PRACTICE OF COVID-19 PREVENTIVE MEASURES AND ITS ASSOCIATED FACTORS AMONG THE UNDERGRADUATE MEDICAL STUDENTS: A CROSS-SECTIONAL STUDY

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ABSTRACT

Introduction

The COVID-19 is an emerging infectious disease with serious public health consequences. Appropriate practice of preventive measures and adherence to it play an essential role in reducing infection rates and controlling the spread of the disease.

Objectives

This study aimed to assess the practices of COVID-19 preventive measures and its associated factors among the undergraduate medical students at Birat Medical College Teaching Hospital.

Methodology

A cross-sectional study was conducted from 25 July 2021 to 25 December 2021 among the medical students at Birat Medical College Teaching Hospital, Morang, Nepal. The complete enumeration of 146 medical students were carried out. Ethical clearance was obtained from the Institutional Review Committee at Birat Medical College Teaching Hospital. A semi-structured questionnaire using google forms was used for data collection. Univariate and bivariate analysis were done. A p-value less than 0.05 was considered statistically significant.

Result

The mean score for practices of preventive measures towards COVID-19 was 16.58±2.73. More than half of the participants (54.1%) adopted good practices. The most frequently performed practice was wearing face masks when going outside the home (98.6%), followed by hand washing using soap and water for at least 20 seconds regularly (96.6%) and covering the mouth when coughing or sneezing with a tissue paper/a disposable handkerchief (96.6%). Moreover, most of the participants used alcohol-based hand sanitizer if soap and water were not available (95.2%), stayed at home when they felt flu-like symptoms (95.2%), visited the nearest health facility when getting sick (95.2%),and avoided close contact with sick individuals with flu-like symptoms (93.2%). Age, gender, ethnicity, religion, marital status, academic year, average monthly family income, any health insurance and vaccination status were not significantly associated with the practice of COVID-19 preventive measures.

Conclusion

More than half of the participants adopted good practices of preventive measures towards COVID-19. Lower practice scores among medical students is the matter of concern.

KEYWORDS

COVID-19, Medical students, Nepal, Pandemic

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by a novel coronavirus (SARS-CoV-2)with a serious public health threat, declared a pandemic on March 11, 2020 by World Health Organization (WHO).[1,2] Nepal has reported Omicron subvariants of COVID-19 which is under monitoring. The Ministry of Health and Population (MOHP) has urged people to take extra precautions and follow health safety standards as there is a risk of emergence of a new COVID-19 variant BF.7.[3]

Preventive measures to control the transmission of COVID-19 includes maintaining a safe distance from others (at least 1 metre), even if they don't appear to be sick, wearing a properly fitted mask when physical distancing is not possible or when in poorly ventilated settings, choosing open, well-ventilated spaces over closed ones, hand washing regularly with soap and water or using an alcohol-based hand rub, covering the mouth and nose when coughing or sneezing with a bent elbow or tissue, disinfect the frequently touched objects, staying home, self-isolationif unwell, and getting vaccinated when a vaccine is available.[4]

Medical students are at higher risk for infection.[5] The adoption of disease prevention measures aids in the containment of coronavirus transmission.[6] It is expected that as future specialists in health care services, medical students should follow good practices of COVID-19 preventive measures. Various studies have been reported regarding the practices of COVID-19 preventive measures.[1,5,7,8] A study conducted in Nepal revealed 73.4% of medical students followed good practices regarding prevention of COVID-19.[9] Medical students are considered to be a valuable human resource to aid in the country's response to the pandemic. The research regarding practice of COVID-19 preventive measures among undergraduate medical students is not much available in Eastern Nepal. The aim of this study was to assess the practices of COVID-19 preventive measures and its associated factors among the undergraduate medical students at Birat Medical College Teaching Hospital.

METHODOLOGY

A cross-sectional study was conducted from 25 July 2021 to 25 December 2021 among the medical students at Birat Medical College Teaching Hospital, Morang, Nepal. The complete enumeration of 146 medical students were carried out. Ethical approval was obtained from the Institutional Review Committee at Birat Medical College Teaching Hospital (Ref: IRC-PA-164/2078-79). Under graduate students studying in the third and fourth year of the Bachelor of Medicine and Bachelor of Surgery (MBBS) course at Birat Medical College Teaching Hospital and those who were willing to participate were included.

An online semi-structured questionnaire using google forms was developed and used for data collection. Electronic informed consent was obtained from each participant at the beginning of the study. They were informed about the objectives of the study, confidentiality, anonymity and they hold the right to withdraw from the study whenever they wish to. The questionnaire was made available to the participants through emails and various social media platforms such as Messenger and WhatsApp. All of the participants were reminded to complete the questionnaire within two weeks.

A semi-structured questionnaire was developed by reviewing related literature and following WHO & CDC guidelines. The content validity of the tool was established by seeking opinions from the experts on the subject and appropriate modifications were made. The questionnaire was divided into socio-demographic characteristicsand practices of COVID-19 preventive measures. Socio-demographic characteristics included: age, gender, ethnicity, religion, marital status, academic year, monthly family income, any health insurance, the status of COVID-19 vaccination, doses received, behavioral characteristics (current smoking, alcohol consumption, history of any chronic illness) and source of information. The practice was assessed by variables such as hygiene and protective measures, physical (social) distancing, movement restrictions, and seeking self-help/ support.[10] It included 21 practice-related questions responded as 'yes' and 'no'. The yes response was scored as '1' and the no response was scored as '0'.The score ranged from 0 to 21. We operationalized the definition of good and poor practice in our context based on the mean cut-off score. Participants who scored above and equal to the mean value (≥16.5) were considered to have good practices, and below the mean value (<16.5) were considered to have poor practices. The completeness of the data was checked on the same day of data collection. The collected data was extracted in Microsoft Excel 2007 and analyzed using Statistical Package for the Social Sciences(SPSS) version 21. Frequencies and percentages were presented in tables. Bivariate analysis was performed using the Chi-square test, Mann-whitney U-test and likelihood ratio. A p-value less than 0.05 was considered statistically significant.

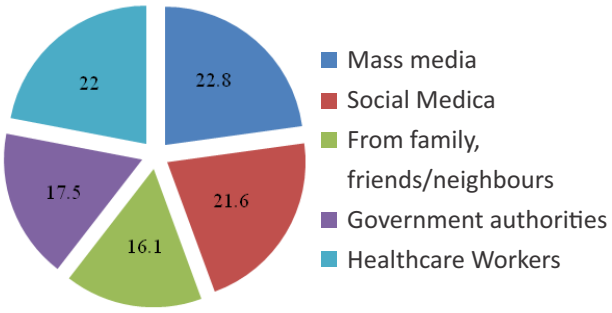
RESULTS

The mean age of the participants was 23.51±1.89 years. Among the participants, 60.3% were aged 21-23 years. More than half of the participants (53.4%) were male and from upper caste groups(55.5%). Most of the participants were Hindu (89.0%) and unmarried (97.9%). The median monthly family income and interquartile range (IQR) was NRs 77,500 (50,000-1,00,000). More than two-thirds of the participants (32.2%) had health insurance. Most of the participants (89.0%) received two doses of COVID-19 vaccination and more than half of the participants (61.0%) received the Vero Cell vaccine. The overall prevalence of current smoking and alcohol consumption was 8.9% and 17.1% respectively. Only 6.8% of the participants had a history of chronic illness (Table 1).

Table 1: Baseline characteristics of the participants (n=146)

Characteristics	Categories	N(%)
Age (in years)	18-20	1 (0.7)
	21-23	88 (60.3)
	≥24	57 (39.0)
Mean ± SD (Min-Max)		23.51±1.89 (20-32)
Gender	Male	78 (53.4)
	Female	68 (46.6)
Ethnicity	Dalit Hill/Terai	1 (0.7)
	Disadvantaged Janjati (Hill/Terai)	9 (6.2)
	Disadvantaged Non-Dalit Terai caste groups	36 (24.7)
	Religious Minorities	13 (8.9)
	Relatively advantaged Janjati	6 (4.1)
	Upper caste groups	81 (55.5)
Religion	Hindu	130 (89.0)
	Muslim	13 (8.9)
	Christian	1 (0.7)
	Kirat	2 (1.4)
Marital status	Married	3 (2.1)
	Unmarried	143 (97.9)
Academic year (MBBS)	Third-year	75 (51.4)
	Fourth-year	71 (48.6)
Average monthly family income (in NPR) IQR (Min-Max)		77,500 (50,000–1,00,000) (10,000-10,00,000)
Any health insurance	Yes	47 (32.2)
COVID-19 Vaccination status	Vaccinated (one or two dose)	145 (99.3)
	Not vaccinated (zero dose)	1 (0.7)
Doses of the vaccination received	Zero dose	1 (0.7)
	One dose	15 (10.3)
	Two doses	130 (89.0)
Name of the vaccination received	Covishield/ AstraZeneca	55 (37.7)
	Vero Cell	89 (61.0)
	Johnson and Johnson	2 (1.4)
Current smoking	Yes	13 (8.9)
Alcohol consumption	Yes	25 (17.1)
History of any chronic illness	Yes	10 (6.8)

The main source of information regarding COVID-19 among the participants was mass media (22.8%) followed by healthcare workers (22.0%) (Figure1).



* Multiple response

Figure 1: Source of COVID-19 information (n = 146)

The most frequently practiced preventive measure was wearing face masks when going outside the home (98.6%), followed by hand washing using soap and water for at least 20 seconds regularly (96.6%) and covering the mouth when coughing or sneezing with a tissue paper/ a disposable handkerchief (96.6%). Moreover, most of the participants used alcohol-based hand sanitizer if soap and water were not available (95.2%), stayed at home when they felt flu-like symptoms (95.2%), visited the nearest health facility when getting sick (95.2%),and avoided close contact with individuals who are sick with flu-like symptoms (93.2%) which represented good practices of COVID-19 preventive measures (Table 2).

Table 2: Practice of the participants related to COVID-19 preventive measures(n=146)

Characteristics	Responses of the study participants	
	Yes [N(%)]	No [N(%)]
Hygiene and preventive measures		
1. W ash hands using soap and water for at least 20 seconds regularly.	141 (96.6)	5 (3.4)
2. Use alcohol-based hand sanitizer (at least 60% alcohol) if soap and water are not available.	139 (95.2)	7 (4.8)
3. Avoid touching eyes, nose, and mouth with unwashed hands.	125 (85.6)	21 (14.4)
4. Cover the mouth or nose while coughing/ sneezing with t issue paper/ a disposable handkerchief.	141 (96.6)	5 (3.4)
5. Disinfect the frequently touched objects.	86 (58.9)	60 (41.1)
6. Wear face masks when going outside the home.	144 (98.6)	2 (1.4)
7. Use eye goggles/ face shields.	61 (41.8)	85 (58.2)
8. Measure the body temperature at least twice a week.	36 (24.7)	110 (75.3)
Physical (social) distancing		
9. Maintain a distance of at least one meter while meeting others for protection against the virus.	112 (76.7)	34 (23.3)
10. Avoid large gatherings (with 50 persons/more during the last 7 days).	119 (81.5)	27 (18.5)
11. Avoid close contact with individuals who are sick with flu-like symptoms.	136 (93.2)	10 (6.8)
12. Avoid shaking hands with others while greeting.	128 (87.7)	18 (12.3)
13. Stay at home if it is not necessary to go out.	135 (92.5)	11 (7.5)
Movement restrictions		
14. Restrict travels or movements.	116 (79.5)	30 (20.5)
15. Stay at home when you feel flu-like symptoms.	139 (95.2)	7 (4.8)
Seeking self-help or support		
16. Visit the nearest hospital or health facility when getting sick.	139 (95.2)	7 (4.8)
17. Purchase medicines from a drugstore or pharmacy.	145 (99.3)	1 (0.7)

The mean score for practices of COVID-19 preventive measures was 16.58±2.73 representing more than half of the participants (54.1%) followed good practices of COVID-19 preventive measures (Table 3).

Table 3: Practice score regarding COVID-19 preventive measures (n=146)

Characteristics	Categories	N (%)
Level of the practice score	Good	79 (54.1)
	Poor	67 (45.9)
Practice score (Mean± SD)	16.58±2.73	

There was no significant association between age, gender, ethnicity, religion, marital status, academic year, average monthly family income, any health insurance, vaccination status, and practice of COVID-19 preventive measures. Table 4.

Table 4: Association between baseline characteristics and practice of COVID-19 preventive measures (n=146)

Characteristics	Categories	Practice ofCOVID-19 preventive measures		P-value
		Good[N(%)]	Poor[N (%)]	
Age (years)	Mean ± S.E.	23.73±2.04	23.24±1.69	0.116[a]
Gender	Male	39 (50.0)	39 (50.0)	0.286[b]
	Female	40 (58.8)	28 (41.2)	
Ethnicity	Disadvantaged Non-Dalit Terai caste groups	21 (58.3)	15 (41.7)	0.775[b]
	Religious Minorities	7 (53.8)	6 (46.2)	
	Upper caste groups	41 (50.6)	40 (49.4)	
	Others (Dalit Hill/Terai, Disadvantaged Janjati (Hill/Terai), Relatively advantaged Janjati)	10 (62.5)	6 (37.5)	
Religion	Hindu	70 (53.8)	60 (46.2)	0.856[b]
	Others	9 (56.3)	7 (43.8)	
Marital status	Married	2 (66.7)	1 (33.3)	0.655[d]
	Unmarried	77 (53.8)	66 (46.2)	
Academic Year (MBBS)	Third Year	41 (54.7)	34 (45.3)	0.890[b]
	Fourth Year	38 (53.5)	33 (46.5)	
Average monthly family income	Median (IQR)	80,000 (50,000-100,000)	70,000 (50,000-100,000)	0.584[c]
Any health insurance	Yes	28 (59.6)	19 (40.4)	0.361[b]
	No	51 (51.5)	48 (48.5)	
Vaccination status	Complete	68 (52.3)	62 (47.7)	0.213[b]
	Incomplete	11 (68.8)	5 (31.3)	

[a]:Independent t-test, [b]: Chi-square test, [c]:Mann-Whitney Utest, [d]:Likelihood ratio

DISCUSSION

This is a web-based cross-sectional study involving 146 medical students studying at Birat Medical College Teaching Hospital. In this study, most of the participants (98.6%) wear face masks when going outside the home. According to World Health Organization, a well-fitting three-layer mask should be worn especially when one can't physically distance, or if indoors. The higher proportion of use of face masks by the participants might be due to the nature of study participants, who are medical students considered to have good health literacy on the use of masks for COVID-19 prevention. A study from India also reported a high proportion of face mask use (97.4%).[11] Hand hygiene is exceptionally essential for infection prevention. In this study, most of the participants practiced hand washing using soap and water for at least 20 seconds regularly (96.6%)and using hand sanitizer (95.2%). However, we still believe that hand hygiene is practically the most neglected measure and usually, medical students do not follow each step of hand washing. Furthermore, studies from India[11] and Malaysia[12] supported our findings of having good practices.

Precautionary measures such as wearing a facemask, hand washing using soap and water for at least 20 seconds regularly, using hand sanitizer, covering the mouth when coughing or sneezing with a tissue paper/ a disposable handkerchief, social distancing, staying at home when they felt flu-like symptoms and visited the nearest hospital or health facility when getting sick were well adopted by participants in this study. This was quite similar in all aspects except wearing a facemask in the survey conducted in Jordan.[13] This could be due to differences in regulations enforced by the state, cultural experiences, the educational level, and shortage of facemask in that particular area.

We found the mean practice score of COVID-19 preventive measures as 16.58±2.73 representing more than half of the participants (54.1%) adopted good practices of COVID-19 preventive measures. A similar finding was reported in a study from Bangladesh (55.1%).[7] This finding was higher than the study conducted in Eastern Ethiopia (40.7%).[14] Since, medical students have better access to information regarding COVID-19, this leads to the practice of appropriate COVID-19 prevention measures. However, higher practice scores were reported by studies from Nepal (73.4%)[9] and Saudi Arabia (94.1%).[15] This discrepancy might be due to differences in cut-off points used to categorize the good or poor practices, sample size, methods of data collection, variables included, and socio-cultural variation between study settings. Since medical students play a significant role in the prevention and control of infection, it is necessary to strictly follow CDC and WHO guidelines on PPE use, hand hygiene, and social distancing.

In this study age, ethnicity, religion, and marital status were not significantly associated with the practice of COVID-19 preventive measures. In contrast to our findings, a study conducted in Ethiopia revealed that academic year, living with family, and type of residence were significantly associated with the practice of COVID-19 preventive measures.[16] Also, a study from China reported that there were significant differences in the practice scores with age, gender, education, occupation, family economic levels, and incidence of chronic diseases.[17] This may be due to differences in cut-off points used to categorize the practice scores and variation in study settings. Similarly, studies conducted in India [1], Saudi Arabia[18] and Ethiopia[10] reported that gender was significantly associated with the practice scores which is inconsistent with our finding. We could not find a statistically significant association between gender and practice of COVID-19 preventive measures. However, a study conducted in Saudi Arabia supported our finding. During the COVID-19 pandemic we assume that the access to information from curricular and extra-curricular platforms for both the gender and different age groups were similar.[15]

CONCLUSION

More than half of the participants adopted good practices of COVID-19 preventive measures. Lower practice scores

among medical students is the matter of concern. However, there is a need to improve practices of COVID-19 preventive measures among medical students since they are a potential source of health information within their communities.

RECOMMENDATIONS

The findings from this study may help policymakers to improve the practice of COVID-19 preventive measures among medical students. It is recommended that a similar study with a wider population be conducted to assess the practice of preventive measures among medical students towards COVID-19.

LIMITATION OF THE STUDY

The study was conducted in only a single setting, which may not be representative of all medical students in Nepal. Additionally, as the data collection was conducted online due to the mitigation measures in place in response to the COVID-19 pandemic, the chances of recall bias could not be ignored. Nevertheless, this study provides an estimate of medical students' practices of COVID-19 preventive measures at Birat Medical College Teaching Hospital during the pandemic.

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CONFLICT OF INTEREST

The authors declare that no competing interests exist.

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No funds were available.

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