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Knowledge and Preventive Practice during COVID-19 Pandemic in Bagmati Province, Nepal

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Abstract

Introduction: COVID-19 has become a global public health concern. In Nepal, the government has imposed lockdown, school closures, non-pharmacological interventions, isolation, and quarantine. People were asked to accept self-care interventions. However, the effectiveness of these preventive measures depends on the knowledge and practice of an individual. Therefore, this study aimed to investigate the association between knowledge and practice among Bagmati province residents during the COVID-19 pandemic. **Methods:** A cross-sectional study was conducted using an online Google Form questionnaire. A total of 296 participants completed the surveys on social media, particularly Facebook. To assess the factors associated with knowledge and practices toward COVID-19, logistic regression analysis was applied. **Results:** The total scores of knowledge and practice were 7.62 ± 2.06 and 11 ± 1.91, respectively. Results showed that education, people having a medical background, and occupation were significantly associated with knowledge. While urban residence, older age, and living in a rental with a shared room were significantly associated with practice. **Conclusions:** People with higher education, medical backgrounds, and household workers had high knowledge about COVID-19; however, knowledge was not associated with practice. There was a gap between knowledge and practice.

Keywords

COVID-19, Knowledge, Nepal, Pandemic, Practice

1. Introduction

On 31st December 2019, the world witnessed an outbreak of pneumonia of unknown origin in Wuhan, China [1]. Later, on 11th February 2020, World Health Organization (WHO) named it as coronavirus disease 2019 (COVID-19), which

is caused by the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) [2]. Coronaviruses belong to the Coronaviridae family and represent crown-like spikes on the outer surface of the virus; thus, it was named as corona virus [3]. The subfamily includes alpha, beta, gamma, delta and omicron coronaviruses [4]. As an emerging acute respiratory infectious disease (ARIs), COVID-19 primarily spreads through the respiratory tract by droplets, respiratory secretions and direct contact [5]. The most common symptoms at onset of COVID-19 illnesses are fever, cough, fatigue, shortness of breath, while other symptoms include sputum production, headache, hemoptysis, diarrhea, etc [6] [7]. However, in immune-compromised patients, there is a chance that the virus could cause a lower respiratory illness like pneumonia and bronchitis [8]. Incubation periods range from 2 days to 14 days from the day of exposure [9].

The first case in Nepal was confirmed on 23rd January 2020, on a 31-year-old student, who had returned from Wuhan, China on 9th January, 2020 [10]. It was the first recorded case of COVID-19 in South Asia. On April 4, first case of local transmission was detected in Kailali district. A country-wide lockdown came into effect on March 24, 2020 and ended on July 21, 2020 [11]. As of 29th August, 2022; the Ministry of Health and Population (MoPH) has confirmed a total of 996,834 cases, 981,521 recoveries and 12,000 deaths across the country [12]. The coronavirus has been detected in all provinces and districts of the country, with Bagmati province and Kathmandu district being the most affected. Total vaccine doses given was 53,747,378 among them 69.6% have been fully vaccinated and only 24.8% people have booster dose [13] until the end of August 2022.

Prevention and control measures for COVID-19 are the only way to contain the disease. The effective preventive measures for COVID-19 are non-pharmaceutical interventions such as wearing masks, washing hands with soap and water, using sanitizer, social distancing, and avoiding close contacts, etc. However, safe and effective vaccines against Corona viruses are considered a game-changing tool [14] [15]. Many studies have shown that high level of education is positively related on COVID-19 [16] [17] [18] [19]. Similarly, a study in Saudi Arabia reported that health education programs were helpful to improve knowledge and preventive practices of the community people [20]. To control the outbreak of the disease in Nepal, it is necessary to understand the knowledge and practices of the population. Therefore, the aim of this study was to determine knowledge and practices about COVID-19.

2. Methods

This was an online-based cross-sectional study conducted from August 1, 2021, to August 30, 2021, among the general population of Bagmati Province, Nepal. A convenience sampling method was used in which the link to the Google Form questionnaire was shared with participants via Messenger and Facebook groups. In addition, Facebook friends were asked to share the link with their circle of friends.

The age group of 15 to 60, who can use social media were included. On the other hand, the age groups below 15 and above 61, as well as illiterates and those who do not have access to social media, were excluded. According to the 2011 census, the total population of Bagmati province was 5,433,818. The sample size was obtained 301 participants, which was calculated using the sample size calculator-relief application 2018 with a margin of error of ± 5%, a confidence level of 90%, a 50% response rate, and a population size of 5,433,818.

The survey was conducted online using a self-reported questionnaire developed according to Centers for Disease Control and Prevention (CDC) guidelines for communities. The Nepali version was reviewed by experienced public health professionals and corrected as needed. The questionnaire consisted of three main sections. The first section collected information on the independent variables of respondents' sociodemographic characteristics, including age, sex, marital status, education level, work status, residence, and income level. The second section obtained information on participants' knowledge of COVID-19. This section included questions about modes of transmission, incubation periods, risk groups, prevention, and control. The last section of the questionnaire assessed respondents' practices. This section consisted of questions on practices and behaviors such as attending social events and busy places, social distance, hand washing after sneezing, coughing, and blowing, and hand washing practices.

2.1. Ethical Considerations

Approval was obtained from Kobe University Graduate School of Health Sciences, Reg No. 1007, and the Nepal Health Research Council, NHRC, Reg No. 231/2021MT. On the first page of the online questionnaire, respondents were clearly informed about the background and objectives of the study. Online consent was obtained before proceeding with the rest of the questionnaire. Privacy, confidentiality, and anonymity were maintained.

2.2. Statistical Analysis

The basic description of the participants was simply tabulated frequencies, proportions, and means. Multivariable logistic regression analysis was performed to identify factors significantly related to participants' knowledge and practice of COVID. The Cronbach's alpha obtained was 0.7.

3. Results

The total number of participants who completed the questionnaire was 296, all living in Bagmati province. They comprised of 152 were male (51.40%) and 144 were female (46.60%). **Table 1** shows the social and demographic characteristics of the respondents. Most participants (57.80%) were in the 15 - 29 age group and the Janajati ethnic group (39.50%). More than half of the participants (51.40%) were unmarried and lived in urban areas (61.50%). Almost one-third of the participants had a bachelor's degree (30.70%) and a master's degree (31.40%). However,

Table 1. Social and demographic characteristics of the participants (N = 296).

Variables	N	%
Sex		
Female	144	46.60%
Male	152	51.40%
Age		
15 - 29	171	57.80%
30 - 44	88	29.70%
45 - 60	37	12.50%
Ethnicity		
Brahmin	73	24.70%
Chhetri	80	27.00%
Janajati	117	39.50%
Others	26	8.80%
Marital Status		
Married	139	47.00%
Unmarried	152	51.40%
Others	5	1.70%
Area of Residence		
Urban	182	61.50%
Rural	114	38.50%
Type of living house		
Single family home	174	58.80%
Shared house	66	22.30%
Shared rental room	56	18.90%
Education		
Primary	12	4.10%
Secondary	30	10.10%
Higher Secondary	64	21.60%
Bachelor	91	30.70%
Master and above	93	31.40%
Others	6	2.00%
Occupation		
Government	38	12.80%
Private	84	28.40%
Unemployed	19	6.40%

Continued		
Daily wages	8	2.70%
Household/farming	17	5.70%
Student	130	43.90%
Income		
<10,000	35	11.80%
10,000 - 20,000	34	11.50%
20,000 - 30,000	33	11.10%
30,000 - 50,000	48	16.20%
>50,000	38	12.80%
Don't know	108	36.50%
Medical background		
No	234	79.10%
Yes	62	20.90%
Knowledge score (Mean, SD)	7.62	2.06
Practice score (Mean, SD)	11.00	1.91

about 43% of the respondents were students, 8% in the private sector and 12% in the government institutions. Only 20.90% of the respondents had medical background. The mean COVID-19 knowledge score was 7.62 (SD = 2.06, range: 0 - 10), and the overall accuracy of the knowledge test was 76% (7.62/10 * 100). The mean practice score was 11 (SD = 1.91, range: 0 - 13), indicating good practice.

Table 2 shows the knowledge of the participants on COVID-19. The knowledge on WHO recommended time to wash hands was (42.90%) compared to the knowledge on the other questions posed to the participants. Nearly 97.5% of participants indicated that clean water is necessary for hand washing. About half of the participants agreed that vaccines are effective against COVID-19, and that travelling is one of the main reasons for the spread of COVID-19. Less than half agreed that the disease could pose a serious threat to public health.

The change to preventive practices towards the COVID-19 pandemic is shown in Table 3. Only 57.3% of the respondents use a handkerchief or tissue when coughing or sneezing. Most of them, about 90%, wore masks when they went outside. Almost 80.7% informed their friends and family members about the preventive measures towards COVID-19. While 84.5% of the participants washed their hands more frequently than before the pandemic, and 85.5% changed their handwashing behavior due to the COVID-19 pandemic.

For knowledge and practice in relation to several independent variables, including gender, age, education, occupation, marital status, residence, house type, and medical background. Multiple logistic regression analysis was conducted. Table 4 shows that education, medical background, and occupation were significantly

Table 2. COVID-19 Knowledge response of the participants (N = 296).

Statement	Correct	Incorrect answer %
COVID-19 is a viral disease	91.70%	8.30%
Antibiotics are effective for COVID-19	75.70%	24.30%
Contains of hand sanitizer	81.00%	19.00%
Term isolation, quarantine and social Distancing are same	69.20%	29.80%
COVID-19 is a preventable disease	68.30%	31.70%
Medium of COVID-19 spreading	76.20%	23.80%
Close contact with pet animals causes COVID-19	82.20%	17.80%
Incubation time of COVID-19	81.00%	19.00%
Main symptoms of COVID-19	87.60%	12.40%
Best preventive measures for COVID-19	94.80%	5.20%
Appropriate length for social distancing	62.00%	38.00%
WHO recommended length of time to wash hands	42.90%	57.10%
Clean water necessity during hand washing	97.50%	2.50%

Table 3. Participants' practice behavior related to COVID-19 (N = 296).

Statement	Yes	No
Tissues or handkerchief use during coughing or sneezing	57.30%	42.70%
Regular mask use when going outside	90.30%	9.70%
Maintain social distance of at least 1 meter while going outside or in the crowd	75.60%	24.40%
Discuss about COVID-19 prevention with your family and friends	80.70%	19.30%
Avoiding crowded places (public vehicles, parties, family functions,	59.10%	40.90%
Avoid touching face, eyes and nose with hands	46.30%	53.70%
Wash hands with soap and water more often than before the pandemic	84.50%	15.50%
Wash hands with soap and water more than 7 times a day	50.10%	49.90%
Carry hand sanitizer along with you while you go outside and use it frequently	68.00%	32.00%
Do you change the behavior of hand washing with the situation of COVID-19	85.50%	14.50%
Sleeping pattern changed during COVID-19	43.90%	56.10%
Eat nutritious diet and practice regular physical activity during COVID-19	67.00%	33.00%
Practice regular physical activity during COVID-19	36.70%	63.30%
Do you have got vaccinated	31.70%	68.30%

Table 4. Regression results of knowledge about COVID-19 and its association with other factors (N = 296).

		Odd ratio	95.0% C.I.		*P*-value
			Lower	Upper	
Living area	Urban				
	Rural	0.7	0.39	1.37	0.331
Type of House	Single family home				
	Shared house	1.6	0.80	3.10	0.188
	Shared room in rent	1.0	0.50	2.12	0.931
Gender	Female				
	Male	1.8	0.96	3.39	0.066
Marital status	Married				
	Unmarried	0.8	0.32	1.87	0.572
Age	15 - 29				
	30 - 44	0.9	0.36	2.09	0.749
	45 - 60	0.5	0.17	1.60	0.254
Education Level	Primary				
	Secondary	6.5	1.07	38.89	0.042
	Higher Secondary	2.9	0.51	16.12	0.232
	Bachelor	4.9	0.89	26.61	0.069
	Master and above	6.8	1.17	39.06	0.032
Medical Background	No				
	Yes	3.9	1.87	8.16	0.000
Occupation	Government service				
	Private office	1.2	0.48	3.02	0.694
	Unemployed	0.5	0.10	2.32	0.362
	Households	8.5	1.66	43.86	0.010
	Students	3.2	1.01	10.00	0.048

Note: The model is adjusted for ethnicity and income of the participants.

associated with knowledge. Similarly, Table 5 shows that area of residence, house type, and age were significantly associated with practice. Both the Table 4 and Table 5 were adjusted for ethnicity and income of the participants. There was no statistically significant relationship between knowledge and practice.

Figure 1 shows that 35% of the participants used social media, such as Facebook,

Table 5. Regression results of practice during COVID-19 and its association with other factors (N = 296).

Factors		Odd ratio	95.0% C.I.		*P*-value
			Lower	Upper	
Living area	Urban				
	Rural	0.4	0.21	0.67	0.001
Type of House	Single family home				
	Shared house	0.7	0.38	1.41	0.358
	Shared room in rent	0.3	0.16	0.64	0.001
Gender	Female				
	Male	1.0	0.58	1.84	0.907
Marital status	Married				
	Unmarried	0.7	0.31	1.74	0.487
Age	15 - 29				
	30 - 44	0.4	0.16	0.90	0.027
	45 - 60	0.2	0.07	0.63	0.005
Education level	Primary				
	Secondary	0.5	0.14	2.05	0.364
	Higher Secondary	1.6	0.48	5.18	0.447
	Bachelor	1.8	0.56	5.61	0.328
	Master and above	1.3	0.38	4.47	0.673
Medical Background	No				
	Yes	1.3	0.65	2.53	0.474
Occupation	Government service				
	Private office	1.7	0.67	4.23	0.271
	Unemployed	1.5	0.41	5.74	0.527
	Households	1.9	0.43	8.28	0.402
	Students	1.3	0.46	3.95	0.592

Note: The model is adjusted for ethnicity and income of the participants.

Twitter, and other sites, to know about COVID-19. Television, newspapers, and government daily reporting MOHP accounted for 17%, 10%, and 15%, respectively. 10% listen to radio, while 11% obtain their information from mobile ringtones and SMS. According to this study, Figure 2 shows that the main triggering factors that lead people to wash their hands during COVID-19 are fear of contracting COVID-19 infection, and self-consciousness.

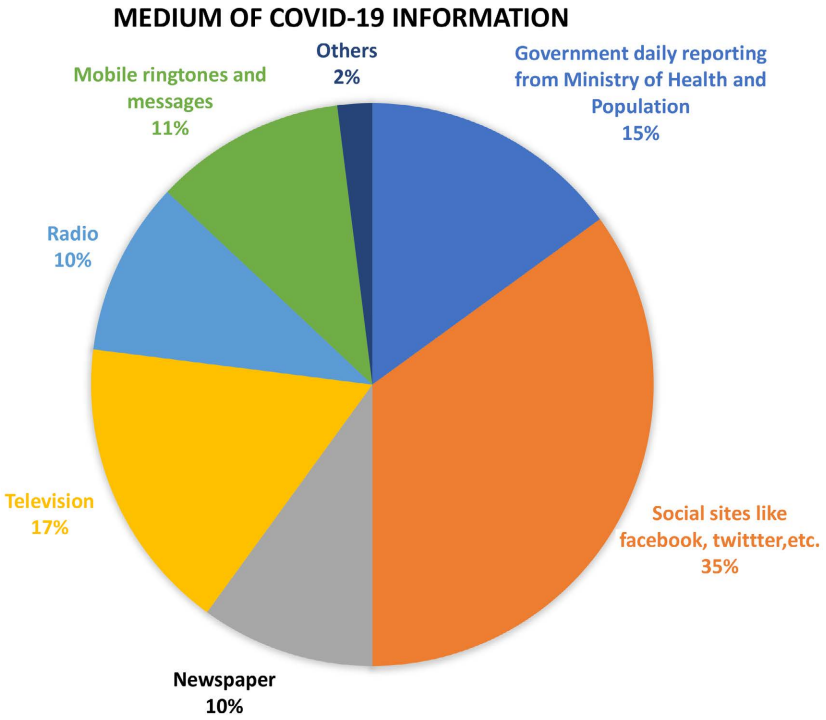

Figure 1. Medium of information for the participants about COVID-19.

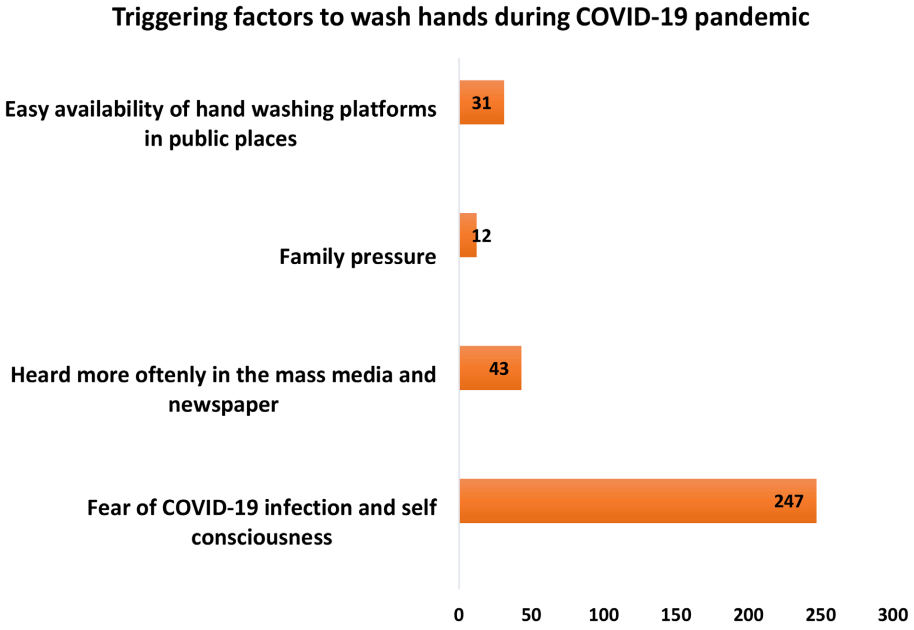

Figure 2. Triggering factors for hand washing during COVID-19.

4. Discussions

This study has shown that most participants were knowledgeable about COVID-19 with a mean achievement of 76.2% (7.62/10 * 100) in knowledge and a practice score of 84.6% (11/13 * 100). Participants' education, medical background, and occupation were significantly associated with knowledge. While living area, type of house, and age were significant factors in practice, rural residents had a com-

paratively better practice score than urban residents. It might be because most of the participants were young adults with easy access to social media who resided in cities for jobs and education but returned to their respective villages during lockdown.

According to this survey, men demonstrated a better level of knowledge than women. Similar findings were made in the Riyadh, Saudi Arabia KAP study [21]. The medical background was positively significant with high knowledge and good practice. A similar outcome was seen among Ugandans [22]. Most of the participants were under 30 years old, single, and had higher education levels. The findings indicated that elderly people have more experience than younger people. This may be brought on by how diseases are perceived to affect older people. In the study of Cameroonian [23] residents, age > 20 years was associated with high knowledge of COVID-19. Women scored lower in practice than men. This research found no significant relationship between knowledge and practice towards COVID-19 pandemic. It was evident that few individuals who were aware of COVID-19 and were not taking it seriously.

Many studies conducted in China [24], USA [25], Egypt [26], Saudi Arabia [27] and Nepal [28] found that people with higher educational levels knew more about COVID-19. According to a study from China [29], unmarried people have higher knowledge; however, our research was unable to identify any evidence linking COVID-19 knowledge and marital status. Furthermore, few individuals were avoiding crowded areas. Similar findings were obtained in Philippines [30], [30] and a previous study from Nepal [28]. Non-pharmaceutical interventions (NPIS), which seek to prevent transmission by lowering contact rates in the general population, include social distance and avoiding large crowds. These practices were not fully adhered to, in Nepal.

5. Limitations of the Study

There were some limitations to this investigation. This study used an online cross-sectional survey for data collection. It used a convenient sampling strategy that could lead to selection bias. To participate, participants must have access to the internet.

6. Recommendation for Further Studies

There were significant gaps in the knowledge of how often to wash hands and how to prevent touching the face, eyes, and nose with the hands. This research indicates that health education should be targeted at females, those with lower levels of education, people who are older, and people without medical backgrounds.

7. Conclusion

Education level and occupation were associated with their knowledge, whereas their living conditions, type of house, and age were significant factors in their

preventive practices towards COVID-19 pandemic. Moreover, men and women both possess knowledge levels that are higher than average, and people with higher education levels have knowledge that is superior to that of those with lower education levels. It is noteworthy that knowledge and preventive practices towards COVID-19 are not related. It demonstrates that having information does not guarantee sound behavior.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Legends

COVID-19: Coronavirus disease of 2019;

SARS-CoV-2: Severe Acute Respiratory Syndrome Coronavirus 2;

WHO: World Health Organization;

CDC: Centers for Disease Control and Prevention;

ARIs: Acute Respiratory Infectious Disease;

KAP: Knowledge Attitude and Practice;

MOHP: Ministry of Health and Population;

NHRC: Nepal Health Research Council;

MERS: Middle East Respiratory Syndrome;

NPIs: Non-pharmaceutical Interventions.