ORIGINAL ARTICLE

PUBLIC UNDERSTANDING AND THEIR RESPONSE TO COVID-19 IN NEPAL: A POPULATION BASED STUDY

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ABSTRACT

Introduction: : Corona Virus Disease (COVID-19) pandemic has become one of the major causes of death. Its prevention and control have been challenging for every nation. Public understanding and practice play vital roles in its containment. This study aimed at identifying public understanding and response to COVID-19 in Nepal.

Method: : A population-based, cross-sectional study was conducted in Nepal among 3,582 adults through an online, self-administered questionnaire shared via Viber group created by Ministry of Health and Population. The outcome variables measured were knowledge, attitude and practice regarding COVID-19. The responses were analysed and predictors of response studied.

Results: Most of the participants were male (73.2%), with mean age of 32.4 years. Majority were married (54.2%) and had knowledge about transmission and symptoms of COVID-19. Almost all (99.6%) stated that hand washing/sanitizing can prevent its transmission. However, myths about prevention like drinking hot water (78.9%), gargling (67.6%), avoiding imports (67.6%), distancing from pets (65.6%), and warm showers (40%) were prevalent. Most of the participants (98%) used mask. The average knowledge score was 9.74±1.59 out of 12, attitude score 7.09±0.77 out of 8, and practice score 2.70±0.53 out of 3. Majority supported the government's efforts but were facing problems like difficulty getting daily consumables, increased levels of mental illnesses due to confinement, and facing increased economic burdens because of lockdown.

Conclusion: From the findings, we can infer that government interventions should focus on minimizing the public's difficulties due to lockdown while enforcing prevention strategies via raising awareness about COVID-19.

Key words: *Attitude; COVID-19; Knowledge; Practice; Survey*

INTRODUCTION

Corona virus disease (COVID-19), is an infectious disease caused by a recently discovered corona virus with flu-like symptoms to acute respiratory distress syndrome (ARDS) and human to human transmission.[1,2,3] In South Asia, 1.7 billion infections and 7.6 million deaths are estimated to occur if no preventive actions are taken.[4] In Nepal, the first case was identified on January 29, 2020. [5]

Application of sound preventive measures is essential in limiting the spread of the virus.[6] People's behaviours are shaped by their knowledge and perception.[7,8] Therefore, this study aimed at identifying the public understanding and their responses regarding COVID-19 in Nepal.

METHODS

Study Design and Participants

A nationwide cross-sectional online study was carried out during the pandemic to investigate the public understanding and response to COVID-19. Non-probability convenience sampling technique was used to select participants from the Viber group of MoHP. The responses to the online form shared in Viber were taken for one week.

Data Collection Procedure

The ethical approval for the study was taken from the Nepal Health Research Council. Only those participants who were 18 years and above, residing in Nepal, and provided consent in the Google Form were included in the study. The Google form containing an information sheet, a consent sheet, and the questionnaire was developed and its link was shared in the Viber Group on a daily basis for one week. It was a self-administered, semi-structured, online questionnaire which was partly adapted from a study in UK.[9] It included socio-demographic information such as age, sex, marital status, education, ethnicity etc. Questions about different aspects of COVID-19 such as understanding and response/attitude towards the disease, the practices adopted by the public for prevention of the disease, and the government's efforts in its prevention were asked. For scoring of the outcome variables, one mark was given to each correct knowledge, each positive attitude and each correct practice. The tool was translated, back translated and the validity was ensured through experts consultation. The Viber group was created by MoHP with the objectives of providing timely updates about COVID-19 in Nepal and sharing the activities carried out by the Ministry to combat its spread. It had 2,94,964 members at the time of data collection.

Data Analysis

Data were collected into Google Sheets and were analyzed using SPSS version 17. Internal Consistency Reliability of the questionnaire was assessed using Cronbach's alpha (0.746). Descriptive results were produced for each of the outcome variables. Frequencies, percentages, and means were calculated as applicable. Knowledge, attitude and

practice of COVID-19 were assessed against demographic variables using independent sample t test and one-way ANOVA at 0.05 level of significance. The variables which were found to be significant at p value <0.25 were again fitted in multivariate analysis model for multiple linear regression. Pearson's correlation was used to analyze the correlation between knowledge, response/attitude, and practice.

RESULTS

Of total 3,929 participants, 347 were excluded. Thus, a total of 3,582 responses were included for analysis. The mean age of the participants was 32.4±10.3 years. Majority, that is 1891 (52.9%) participants were between 25 and 39 years, 1939 (54.1%) were married, 2674 (74.7%) had completed at least an undergraduate degree, and 2904 (81.2%) were non-health personnel. More than half, that is 2341 (65.4%) were from the Bagmati province.

Public Understanding on COVID-19

The study found that majority of the participants had knowledge about various aspects of COVID-19 prevention and control as shown in table 1. Participants also believed in common myths.

Table 1. Public understanding/knowledge about COVID-19 (n=3578)*

Public understanding/knowledge about COVID-19	Male (%)	Number	Female (%)	Number	Total (%)	Number
Fever, dry cough and tiredness are the major symptoms	75.7	1984	72.9	698	74.9	2682
Hand washing/sanitizing, not touching face, avoiding close contact with sick, disinfecting touched objects, and wearing mask are the preventive measures.	66.2	1735	65.4	626	65.9	2361
Social distancing is maintaining 3 feet distance in essential social meetings	90.7	2373	87.1	832	89.8	3205
Isolation is treating sick people by keeping them separate from the rest	92.0	2408	93.3	891	92.4	3299
Quarantine is observing people well and keeping them separate	81.8	2141	86.3	824	83.0	2965
Old age people are most likely to die from COVID-19	68.3	1788	62.8	600	66.9	2388
Chances of getting sick increases in people having other health problems	94.5	2473	96.5	922	95.1	3395
80%, 15%, and 5% people infected with COVID-19 are mild, and severe disease respectively	79.9	2091	73.0	697	78.1	2788
Asymptomatic infected people can transmit the disease	84.5	2211	88.3	843	85.5	3054
Children and young adults must take preventive measures	91.1	2382	93.5	893	91.7	3275
Personal Protective equipment (PPE) should be used by Frontline Healthcare professionals	64.6	1689	62.7	599	64.1	2288
Recovered patients should be kept in community	87.0	2275	87.6	837	87.1	3112

***4 participants of other gender excluded**

Public Response to and Practice on Prevention of COVID-19

Public response was assessed with questions regarding prevention, treatment, and control measures. Majority were in favour of the government efforts for controlling the infection. Similarly, majority followed the recommended approaches for prevention as shown in table 2.

The participants also faced different problems during lockdown like difficulty getting daily consumable items by 1978 (58%), economic burden by 1044 (30.6%), mental illness due to fear by 377 (11%) participants.

Table 2. Public response/attitude and practice on prevention of COVID-19 transmission (n=3578)*

Public Response	Male (%)	Number	Female (%)	Number	Total (%)	Number
Public response/attitude						
Will self-quarantine/isolate if febrile	96.7	2529	98.4	940	97.1	3469
Travel across or within the country is not safe during lockdown	98.6	2579	99.7	952	98.9	3531
Calling the toll-free hotline number is the best action if disease suspected	55.0	1438	58.4	558	55.9	1996
Quarantining everyone returning from abroad for 14 days is an effective government effort to prevent spread	98.0	2569	98.4	942	98.3	3511
Suspending air travel is an effective government effort to prevent spread	96.8	2536	96.4	923	96.7	3459
Closing schools' days is an effective government effort to prevent spread	95.4	2500	95.5	914	95.4	3414
Forbidding mass gatherings is an effective government effort to prevent spread	98.4	2580	98.5	943	98.5	3523
Lockdown is an effective government effort to prevent spread	92.4	2423	94.7	906	93.0	3329
Public practice						
Have not breached lockdown	76.3	1997	85.0	812	78.7	2809
Have not gone to crowd	93.1	2440	95.4	913	93.7	3353
Used mask while going out	97.9	2567	97.8	936	97.9	3503
Measures taken to prevent infection from groceries	84.5	2215	86.5	828	85.0	3041

***4 participants of other gender excluded**

Factors Associated with Knowledge, Attitude and Practice regarding COVID-19

The mean COVID-19 knowledge score was 9.74±1.59 out of 12, with overall 81.2% (9.74/12 *100) correct rate. Socio-demographic variables which were found significantly associated with knowledge score were again fitted in a multiple regression model. It revealed that age and education had statistically significant positive association with knowledge; ethnicity and marital status had statistically negative association with knowledge; and occupation and residence had no significant relationship with knowledge on COVID-19 (table 3). These variables predicted the knowledge on COVID-19, which was statistically significant; $F_{(6, 3543)} = 41.278$, $p < 0.001$.

The overall mean attitude score was 7.09±0.77 out of eight, suggesting an overall positive attitude rate of 88.6% (7.09/8 *100). The demographic variables which were found significantly associated with attitude were again fitted in multiple regression model which is shown in table 4. No two predictors were significantly associated with response score.

The mean practice score was 2.70±0.53 out of a total score of 3, indicating an overall 90% (2.7/3*100) good practice rate. The demographic variables which were significantly associated with the practice score were again fitted in multiple regression. Only age and gender had a statistically significant positive association with practice on COVID-19 (table 5). These variables predicted the practice on COVID-19, which was statistically significant; $F_{(5, 3540)} = 9.303$, $p < 0.001$.

Table 3. Demographic factors associated with knowledge score of COVID-19

Charactristics	n**	Mean±SD	Coefficient	Std. error	t	p*
Age (in years)			0.196	0.044	4.451	<0.001
Less than 25	903	9.34±1.63				
25-39	1896	9.79±1.55				
40-54	641	10.14±1.49				
55-69	132	10.18±1.49				
70 and above	10	10.00±1.50				
Residence (Province)			0.005	0.022	0.238	0.812
Koshi	293	9.57±1.57				
Madhesh	204	9.31±1.62				
Bagmati	2345	9.81±1.58				
Gandaki	267	9.80±1.51				
Lumbini	308	9.64±1.65				
Karnali	57	9.33±1.54				
Sudurpaschim	108	9.86±1.64				
Marital Status**			-0.157	0.067	-2.341	0.019
Married	1939	9.96±1.53				
Unmarried	1611	9.50±1.61				
Educational level			0.269	0.031	8.544	<0.001
Secondary or lower	175	9.10±1.77				
Higher secondary	732	9.39±1.64				
Bachelor's	1404	9.69±1.56				
Master's or higher	1271	10.11±1.45				
Occupation			0.000	0.035	-0.013	0.989
Unemployed	723	9.25±1.69				
Health care	674	10.21±1.37				
Other profession	2185	9.76±1.57				
Ethnicity			-0.184	0.027	-6.786	<0.001
Brahmin/Chhetri	2259	9.88±1.54				
Newar	653	9.68±1.61				
Adibasi/Janajati	388	9.37±1.64				
Others	282	9.36±1.58				

*Multiple linear regression; **4 participants of other gender excluded; ***32 others (divorced, separated, widow) excluded

Correlation between Knowledge, Attitude and Practice

There was no correlation found between knowledge and attitude/response, whereas, statistically significant but weak positive correlations were found between knowledge and practice (r = 0.064, n = 3582, p = <0.001) and also between attitude/response and practice (r = 0.112, n = 3582, p = <0.001)

Table 4. Demographic factors associated with response/attitude score of COVID-19

Charactristics	n**	Mean±SD	Coefficient	Std. error	t	p*
Age (in years)			0.022	0.022	1.001	0.317
Less than 25	903	7.09±0.74				
25-39	1896	7.06±0.77				
40-54	641	7.13±0.83				
55-69	132	7.23±0.65				
70 and above	10	7.40±0.52				
Residence (Province)			0.034	0.011	3.149	0.002
Koshi	293	7.10±0.81				
Madhesh	204	7.17±0.68				
Bagmati	2345	7.05±0.76				
Gandaki	267	7.03±0.89				
Lumbini	308	7.20±0.64				
Karnali	57	7.39±0.56				
Sudurpaschim	108	7.31±0.87				
Marital Status**			-0.039	0.033	-1.177	0.239
Married	1939	7.11±0.77				
Unmarried	1611	7.06±0.75				
Occupation			-0.014	0.017	-0.808	0.419
Unemployed	723	7.07±0.80				
Health care	674	7.13±0.65				
Other profession	2185	7.08±0.79				

*Multiple linear regression; **4 participants of other gender excluded; ***32 others (divorced, separated, widow) excluded

Table 5. Demographic factors associated with practice score of COVID-19

Charactristics	n	Mean±SD	Coefficient	Std. error	t	p*
Gender**			0.126	0.020	6.163	<0.001
Male	2621	2.67±0.55				
Female	957	2.79±0.44				
Age (in years)			0.037	0.015	2.493	0.013
Less than 25	903	2.69±0.53				
25-39	1896	2.69±0.54				
40-54	641	2.73±0.51				
55-69	132	2.81±0.41				
70 and above	10	2.90±0.32				
Residence (Province)			0.004	0.007	0.529	0.597
Koshi	293	2.64±0.57				
Madhesh	204	2.65±0.58				
Bagmati	2345	2.73±0.51				
Gandaki	267	2.69±0.56				
Lumbini	308	2.63±0.57				
Karnali	57	2.74±0.52				
Sudurpaschim	108	2.72±0.53				
Marital Status**			-0.004	0.023	-0.178	0.858
Married	1939	2.71±0.53				
Unmarried	1611	2.69±0.53				
Educational level			0.011	0.011	1.000	0.318
Secondary or lower	175	2.68±0.54				
Higher secondary	732	2.67±0.56				
Bachelor's	1404	2.71±0.52				
Master's or higher	1271	2.72±0.51				

*Multiple linear regression; **4 other gender excluded ;***32 others (divorced, separated, widow) excluded

DISCUSSION

The results showed that majority of the participants had knowledge about transmission, symptoms, and their approach towards COVID-19. This was because majority of the participants had completed Bachelor's (39·2%) and Master's (35·5%) level of education, and education was found to have positive association with the knowledge on COVID-19 while adjusting for other variables.[10] A positive public response towards self-protection and adherence to government's efforts of containing outbreak was also found.

The findings of this study corroborate the findings of similar studies done elsewhere.[9,11,12] The participants had 81% correct rate in knowledge score, and a study conducted in Egypt found it to be 71%[11] and in China it was 90%.[13] Belief in myths was found prevalent among the public regarding prevention of COVID-19 in this study, just as in US and UK residents.[9] More than 90% of the participants were in favor of the government efforts like quarantining, suspending air travel, closing schools, forbidding mass gatherings, and imposing lockdowns similar to that seen in Malaysia.[14] During the pandemic, majority of the participants had avoided crowds (93·7%) and used masks (97·9%). These findings are consistent with another study in which 96·4% avoided crowds and 98% used masks.[13,15]

Knowledge was significantly higher among older age groups than among lower age groups, was higher in educated people and in married people, which is consistent with the study among Chinese residents.[13] Another study conducted in the Egyptian population expressed significantly lower knowledge among participants who were older, less educated, had lower income, and lived in rural areas.[11] Attitude was found to be significantly associated with province of residence, similar to that observed by the preliminary research report of Nepal.[12]

The study found a significant and positive correlation between knowledge and practice scores, and also between attitude towards COVID-19 and practice scores. These findings suggest the importance of health education programs, and developing positive attitudes through behavior change communication and information education communication programs. Similarly, the findings of the study showed association of the educational status with knowledge and practice, and this emphasizes the need for health education programs targeting people with low education, as is also seen in China.[13]

The large number of participants involved has contributed to the strength of this study. However, non-random sampling and online deployment of questionnaire has excluded participants without access to technology.

CONCLUSION

Participants with better knowledge and participants with positive attitude employed good practices regarding prevention. However, many participants also believed in myths like drinking hot water, gargling, avoiding imports from abroad, or distancing from pets prevented disease transmission.

Hence, the awareness and educational efforts implemented by the government for improving the knowledge, attitude, and practices to contain COVID-19 were effective and were encouraged to continue by submitting a report to the MOHP. Moreover, the government needs to boost its efforts to counter myths and convey evidence-based knowledge related to COVID-19 for more effective containment measures. Therefore, with the generated evidence, a report was submitted to MOHP which included suggesting the government to continue and to update its strategies to raise awareness to help reduce transmission of COVID-19 and highlighting the government need to develop strategies to counter the myths related to COVID-19.

The demographics of this survey showed that the government's reach via online portals is very much limited to Bagmati province, where the capital of the country is also situated. In some other provinces, reach of online information does not seem to be adequate. Therefore, in future if we want to disseminate any information to citizens in urban areas the online portals could be a very good medium whereas for rural areas, we may have to use other methods of communication.

The study found that majority of the public were facing problems due to lockdown. Therefore, in future, in times of emergency Government interventions should focus on minimizing the public issues and problems due to lockdowns or similar strategies while addressing the issue of concern.

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process.

AUTHOR CONTRIBUTIONS

Rakesh Ghimire: conceptualization, methodology, writing original, data curation, writing-reviewing and editing,visualization, data and statistical analysis, writing-reviewing and editing, project administration. Bidur Bhandari: conceptualization, methodology, writing original, data curation, writing-reviewing and editing,visualization, data and statistical analysis, writing-reviewing and editing, project administration. Akritee Pokharel: conceptualization, methodology, writing original, data curation, writing-reviewing and editing,visualization, data and statistical analysis, writing-reviewing and editing, project administration. Ranjeeta Subedi: data curation, writing-reviewing and editing. Sujata Shakya: data analysis and statistical analysis, writing-reviewing and editing. Anju Khapung: data curation, writing-reviewing and editing. Shristi Kharel: data curation, writing-reviewing and editing. Shital Bhandary: methodology, writing-reviewing. pradip gyanwali: data acquisition, writing-reviewing, resources.

CONFLICT OF INTEREST

The authors declared no competing interests besides getting funding by NHRC.

ETHICAL CONSIDERATION

Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.