Knowledge and Perception on Corona Virus Disease 2019 (COVID-19) among the General Public in Nepal

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Abstract
The global pandemic of COVID-19 has created havoc worldwide with its high transmission rate. The vaccine and drugs are still under trial; thus, the only option is to break the chain of transmission of disease by imparting the knowledge and designing awareness campaigns to educate people about the risks and preventive measures of COVID-19. This study was conducted to explore the knowledge and perception on health behaviors related to prevention along with addressing several myths and practices for COVID-19. An online cross-sectional survey was carried out in the initial days of disease outbreak in Nepal. A structured questionnaire was used for the data collection and recruitment of participants was done using snowball sampling technique. A total of 358 participants from all over the country were recruited for the study. Output measures were portrayed through descriptive statistical analysis with the use of frequencies (n) and percentages (%). Most of the participants (94.1%) knew about the high-risk age group, 38.5% were unaware that SARS-CoV-2 can be transmitted even from objects. Participants had better knowledge on modes of transmission of disease (77.1%) while 49.2% thought that regular surgical mask is highly effective for the preventive measure. Findings of this study suggests that people of Nepal are required to be educated about false beliefs and misconceptions. The findings and concerns raised in the study would be beneficial to design awareness-raising campaigns tailored specifically to the need for and understanding of the Nepalese community.

Introduction

Coronavirus disease (COVID-19) is a respiratory illness caused by the novel coronavirus, now named as Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV-2) (WHO, 2020a). The COVID-19 cases were reported

from Wuhan, Hubei Province, China towards the end of the year 2019 (Adhikari *et al.*, 2020; Li *et al.*, 2020), which has now spread to all continents with the exception of Antarctica (WHO, 2020b; UNDP, 2020). The first disease outbreak news was released by the World Health Organization (WHO) on January 5, 2020 (WHO, 2020b). The first case reported outside China was in Thailand on January 13, 2020 and by the end of January, more than 18 countries reported positive cases (WHO, 2020b). The WHO declared this disease as Public Health Emergency of International concern on January 30, 2020, and later declared it as Pandemic on March 11, 2020 (WHO, 2020c, WHO, 2020d). This viral pandemic has now resulted in a total of 2,54,84, 767 confirmed cases and 8,50,534 deaths as of September 1, 2020 (7:32 PM) (JHU, 2020). In Nepal, the first COVID-19 case was confirmed on January 23, 2020 followed by the second case confirmed after two months on March 23, 2020 (HEOC, 2020; Poudel, 2020). The total number of 40,529 confirmed cases with 239 deaths were reported as of September 1, 2020 (HEOC, 2020).

Different countries are adopting different strategies and policies for mitigating this pandemic and curb the spread of the virus. At the same time, the knowledge and perception among health care workers and the general public is an important aspect that can influence the prevention and transmission of the disease. In the current situation where vaccines or drugs are under trails, proper and correct knowledge is crucial to prevent and control the pandemic (Adhikari *et al.*, 2020; CDC, 2020). Knowledge such as regular hand hygiene, physical distancing, use and disposal of face masks, covering of cough and cold are key measures to breaking the chain of transmission (CDC, 2020; WHO, 2020a; Wilder-Smith and Freedman, 2020). Government and health organizations are trying to disseminate correct information to make an individual understand it properly because the role of the general public is crucial in combating this pandemic. Many studies have shown that assessing the knowledge and perception of the general public is the utmost necessary (Alzoubi *et al.*, 2020; Erfani *et al.*, 2020; Geldsetzer, 2020; Kazi Abdul and Khandaker Mursheda, 2020; Ranjan and Ranjan, 2020). After the outbreak of COVID-19, there was an immediate upsurge of responses from the researchers to understand this novel virus (Adhikari *et al.*, 2020). Studies on knowledge and perception from all over the world have helped researchers understand the ground-level information among people. In Bangladesh, an online cross-sectional study revealed that most people gathered the information about COVID-19 via the internet and showed a clear knowledge gap between the health professionals and other general public regarding the mode of transmission and the incubation period (Kazi Abdul and Khandaker Mursheda, 2020; Ranjan and Ranjan, 2020). The findings on knowledge and perception differ from countries to countries and the media used for the

purpose varies. The previous study in Nepal has pointed out the need for a study to see the knowledge and risk perception of people for the COVID-19 (Poudel, 2020). Hence, understanding the local knowledge gap and designing communication tools/techniques for the dissemination of information ensures the optimum utilization of resources.

This study aims at exploring the knowledge and perception of health behaviors related to prevention along with addressing several myths and practices among the general public during the initial days of disease outbreak in Nepal. The findings of this study are expected to be pivotal to design awareness-raising campaigns tailored specifically to the need for and understanding of the Nepalese community. Studies such as this and the ones enumerated above help us understand commonly used social media platforms which can further help to decide where campaigners can reach out to most people. Through these findings, recommendations for policymakers can be made for optimistic control and elimination of COVID-19.

Materials and Methods

Study Design and Duration
This study is based on the data collected from an online cross-sectional survey carried out in Nepal during a period of 10 days (5th April to 15th April 2020). A Snowball sampling technique was used to recruit the participants from all the provinces living in a country during the pandemic situation. An online semi-structured questionnaire adapted with permission from a similar kind of study was used by using google forms, with a consent form attached to it. The link of the questionnaire was sent through emails, WhatsApp, Viber, Facebook groups, and other social media to the contacts of the investigators. The participants were asked and energized to roll out the study to as numerous individuals as conceivable. In this way, the link was sent to individuals separated from the primary point of contact, and so on. On getting and clicking the link the respondents got auto directed to study information, participant information sheet, and informed consent. Participation in the survey was completely voluntary and anonymous. After they have provided consent to participate in the survey, they filled up the demographic details. Then a set of a few questions showed up successively, which the respondents were to answer.

Study Variables
We were able to collect data from all the seven provinces of Nepal. The socio-demographic variables included age, gender, education, ethnicity, and the province of residence.

The online self-reported questionnaire contained 22 questions about i) case fatality rate and high-risk groups; ii) knowledge of symptoms and recommended healthcare-seeking behavior; iii) measures to prevent a COVID-19

infection; iv) their perception of the risk posed by individuals of foreign ethnicity in their community. The questionnaire also contained specific questions about "myths" or falsehoods listed on the WHO's 'myth busters' website (WHO, 2020a).

Sample Size Calculation and Statistical Analysis

The sample size was calculated at confidence level 95% and confidence interval 5, for populations above the size of 5000, which resulted in the minimum required sample of 357 respondents for the study. A total number of 358 respondents were recruited to meet the purpose in the present study. Data retrieved from the online survey were entered into Microsoft Excel and then imported into the Statistical Package for Social Sciences (SPSS) version 25. Output measures were calculated through descriptive statistical analysis with the use of frequencies (n) and percentages (%).

Inclusion Criteria and Ethical Approval

Participants with age more than 18 years, able to understand English and Nepali, and willing to give informed consent were included. Participants without access to the internet were not able to participate in the survey as it is an online survey. The Ethical Review Board of Nepal Health Research Council approved the study protocol (no. 279/2020) and procedures of informed consent before the formal survey.

Result

Socio-Demographic Characteristics

A total of 358 participants from all over the country were included in the study. The participants ranged from 18 to 65 years of age, of which the age group of 18-27 years had the highest percentage (65.9%). The majority of the participants were male (61.2%) and of Brahmin/Chhetri ethnicity (53.1%). Out of a total of 358 participants, 134 (37.4%) were health care providers. Among the specified health care providers, the majority were physicians 40 (11.2%). Maximum participants were well educated with 72.8% having a bachelor's degree or above, and most of them (49.2%) lived in the Bagmati Province (Table 1).

Knowledge and Perception on Different Aspects of COVID-19

Case Fatality Rate and High-Risk Group

Most of the participants knew about the age group most likely to die from the illness caused by the COVID-19 with 94.1% (95% CI 92%-96.8%) answering the older adult group. Likewise, 86.3% of the participants knew that coronavirus patients with other chronic conditions had a higher chance of dying. However, many participants (38.5%) were unaware of the fact that the SARS-CoV-2 can be transmitted even from objects. And, some participants 6.5% (95% CI 3.9%-9.1%) had a misconception that the SARS-CoV-2 only infects older adults (Table 2).

Table 1: Socio-Demographic Characteristic of Participants

Characteristics	Number (%)
Total	**358 (100)**
Gender	
Male	219 (61.2)
Female	139 (38.8)
Age (Years)	
18-27	236 (65.9)
28-37	106 (29.6)
38-47	12 (3.4)
48-57	1 (0.3)
58+	3 (0.8)
Ethnicity	
Adibashi/Janjati	60 (16.8)
Brahmin/Chhetri	190 (53.1)
Dalit	3 (0.8)
Madheshi	79 (22.1)
Muslim	7 (2.0)
Others	19 (5.3)
Province	
Province 1	71 (19.8)
Province 2	60 (16.8)
Bagmati Province	176 (49.2)
Gandaki Province	17 (4.7)
Province 5	21 (5.9)
Karnali Province	2 (0.6)
Sudur Paschim Province	11(3.1)

Table 1: Socio-Demographic Characteristic of Participants (Contd.)

Characteristics	Number (%)
Level of Education	
Less than 10	6 (1.7)
10th Pass	5 (1.4)
10 +2	87 (24.3)
Bachelor	181 (50.6)
Masters	65 (18.2)
Professional Degree	12 (3.4)
Doctorate	2 (0.6)
Working as Healthcare Provider	
Nurse	22 (6.1)
Physician	40 (11.2)
Community health worker	7 (2.0)
Pharmacist	9 (2.5)
Other healthcare provider	56 (15.6)

Table 2: Knowledge on Case-fatality rate, high-risk groups, and symptoms of COVID-19

Questions	Responses	% (95% CI)
Case-fatality rate and high-risk groups		
When they have been infected, what age groups are most likely to die from the illness caused by the new corona virus? Please select all options that you think are correct.	Children	27.1 (22.5-1.7)
	Young Adults	3.1 (9.6-16.6)
	Older Adults	94.4 (92-96.8)
Are those with other health problems more likely to die from an infection with the new corona virus disease than those without any other health problems?	Yes	86.3 (82.7-89.9)
Does receiving a letter or package from foreign land put you at risk of getting infected with the new corona virus?	Yes	61.5 (56.4-66.5)
Only older adults can become infected with the new corona virus.	True	6.5 (3.9-9.1)
Symptoms of COVID-19		
What is the main way in which people are currently getting infected with the new corona virus?	Droplets of saliva that land in the mouths or noses of people who are nearby when an infected person sneezes or coughs	77.1 (72.5-81.2)
What are common signs or symptoms of an infection with the new corona virus?	All of these: Cough, fever, and shortness of breath	96.4 (94.0-97.9)
	At least one of these: Skin Rash, Frequent Urination, Constipation and Nose bleeds	27.7 (23.2-32.5)
Recommended healthcare-seeking behavior		
If you have a fever or cough and recently visited China, or spent time with someone who did, what would be the best course of action?	Go to your primary care doctor, such as by taxi or public transport to avoid driving yourself	2.8(1.4-4.9)
	Have someone drive you to the emergency room	1.1 (0.4-2.6)
	Stay home and call your primary care doctor	11.5 (8.5-15.1)
	Rest more than usual and then call your primary care doctor if you still feel sick after 2-3 days	7.3 (4.9-10.3)
	Self-quarantine yourself for at least 2 weeks and consult a doctor if you develop any symptoms during that time	77.4 (72.8-81.5)

Symptoms of COVID-19 and Recommended Health Seeking Behavior

The majority of the participants, 77.1% (72.5-81.2%) knew that droplets of saliva from infected people that lands in the mouths and noses are the primary mode of transmission of the COVID-19. Most of the participants, 96.4% (94%-97.9%) recognized fever, cough, and shortness of breath as the three typical symptoms and signs of COVID-19. However, there was a misconception among 27.7% of participants that at least one of the following symptoms should be present: skin rash, frequent urination, constipation, and bleeding from the nose. Regarding the knowledge of respondents for people with travel and contact history, 77.4% of them correctly chose self-quarantine for at least two weeks as the best course of action (Table 2).

Prevention and control of COVID-19

The Government of Nepal (GoN) has implemented preventive measures against the COVID-19 disease. Thus, most of the participants were well informed about closed schools (98.3%); self-quarantine rule for everyone coming from abroad for 14 days (93.3%); suspension of all air travel to the country (92.7%); forbidding of any mass gathering such as sports events or concerts (96.9%); the requirement of everyone to remain in their homes except to seek medical care or obtain food (95.3%). However, a significant proportion of participants (72.1%) had a false conception that the government has made it mandatory for adults to wear a face mask while outdoors though it was not compulsory at the time of data collection. There was also a misconception among 19.8% of participants who believed that the government had decided to go door to door to measure everyone's temperature. Most of the participants (87.7%) had good knowledge about the actions that help to prevent catching SARS-CoV-2 infection. However, a substantial portion of participants 77.7% (73.1%-81.7%) also thought using a hand dryer, taking antibiotics, regularly rinsing your nose with saline, getting a vaccination against pneumonia, gargling mouthwash, putting sesame oil on the skin, and eating garlic were effective preventive measures. Besides, 49.2% of the participants were wrong to believe that a regular surgical mask is highly effective (95% risk reduction) in the protection against the virus (Table 3).

Risk perception of COVID-19

On the question regarding the perception of risk of dying when infected by COVID-19, only 68.7% respondents chose to answer this question, who believed approximately 12.1% (95% CI 10.0%-14.1%) of people infected from this virus end up dying from this infection. Likewise, when asked on the perception of risk for "What percent of people who get infected with the common flu end up dying from the common flu?", 93.6% of participants who answered believe that approximately 10.9% (95% CI 9.0%-12.9%) people who get infected with the common flu end up dying (Table 3).

Table 3: Knowledge on Prevention and Perception of the Risk of COVID-19

Question	Response	% (95 % CI)
Prevention of COVID-19		
At this point in the corona virus pandemic, what are the measures that our government has taken to prevent spreading of the virus?	Close all schools	98.3 (96.6-99.3)
	Quarantine everyone coming in from abroad for 14 days	93.3 (90.4-95.5)
	Made it mandatory for adults to wear a face mask while outdoors	72.1 (67.3-76.5)
	Suspend all air travel to your country	92.7 (89.7-95.1)
	Forbid any mass gatherings (e.g., sport events or concerts)	96.9 (94.7-98.4)
	Require everyone to remain in their home except to seek medical care and obtain food	95.3 (92.7-97.1)
	Go door to door to measure everyone's temperature	19.8 (16.0-24.2)
Which of the following actions help prevent catching an infection with the new corona virus?	All of these: Avoid close contact with people who are sick, washing hands, avoid touching your eyes, nose and mouth with unwashed hands, and wear a face mask	87.7 (84.0-90.8)
	At least one of them: Using a hand dryer, taking antibiotics, regularly rinse your nose with saline, get a vaccination against pneumonia, gargling mouthwash, putting sesame oil on skin and eating garlic	77.7 (73.1-81.7)
Consistently wearing a face mask is highly effective in protecting you from getting infected with the new corona virus.	True	49.2 (44.0-54.3)
Perception of the Risk		
What percent of people who get infected with the new corona virus die from this infection?	Continuous variable	12.1 (10.0-14.1)
What percent of people who get infected with the common flu end up dying from the common flu?	Continuous variable	10.9 (9.0-12.9)

Discussion

COVID-19 is currently a very important public health problem at a global level. This study was conducted among the participants at various age groups, education, ethnicities, and provinces in Nepal to analyze the knowledge and perception regarding COVID-19 among the general public of Nepal in the initial days of disease outbreak in Nepal. In the present study, although most of the participants correctly identified older adults and participants with other health problems as high risk groups for mortality, there was a misconception among the participants that there is less chance for children and younger adults to get infected from COVID-19. Thus, in contrast to people in the US and UK, people in Nepal believe that children and younger adults are at lower risk of COVID-19 infection (Geldsetzer, 2020). It is fascinating to see that participants from our study in Nepal and other South Asian countries like India, Bangladesh are well aware of the major core symptoms of COVID-19 (Kazi Abdul and Khandaker Mursheda, 2020; Krishna *et al.*, 2020) like fever, cough, sore throat, and headache. On the other aspect, one concerning thing was that over one-fourth of the participants selected insignificant symptoms for assessing COVID-19, which can lead to excessive and unnecessary use of the already underwhelming health system of Nepal. Therefore, instructions should be passed on to the people so that they only seek health services when core symptoms of COVID-19 are present.

Most of the participants in our study were aware of the major mode of transmission of COVID-19. It is really encouraging to see similar findings on the mode of transmission to be well known to the general public of different developing countries e.g., India, Bangladesh, Jordan (Alzoubi *et al.*, 2020; Kazi Abdul and Khandaker Mursheda, 2020; Krishna *et al.*, 2020). However, despite the information disseminated by the government about the COVID-19 to the general public through different portals (news, online media, Viber, Facebook, and government websites), a significant portion of the participants was unaware of all the modes of transmission, e.g., through inanimate objects. In a similar study conducted in India, a certain proportion of participants were unaware of the risk factors and modes of transmission (Kazi Abdul and Khandaker Mursheda, 2020; Krishna *et al.*, 2020). This clear knowledge gap could be due to a reason that awareness raised by public health departments and media campaigns solely focused on direct contact and aerosol contact only a as major mode of transmission and not prioritizing other modes of transmission. Thus, it is important that public health departments and media campaigns should educate people about the survival time of COVID-19 on inanimate objects and the necessity to disinfect objects. A similar study done in the United States of America (USA) and United Kingdom (UK) reported that a substantial portion of

people believed in the "myth busters" who continue to spread disinformation about COVID-19 (Geldsetzer, 2020). In the present study as well, about 2/3rd of the participants believed myths like rinsing your nose with saline, using a hand dryer, taking antibiotics, gargling mouthwash, which the public health departments should discredit as myths and work closely with WHO to minimize this disinformation as these are also listed on WHO 'myth busters' (WHO, 2020c). The most alarming knowledge and the perception that was found in the present study was that about half of the participants believed that wearing a common surgical mask alone is adequate to protect from the virus, which is completely misleading. Rather than asking the general population to only wear masks, it can additively be beneficial to educate people to take other preventive measures (e.g., avoid contact with people who are sick, social distancing, and proper handwashing) which can be instrumental in the prevention of COVID-19.

The higher knowledge scores on COVID-19 were found to be linked with age and educational level, which is similar to the study conducted in China (Lu *et al.*, 2020). Adult people above the age of 29 years showed a significant increase in knowledge scores than younger people. The findings from the present study are concurrent with the study conducted in the middle-east country like Jordan regarding the best practices towards the disease prevention measures and their response if they have the core symptoms of COVID-19 (Alzoubi *et al.*, 2020). The Government of Nepal is currently employing isolation and quarantine, lockdown of cities, restricting travel, forbidding mass gathering, requiring everyone to remain in their home except for seeking care or obtaining food (HEOC, 2020; Poudel, 2020). These practices were also done in China to a massive extent at the time when the disease was rampant in China (Wilder-Smith and Freedman, 2020).

The participants overestimated the fatality among those infected with COVID-19. Participants thought that the fatality rate from COVID-19 was 12.1%, while the case fatality rate is believed to be less than 1% (Fauci AS, 2020). It is interesting to see that participants in developed countries like the USA and UK also overestimated the case fatality rate to be much higher than the actual current rate (Geldsetzer, 2020). These findings state that people are fearful of the disease whether in developing countries like Nepal or developed countries like the USA and UK. Another important concern to be noted while designing and disseminating the information is that the concerned stakeholders should try in boosting the motivation of people together while giving or sharing the correct information, else the fear of disease might contribute to stigmatization towards the diseases, and infected people.

Strengths and Limitations of The Study

To the best of the researcher's knowledge and literature review, this is the first study in Nepal to investigate the knowledge and perception towards COVID-19 amongst the general Nepalese population. This study summarizes the knowledge and perception of COVID-19, identifies knowledge gaps among the general population in Nepal, and highlights some concerns that need to be addressed by concerned stakeholders while disseminating the information. The study has a few limitations. We were not able to perform the study face to face or with other random sampling technique considering the current situation of lockdown in the country and the urgency of the study. The online survey modality and snowball sampling technique have their own limitations. People from the lower economic backgrounds who are in the higher risk groups might have been missed from the study due to inaccessibility to the internet.

Conclusion

The findings of this study suggest that the general population of Nepal had adequate knowledge, about the COVID-19, its transmission modes, and preventive measures. In addition, the government is taking steps to minimize the spread of COVID-19 and is continuously providing information on preventive measures to be taken to prevent spread at the community level. However, the findings also show a clear knowledge gap among a certain proportion of the population in different aspects of transmission modes and preventive measures. Since the positive cases of COVID-19 are increasing rapidly and the situation is getting worse, people still need to be educated and aware of false beliefs and misconceptions. The correct information dissemination should be targeted especially among the people with the lower levels of education and people in rural areas of provinces through the combined efforts of the health ministry and programs at the local level to reach out to all the general population of Nepal.

Author Contributions

All the authors were involved during the conceptualization and write up of the article. Final form of the manuscript was approved by all authors

Conflict of Interests

The authors declare that there is no potential conflict of interest with respect to this paper.

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