



Knowledge, Attitude, and Practices Towards Covid-19 in Nepal: A Cross-sectional Study

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Abstract

Background: The recently surfaced infectious disease SARS-CoV-2 caused by novel corona virus was first reported in Wuhan, China in December 2019. Despite the entire endeavor, it has rapidly infected nearly 200 countries and millions of deaths while many more are counting. In Nepal, the first case had appeared in late January 2020. Till now the lack of knowledge and lack of safe practices are main reason of the spread the pandemic world-wide. Our study aims to assess the Nepalese's knowledge, attitude regarding COVID-19 and its preventive practices.

Methods: A cross-sectional survey was conducted from March 28th to April 8th, 2020. A total of 114 Nepalese residents were selected using convenience sampling method. An anonymous, self-administered questionnaires (SAQ) containing 16 knowledge questions and 3-point Likert scale to acknowledge attitude and practices regarding COVID-19 was used for data collection. Chi-square test as Bivariate analysis and Linear regression models as multivariate analysis were used to assess association between KAP.

Results: The mean knowledge score was 10.20 ± 2.06 (range 0 - 16), indicating moderate level of Knowledge. Majority of participants were well aware about symptoms (91.2%), route of transmission (80.7%), however less of them had correct concept regarding preventive measures and control measures. Similarly mean attitude score (4.72 ± 1.37 , range: 2 - 6) and mean practice score (4.34 ± 1.401 , range: 0 - 6) showed positive, optimistic attitude and good practices. Subjects with adequate level of knowledge score had more good practices.

Conclusion: Our study showed that knowledge towards COVID-19 was average with good practices and positive attitude among Nepalese. Utility of considerable knowledge, positive attitude and good practices may aid to control the pandemic.

Keywords: Attitude; COVID-19; Knowledge; Pandemic; Practices

Abbreviations

SARS: Severe Acute Respiratory Syndrome; RNA: Ribonucleic Acid; FDA: US Food and Drug Administration (FDA); KAP: Knowledge, Attitude and Practices; COVID-19: Coronavirus Disease 2019

Background

The outbreak of corona virus disease 2019 (abbreviated "COVID-19") caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2) has recently spread worldwide [1]. The Wuhan City,

Hubei Province of China was the first city that witnessed as to a cluster of pneumonia patients on 31st December 2019 [2,3]. COVID-19, a large family of viruses [4] is third zoonotic coronavirus after SARS-CoV and MERS-CoV. COVID-19 is the only one appears to be the with pandemic potential [5].

The pandemic gave rise to a major public health crisis worldwide and challenged healthcare system across six continents [6]. As the infection has spread to over 216 countries WHO declared the COVID-19 eruption a Public Health Emergency of International Concern on 30th January 2020 [4,7]. Till 20th June, 2020 the number of laboratory confirmed cases 8,506,107 and 4,55,231 death have been reported globally [8].

Nepal confirmed first positive case of COVID-19 on 13th January 2020. The infected person was native student returned from Wuhan, China [9-11] and ever since numbers are increasing day by day.

According to Ministry of Health and Population, the virus has spread to 74 districts of Nepal and the greatest number has been reported from Rautahat district [10,12]. As of 20th June, 2020, Nepal has recorded 8,605 confirmed positive cases with 22 deaths and the trend is going up, however, so far 1,578 persons were recovered from COVID-19 [13].

SARS-CoV-2 is a subfamily of enveloped non-segmented positive sense RNA viruses that is β -corona virus [14]. Clinical features of COVID-19 are often asymptomatic [14,15] or may progress with flu like symptoms to respiratory failure, multiple organ dysfunction syndromes and even death [15-17]. Transmission may takes place by animals and human-to-human via respiratory droplets, direct contact and fomite [14,18]. Preventive measures, includes frequent hand washing, refraining from excessive outdoor activities and avoiding infected individuals and crowded places [19,20]. There is no currently approved treatment or vaccines for COVID-19 yet and unethical usage of drug should be avoided [21].

South Asian countries including Nepal facing major challenges to public health due to shortage of testing kits, medical supplies, personal protective equipment and poor reporting and difficulty in controlling the spread of COVID-19 [22]. As the residents of country are the most important stakeholders, the Government of Nepal had announced nationwide total lockdown on March 24, 2020 in a bid to stop the covid-19 from spreading out of control [23]. Even

though Government has taken unprecedented national measures to control over COVID-19 outbreak, the success or failure of these efforts is largely based on Public awareness and behavior [24].

Due to anonymity nature of the virus has become challenge with vast amount of misinformation and disinformation shared on social media that clouding peoples' understanding level of COVID-19. On the other hand it created panic and confusion among general population [25]. Despite of lockdown due to panic people crowded public transportation hubs to travel back to their hometowns, potentially increasing the risk of infection. The general public misconceptions should be corrected, targeted in information campaigns organized by government agencies, information provision by clinicians to their patients, and media coverage [26].

The knowledge, attitude and practices towards COVID-19 play an integral role in determining a society's readiness to accept behavioral change measures from health authorities. These studies provide baseline information to determine the further measures to change the misconception and raise the awareness about the zoonotic infection [25]. Previous pandemic due to SARS has clearly indicated that knowledge and attitude are associated with levels of panic and emotion which could further complicate measures to control the spread of the disease [26,27]. Another study felt need to intensify the awareness through good knowledge and attitude to address the mental health issues of people during this COVID-19 pandemic [28]. Public awareness and knowledge's assessment about the corona virus, deeper insight into existing public perception and practices can be gained and the attributes that influence the public in adopting healthy practices and responsive behavior [29].

Thus, to facilitate breakout management of COVID-19 Nepal, there is an urgent need to understand the public's awareness of COVID-19 at this critical moment. In this study, we detected the knowledge, attitude and practices towards COVID-19 among Nepalese during the rapid rise period of the COVID-19 outbreak. The results of present study are salient to notify future attempt on societal readiness to comply with COVID-19 outbreak measures.

Method

The study aimed to assess the knowledge, attitude towards COVID-19 and practices to prevent the infection among Nepalese during pandemic period.

Study design and subjects

The study employed with quantitative approach, a Cross-sectional research design among the general population of Nepal, from 28th March 2020 to 8th April 2020. Non-probability convenience sampling technique was used to select 114 Nepalese residents from all the seven province of Nepal. The sample size was determined using Cochran formula [30], where estimated proportion of the population (p) was 50% with 95% of confidence level and at least 10% of plus or minus precision. As it was not feasible to conduct a community based national sampling survey due to lockdown in Nepal, online survey was performed. Questionnaires were prepared in Google form and sent via email, facebook, and viber messenger. Some of the subjects did not use any mobile apps, so the data was collected via phone calls. Institutional review board approved our study protocol and procedure before the formal survey.

Participants completed an anonymous, online survey, after reading the written consent form and explicitly agreeing to participate the survey, participants had to answer a yes-no question to confirm their willingness to participate voluntarily. After confirmation of the question, the participant was directed to complete the self-administered questionnaire. Nepalese residents, who were age range of 16 to 60 years at baseline, can speak Nepali and/or English and willing to participate were included in the study. Medical, nursing or para-medical personnel and person infected with COVID-19 were excluded from the study.

Measures

A self-administered questionnaire was developed by reviewing the relevant literature, Ministry of Health and population of Nepal and WHO's published resources on COVID-19 [31,32]. The questionnaire was prepared in English language then converted to Nepali language. The online survey questionnaire included four different sections: A) socio-demographic variables, B) Knowledge questionnaire on COVID-19, C) Attitudes towards COVID-19 and D) Practices of subjects regarding COVID-19.

Socio-demographic information

The Section A: includes socio-demographic variables such as age, gender, educational status, occupational status, and health education regarding COVID-19, source of information regarding COVID-19 and province number of Nepalese Residents.

Knowledge on COVID-19

In the section of Knowledge on COVID-19, the self structured questionnaire had 16 questions regarding introduction (KQ13-

KQ16), clinical presentations (KQ1-KQ4), regarding transmission routes (KQ5-KQ7), regarding preventive measures (KQ8-KQ11) and control (KQ11-KQ12) of COVID-19. Respondents were asked to respond to knowledge item as either true or false with an additional "don't know". Correct answer was assigned as 1 point, there was no any negative marking for wrong answer. The maximum score was 16 for knowledge assessment. To interpret the level of knowledge, score was distributed as a) > 75%: adequate knowledge b) 50 - 75%: moderate knowledge c) < 50%: Inadequate knowledge. The tool validity was maintained with expert's opinion. The reliability of self-structured knowledge was obtained from Cronbach's alpha coefficient i.e. 0.95, which indicates the tool was highly reliable.

Attitudes towards COVID-19

In the Section on Attitudes towards COVID-19, scores were calculated based on the respondent's answer to each attitudinal statement, 1 = disagree, 2 = undecided and 3 = agree. Score was calculated by averaging respondent's answers to the two statements and the high scores presented positive attitude. Total scores ranged from 2 to 6. The Likert scales were assessed for internal reliability, using Cronbach's alpha coefficient i.e. 0.81 that indicates high internal reliability.

Practices of subjects regarding COVID-19

In the section on Practices, respondents were asked to respond "yes" or "no" to the items. One score was given to answer that reflected good practice, and zero score was given for answers that reflected bad practices. The total score ranged from zero to six, with high scores indicating better practices.

Statistical analysis

Analysis of gathered data was done by descriptive statistics and Inferential statistics using SPSS-20 version. A descriptive analysis: frequency and percentage distribution used to describe the socio-demographic variables whereas mean and standard deviation was used to describe the knowledge among Nepalese residents. An inferential analysis: the univariate analysis was done using Chi-square test to find association between the level of KAP and selected socio-demographic variables of Nepalese residents. Significant factors were subjected to the multiple logistic regression analysis. The statistically significant level was set up at $p < 0.05$ (two sided).

Result

The collected data were analyzed and interpreted based on research objectives.

Demographic characteristics

A total of 114 subjects completed the questionnaire among them 75 (65.8%) were male. The mean age of subjects was 28.04 ± 8.72 years. Table 1 shows the demographic characteristics of the study subjects. With regards to residential less than half i.e. 44 (38.6%) of subjects were from province two and 28 (24.6%) were from province three. As per survey more than half of subjects 62 (54.4%) had completed Bachelor degree. In terms of occupational status 28 (24.5%) of the subjects were students, 22 (19.3%) were government job holder, whereas only 7 (6.1%) were working Abroad among them 7 (6.1%) worked as laborer. Majority of subjects i.e. 113 (99.1%) heard about COVID-19 among them 14 (12.3%) of the subjects had attended health educational program on COVID-19. Social Media (36.8%) and News (33.3%) were the main source of information.

Knowledge, attitudes and practices towards COVID-19

The Overall response to the survey was acceptable as majority of the subjects had moderate knowledge i.e. 94 (82.5%), 10 (8.8%) had adequate knowledge and 10 (8.8%) had poor knowledge. The mean knowledge score of subjects was 10.20 ± 2.06. Most (91.2%) of the subjects knew about the clinical presentation, 88.6% subject stated that early symptomatic and supportive treatment can help most of the patients to recover. Nearly half (42.1%) of the subject stated eating or contacting wild animals would result in the infection by the COVID-19, majority (80.7%) of subjects knew the virus spreads via respiratory droplets. With regards to preventive measures 56.1% subjects had correct answer that wearing general masks can prevent infection, 93.9% of subjects agreed to avoid crowded places. Isolation of infected person or contacted to infected one is best method to control the spread of virus was stated by 93% of subjects. The aggregate responses were summarized in table 2.

Variables		Frequency (n = 114)	Percentages (%)
Gender	Male	75	65.80
	Female	39	34.20
Age in years	Mean ± SD	28.04 ± 8.72	
	16 - 25	45	39.50
	26 - 35	56	49.10
	36 - 45	5	4.40
	> 45	8	7.00
Educational Status	High School or below	29	25.43
	College/University degree	62	54.40
	Postgraduate degree and above	23	20.17
Occupational Status	Government employee	22	19.30
	Non-government employee	42	36.84
	Agriculture	3	2.73
	Abroad Worker	7	6.14
	Student	28	24.60
	Home maker	12	10.50
Information regarding COVID-19	Yes	113	99.10
	No	1	0.90
Attended Health Educational Program	Yes	14	12.30
	No	100	87.70
Source of Information	Social Media	42	36.84
	Ministry of Health and Population website	8	7.02
	News on TV/Paper	41	35.97
	Friend's Circle	23	20.18
Area of residence	Province 1	7	6.10
	Province 2	44	38.60
	Bagmati Province (3)	28	24.60
	Gandaki Province (4)	3	2.60
	Province 5	9	7.90
	Karnali Province (6)	6	5.30
	Sudurpaschim Province (7)	17	14.90

Table 1: Social and demographic characteristics of the study participants.

Statements	Correct Answer (%)		
	Male (n = 75)	Female (n = 39)	Total (n = 114)
Introduction			
Corona is deadly disease	73 (97.33)	29 (74.36)	35 (30.70)
Corona occurs due to Virus	29 (38.67)	22 (56.41)	93 (81.60)
Corona viruses are large family of viruses that may cause illness in animals or humans	66 (88)	35 (89.74)	74 (64.90)
COVID-19 and SARS are genetically related but diseases are different.	57 (76)	25 (64.10)	55 (48.20)
Clinical presentation			
fever, fatigue, dry cough and myalgia are main clinical symptoms	24 (32)	24 (61.54)	104 (91.20)
Stuffy nose, runny nose, and sneezing are less common in case of COVID-19	15 (20)	13 (33.33)	41 (36)
early symptomatic and supportive treatment can help most of the patients to recover	61 (81.33)	34 (87.18)	101 (88.60)
Not all persons with COVID-2019 will develop to severe cases.	35 (46.67)	29 (74.36)	26 (22.80)
Transmission routes			
Eating or contacting wild animals would result in the infection by the COVID-19 virus.	14 (18.67)	7 (17.95)	48 (42.10)
Persons with COVID-2019 cannot infect the virus to others when a fever is not present.	64 (85.33)	38 (97.44)	25 (21.90)
The COVID-19 virus spreads via respiratory droplets of infected individuals.	70 (93.33)	34 (87.18)	92 (80.70)
Preventive measures			
Ordinary residents can wear general medical masks to prevent the infection by the COVID-19 virus.	67 (89.33)	37 (94.87)	64 (56.10)
Children and young adults don't need to take preventive measures	45 (60)	31 (79.49)	89 (78.10)
Individuals should avoid going to crowded places	10 (13.33)	5 (12.82)	107 (93.90)
Control			
Isolation and treatment of people with the COVID-19 reduce spread of the virus	44 (58.67)	32 (82.05)	105 (92.10)
People contacted with infected one should be isolated for 14 days of observation period	40 (53.33)	18 (51.43)	106 (93)

Table 2: knowledge on introduction, clinical presentations, transmission routes, preventive measures and control of COVID-19.

Note: Knowledge was assessed by giving 1 to correct answer and 0 to wrong answer. Maximum Knowledge score was 16 to minimum 0.

The Mean knowledge score was 10.20 ± 2.06.

Among total subjects' majority of them 88 (77.2%) agreed that COVID-19 will successfully controlled whereas more than half i.e. 69 (60.5%) had confidence that Nepal can win the battle against the COVID-19. The mean attitude score of subjects was 4.72 (SD = 1.37, range: 2 - 6) that indicates positive attitude. The mean practices score was 4.34 (SD = 1.401, range: 0 - 6). Majority of subjects i.e. 83 (72.8%) were using mask while leaving home, 39 (34.2%)

subjects had avoided crowded, highest percentage of subjects i.e. 89 (78.1%) were maintaining minimum 3feet distance between themselves and other persons, more than half i.e.69 (60.5%) of subjects avoided touching eyes, nose and mouth and majority of subjects i.e. 109 (95.6%) washed hands regularly. The correct answers of attitude and practices were mentioned in table 3.

Statement	Attitude's Frequency(n=114) and Percentages (%)		
	Disagree	Undecided	Agree
AQ1. Agreed that COVID-19 will successfully be controlled	12 (10.5%)	14 (12.3%)	88 (77.2%)
AQ2. have confidence that Nepal can win the battle against the COVID-19 virus	44 (38.6%)	1 (0.9%)	69 (60.5%)
	Practice's Frequency (n = 114) and Percentage (%)		
		Yes	No
PQ1.Gone to crowded place		39 (34.2)	75 (65.8)
PQ2.Worn a mask when leaving home		83 (72.8)	31 (27.2)
PQ3.Maintained at least 1meter (3feet) distance with other person		89 (78.1)	25 (21.9)
PQ4.Avoid touching eyes, nose and mouth		69(60.5)	45 (39.5)
PQ5.Regularly and thoroughly clean hands		109(95.6)	5 (4.4)
PQ6. Frequency of hand wash			
< 5 times		41 (36.0%)	
5 - 10 times		28 (24.6%)	
11 - 15 times		19 (16.7%)	
> 15 times		26 (22.8%)	
Level of Knowledge			
Inadequate Knowledge		10 (8.8%)	
Moderate Knowledge		94 (82.5)	
Adequate Knowledge		10 (8.8)	
	Mean ± SD	Min	Max
Knowledge Score	10.20 ± 2.06	0	16
Attitude Score	4.72 ± 1.37	2	6
Practice Score	4.34 ± 1.401	0	6

Table 3: Level of knowledge, attitude and practice of the participants towards COVID-19.

Note: Attitude was assessed by giving 1to Disagree, 2 to undecided and 3 to Agree. The Practice was assessed by giving 1 to yes and 0 to no. there was no negative marking.

Association between knowledge, attitude and practices with Socio-demographic variables

The univariate association of socio-demographic variables with a knowledge, attitude and practice score was assessed using the Chi-square test. There was a statistically significant association of Knowledge score with gender, educational status and subjects attended health educational program related COVID-19 and working abroad at p < 0.05. In another way Knowledge score had statistically significant positive relation with occupational status and area of residence at p < 0.05 (Table 4). The attitude of subjects had statisti-

cally significant association with the age, subjects living in different province of Nepal and Occupational status at p < 0.05. Similarly gender and educational status had statistically significant association with good practices regarding COVID-19 at p < 0.05. There was positive relation between practice score and age and educational status at p < 0.05. Significant factors were subjected to the Multiple logistic regression analysis and the results showed that occupational status (β = 0.225, p = 0.037), subjects living in different province (β = -0.222, p = 0.029) and good knowledge score were statistically significant at p < 0.05. Subjects with higher educational status (β = 0.29, p = 0.011) were significantly more prevalent to good practices (Table 5 and 6).

Variables			Univariate analysis		Multivariate analysis			
	Knowledge Score		Chi-square test	p-value	β	SE	t- value	p- value
	Below median	Above median						
Gender			17.231	0.028*	0.59	0.443	0.58	0.563
Male	57	18						
Female	30	9						
Age			0.365	0.57	-0.081	0.025	-0.747	0.457
< 35 years	77	25						
≥35 years	10	2						
Educational status			0.50	0.021*	0.051	0.205	0.447	0.656
High School or below	27	9						
College/University degree	60	18						
Occupational status			0.316	0.53	0.225	0.106	2.114	0.037*
Office worker	32	8						
Non office worker	55	18						
Information regarding COVID-19			8.575	0.055	-0.073	2.035	-0.784	0.435
Yes	85	27						
No	1	1						
Attended health educational program			20.497	0.024*	0.052	0.590	0.555	0.58
Yes	10	5						
No	74	25						
Source of Information			8.741	0.277	0.135	0.138	1.333	0.186
News	54	8						
Social media	33	19						
Area of residence			63.505	0.193	-0.222	0.107	-2.215	0.029*
Province 1	6	3						
Province 2	29	13						
Bagmati Province (3)	21	7						
Gandaki Province (4)	3	0						
Province 5	8	1						
Karnali Province (6)	6	1						
Sudurpaschim Province (7)	15	2						

Table 4: Association between level of knowledge and socio-demographic variables.

P < 0.05 was set as statistically significant. *= significant.

Variables			Univariate analysis	Multivariate analysis				
	Attitude Score		Chi-square test	p-value	β	SE	t- value	p- value
	Low	High						
Gender			0.78	0.08	0.12	0.16	1.05	0.29
Male	38	37						
Female	17	22						
Age			0.02	0.01*	0.14	0.01	1.27	0.21
< 35 years	49	53						
\geq 35 years	6	6						
Educational status			13.42	0.07	0.02	0.08	0.18	0.86
High School or below	14	22						
College/University degree	41	37						
Occupational status			0.04	0.02*	-0.02	0.04	-0.15	0.88
Office worker	20	20						
Non office worker	35	38						
Information regarding COID-19			5.04	0.17	-0.17	0.75	-1.78	0.77
Yes								
No								
Attended health educational program			1.06	0.07	-0.09	0.22	-0.98	0.33
Yes	10	5						
No	74	25						
Source of Information			0.62	0.07	0.14	0.05	1.37	0.17
News	32	30						
Social media	23	29						
Area of residence			15.51	0.01*	-0.05	0.04	-0.49	0.62

Table 5: Association between Attitude and socio-demographic variables.
 P < 0.05 was set as statistically significant. *= significant.

Variables			Univariate analysis	Multivariate analysis				
	Practice Score		Chi-square test	p-value	β	SE	t- value	p- value
	Low	High						
Gender			2.93	0.02*	0.12	0.30	1.19	0.24
Age			0.60	0.81	-0.10	0.02	-0.93	0.35
< 35 years	82	20						
\geq 35 years	10	2						
Educational status			0.29	0.50	0.29	0.14	2.58	0.01*
High School or below	28	8						
College/University degree	64	14						
Occupational status			0.79	0.84	-0.12	0.07	-1.09	0.28
Office worker	34	6						
Non office worker	57	16						
Information regarding COID-19			4.22	0.11	0.12	1.39	1.30	0.19
Attended health educational program			5.38	0.12	-0.11	0.40	-1.21	0.23
Source of Information			0.94	0.09	0.09	0.09	0.97	0.34
News	48	14						
Social media	44	8						
Area of residence			22.79	0.01	0.10	0.07	0.10	0.92

Table 6: Association between practices and socio-demographic variables.
 P < 0.05 was set as statistically significant. *= Significant.

The association between level of knowledge regarding COVID-19 and the practices of subjects were statistically significant at $p < 0.001$. Although there was poor positive correlation between knowledge, attitude and practices, there was no significant association of knowledge with attitude and attitude with practice.

Discussion

The knowledge, attitude and practices towards a specific infectious illness can be influenced by the seriousness of the illness, spread of the disease, fatality rate and methods for sharing and distribution of knowledge [33]. The current study aimed to assess the knowledge, attitude and practices towards COVID-19 among Nepalese residents during pandemic period. Till the date COVID-19 is considered as an emergency and have to increased more risk of infection. Several studies have been documented to show the KAP of pilgrims from many other countries towards prevention and to increase awareness regarding COVID-19 [17,25,36]. However, data on the knowledge, attitude and practices toward COVID-19 among Nepalese are still lacking, hence there is censorious need to gather crucial data for effective control and preventive plans.

The Ministry of Health and Population of Nepal has conducted an intensive awareness campaign, communicated via its website, television, social media, viber messenger, caller tune on mobile phone. We found that 99.1% had heard about COVID-19 using social media (36.8%) and news (33.3%) as major source of information. Previous study in Saudi Arabia reported that majority of students (98.5%) heard about corona among them 66.4% students used social media and 55.3% used news as a source of information [34]. Our results have shown that 82.5% and 8.8% of subjects were classified into the moderate and adequate level of knowledge about COVID-19 respectively. Study participants achieved a mean of 63.75% in the knowledge questionnaire. Nepal population density is 204.2 people square kilometer in 2020 with literacy rate of 64.9% and all most two-thirds of the residents depend on agriculture [35]. In this scenario it is really great achievement to have majority of population with moderate level of knowledge. The finding is compatible with other studies that have shown optimal knowledge, across the Nepalese population, for COVID-19 pandemic [16,36,37].

Most of the subjects i.e. 91.2% knew about the clinical presentation, 88.6% subject stated that early symptomatic and supportive treatment can help most of the patients to recover. These results are in line with the findings from a study in Jordan reported that

90% of participants had knowledge about symptoms [38]. Similarly another studies i.e. in kingdom of Saudi Arabia stated that 98% and in south western Saudi Arabia reported 83.9% of participants were aware of clinical symptoms [24,34]. Nearly half (42.1%) of the subject stated eating or contacting wild animals would result in the infection by the COVID-19, majority (80.7) of subjects knew the virus spreads via respiratory droplets. The results are consistent with findings reported by a study conducted in Malaysia as participants answered correctly regarding virus as airborne disease (43.3%) and touching and eating wild animals could result in infection (35.7%) [25]. In relation with preventive measures subjects had correct answer about using masks (56.1%), agreed to avoid crowded places (93.9%) and isolation of infected person is needed (93%). These results corroborate with other studies' report that 99.1% of people knew that infected person should be immediately isolated [34], 90.7% of people reported wearing mask is one way of preventive measures [39], 68.23% participants of a study in Iran had best awareness of prevention method [40].

Nevertheless, our results revealed that participants had positive and optimistic attitude towards COVID-19 pandemic. Approximate 77.2% subjects acceded that COVID-19 will successfully be controlled and 60.5% had confidence that Nepal can win the skirmish against the COVID-19. Positive attitudes and high credence in the control of COVID-19 can be described by the early measures taken by government such as lockdown, suspension of all domestic and international flights, closing of public and private offices, schools and colleges, facility of quarantine, and generating public awareness to safeguard citizens and ensure their well-being. The finding is consistent with several national and international studies. A recent study conducted in Nepal stated that 78.4% of participants were confident that COVID-19 can be successfully controlled [16]. Another survey presented that 94% Saudi Arabians believed virus can be successfully controlled and 97% had convinced on Government of Saudi that will control the pandemic [24]. An Indian study revealed high attitude of peoples and their willingness to follow government guidelines on quarantine and social distancing [28]. More than 70% of subjects exhibited a positive attitude towards MERS-COV in south-western Saudi Arabia [34].

Concerning practices, outcome of the study presented that subjects' high knowledge of COVID-19 rendered into good and safe practice at $p < 0.001$. Around 34.2% participants avoided crowded places, 72.8% worn mask when leaving home, 78.1% maintained at least 3feet distance from other person and 60.5%

subjects avoided touching eyes, nose and mouth. Social distancing is a technique to maintain proper distance between individuals in order to limit or control the transmission of COVID-19 [41]. These practices designated towards a general willingness for the subjects to make behavioral changes in the face of COVID-19 outbreak. Based on previous study of Nepal 94.9% of the participants had not been to crowded places, 88.2% worn mask incorrect way [36]. Survey in Malaysia stated 83.4% participants avoided crowded places, 50.74% used to wear mask when outside [25], similarly 94% respondents avoided crowded place in Saudi Arabia [24]. Another survey conducted among Chinese residents outlined that majority of respondents had not visited crowded place and wore mask when living home [7]. Almost 95.6 participants regularly washed their hands. According to subject's frequency of proper hand washing has increased these days up to more than 15 times for 22.8% and only 36% of subjects washed their hand less than 5 times a day. Another study of Nepal stated that majority of the participants (95%) agreed that maintaining good personal hygiene, washing hand frequently, staying home, following social distancing, and avoiding crowds would prevent the spread of COVID-19 [37].

Furthermore, higher the knowledge score had significant association with gender, and subjects had training regarding COVID-19. There was a statistically significant association of Knowledge score with gender, subjects had training related COVID-19, and working abroad at $p < 0.05$. Occupational status had positive correlation with both the knowledge score and good practices, whereas attitude was significantly associated with subjects working abroad. The finding also presented that higher the educational level higher was the practice score. The results consistent with a similar cross sectional study performed among healthcare workers in Vietnam as result of the study revealed that subjects had good knowledge and a positive attitude with good practices [42]. Another alike study contradicted the current study as the result exhibited that a significant proportion of HCWs had poor knowledge of its transmission (61%) and symptom onset (63.6%) and showed positive perceptions of COVID-19 prevention and control [43]. A survey in Kingdom of Saudi Arabia reported that men had less knowledge, less optimistic attitude and less good practices, whereas older adult had good knowledge and practices towards COVID-19 [24,44]. Knowledge among people of Nepal about COVID-19 was satisfactory, yet a significant number of participants were lacking confidence in comparison to other countries [36]. Study in Iran represented that Age and educational level or working experience didn't affect the knowledge score [40].

Finally, the study findings may be utilitarian to healthcare professionals, policy makers, health interventions, awareness raising and health education programs. Our finding suggests that targeted health education interventions should be directed to particular vulnerable population such as to women, lower educational status, to all the province of Nepal and to people with all the occupational status. This study would be a contribution to evidence based literature in the Nepali Context. Despite of narrow scope of the study may be assumed to be an important addition to the existing body of knowledge, especially in context of Nepal. The potential limitation of the study includes its non-probability sampling technique, which may limit the external validity of the findings and the relatively small sample size that might not be enough to represent the entire population of our country.

Conclusion

To conclude, the present study revealed moderate level of knowledge, good practices, and high level of positive attitude towards COVID-19. Most of the subjects with higher level of education, higher post and male are aware of the infection due to COVID-19. Knowledge including clinical presentation, rout of transmission and preventive measures of COVID-19 are essential key to adopt positive attitude and good practices to control the transmission. Results of the study suggest that more emphasis should be placed on the people living in all geographic area of Nepal, all level of education and occupation and both genders equally. The findings may help plan and policy maker to detect the target population for the prevention, control and early management of COVID-19. To win this warfare, awareness among community people is most essential that can bring through adequate knowledge, optimistic attitude, and proper practices.

Consent for Publication

All participant and the coauthors have given consent for the publication of data and the required information.

Competing Interests

The authors declare that there is no competing interest.

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