

Assessment of Attitude and Practices towards COVID-19 among Paramedical Students

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ARTICLE INFO

Article history:

Received: 5 May 2023

Revised: 15 June 2023


Accepted: 26 June 2023

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Citation:

Yadav K, Prakash S, Yadav BK, Pokhrel B. Assessment of Attitude and Practices towards COVID-19 among Paramedical Students. MedS. J. Med. Sci. 2023;2(4):52-62.

ABSTRACT

INTRODUCTION: The country's response to a potential outbreak may benefit greatly from the practical knowledge, experience and skills of paramedical students in a number of ways. Thus, this study was conducted to evaluate attitude and practices regarding COVID-19 among paramedical students studying in different colleges of Janakpur, Nepal. **MATERIALS AND METHODS:** A structured questionnaire was used in a descriptive cross-sectional study to collect information on COVID-19 attitude and practices among HA students enrolled in different selected colleges affiliated to Council for Technical Education and Vocational Training (CTEVT), Nepal in April and May of 2022. Statistical Package for the Social Sciences was used to analyse the data. Significant results were defined as a p-value of less than 0.05. **RESULTS:** Majority of girls from NHRDA and MTA (53.7% and 50.58%) respectively, believed that COVID-19 infection is a global problem than CMC girls (35.08%). Of 63.5% and 49.35% girls from NHRDA and MTA agreed that the public is crucial for infection control. More than 60% of girls from NHRDA and MTA suffered from mild fever after immunization fall down by 52.17% girls from CMC's while 52.3%, 30.6% and 42.42% girls from each college respectively felt healthy after immunization and one fourth of total suffered from high fever after immunization. The significant association between the COVID-19 immunization among the students of different colleges ($p = 0.00$). **CONCLUSIONS:** Most of the girl students had positive attitude and optimistic practice, while the boys followed appropriate safety measures to avoid contracting COVID-19. A significant correlation has been found between students from various colleges and the COVID-19 vaccine.

KEYWORDS: Attitude; COVID-19; Practice; Paramedical Students; Vaccine.



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<https://doi.org/10.3126/mjms.v3i6.66577>

INTRODUCTION

Throughout recorded history, humans have been assaulted by severe epidemics of infectious disease [1]. The new pandemic, COVID-19 is a disease caused by one of the novel coronavirus families called severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) that causes diseases in humans and animals [2]. When COVID-19 arrived in humans in late 2019, the causative agent of SARS-COV-2 was quickly identified and isolated, recognized as a coronavirus, and its genome was sequenced. SARS-COV-2 infection usually causes a relatively mild disease, COVID-19 can present with severe pneumonia, leading to respiratory collapse and death [1].

Since the date that COVID-19 was declared a pandemic [3], global communities strived to implement various strategies to mitigate the deadly impact caused by the virus. Students are an influential group in society and can play a positive role in educating the general public and preventing stress in different sections of society against COVID-19. Health assistants (HA) in Nepal, who are healthcare workers holding a Proficiency Certificate in General Medicine, have primary responsibilities for offering the general public in hospitals and clinical settings

regarding therapeutic, preventative, and promotional services [4]. If healthcare workers and other medical professionals, have sufficient awareness, a good perspective, and understanding of best practices addressing COVID-19, they can prevent cross-infection during patient's care [5].

Knowledge, attitude, and practice (KAP) about COVID-19 pandemic is critically a suitable method for evaluating effective behavioural change strategies among health care workers. Several researchers have conducted KAP surveys with a variety of respondents which included the general public [6, 7] and other studies involved healthcare students [8, 9], students from various academic programs [10] as well as undergraduate medical and dental students in Nepal [11]. Comprehensive assessments of paramedical students' knowledge, attitude, and practice are essential for optimizing their potential in educating the public and encouraging communities to follow health standards. However, there is still a dearth of KAP data among students enrolled as health assistants in Janakpur, Madhesh Province, Nepal. As part of our KAP study, the knowledge assessment on COVID-19 among paramedical

students has been revealed in our earlier published data [4]. Here, we are presenting probably the first exploration so far to evaluate attitude and practices regarding COVID-19 among paramedical students studying in different colleges of Janakpurdham, Nepal.

MATERIAL AND METHODS

Study design and setting:

This study was used in a descriptive cross-sectional study to collect information on COVID-19 attitude and practices from HA students enrolled in National Human Resources Development Academy (NHRDA), Care Medical Center (CMC), and Mithila Technical Academy (MTA) colleges in Janakpurdham, Madhesh Province, Nepal. These educational institutions are situated in Janakpurdham, Nepal, and are affiliated with the Council for Technical Education and Vocational Training (CTEVT), Nepal. The data was obtained in April and May of 2022.

Participants, sample size and sampling technique:

Interviews were conducted with HA students enrolled in NHRDA, CMC, and MTA programs. At the time of data collection, all first, second-, and third-year students who were enrolled in three different colleges were considered eligible. All participants were briefed about the objective of the study, and those who accepted to sign a consent form were included in the study. Our target group comprised 120 students from each college enrolled in a three-year general medical proficiency certificate program. Out of total targeted 360 students, 280 were enrolled. The teaching faculty, staff members, nursing students, and laboratory students enrolled at these colleges were excluded.

Data collection procedure and study variables

A standardized, self-administered structured questionnaire was developed by reviewing the relevant available literature to collect data. Sixteen questions were designed for the attitude and practice and data collection was conducted through face-to-face interviews. A prior published research included information on socio-demographic characteristics and sixty-two knowledge-based items on the COVID-19. Readers are referred to our previous publication for further details [4].

Statistical analysis and data management:

Statistical Package for the Social Sciences (SPSS), version 21, was used to code, validate, and analyze the data. The frequencies and proportions were determined using descriptive analysis. Chi-square test was applied and significant results were defined as a p-value of less than 0.05.

Ethical consideration:

Prior to data collection, the National Human Research Development Academy (Ref: 72/078-079), Mithila Technical Academy (Ref: 115/079), and Care Medical Centre (Ref: 27/079) affiliated with CTEVT, Nepal provided work approval letters.

RESULTS

Attitude towards COVID-19 among study population

In all, 280 students were enrolled for this study. Of these, 102 were from NHRDA, 95 from MTA, and 83 from CMC. The majority of girls from NHRDA and MTA, 53.7% and 50.58%, respectively, believed that COVID-19 infection is a global problem. However, fewer girls (35.08%) than in CMC had a positive attitude. A greater proportion of girls among all three institutions had a positive attitude towards the risk of contracting COVID-19, but the same proportion of boys and girls from NHRDA and MTA showed a negative attitude towards risk of getting COVID-19 infection. The public can play the most significant role in COVID-19 control, based on 50% of boys and girls in CMC had a positive attitude. However, more than half of NHRDA girls (63.5%) and MTA girls (49.35%) agreed that the public is crucial for infection control. Table 1 presents the findings.

Out of total study population, disinfectant was used in the house on a daily basis by the majority of NHRDA boys (56.5%) and (43.5%) of girls followed by MTA and CMC students. More than 60% of boys from CMC practiced the proper methods of coughing and sneezing etiquette followed by the boys of MTA and NHRDA. Most of the MTA boys (53.57%) and (42.23%) of girls pro-actively reported to the institution and isolated themselves when they had close contact with confirmed case followed by students of

Table 1| Attitude towards COVID-19 among study population

S. No	Attitude	Gender (CMC)		Total N= 83	Gender (NHRDA)		Total N= 102 Boys (n=48) (%)	Gender (MTA)		Total N= 95
		Boys (n=39) (%)	Girls (n=42) (%)		Boys (n=45) (%)	Girls (n=57) (%)		Girls (n=47) (%)		
1	COVID-19 infection is a global problem									
	Agree	37 (64.9)	20 (35.0)	57	44 (46.3)	51 (53.7)	95	42 (49.4)	43 (50.5)	85
	Disagree	1 (4.3)	22 (95.6)	23	1 (14.3)	6 (85.7)	7	2 (33.3)	4 (66.6)	6
	Neutral	1 (33.3)	2 (66.6)	3	0	0	0	4 (100)	0	4

2	There is always risk of getting COVID-19 infection									
	Agree	29 (44.6)	36 (55.3)	65	36 (42.4)	49 (57.6)	85	35 (49.2)	36 (50.7)	71
	Disagree	4 (57.1)	3 (42.8)	7	3 (50)	3 (50)	6	11 (50)	11 (50)	22
3	You should consult doctor for COVID-19 infection									
	Agree	23 (37.7)	38 (62.2)	61	31 (36.4)	54 (63.5)	85	45 (51.1)	43 (48.8)	88
	Disagree	5 (50)	5 (50)	10	2 (100)	0	6	1 (20)	4 (80)	5
4	COVID-19 is preventable									
	Agree	26 (45.6)	31 (54.3)	57	32 (45.1)	39 (54.9)	89	38 (50.6)	37 (49.3)	75
	Disagree	5 (45.4)	6 (54.5)	11	6 (42.9)	8 (57.1)	2	6 (42.8)	8 (57.1)	14
5	Government's responsibility is to prevent COVID-19									
	Agree	17 (37.7)	28 (62.2)	45	28 (41.2)	40 (38.8)	71	31 (49.2)	32 (50.7)	63
	Disagree	9 (39.1)	14 (60.8)	23	14 (48.3)	15 (51.7)	29	11 (42.3)	15 (57.6)	26
6	Individual can contribute to prevention of COVID-19									
	Agree	32 (47.7)	35 (52.2)	67	23 (34.8)	43 (65.2)	66	37 (46.8)	42 (53.1)	79
	Disagree	6 (60)	4 (40)	10	16 (66.7)	8 (33.3)	24	4 (66.6)	2 (33.3)	6
7	Public can play the most important role in COVID -19 control									
	Agree	35 (50)	35 (50)	70	31 (36.5)	54 (63.5)	85	39 (50.6)	38 (49.3)	77
	Disagree	2 (28.5)	5 (71.4)	7	12 (85.7)	2 (14.3)	14	9 (52.9)	8 (47.0)	17
8	There is a high chance for COVID-19 to spread in the future if it happens once									
	Agree	25 (47.1)	28 (52.8)	53	29 (40.3)	31 (51.7)	60	20 (41.6)	28 (58.3)	48
	Disagree	8 (47.0)	9 (52.9)	17	9 (36)	16 (64)	25	15 (48.3)	16 (51.6)	31
9	You are worried that you might get COVID-19 infection									
	Agree	19 (35.8)	34 (64.1)	53	26 (41.9)	36 (58.1)	62	22 (40.7)	32 (59.2)	54
	Disagree	10 (66.6)	5 (33.3)	15	11 (40.7)	16 (59.3)	27	15 (53.5)	13 (46.4)	28
10	COVID-19 prevention measures should only be applied by older adults and age groups most risk									
	Agree	22 (40)	33 (60)	55	23 (52.3)	21 (47.7)	44	30 (62.5)	18 (37.5)	48
	Disagree	13 (68.4)	6 (31.5)	19	16 (42.1)	22 (57.9)	38	16 (36.3)	28 (63.6)	44
11	If I develop symptoms of COVID-19, I will seek to visit health facility									
	Agree	31 (46.2)	36 (53.7)	67	36 (42.9)	48 (57.1)	84	44 (56.6)	35 (44.3)	79
	Disagree	4 (44.4)	5 (55.5)	9	6 (54.5)	5 (45.5)	11	3 (37.5)	5 (62.5)	8
12	Limitation of the contact decreases the transmission									
	Agree	28 (45.9)	33 (54.09)	61	33 (38.8)	52 (61.2)	85	27 (41.5)	38 (58.4)	65
	Disagree	5 (35.7)	9 (64.2)	14	7 (70)	3 (30)	10	11 (73.3)	4 (26.6)	15
13	Students studying in colleges are vulnerable for COVID-19									
	Agree	32 (47.7)	35 (52.2)	67	41 (48.2)	44 (51.8)	85	36 (48.6)	38 (51.3)	74
	Disagree	4 (44.4)	5 (55.5)	9	1 (9.1)	10 (90.9)	11	12 (75)	4 (25)	16
13	Students studying in colleges are vulnerable for COVID-19									
	Agree	2 (28.5)	5 (71.4)	7	3 (50)	3 (50)	6	0	5 (100)	5

14	Do you think that outbreak has impacted your study									
	Agree	25 (41.6)	35 (58.3)	60	32 (38.6)	51 (61.4)	83	45 (50.5)	44 (49.4)	89
	Disagree	4 (44.4)	5 (55.5)	9	9 (90)	1 (10)	10	2 (50)	2 (50)	4
	Neutral	6 (42.8)	8 (57.1)	14	4 (44.4)	5 (55.6)	9	1 (50)	1 (50)	2
15	Was online teaching effective to you during lockdown period?									
	Agree	21 (44.6)	26 (55.3)	47	27 (58.6)	19 (41.3)	46	22 (44.8)	27 (55.1)	49
	Disagree	16 (50)	16 (50)	32	18 (40.9)	36(81.8)	44	21 (53.8)	18 (46.1)	39
	Neutral	2 (50)	2 (50)	4	4 (33.3)	8(66)	12	4 (57.1)	3 (42.8)	7
16	Do you think that consumptions of raw vegetables and wild animal products have no role in transmission of COVID-19									
	Agree	16 (44.4)	20 (55.5)	36	23 (62.2)	14 (37.8)	37	18 (47.3)	20 (52.6)	38
	Disagree	16 (50)	16 (50)	32	18 (40)	27 (60)	45	25 (49.0)	26 (50.9)	51
	Neutral	7 (46.6)	8 (53.3)	15	4 (20)	16 (80)	20	5 (83.3)	1 (16.6)	6

NHRDA and CMC. More than 60% of girls from NHRDA and MTA suffered from mild fever after immunization fall down by 52.17% girls from CMC while 52.3%, 30.6% and 42.42% girls from each college respectively feeling healthy after immunization and one fourth of total suffered from high fever after immunization. The results are shown in table 2.

Association of preventive practices among students of different college

Table 3 depicts the significant association between the COVID-19 immunization among the students of different colleges ($p = 0.00$) but revealed no any association between experience after immunization, mask wearing, maintaining distance between people and when got fever and cough at $p = 0.33, 0.64, 0.18, 0.32$ respectively.

DISCUSSION

Emerging as an established infectious disease, COVID-19 poses an unacceptable risk to human health. It is possible to effectively reduce infection rates while controlling the spread of virus by implementing preventive measures. As a result, emphasis should be focused on practices and attitude among paramedical students in order to implement a creative role in preventing and controlling future pandemics. A total of 280 students were enrolled in this study. Of these, 95 were from MTA, 102 from NHRDA, and 83 from CMC. The majority of girls from NHRDA (53.7%) and MTA (50.58%) agreed that COVID-19 infection is a global problem. However, in comparison with CMC students, just over one-third of girls (35.08%) showed a positive attitude. This could be related with knowledge and awareness about COVID-19 pandemic among the girl students. Moreover, global crisis as a result of the coronavirus outbreak of 2019 destroyed environmental sustainability and increased mortality every day. Thousands of people had died as a result of the COVID-19 globally, and it posed an unprecedented threat to society, food systems, employment, and public health [12].

Regarding the risks of contracting COVID-19, a higher percentage of girls from all three institutions had a positive attitude, but the same proportion of boys and girls from NHRDA and MTA indicated a negative attitude. Similar type of results were obtained among university students in Jordan by Olaimat et al. [13] and Alzoubi et al. [14] which is almost compatible with our results. In another study, Huynh et al. reported that 93.3% of healthcare workers in Vietnam had acceptable attitudes toward COVID-19. Human attitudes and their actions are influenced by multiple factors worldwide, such as the high rate of disease fatality, the virulence of the disease, potential health problems, and its highly contagious nature [15]. However, the participants in a study conducted in Northwest Ethiopia believed they had a modest risk of contracting COVID-19 [16], which is contrary to our findings. The variations in the study periods may be the cause of this variation in behavioural habits.

The majority of NHRDA girls (63.52%) followed by CMC girls (62.29%) exhibited a positive attitude toward consultation of COVID-19 infection with a doctor. However, boys (51.13%) had a more positive attitude about the consultation in the context of MTA. It is possible that being worried about contracting the SARS-CoV-2 virus remained a valid reason to seek consultation and cannot be neglected. During the COVID-19 pandemic, the number of patients reporting to hospitals and clinics reduced by around one-third, mostly among those with less severe symptoms [17]. Consequently, telemedicine made possible to continue treatment. Teleconsultations had become increasingly popular, enabling medical consultations during Pandemic. Based on existing research, patient attitude has a major role in the effectiveness of teleconsultations and the subsequent satisfaction with medical advice [18]. Furthermore, physiotherapists, paramedics, and healthcare professionals were the most likely to claim that teleconsultation saved time when compared to in-person consultations [19].

Table 2| Practices towards prevention and control of COVID-19 among study population

S. No	Practice	Gender (CMC)			Total N= 83	Gender (NHRDA)		Total N= 102	Gender (MTA)		Total N= 95
		Boys (n=39) (%)	Girls (n=42) (%)			Boys (n=45) (%)	Girls (n=57) (%)		Boys (n=48) (%)	Girls (n=47) (%)	
1	Used disinfectant in house										
	Daily	20 (50)	20 (50)	40	39 (56.5)	30 (43.5)	69	29 (46.0)	34 (53.9)	63	
	Alternately	5 (23.8)	16 (76.1)	21	2 (15.4)	11 (84.6)	13	10 (58.8)	7 (41.1)	17	
	Weekly	7 (46.6)	8 (53.3)	15	1 (20)	4 (80)	5	8 (53.3)	7 (46.6)	15	
	Others	7 (100)	0	7	3 (20)	12 (80)	15	0	0	0	
2	Committed to hand wash										
	Often or more	33 (44.5)	41 (55.4)	74	43 (43.8)	55 (56.1)	98	48 (50.5)	47 (47.9)	95	
	Rarely or less	5 (55.5)	4 (44.4)	9	2 (50)	2 (50)	4	0	0	0	
3	Practice of the proper methods of coughing and sneezing etiquette										
	Often or more	28 (68.2)	13 (31.7)	41	35 (48)	38 (52)	73	35 (53.8)	30 (46.1)	65	
	Rarely or less	21 (50)	21 (50)	42	10 (34.5)	19 (65.5)	29	13 (43.3)	17 (56.6)	30	
4	Wear face masks regularly										
	Often or more	33 (46.4)	38 (53.5)	71	40 (43)	53 (57)	93	41 (50)	41 (50)	82	
	Rarely or less	6 (50)	6 (50)	12	5 (55.6)	4 (44.4)	9	7 (53.8)	6 (46.1)	13	
5	Gathered like in bar or restaurants										
	Often or more	28 (68.2)	13 (31.7)	41	20 (42.6)	27 (57.4)	47	15 (48.3)	16 (51.6)	31	
	Rarely or less	21 (50)	21 (50)	42	25 (45.5)	30 (54.5)	55	33 (51.5)	31 (48.4)	64	
6	Maintain safe distance between you and individual to prevent infection										
	Often or more	34 (44.7)	42 (55.2)	76	38 (33.7)	47 (55.3)	85	40 (54.0)	34 (45.9)	74	
	Rarely or less	4 (57.1)	3 (42.8)	7	7 (41.2)	10 (58.8)	17	18 (85.7)	3 (14.2)	21	
7	If you had close contact with confirmed case										
	Pro-actively reported to the institution and I isolated myself	33 (46.4)	38 (53.5)	71	31 (39.7)	47 (60.3)	78	45 (53.5)	38 (45.2)	84	
	Don't know what to do	6 (50.0)	6 (50.0)	12	14 (58.3)	10 (41.7)	24	3 (27.2)	8 (72.7)	11	
8	If someone infected from COVID -19 wants to meet you										
	I will meet and show kindness	24 (47.0)	27 (52.9)	51	18 (34)	35 (66)	53	13 (50)	13 (50)	26	
	I will excuse him and avoid contact	15 (46.8)	17 (53.1)	32	27 (55.1)	22 (44.9)	49	35 (50.7)	34 (49.2)	69	
9	What would you do if you had fever and dry cough										
	I will analyze the situation rationally and report to nearby health facility	35 (45.4)	42 (54.5)	77	39 (42.4)	53 (57.6)	92	47 (51.0)	45 (48.9)	92	
	Don't know what to do	3 (50)	3 (50)	6	6 (60)	4 (40)	10	1 (33.3)	2 (66.6)	3	

10	Do you immunize with the COVID-19 vaccine									
	Yes	25 (38.4)	40 (61.5)	65	40 (41.7)	56 (58.3)	96	53 (62.3)	32 (37.6)	85
	No	7 (46.6)	8 (53.3)	15	3 (75)	1 (25)	4	0	3 (100)	3
	Not yet	0	3 (100)	3	2 (100)	0	2	5 (71.5)	2 (28.5)	7
11	Experience after immunization									
	Feeling healthy	20 (47.6)	22 (52.3)	42	30 (69.4)	19 (30.6)	49	19 (57.5)	14 (42.4)	33
	Suffered from high fever	6 (33.3)	12 (66.6)	18	3 (17.6)	14 (82.4)	17	14 (66.6)	7 (33.3)	21
	Suffered from mild fever	11 (47.8)	12 (52.1)	23	12 (33.3)	24 (66.7)	36	15 (36.5)	26 (63.4)	41
12	Family member took COVID-19 vaccine dose									
	Yes	36 (46.7)	41 (53.2)	77	40 (46.5)	46 (53.5)	86	48 (51.6)	45 (48.3)	93
	No	3 (50)	3 (50)	6	15 (93.8)	1 (6.2)	16	0	2 (100)	2
13	Family member in quarantine									
	Yes	9 (47.3)	10 (52.6)	19	22 (50)	22 (50)	44	9 (36)	16 (64)	25
	No	28 (43.7)	36 (56.2)	64	23 (39.7)	35 (60.3)	58	39 (55.7)	31 (44.2)	70
14	Time of your family member in quarantine									
	7 days	18 (62.0)	11 (37.9)	29	2 (12.5)	14 (87.5)	16	1 (14.2)	6 (85.7)	7
	14 days	3 (8.5)	32 (91.4)	35	36 (50)	36 (50)	72	7 (87.5)	1 (12.5)	8
	21 days	18 (94.7)	1 (5.2)	19	2 (50)	2 (50)	4	2 (66.6)	1 (33.3)	3
	30 days	0	0	0	5 (50)	5 (50)	10	31 (32.6)	46 (48.4)	77
15	What was result of RT-PCR test for you if done									
	Positive	5 (38.4)	8 (61.5)	13	7 (50)	7 (50)	14	7 (63.6)	4 (36.3)	11
	Negative	24 (72.7)	9 (27.2)	33	25 (51)	24 (49)	49	21 (53.8)	18 (46.1)	39
	Not done	10 (27.0)	27 (72.9)	37	13 (33.3)	26 (66.7)	39	20 (44.4)	25 (56.1)	45
16	Took both shots of COVID-19 vaccine provided by government									
	1 st dose	8 (61.5)	5 (38.4)	13	1 (4.8)	20 (95.2)	21	10 (55.5)	8 (44.4)	18
	2 nd dose	20 (40)	30 (60)	50	38 (54.3)	32 (45.7)	70	35 (62.5)	21 (37.5)	56
	Booster dose	7 (53.8)	6 (46.1)	13	4 (44.4)	5 (55.6)	9	3 (15.7)	16 (84.2)	19
	None	7 (100)	0	7	2 (100)	0	2	0	2 (100)	2

Over 50% of girls from NHRDA and CMC agreed that COVID-19 is preventable followed by MTA girls (49.33%). One third of the boys from CMC (37.77%) agreed that it is the responsibility of the government to prevent COVID-19, whereas boys from NHRDA and MTA showed more positive attitudes, with 41.2% and 49.2% respectively, on the government's responsibility to prevent infection. It's possible that boys were aware of government programs and national strategies of Nepal. The government is in prime responsibility of testing plans, contact tracing, managing isolation and quarantine facilities, and organizing awareness and education programs for the public in order to prevent the spread of COVID-19. But, the pandemic has exposed Nepal's long standing healthcare system [20]. A nationwide demand for timely and high-quality healthcare services has arisen from the country's understaffed and under-resourced health care system, which has been

battling the severe health impacts of COVID-19 [21]. Currently, secondary and tertiary health systems in Nepal are overwhelmed with the management of COVID-19 cases and, at the same time, the priority to address the needs of other infections and non-communicable diseases (NCD) has not been prioritized due to a lack of quality human resources, health system capacity and significant resource constraints [20].

Likewise, majority of girls from all the three college agreed about the individual can contribute to prevention of COVID-19. Equal percentage boys and girls of 50% from CMC showed positive attitude regarding public can play the most important role in COVID-19 control but the maximum number of girls (63.5%) from NHRDA followed by MTA girls (49.35%) agreed about the public importance in infection control. Disseminating correct information

Table 3| Association of preventive practices among students of different college

S.No.	Practices	Total HA students			Total (n=280)	p-value
		CMC (n=83)	NHRDA (n=102)	MTA (n=95)		
1	Wear face masks regularly					
	Often or more	71	93	82	246	0.640
	Rarely or less	12	9	13	34	
2	Maintain safe distance between you and individual to prevent infection					
	Often or more	76	85	74	235	0.180
	Rarely or less	7	17	21	45	
3	What would you do if you had fever and dry cough					
	I will analyze the situation rationally and report to nearby health facility	77	92	92	261	0.320
	Don't know what to do	6	10	3	19	
4	Do you immunize with the COVID-19 vaccine					
	Yes	65	96	85	246	<0.001
	No	15	4	3	22	
	Not yet	3	2	7	12	
5	Experience after immunization					
	Feeling healthy	42	49	33	124	0.330
	Suffered from high fever	18	17	21	56	
	Suffered from mild fever	23	36	41	100	

and education to the public is an effective measure to control and prevent the spread of any disease, especially in the time of the pandemic [22]. Individual responses to the COVID-19 pandemic include hand washing, staying indoors, wearing masks when coughing or sneezing, and social distancing where the disease may spread. It was vitally crucial to prevent infectious and highly contagious diseases [23].

The majority of the girls from each college concurred that there is more chance of COVID-19 will spread in the future once it occurs. Of the girls, 64.15% from CMC felt worried about contracting COVID-19. These were followed by girls from MTA (59.25%), who were dropped by girls from NHRDA (58.1%). In a survey of 2,100 UK citizens, 52% of women said they were very worried about the spread of the virus [24] which is in close proximity with our results. However, the sample size and study population differs with each other. Other possibilities are that women, particularly in developing countries, are disproportionately affected by natural disasters, extreme weather, and climate change as a result of cultural norms and the unequal allocation of responsibilities, resources, and power [25].

More over 50% of the girls from CMC, NHRDA (47.7%), and MTA (37.5%) agreed that COVID-19 preventive measures should only be applied by older adults and those group who are at risk. The explanation ought to be that an elderly relative of girls might have had COVID-19 and encountered various challenges. It is now evident that older people were amongst the most vulnerable population with a mortality rate of approximately 15%

[26, 27]. In addition, people with pre-existing chronic conditions such as diabetes, cardiovascular disease, lung disease, hypertension, and cancer were at increased risk of mortality [26,28].

Less than 50% of boys from CMC and NHRDA showed positive attitude about seeking medical attention when they experience COVID-19 symptoms, but boys from MTA (56.69%) had the highest positive attitude about seeking medical attention when symptoms arise. The probability is that most people with COVID-19 had mild to moderate symptoms, the disease can cause severe medical complications and lead to death in some people. Direct contact with an infected person or airway droplets results in the spread of COVID-19. Clinical sign and symptoms of COVID-19 are variable, but often include sore throat, fever, cough, headache, fatigue, breathing difficulties and loss of smell and taste in individuals with COVID-19 within 14 days of the incubation period [4, 29].

Likewise, a greater proportion of female students in each institution exhibited a positive attitude regarding contact restriction, which reduces the spread of infection and students are particularly susceptible to COVID-19. The positive attitude may be attributed to the early actions made by the World Health Organization (WHO), the Nepalese government, and the Ministry of Health to strictly adhere to social distancing and lockdown protocols.

The study found that the majority of girls (61.4%) from CMC, followed by girls from NHRDA (58.33%) and MTA (49.43%), strongly agreed that the pandemic had impacted their study. More than half of the boys (58.69%) from NHRDA agreed that online learning was effective

during the lockdown, with the remaining boys (45%) from CMC and MTA. Owing to the COVID-19 pandemic, there existed hardly in-person formal or informal learning opportunities, and health professional courses moved to exclusive delivery through online education [30]. The process of learning in health professional courses involved a variety of blended learning tools, such as formative quizzes, synchronous online tutorials, e-learning in simulation sessions, asynchronous activity in moderated discussion forums, and other teacher or student directed learning activities [31]. Understanding the impact of these initiatives on student engagement, learning and behavior (both positive and negative), will provide important information for teaching and learning practice into the future [32]. Although, the traditional classroom teaching was compensated by online teaching tools, but it is crucial to figure out the effectiveness and influence of online education on the development of practical skills and graduate readiness to be practiced in Nepal [33].

In terms of practices toward COVID-19, majority of students of NHRDA of 56.5% boys and 43.5% girls used disinfectant in their houses daily followed by the student of MTA and CMC. This implies that, as HA students, they were aware that disinfection involves the thermal or chemical killing of infectious microorganisms as well as other types of microbes. Numerous disinfectants can effectively neutralize SARS-CoV-2 [34, 35]. In 2015, the World Health Organization (WHO) recommended that “disinfectant: alcohol-based hand sanitizer” should contain 80% ethanol and 75% isopropyl alcohol [36], and advocates efficacy against emerging viruses, such as MERS, Ebola, and Zika [37]. Lipid solvents, including ethanol (> 75%), formaldehyde (> 0.7%), isopropanol (> 70%), povidone-iodine (> 0.23%), sodium hypochlorite (> 0.21%), or hydrogen peroxide (H_2O_2 ; > 0.5%), can also be used to inactivate SARS-CoV-2 [38]. As per one published literature, coronavirus could be destroyed in approximately in about thirty seconds with an ethanol concentration of little over 42.5% [39]. Other possibility might be because environmental factors can have an impact on the persistence, stability, and viability of viruses. As a result, the majority of students might had used disinfectants at home.

The majority of NHRDA girls (56.1%) followed by CMC (55.4%) were more devoted to hand washing than MTA (47.95%). A higher percentage of boys (50.52%) from MTA than from NHRDA and CMC pledged to wash their hands. Over 60% of the boys from CMC adopted the proper methods of coughing and sneezing etiquette followed the boys from MTA and NHRDA. It's possible that awareness of respiratory hygiene practices and cough etiquette is included in the routine safety measures that need to be followed in order to stop the spread of serious respiratory diseases including COVID-19, influenza, respiratory syncytial virus (RSV), and whooping cough. It's unclear, though, if they have actually been exercising it.

In all three colleges, more than half the girls used face masks on a regular basis than the boys. Comparably, in a survey conducted on children in grades 9 and 10 in urban schools in the Bharatpur, Nepal the majority of the participants claimed to regularly wash their hands (79.21%), use face masks (77.23%), and avoid touching their mouths, eyes, or

noses frequently [40]. Similarly, in an Iranian study among medical students, 96.7% reported washing their hands more frequently, 93.8% reported using public transit less, and 97.1% reported not coughing in public [41]. However, in another research among 250 adult Iranians, 65.1% of the participants consistently cleaned their hands with soap or hand sanitizer. 71.8% of respondents said they always wore a face mask outside [42]. It's possible that females were psychologically motivated than males to use personal protective equipment (PPE), wash their hands more frequently, and wear face masks more frequently in order to protect themselves from SARS-CoV-2. Additional arguments might be included that males underestimated the health risks and supposed that wearing a face mask leads to the fallacy of the masculine image.

In our study, majority of the students from each college disliked to gather in the bar or restaurant during COVID outbreaks. About 55% of girls from NHRDA and CMC often or more maintained safe distance between people to prevent infection followed by 45.94% girls from MTA. Gender disparity in safe distancing was identified. Our results showed that girls were more likely than boys to practice safe distancing during the COVID-19. It seems that the girls were feeling anxious about the pandemic and were conversant with the conviction held by health authorities and experts, who emphasized the importance of keeping a physical distance from people and avoiding crowds in order to reduce the extent and frequency of COVID-19 dissemination [34,35,43]. In contrast, a study reports among adults of Iran that 34.9% of participants in the study did not maintain social distancing because they wore face masks, while 56.7% of participants kept a safe distance from individuals [42].

Most of the students from MTA of 53.57% boys and 42.23% girls pro-actively reported to the institution and isolated themselves when they had close contact with confirmed case of COVID-19 followed by students of NHRDA and CMC. If someone tried to meet infected from COVID-19, more than 50% of the boys from NHRDA and MTA avoided to contact with them, followed by the boys from CMC at 46.87%. The probability is that the self-isolation represents one of several measures and the most effective way of prevention of infection control of COVID-19. Additionally, the majority of girls from NHRDA (56.7%) logically assessed the situation and reported to a nearby health facility if they experienced fever or a dry cough, a practice that had been discontinued by girls from CMC (54.54%) and MTA (48.91%). Conversely, a study conducted by Lechien et al. found that men were more likely than women to report having a fever and cough. Moreover, women were considerably more likely to report certain COVID-19 symptoms, including tiredness, anosmia, headache, sore throat, and nasal obstruction than men. Our results are contradicted with findings of Lechien et al. [44].

The COVID-19 vaccines now in use are effective against the different variants of virus [45]. But, still, there remains hesitation with the COVID-19 vaccination [46]. Almost all of the college students in our study were vaccinated against COVID-19, with very few not getting the shot. From each institution, a higher percentage of the students' family members had been vaccinated against COVID-19, however very few were not vaccinated. The majority of

NHRDA students 54.3% of boys and 45.7% of girls took both of the government-provided COVID-19 vaccination shots followed by students of MTA and CMC. However, one fourth of total only got booster dose of vaccine. The possibility is that the government had neither the vaccine doses in stock nor managing large frightening crowds during vaccinations which is suggestive of failure to provide the boosters during pandemic which may be viewed as an example of acute mismanagement.

In an online survey of medical and non-medical students revealed that 65.3% of medical students were aware of the COVID-19 vaccine [47], which was more than 58.4% of nursing students in the United States [48] and comparable to the 45.5%–68.3% awareness rate among American university students [49] which is not in line with our study. A very effective vaccine and high vaccination rates are necessary for the disease to be successfully eradicated [50]. It's possible that students due to fear about contracting COVID-19 acquired the vaccination that Government of Nepal offered. Additionally, previous literatures depicts that those who believed there is little chance of contracting COVID-19 that can be prevented by vaccination, thought the symptoms are mild, and lack concern much about the disease reported less vaccinated and were more probable to remain unvaccinated [51,52]. A key determining factor in people's decision to get vaccinated is the risk they relate with the disease which the vaccine protects [51,53].

Over 60% of girls from NHRDA and MTA experienced a moderate fever following vaccination, compared to 52.17% of girls from CMC. Similarly, 52.3%, 30.6%, and 42.42% of CMC, NHRDA and MTA of girls respectively from each college reported feeling well following vaccination, and almost one quarter of all girls experienced a high fever following vaccination. This might be due to the fever, headaches, sore muscles, nausea, fatigue, and injection site pain are the most frequent side effects of post vaccination. These effects, which are normal and usually subside quickly, indicate that the vaccination had an effect on the body and that the immune system has been activated. These side effects commonly manifest within the first 48 hours following vaccination. It all depends on the immune system of vaccinated person; the same vaccine can cause symptoms in some people and no reaction in others [54].

Within the jurisdiction of public health, the quarantine phase is a complex intervention [55]. In our study, NHRDA accounted for the majority of the student's family members were in quarantine, followed by MTA and CMC. The duration time that a family member spent in quarantine varied among study population of three different colleges. In a different study involving 625 medical students, those under quarantine reported feeling

disheartened and depressed. The most likely causes of the adverse impacts on mental health during quarantine were people's negative perceptions and unpleasant experience, which included being far from friends, family, and co-workers, to live with restrictions, being unable to move around freely, doubting the spread of the disease, and experiencing strong emotions and reactions [56]. Quarantine measures during COVID-19 outbreaks have been shown by Rohr et al. to have significant negative impacts on mental health [57]. In an additional study, Lei et al. found that individuals who were placed under quarantine during the COVID-19 outbreak in southwest China had significant rates of depression and anxiety [58].

The standard Q COVID19 Ag detection test is now advised to be used in combination with the RT-PCR test as a point of care diagnostic assay for testing in hospitals and containment zones [59]. More than 60% of the boys from MTA had positive RT-PCR findings, followed by 50% and 38.46% NHRDA and CMC. Males had significantly greater rates of morbidity and case fatality than females, reported by Salje et al. [60], Chen et al. [61], Dudley and Lee [62], and Borghesi et al. [63]. In another study, men were found to be 2.4 times more likely to die and to develop a severe form of the disease than women, independent of age. In general, men are more likely to engage in cigarette smoking, consume alcohol, and have higher rates of pre-existing comorbidities linked with a worse COVID-19 prognosis [64]. There was a significant association ($p = 0.00$) between students from different colleges and the COVID-19 vaccination; however, there was no correlation between the experience following immunization, mask wearing, maintaining distance between people, and experiencing fever or cough ($p = 0.33, 0.64, 0.18, \text{ and } 0.32$, respectively). The results of this study might not apply to all the paramedical students, because it was limited to a few chosen colleges at Janakpur, Nepal. The only tool utilized to evaluate student's attitude and practice was a questionnaire, and some respondents might have selected responses at random in order to finish it as quickly as possible. Furthermore, the precision of the attitude and preventive assessments may be impacted by the small number of items.

CONCLUSION

The vast majority of girl students had an optimistic attitude, whereas the boys implemented appropriate preventive measures against COVID-19. There was a significant association between students from different colleges and the COVID-19 vaccination. To support healthcare professionals in enhancing their preventive measures to safeguard themselves and stop the spread of infection, national strategies, educational programs, and training courses are required.

ADDITIONAL INFORMATION AND DECLARATIONS

Acknowledgements: We express our gratitude to all students and the college administration team for their cooperation in creating a research environment during the study period.

Conflict of interest: There is no conflict of interest declared by the authors.

Funding: None

Author's Contribution: Study design, data collection, literature review, and data analysis and interpretation, drafting first draft - **KY, SP**; Drafting and editing of the manuscript's first version-**KY, BK, BP**; revision of the second draft of the manuscript; reference management; and final approval with intellectual critics-**SP, KY**. The final draft was authorized for publishing after being reviewed by all the authors.

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