J Nepal Health Res Counc 2023 Jan-Mar;21(58): 145-52

Knowledge, Attitudes, and Practices Concerning COVID-19 in Nepal

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ABSTRACT

Background: Coronavirus disease-2019 (COVID-19) severely affects patients with chronic diseases. Adequate knowledge, attitudes, and practice related to COVID-19 is associated with decrease morbidity and mortality. Therefore, this aimed to assess knowledge, attitudes, and practice toward COVID-19 disease among chronic diseases patients visiting tertiary hospitals in Kathmandu.

Methods: A cross-sectional study was conducted among chronic disease patients who visited Tribhuvan University Teaching Hospital and Manmohan Cardiothoracic Vascular and Transplant Center, Kathmandu. Structured questionnaire was used to collect patients' socio-demographic data and perspectives on COVID-19.

Results: Four hundred chronic disease patients participated in the study, with 53.2% female and 46.8% male, and 56.8% of age ≥50 years. Overall, 55.5% of the participants had good knowledge, 56.2% had good practice, and 30.7% had positive attitude towards COVID-19. Younger patients, 18-34 years, were found to have higher odds of having good knowledge compared to other age groups (aOR: 2.5; 95% CI: 1.3-6.0). The patients with less than average family income and those unable to read and write had lower odds of having positive attitude towards COVID-19 (aOR: 0.6; 95% CI: 0.4-0.9 and aOR: 0.4; 95%CI: 0.2-0.9, respectively). A statistically significant correlation was found between the patients' knowledge and practice, knowledge and attitude, and attitude and practice ($p < 0.001$).

Conclusions: Nearly half of the chronic disease patients in Nepal had poor knowledge and practice whereas more than two-third had negative attitude towards COVID-19 disease. Older age of the patient was significantly associated with poor knowledge and practice.

Keywords: Attitudes; chronic diseases; COVID-19; knowledge; practice

INTRODUCTION

COVID-19 causes mild to moderate respiratory illness; however, medical attention is required mostly in patients with underlying medical conditions.[1] Comorbid conditions such as chronic obstructive pulmonary disease, hypertension, diabetes, chronic kidney diseases, coronary heart disease, chronic liver disease, malignancy, and shock are more likely to increase clinical severity in COVID-19.[2] In lung disease, severity of COVID-19 increased by five-folds.[3] These comorbidities are likely to increase the expression of cellular receptors which play an important role in the establishment of SARS-CoV-2 infection.[4,5]

Poor understanding related to the virus increases the spread of infection.[6] Globally, studies have assessed COVID-19 KAP in health workers, students, and general public, but only a few studies have been conducted in chronic diseases individuals.[7-9] In Nepal, despite a high proportion of population living with chronic disease limited studies conducted.[8,10] Therefore, this study aimed to determine KAP regarding to COVID-19 among chronic disease patients who visited tertiary hospitals in Kathmandu.

METHODS

A cross-sectional study was conducted in two tertiary care hospitals in Kathmandu: Tribhuvan University Teaching Hospital (TUTH) and Manmohan Cardiothoracic Vascular

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and Transplant Center (MCVTC). The study enrolled patients aged 18 years and above with chronic diseases conditions who attended the outpatient department of different departments of TUTH and MCVTC for their routine treatment and follow-up between 22 August 2021 and 19 December 2021.

Informed written consent was taken before initiating the data collection from respondents. Ethical approval was obtained from the Ethical Review Board of the Nepal Health Research Council (NHRC), Kathmandu Nepal (Reference number: 639/2021 P) and administrative approval was taken from the study sites.

Study participants were selected systematically, recruiting every 10thpatient from the patient register. Sample size was assumed at 50% prevalence of KAP, and calculated using Cochran's formula, n = Z2pq/d2. The estimated sample size was 384, but after adjusting for possible non-response rate of 10%, the final sample size was 422.During data collection, 22 respondents did not provide full information. Fifteen chronic disease patients were interviewed per day. Data were collected by face-to-face interviews with participants and the range of duration was12 to 15 minutes. Considering the COVID-19 pandemic situation, the patients' safety was assured by maintaining physical distance (at least 2 meters) and wearing a face mask and gloves. Those patients with serious health complications including advanced liver failure, advanced respiratory problems, advanced heart failure, hearing impairment, and advanced dementia or mental disorders were excluded.

The research tool included structured questionnaires related to socio-demographic information of participants, their clinical characteristics, and specific information about KAP on COVID-19.The tool had13 knowledge related items (clinical presentation, route of transmission, prevention and control of the outbreak) scored as true, false or not sure.[11,12] In attitude-related questions, six statements were adopted from the literature assessing participants' attitudes toward COVID-19, using a five-point Likert scale, with scores ranging from 1 (Strongly disagree) to 5 (Strongly agree). Total scores ranged from 6to 30, where high score indicated positive attitude.[13] For practice-related questions, total eight questions were used from a previous study, allowing participants to choose between two options 'Yes' and 'No'.[14] All the tools were developed by the researchers with the help of extensive literature review and consultation with experts. The pre-testing was done in 15 chronic disease patients of Bir Hospital, Kathmandu in order to check the quality and sequencing of the questionnaires in the Kobo tool. Based on pre-testing, minor changes were made in the wording and sequence of the questions. The questionnaires were developed in both English and Nepali languages.

Data was entered in the Epi Data version 3.1, then transported to the Statistical Package for Social Sciences (SPSS IBM) version 21.0 for analysis. At first, we performed a descriptive analysis which included calculation of frequency, percentage, mean and median for presentation of socio-demographic and KAP-related variables. The Chi-square test was used to assess differences in categorical variables. Variables with p value of ≤ 0.2 were retained in the multivariable logistic regression to determine potential factors associated with the outcome variable; thus, adjusted odd ratios were calculated. We also checked multi-collinearity between predictor variables. For final result of logistic regression, p value was set statistically significant at <0.05. Additionally, we examined the effect of several predictor variables (age, sex, occupation, marital status, family income, family support, study site, duration of chronic disease, and health insurance) on COVID-19 knowledge; the effect of occupation, education, family support, study site, and duration of chronic illness on COVID-19 attitude; and the effect of age, ethnicity, occupation, marital status, family income, family support, duration of chronic illness, and health insurance on the participant's practice. The level of significance was considered at 5% with p< 0.05 and 95% confidence interval to determine the strength of association between independent variables and outcome variables.

RESULTS

Out of 400 participants who completed the questionnaires,36.0% (144) had heart disease, 21.7% (87) had lung disease, 15.2% (61) had kidney disease, 9.7%(39) had cancer, and 20.0%(80) had other chronic illness. More than half of the participants (56.8%) were in the age group of 50 and above, and 53.3% were females. Majority (65.3%) of the participants had a history of chronic disease less than 5 years. At the time of study, 61.8% of the participants were immunized with 2 doses of COVID-19 vaccine (Table 1).

Table 1. Socio-demographic characteristics of the participants.			
Characteristics		Frequency	Percent
Age (years)	18-34	55	13.8
	35-49	118	29.5
	50 and above	227	56.8
Sex	Male	187	46.8
	Female	213	53.2
Ethnicity	Dalit	38	9.5
	Aadibashi/ Janajati	139	34.8
	Brahmin/Chhetri	185	46.3
	Others	38	9.5
Marital status	Married	315	78.8
	Marital dislocation	56	14.0
	Never married	29	7.2
Education	Illiterate	64	16.0
	literate	83	20.8
	up to SLC	148	37.0
	Plus two and higher	105	26.3
Occupation	Employee	142	35.5
	Agriculture	99	24.8
	Housewife	77	19.3
	Currently not working	64	16.0
	Labor	18	4.5
Family income (per month in Nepalese rupees)	≥30,000	225	56.3
	<30,000	175	43.8
Duration of chronic disease (years)	<5 years	261	65.3
	5 to 10 years	84	21.0
	> 10 years	55	13.8
National health insurance	Insured	142	35.5
	Not insured	258	64.5
COVID-19 vaccination	No	89	22.3
	Single dose	64	16
	Full dose	247	61.8

The higher proportion of participants (62-91%) had good knowledge about COVID-19 symptoms, treatment, severity, transmission, use of face-mask, social distancing, role of isolation, and differences between common cold and COVID-19. However, some participants (10-25%) were doubtful about the transmission of COVID-19 via contact with wild animals and protection measures for children and young adults (Table 2).

More than half of the participants (55-56%) agreed with the importance of precaution measures (social distancing and hand washing) which need to be taken during the pandemic. A quarter of the participants strongly agreed that compliance with the government rules would prevent the spread of COVID-19 (Table 3).

Table 2. Knowledge of chronic disease patients on COVID-19 infection.			
Knowledge	True, n (%)	False, n (%)	I am not sure, n (%)
The main symptoms of COVID-19 are fever, fatigue, dry cough, and body aches. (True)	363 (90.8)	12 (3)	25 (6.3)
Unlike the common cold, stuffy nose, and sneezing are less common in person infected with the COVID-19 virus.(True)	251 (62.7)	67 (16.8)	82 (20.5)
Currently, there is no effective cure for COVID-19, but early symptomatic and supportive treatment can help most patients recover from the infection. (True)	335 (83.8)	18 (4.5)	47 (11.8)
Not all persons with COVID-19 will develop to severe cases. Only those who are elderly and have chronic Illnesses are more likely to be severe cases.(True)	350 (87.5)	20 (5.0)	30 (7.5)
Eating or touching wild animals is the primary cause COVID-19 infection.(False)	95 (23.8)	165 (41.3)	140 (35.0)
Persons with COVID-19 cannot infect the virus to others if they do not have a fever. (False)	72 (18.0)	250 (62.5)	78 (19.5)
The COVID-19 virus spreads via respiratory droplets of infected individuals.(True)	348 (87.0)	12 (3.0)	40 (10.0)
The COVID-19 virus is airborne.(True)	273 (68.3)	52 (13.0)	75 (18.8)
Ordinary residents can wear face masks to prevent the infection by the COVID-19 virus.(True)	366 (91.5)	9 (2.3)	25 (6.3)
It is not necessary for children and young adults to take measures to prevent the infection by the COVID-19 virus. (False)	40 (10)	333 (83.3)	27 (6.8)
To prevent the infection by COVID-19, individuals should avoid going to crowded places and avoid taking public transportation. (True)	350 (87.5)	26 (6.5)	24 (6.0)
Isolation and treatment of people who are infected with COVID-19 virus are effective ways to reduce the spread of the virus.(True)	347 (86.8)	13 (3.3)	40 (10)
People who have contact with someone infected with the COVID-19 virus should be immediately isolated in a proper place. In general, the isolation period is 14 days. (True)	306 (76.5)	28 (7.0)	66 (16.5)

Table 3. Attitude of chronic disease patients towards COVID-19 infection.

Attitudes	Strongly disagree n(%)	Disagree n(%)	Neutral n(%)	Agree n(%)	Strongly agree n(%)
It is important to keep my distance from others, to avoid spreading SARS-CoV-2	5 (1.3)	6 (1.5)	8 (2.0)	154 (38.5)	227 (56.8)
Washing hands is essential to protect myself from COVID-19	3 (0.8)	3 (0.8)	13 (3.3)	159 (39.8)	222 (55.5)
To protect myself from COVID-19 exposure, I should stay home if I am sick, unless I am receiving medical care.	3 (0.8)	9 (2.3)	29 (7.2)	204 (51)	155 (38.8)
COVID-19 will eventually be successfully controlled.	30 (7.5)	70 (17.5)	106 (26.5)	155 (38.8)	39 (9.8)
Nepal's measures can help win the battle against COVID-19	35 (8.8)	78 (19.5)	88 (22.0)	159 (39.8)	40 (10)
Compliance with Ministry of Health precautions will prevent the spread of COVID-19	15 (3.8)	29 (7.2)	39 (9.8)	217 (54.3)	100 (25.0)

Furthermore, analysis of participants' compliance toward COVID-19 prevention showed that the majority (63-92%) followed a good practice to reduce transmission and prevent the infection. However, only one-third of the participants had noted helpline numbers in their mobile device or phone diary for emergency contact, in case they or someone they know needed COVID-19 advice (Table 4).

Table 4. Practices related variables of chronic disease patient's regarding COVID-19 infection.

Practices	Yes n(%)	No n(%)
Did the outbreak of the COVID-19 make you increase the frequency of washing hands?	369 (92.3)	31 (7.8)
Did the outbreak of the COVID-19 make you use hand sanitizer more frequently?	348 (87.0)	52 (13.0)
Did the outbreak of the COVID-19 make you use personal protective equipment (e.g. mask) more frequently?	357 (89.3)	43 (10.8)
Did you carry hand sanitizer with you during the outbreak in Nepal?	253 (63.2)	147 (36.8)
Did you write down or store in your phone any helpline number to contact in case you suspected that you or someone you know had the COVID-19 virus?	137 (34.3)	263 (65.8)
Did you maintain social distance during the outbreak?	364 (91)	36 (9)
Did you cover cough and sneeze with a tissue, handkerchief, etc. during the outbreak?	339 (84.8)	61 (15.3)
Did you avoid unnecessary travel or outing during the outbreak?	343 (85.8)	57 (14.2)

In addition, there was a significant difference (p-value < 0.01) regarding knowledge, attitude, and practice of chronic disease patients toward COVID-19 (Table 5).

Table 5. Correlation between knowledge, attitude and practice of chronic disease patient toward COVID-19 infection.

Variable	Correlation coefficient (rs)	p-value
Knowledge-Attitude	0.2**	0.001
Knowledge-Practice	0.4**	<0.001
Attitude-Practice	0.2*	0.003

*Notes: rs, Spearman's correlation coefficient; * correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the level of 0.01 level (2-tailed).*

Overall, 55.5% of the study participants had good knowledge, 56.2% had good practice, and 30.7% had positive attitude towards COVID-19 disease. People aged 18-34 years had higher odds of having good knowledge (aOR:2.5, 95% CI: 1.3-6.0) compared to those aged 50 years and above. Likewise, people with family income below average had lower odds (aOR: 0.6; 95% CI: 0.4-0.9) of having good knowledge compared to those with above-average income. Participants who were unable to read and write had lower odds of having positive attitude (aOR: 0.4, 95%CI: 0.2-0.9) compared to those pursing secondary and above education. In our multivariable analysis, age, family income, family support, and enrolment into national health insurance were found to be associated with good COVID-19 related practices. All the variables whose p value was<0.2 were adjusted, except education which showed interaction with knowledge variables (Table 6).

Table 6. Factors associated with knowledge of COVID-19 among chronic disease patients.

Variables	Category	Knowledge n(%)		aOR (95% CI)	Practice n(%)		aOR (95% CI)	Attitude n(%)		aOR (95% CI)
		Good (n= 222)	Poor (n= 178)		Good (n= 225)	Poor (n= 175)		Good (n= 123)	Poor (n= 277)	
Age	18-34 years	41 (74.5)	14 (25.5)	2.5 (1.3-6.0)*	43 (78.2)	12 (21.8)	2.6 (1.1-6.5)*	20 (36.4)	35 (63.6)	-
	35-49 years	75 (63.6)	43 (36.4)	1.7 (1.1-2.8)*	72 (61)	46 (39)	1.7 (1-2.8)*	36 (30.5)	82 (69.5)	-
	50 and above	106 (46.7)	121 (53.3)	Ref	110 (48.5)	117 (51.5)	Ref	67 (29.5)	160 (70.5)	-
Sex	Male	110 (58.8)	77 (41.2)	1.4 (0.8-2.4)	-	-	-	58 (31)	129 (69)	-
	Female	112 (52.6)	101 (47.4)	Ref	-	-	-	65 (30.5)	148 (69.5)	-
Occupation	Employee	93 (65.5)	49 (34.5)	0.9 (0.3-2.9)	93 (65.5)	49 (34.5)	2.2 (0.6-7.7)	44 (31)	98 (69)	1.5 (0.4-6.2)
	Agriculture	52 (52.5)	47 (47.5)	0.8 (0.2-2.4)	46 (46.5)	53 (53.5)	1.5 (0.4-5.4)	24 (24.2)	75 (75.8)	1.5 (0.4-6.1)
	Housewife	42 (54.5)	35 (45.5)	1.3 (0.4-4.3)	41 (53.2)	36 (46.8)	1.9 (0.5-6.9)	33 (42.9)	44 (57.1)	3 (0.8-12.0)
	Unemployed	25 (39.1)	39 (60.9)	0.5 (0.1-1.9)	40 (62.5)	24 (37.5)	3.9 (1.1-14.8)	19 (29.7)	45 (70.3)	1.9 (0.5-8.1)
	Labor	10 (55.6)	8 (44.4)	Ref	5 (27.8)	13 (72.2)	Ref	3 (16.7)	15 (83.3)	Ref
Education	Illiterate	18 (28.1)	46 (71.9)	-	-	-	-	11 (17.2)	53 (82.8)	0.4 (0.2-0.9)*
	literate	34 (41.0)	49 (59.0)	-	-	-	-	31 (37.3)	52 (62.7)	1 (0.5-2)
	up to SLC	81 (54.7)	67 (45.3)	-	-	-	-	44 (29.7)	104 (70.3)	0.8 (0.4-1.4)
	≥Plus two	89 (84.8)	16 (15.2)	-	-	-	-	37 (35.2)	68 (64.8)	Ref
Marital status	Never	23 (79.3)	6 (20.7)	2.6 (0.6-10.2)	23 (79.3)	6 (20.7)	1.5 (0.4-6.1)	-	-	-
	Married	178 (56.5)	137 (43.5)	1.8 (0.9-3.7)	182 (57.8)	133 (42.2)	1.7 (0.9-3.4)	-	-	-
	Marital dislocation	21 (37.5)	35 (62.5)	Ref	20 (35.7)	36 (64.3)	Ref	-	-	-
Family income	Up to 30,000	113 (50.2)	112 (49.8)	0.6 (0.4-0.9)*	108 (48)	117 (52)	0.5 (0.3-0.8)*	62 (27.6)	163 (72.4)	0.7 (0.4-1.2)
	>30,000	109 (62.3)	66 (37.7)	Ref	117 (66.9)	58 (33.1)	Ref	61 (34.9)	114 (65.1)	Ref
Family support	No support	7 (41.2)	10 (58.8)	0.6 (0.2-2.2)	8 (47.1)	9 (52.9)	0.9 (0.3-3.0)	4 (23.5)	13 (76.5)	1.1 (0.3-4.0)
	Full support	163 (59.1)	113 (40.9)	1.4 (0.8-2.4)	179 (64.9)	97 (35.1)	2.4 (1.5-4.1)**	96 (34.8)	180 (65.2)	1.5 (0.9-2.7)
	Neutral	52 (48.6)	55 (51.4)	Ref	108 (48)	117 (52)	Ref	23 (21.5)	84 (78.5)	Ref
Study site	MCVTC	107 (69.5)	47 (30.5)	3 (1.9-4.9)***	-	-	-	29 (18.8)	125 (81.2)	0.4 (0.2-0.6)***
	TUTH	115 (46.7)	131 (53.3)	Ref	-	-	-	94 (38.2)	152 (61.8)	Ref
Duration of chronic disease	< 5 years	160 (61.3)	101 (38.7)	1.6 (0.8-3.1)	162 (62.1)	99 (37.9)	1.6 (0.8-3.1)	90 (34.5)	171 (65.5)	1.7 (0.8-3.3)
	5 to 10 years	40 (47.6)	44 (52.4)	1.2 (0.6-2.5)	37 (44)	47 (56)	0.8 (0.3-1.8)	18 (21.4)	66 (78.6)	0.9 (0.3-2.1)
	>10 years	22 (40)	33 (60)	Ref	26 (47.3)	29 (52.7)	Ref	15 (27.3)	40 (72.7)	Ref
Health insurance	Insured	90 (63.4)	52 (36.6)	Ref	93 (65.5)	49 (34.5)	Ref	-	-	-
	Not insured	132 (51.2)	126 (48.8)	0.7 (0.4-1.08)	132 (51.2)	126 (48.8)	0.6 (0.3-0.9)*	-	-	-

*Notes: *p value less than 0.05; **p value less than 0.01 ; *** p value less than 0.001*

DISCUSSION

In our study, 65.3% of participants had a history of at least one chronic disease, with the majority aged 50 years and above. The study participants suffered from a variety of chronic diseases such as cardiovascular disease, lung disease, kidney disease, and cancer, among 36.0%, 21.7%, 15.2%, and 9.7% respectively. Studies have shown that these chronic conditions, one or multiple, attribute to disease severity and worsen clinical outcomes in COVID-19 patients.[15-19]

Nepal is a lower-middle-income country with fragile health systems including chronic inadequacy of human resource.[20] People's knowledge, attitude, and practice with regard to COVID-19 could have played an important role in breaking the chain of transmission in the communities, hence, minimizing the impact. But, this study found that only 55.5% of the participating patients (requiring long-term care) had good knowledge, 56.2% had good practice, and 30.7% had positive attitude towards COVID-19. In a study conducted among cancer patients in Nepal, 79.4% of the participants gave correct response to knowledge related questions, 89.7% had positive attitude towards isolation need for infected individuals, and 95.5% reported good practices such as avoiding crowded place.[8] In our study, 90.8% of the participants were aware about COVID-19 symptoms, 91.5% had knowledge about the role of face masks in preventing spread of virus, 87.5% avoided crowded places, and 83.8% knew that no specific antiviral treatment was available for COVID-19. A similar community based study conducted among the general public of province 2 showed that the participants had adequate knowledge about COVID-19.[7]

More than half of the study participants in Nepal having a good knowledge and practice regarding COVID-19 might be a satisfactory finding for relevant stakeholders, and it could be due to the national and international efforts for public awareness through different means of communication. The Government of Nepal had urged the public through audio-visual channels, social media platforms, and telecommunication services to adopt social distancing, use mask at public places, and periodically use sanitizer or hand washing measures. Moreover, this study found that most of the participants agreed about the importance of strictly following the government's public health message. In contrast, 19.5% and 8.8% of the participants disagreed and strongly disagreed that the government's public health measures would help curb the pandemic. This may be due to the public dissatisfaction towards politicians and government officials as they kept on violating government's public health rules by organizing mass gatherings and rallies during the pandemic.[21]

Regarding COVID-19 related practice, most of the chronic disease patients in this study (92.3%) were found to have increased the frequency of hand washing during the pandemic than before. More than 80.0% of the participants frequently used hand sanitizer, wore personal protective equipment, maintained social distance, maintained cough and sneeze etiquettes, and avoided unnecessary travel. A similar study from Vietnam revealed that knowledge was significantly associated with participants' practice, i.e. those having good knowledge about COVID-19 had a higher probability of following good practices.[22]

Younger adult patients (18-34 years) with chronic disease had two folds of good knowledge compared to older adults aged 50 and above. Participants' education, family income, family support, and health insurance status were found to be associated with COVID-19-related practices. It is suggested that KAP theory enhances awareness, increases consciousness, and encourages positive behavior among participants.[23]Similarly, we have also found that the participants' education is positively associated with COVID-19 related practices. Chinese residents have been shown that good knowledge related to COVID-19 is associated with a positive attitude and proper practices.[24] Also, a report from Bangladesh have noted that literate participants show more sophisticated knowledge about COVID-19 than illiterate participants.[25]

It is often observed that worse health condition is related to low economic status.[26] In addition, a high level of socioeconomic status is related to adequate KAP for COVID-19.[24] Likewise, people who live in urban areas show high knowledge levels.[25] A study from Spain has suggested that a lower socioeconomic status is associated with a greater risk of infection and complications.[27] Nepal Insurance Authority (NIA) has been managing health insurance during COVID-19. In this study, about one-third of the participants were covered under the scheme of national health insurance, and was found a significant difference in practices. In Nepal, the chronic disease patients with no registration with social health insurance were less likely to have good practice regarding COVID-19. This finding suggests that increasing the coverage of health insurance would help in improving the pandemic related practices in individuals or households requiring long-term care. It is important that all people, regardless of health status, are aware of and strictly follow the general public health advice issued by the Centre for Disease Control and Prevention or the World Health Organization.[28,29] Also, in regard

to practice, participants who had full family support found a significant difference. A report from China has evidently shown that family support plays a vital role for a positive attitude towards social distancing and positive mental health during the COVID-19 pandemic.[30]

The study has few limitations. It captured the patient population of Kathmandu valley only, so the KAP of chronic disease patients living in other areas of the country could not be explored. Further, the study did not ask 'quality of life' related questions, which would have helped us understand the status of people who require long-term care and the findings would have a policy and programmatic impact regarding the improvement of healthcare services for the most needy group of patients.

CONCLUSIONS

Nearly the half of chronic disease patients had poor knowledge and practice, whereas more than two-third had a negative attitude, regarding to COVID-19. Increasing age was significantly associated with poor knowledge and poor practice. Chronic disease patients who were not enrolled into the national social health insurance program were not found to have a good practice either. Based on these findings, effective health education and awareness programs might be urgently needed that are aimed at mobilizing and improving COVID-19 related KAP, especially for chronic disease patients from low family income, with older age, and those not covered by the health insurance.

ACKNOWLEDGEMENTS

We would like to express our gratitude to Nepal Health Research Council for funding support under provincial research grants. We also thank Dr. Shiva Raj Mishra, for supporting us during preparation of the manuscript.

CONFLICT OF INTEREST

The authors declare no conflict of interest

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