. So, data was collected from total 144 nursing staffs i.e, 100% response rate.

Simple random sampling technique was used to select sample. A self-administered structured questionnaire was developed by researcher herself based on literature review, consultation with research advisor and subject matter specialist. The instrument was divided into 3 parts consisting of 36 items; socio-demographic variables and work-related information (12-items), vulnerable related factors (4-items) and perceived risk variables (20-items).

Part I: Questions related to socio-demographic variables and work-related information consisted of 12 items including age, marital status, ethnic group, religion, qualifications, designation, working unit, work experience, infection prevention and control (IPC) training, online course related to COVID-19, availability of personal protective equipment (PPE) and involved in care of COVID-19 patients.

Part II: Questions related to vulnerable related factors consisted of 4 items including the presence of any chronic disease, maternal-related health condition, living with vulnerable family members, and history of COVID-19 positive.

Part III: Questions related to perceived risk variables consisted of 20 items including vulnerability and feeling (5 items), fears and worries (10 items), and seriousness and preparedness (5 items).

For perceived risk, a five-point Likert scale was used (Score 1 for strongly disagree, score 2 for disagree, score 3 for neutral, score 4 for agree and score 5 for strongly agree). A total score was calculated by adding up each items score. The score ranged from 20-100 and the mean score was 60. Perceived risk was categorized into two groups on the basis of the mean score; high score > 60 and low score ≤ 60. For analysis purpose, "strongly disagree", "disagree", "neutral" were grouped into one category and "agree" and "strongly agree" into another. Negative statement, item 17 was reversely coded (Score 1 for strongly agree, score 2 for agree, score 3 for neutral, score 4 for disagree and score 5 for strongly disagree).

Prior to data collection, approval letter was obtained from the Research Committee of TU, IOM, Pokhara Nursing Campus. Ethical approval letter from Institutional Review Committee (IRC) of TU, IOM was taken and formal permission was obtained from administration of MCVTC. Respondents were explained about their voluntarily participation and informed that they could withdraw from the study at any time if they were unwilling to participate. Informed written consent was obtained prior to data collection. Data were collected by researcher herself using self-administered structured questionnaire at convenient time of respondents. Anonymity was maintained by using code number instead of mentioning the name or email address. Confidentiality was maintained to respect their privacy and they were ensured that collected data will be used for study purpose only. Precaution was taken throughout the study in every step to safeguard the right of all nurses. After checking accuracy, consistency and completeness, the collected data were entered into Epi-data version 3.1 and transported to statistical package for social science (SPSS) version 16 for further analysis. Data was analyzed and interpreted according to the objectives of the study and research questions. Both descriptive and inferential statistics was used to analyze the data. Descriptive statistics

such as frequency, percentage, mean and standard deviation were used to describe the socio-demographic variables, work-related information, vulnerable related factors and perceived risk variables and in inferential statistic: Chi-square test was used to measure the association between level of perceived risk and selected variables. A p-value of < 0.05 was considered significant.

RESULTS

Demographic Characteristics

The age of the respondents ranged from 21-54 years (mean ± SD = 28.12 ± 5.045). Seventy-six (52.8%) were unmarried. Eighty-four (58.3%) were upper-caste groups. One-hundred twenty-nine (89.6%) were Hindu and the remaining [15(10.4%)] were other religions. One-hundred twenty-nine (84%) were bachelor in nursing. The details of the socio-demographic characteristics of the respondents are shown in table 1.

Table 1 Socio-demographic Characteristics of the Respondents (n=144)

Characteristics	Number	Percent
Age		
20-29 years	103	71.5
30-39 years	36	25.0
≥40 years	5	3.5
Mean age ± SD = 28.12±5.045		
Range = 21-54 years		
Marital Status		
Unmarried	76	52.8
Married	68	47.2
Ethnic Group		
Disadvantaged Janajati	10	6.9
Disadvantaged Non-dalit Terai	2	1.4
Relatively Advantaged Janajati	48	33.4
Upper-caste Groups	84	58.3
Religion		
Hindu	129	89.6
Buddhist and others	15	10.4
Qualification		
PCL Nursing	23	16
Bachelor in Nursing	121	84

Work-related Information

Almost all [135(93.7%)] respondents were staff nurses. Forty (27.8%) were working in the intensive-care unit and five (3.5%) were working in the outpatient department. Nearly two-thirds [87(60.4%)] of respondents had less than five years of work experience. The majority [124(86.1%)] respondents had not been involved in infection prevention and control training. Only, twenty (13.9%) respondents had been involve in online courses related to COVID-19. One-hundred nine (75.7%) respond for sufficient availability of personal protective equipment. One hundred nine (75.7%) respondents were involved in care of COVID-19 patients. The details of the work-related information of the respondents are shown in table 2.

Table 2 Work Related Information of the Respondents (n=144)

Variables	Number	Percent
Designation		
Staff Nurse	135	93.7
Nursing Officer	9	6.3
Working Unit		
ICU	40	27.8
General ward	25	17.4

Variables	Number	Percent
OT	22	15.3
CCU	17	11.8
Emergency	14	9.7
Annex ward	11	7.6
Cath lab	10	6.9
OPD	5	3.5
Work experience		
<5 years	87	60.4
≥5 years	57	39.6
***IPC training**		
Yes	24	16.7
No	120	83.3
Online course related to COVID-19		
Yes	20	13.9
No	124	86.1
Sufficient availability of #PPE		
Yes	109	75.7
No	35	24.3
Involved in care of COVID-19 patients		
Yes	109	75.7
No	35	24.3

**Infection Prevention and Control, #Personal Protective Equipment*

Vulnerable Related Factors

Almost all [139(96.5%)] respondents had no chronic disease. Only, twenty (13.9%) respondents had maternal-related health conditions. More than half [75(52.1%)] of the respondents were living with vulnerable family members. Fifty-eight (40.3%) respondents had a history of COVID-19 positive. The details of vulnerable related factors of the respondents are shown in table 3.

Table 3 Vulnerable Related Factors of the Respondents (n=144)

Variables	Number	Percent
Presence of any chronic disease		
Yes	5	3.5
No	139	96.5
Maternal related health condition		
Yes	20	13.9
No	124	86.1
Living with vulnerable family members		
Yes	75	52.1
No	69	47.9
History of COVID-19 positive		
Yes	58	40.3
No	86	59.7

Perceived risk of COVID-19

Out of 144 respondents, 125(86.8%) had a higher level of the perceived risk of COVID-19, and one-hundred twelve (77.8%) respondents felt their job putting them at risk and at-risk caring for COVID-19 patients. Almost all [132(91.7%)] respondents were worried about their loved one's health. One-hundred twenty-three (85.4%) respondents agreed with the high-risk transmission of COVID-19. The details of the perceived risk of COVID-19 of the respondents are shown in table 4.

Table 4 Perceived Risk of COVID-19 of the Respondents (n=144)

Perceived Risk item	Strongly Disagree / Disagree/ Neutral	Agree/ Strongly Agree
	No. (%)	No. (%)
Vulnerability and feelings		
My Job is putting me at risk	32(22.2)	112(77.8)

Perceived Risk item	Strongly Disagree / Disagree/ Neutral	Agree/ Strongly Agree
	No. (%)	No. (%)
Thinking about resigning because of COVID-19	128(88.9)	16(11.1)
Anxious to be shifted towards for COVID ward	95(66)	49(34)
Risk of caring for COVID-19 patient	32(22.2)	112(77.8)
Feeling more stress at work	64(44.4)	80(55.6)
Fear and worries		
Afraid of falling ill with COVID-19	52(36.1)	92(63.9)
Afraid of losing own life because of COVID-19	95(66)	49(34)
Transmit COVID-19 to loved one	37(25.7)	107(74.3)
Afraid of losing loved one	42(29.2)	102(70.8)
Worried about own mental health	73(50.7)	71(49.3)
Worried about own physical health	41(28.5)	103(71.5)
Worried about being quarantined or isolation	74(51.4)	70(48.6)
Worried about loved one's health	12(8.3)	132(91.7)
Society avoid family due to own work	96(66.7)	48(33.3)
Unable to visit relatives	46(31.9)	98(68.1)
Seriousness and preparedness		
COVID-19 is a fatal disease	51(35.4)	93(64.6)
The risk of COVID-19 transmission is low (R)	21(14.6)	123(85.4)
Hands washing and mask prevent COVID-19	22(15.3)	122(84.7)
Vaccine controls the spread of COVID-19	55(38.2)	89(61.8)
Disinfect equipment and working area at least once a day prevent COVID-19	24(16.7)	120(83.3)

(R) Reversely coded

Level of Perceived Risk of COVID-19

Regarding level of perceived risk, most of the respondents (86.8%) had high level of perceived risk and only 13.2 percent of them had low level of perceived risk of COVID-19 (Table 5).

Table 5 Level of Perceived Risk of COVID-19 of the Respondents (n=144)

Level	Number	Percent	95% Confidence Interval
High	125	86.8	81.0 – 93.5
Low	19	13.2	6.5- 19.0
Total	144	100	

Association between Level of Perceived Risk with Work Related Information and Vulnerable Related Factors

The study showed the analysis of the association between the level of perceived risk and work-related information. There was no statistically significant association between the level of perceived risk and work-related information; designation, working unit, work experience, involvement in IPC training, online courses related to COVID-19, sufficient availability of PPE, and involvement in the care of COVID-19 patients (Table 6). There was no statistically significant association between vulnerable-related factors; maternal related health conditions, living with vulnerable family members and history of COVID-19 positive (Table 7).

Table 6 Association between the Level of Perceived Risk and Work Related Information of the Respondents

Variables	Level of Perceived Risk		X2 value	p-value
	Low No. (%)	High No. (%)		
Designation				
Staff nurse	17 (12.6)	118 (87.4)	-	0.338#
Nursing incharge	2 (22.2)	7 (77.8)		
Working unit				
Special department	17 (16.5)	86 (83.5)	3.461	0.63
General department	2 (4.9)	39 (95.1)		
Work experience				
<5 years	15 (17.2)	72 (82.8)	3.143	0.076
≥5 years	4 (7)	53 (93)		
IPC training				
Yes	5 (20.8)	19 (79.2)	-	0.317#
No	14 (11.7)	106 (88.3)		
Online course related to COVID-19				
Yes	2 (10)	18 (90)	-	1.000#
No	17 (13.7)	107 (86.3)		
Sufficient availability of PPE				
Yes	15 (13.8)	94 (86.2)	-	1.000#
No	4 (11.4)	31 (88.6)		
Involved in care of COVID-19 patients				
Yes	14 (12.8)	95 (87.2)	-	0.781#
No	5 (14.3)	30 (85.7)		

 # Fisher's Exact test, p-value is significant at < 0.05 level

Table 7 Association between Level of Perceived Risk and Vulnerable Related Factors of the Respondents

Variables	Level of Perceived Risk		X^2 Value	p-value
	Low No. (%)	High No. (%)		
Maternal -related health condition				
Yes	2 (10)	18 (90)	-	1.000#
No	17 (13.7)	107 (86.3)		
Living with vulnerable family members				
Yes	7 (9.3)	68 (90.7)	2.037	0.153
No	12 (17.4)	57 (82.6)		
History of COVID-19 positive				
Yes	8 (13.8)	50 (86.2)	0.030	0.862
No	11 (12.8)	75 (87.2)		

#Fisher's Exact test, p-value is significant at < 0.05 level

DISCUSSION

COVID-19 is without a doubt a global concern, specifically among HCWs. The present cross-sectional descriptive study was used to find out the perceived risk of COVID-19 among nurses working in a tertiary-level hospital in Kathmandu. In this study, most of the respondents [125(86.8%)] contributing to the study appeared to have high levels of perceived risk. Similar findings in a global study showed overall 78% of HCWs had a high level of risk perception (11)the surge of coronavirus disease 2019 (COVID-19. In contrast, a study from Ghana revealed 68.3% of HCWs had a high level of risk perception (12). Likewise, a study conducted in Ethiopia revealed that 57.60% of HCWs reported a high level of risk perception (13). This differences may be due to difference in methodology.

The current study showed that majority of respondents [112(77.8%)] believed their job is putting them at risk and risk of caring COVID-19 patient, and two-thirds of the respondents [92(63.9%)] were afraid of falling ill with COVID-19. The finding is consistent with another study from Nepal which showed 76.4% of nurses believed their job is putting them at risk, 80.2% of them accepted the risk of caring for COVID-19 patients and 65.1% of nurses afraid of falling ill with COVID-19 (14).

Furthermore, the present study showed that majority of the respondents [102(70.8%)] were worried about losing someone they loved. Similar findings a study from Ethiopia where 66% of HCWs were worried of losing someone they loved (15)Ethiopia. A hospital-based cross-sectional study was conducted from 9th to 26th June 2020 among healthcare professionals working at six public hospitals in Addis Ababa. Data were collected using a self-administered structured questionnaire. Frequency, percentage, and mean were used to summarize the data. A binary logistic regression analyses were performed to identify factors associated with risk perception about COVID-19. A total of 1,134 participants were surveyed. Wearing facemask (93%. Likewise, the current study showed almost all respondents [132(91.7%)] were worried about their loved one's health, which differs from a study done in Ethiopia showed 66.7% of HCWs were worried on their loved one's health (15) Ethiopia. A hospital-based cross-sectional study was conducted from 9th to 26th June 2020 among healthcare professionals working at six public hospitals in Addis Ababa. Data were collected using a self-administered structured questionnaire. Frequency, percentage, and mean were used to summarize the data. A binary logistic regression analyses were performed to identify factors associated with risk perception about COVID-19. A total of 1,134 participants were surveyed. Wearing facemask (93%. This study showed that more than two-third of respondents [107(74.3%)] had fear of transmission of COVID-19 to their loved one's which is consistent with a study conducted in the United Kingdom where 81% of HCWs were worried about passing infection to loved one's (16).

This study finding revealed ninety-three (64.6%) of the respondents perceived COVID-19 is a fatal disease and two-third of them [89(61.8%)] believed vaccine controls COVID-19 transmission. Contrast result was found in a study from Afghanistan where more than 90% of HCWs believed COVID-19 is not a fatal disease and 94% of them believed flu vaccine is not sufficient to prevent COVID-19 (10). This differences may be difference in population. One-hundred twenty two of the respondents (84.7%) reported hand washing and mask prevents from COVID-19. Nearly similar findings from Ghana study showed 89.4% of HCWs believed washing hands with soap and water prevent from COVID-19 (12).

In this study, there was no statistically significant association between perceived risk and nurses' age, marital status, qualification, designation, working unit, work experience, IPC training, online course related to COVID-19, availability of PPE, maternal related health condition, living with vulnerable family members, involvement in care of COVID-19 patient and history of COVID positive. A study done in Korea revealed similar findings where there was no statistically significant association between risk perception with marital status (18). In addition, a study conducted in Saudi Arabia showed there was no statistically significant association between risk perception with qualification (19). In contrast, a study conducted in Indonesia depicted there was statistically significant association of risk perception with age and marital status (20). This difference may be difference in population and methodology. Meanwhile, statistically significant association between risk perception with HCWs having training related to COVID-19 was found in a study from Ethiopia (13). Similarly, findings of

a study in China and HongKong showed that there was statistically significant association between perceived risk with availability of PPE and involvement in close contact with COVID-19 patients (21). Moreover, statistically significant association between risk perception with person having direct experience with the coronavirus was found in a study done in Jordan (22)having a public awareness role and providing care for patients. Advocating and supporting the sick and their families, ignoring and underestimating their role, nurses have a positive perception of their roles during the coronavirus pandemic. Besides being responsible for their daily activities during the epidemic, they had additional roles of ensuring the safety and contentment of their patients. Conclusion: In general, nurses in Jordan perceived their roles during the COVID-19 outbreak to be constructive. They performed the task of supporting and advocating for the sick and their families. Despite these efforts during the outbreak. Implication for Nursing: Nurses in general, nursing leaders and managers are in the forefront of responding to the unique needs of their workforces during the COVID-19 crisis. There must be an explicit adoption of strategy in all clinical environments and other clinical institutions to enhance the nurse image among themselves and community members. However, statistically significant association between risk perception with work experience was found in a study done in Cyprus (23) inadequate knowledge of prevention measures, and their erroneous practices may directly increase the risk of spread. As a result, matters are complicated further as far as the chain of infection is concerned. The present cross-sectional study was conducted with 494 Health Worker participants in Cyprus between the 1st and 20th of May and the data were collected via an online questionnaire. The survey was created using information from a previous study as well as current directives published on the WHO website. The statistical software SPSS 22.0 was used for data analysis. The ANOVA test was used for the comparison of quantitative variables, while the Kruskal–Wallis test was used in cases of non-parametric distribution. The Pearson or Spearman coefficients were used to test correlation and the levels of materiality were set to 0,05. Women constituted 66,7% of the participants and 44,8% of all participants were between the age of 30–39 years old. The majority (75,4%. Statistically significant association regarding risk perception of HCWs with working unit was found in a study conducted in Ethiopia (15)Ethiopia. A hospital-based cross-sectional study was conducted from 9th to 26th June 2020 among healthcare professionals working at six public hospitals in Addis Ababa. Data were collected using a self-administered structured questionnaire. Frequency, percentage, and mean were used to summarize the data. A binary logistic regression analyses were performed to identify factors associated with risk perception about COVID-19. A total of 1,134 participants were surveyed. Wearing facemask (93%.

The disparity in findings could be because COVID-19 is a highly contagious disease which has high case fatality rate around the globe. It has affected people of all nations, races, age group and socio-economic groups. HCWs working in any health institution are at higher risk due to continuous direct or indirect exposure with COVID-19 cases in this pandemic situation.

The limitation of the study includes findings of the study are based on self-reported data, so the nurses might not have answered genuinely. Due to cross-sectional nature of the study, researcher could not assess change in risk perception over time.

CONCLUSIONS

The study concluded that most of the nurses had high level of perceived risk of COVID-19. There was no statistically significant association between perceived risk and nurses' age, marital status, qualification, designation,

working unit, work experience, IPC training, online course, availability of PPE, involved in care of COVID-19 patients, maternal related health condition, living with vulnerable family members and history of COVID positive. Most of the nurses found themselves susceptible to acquiring COVID-19 in health care setting. High level of perceived risk might lead to suboptimal health care services as well as less effective management of COVID-19 cases. To mitigate these problems, proper intervention program should be organized to motivate them through incentives, counseling and education.

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