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Correspondence

Prof. Dr. Jay N Shah
Surgery, Patan Hospital, Patan
Academy of Health Sciences,
Lalitpur, Kathmandu, Nepal.
Email: drjaywufei@hotmail.com

Peer Reviewers

Prof. Dr. Gehanath Baral
Nobel Medical College

Assoc. Prof. Dr. Ajay K Mishra
Janaki Medical College

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Knowledge and perceptions towards COVID-19 among final year undergraduate medical students and interns in Province 2, Nepal

Jay N Shah¹✉, Binay Kumar Panjiyar², Sushma Sah³, Sabita Sah⁴, Jenifei Shah⁵

¹Prof., Surgery, Patan Hospital, Patan Academy of Health Sciences, Lalitpur, Kathmandu, Nepal; ²Medical Officer, College of Medical Sciences, Kathmandu University, Nepal; ³Bachelor in Public Health, Institute of Medicine, Maharajgunj Medical Campus, Nepal; ⁴Medical Officer, Dhulikhel Hospital, Kathmandu University, Nepal; ⁵Fellow resident, Rui Jin Hospital, Shanghai Jiao Tong Univ School of Medicine, China

Abstract

Introduction: Corona Virus Disease-19, the COVID-19, has become a pandemic of public health concern, more so for developing countries like Nepal with an inadequate and vulnerable health system. Among all the seven provinces of the country, Province-2 seems to be at higher risk due to population density and open porous border with neighboring India. This survey was conducted among the undergraduate medical students of medical colleges in Province-2, Nepal to evaluate their knowledge and perception regarding the prevention and spread of the virus.

Method: A descriptive cross-sectional study was conducted in September 2020 among final-year undergraduate medical students and interns from Janaki Medical College in Janakpur and National Medical College in Birgunj of Province-2, Nepal. A structured 30-item questionnaire containing demographics (5 items), knowledge (15 items), and perception (10 items) regarding COVID-19 was used for an online survey via email. Ethical approval was taken. Descriptive analysis was performed.

Result: A total of 200 out of 250 respondents (>95%) had an adequate level of knowledge on etiology, symptoms, hand hygiene, severity, vulnerability, precautionary measures, and treatment guidelines of COVID-19. More than 80% were ready to work in the hospital during the pandemic with support from their family and nearly half of them (49%) perceived that the preparedness and supplies were sufficient in their institutions.

Conclusion: The survey revealed that the majority of the final-year medical students and interns in Province-2 Nepal had adequate knowledge and perception regarding COVID-19.

Keywords: COVID-19, interns, knowledge, medical students, perception, Province-2 Nepal, SARS-COV-2

Introduction

An outbreak of novel coronavirus pneumonia in Wuhan, China, in late 2019, caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) was named coronavirus disease (COVID-19) and declared a global pandemic by the WHO.¹

In early June, province-2 in Nepal, a populous plain land (Terai) with supposedly manageable infrastructure, reported the highest number of infections.² And, by 1 September 2020, all seven provinces and 77 districts in the country had reported positive cases.³ Despite cases decreasing in Southeast Asia, case morbidity and mortality increased in Nepal⁴, with 179,613 cases and 1034 deaths as of November 4th and the COVID19-dashboard⁵ showed 2103 new cases on Nov 19.

Medical students in Pakistan were found to be aware of COVID-19, but lacked in-depth knowledge, raising the need for additional educational interventions.⁶ Studies report that medical students and health care workers (HCWs) are deficient in certain aspects regarding COVID-19 and suffered anxiety during the pandemic.⁷⁻¹⁰ In Pakistan HCWs perceived that limited infection control material and knowledge on transmission were the barriers to infection control.¹¹

This study among final-year medical students and interns in Province-2 aims to evaluate their knowledge and perception of the COVID-19 pandemic, which may help in further planning for health education and service delivery.

Method

A descriptive cross-sectional study was conducted among final-year undergraduate medical students and interns of both the medical colleges i.e., Janaki Medical College in Janakpur and National Medical College in Birgunj during the 3rd week of September 2020. An online email survey via Google form with a structured 30-item questionnaire in English, based on reference material, fact sheets, and

information leaflets on COVID-19 covered the demographics, general awareness, information sources, knowledge, and perceptions related to COVID-19. The content validation was done by physicians (pi, co-pi) for clarity and significance. The questionnaire contained three sections- information sheet and consent; demographic details; and questions on knowledge (15 items) and perception (10 items) regarding COVID-19.

Email addresses were obtained from student unions. An introductory paragraph outlining the aims and objectives of the study as well as instructions to complete the questionnaire was provided in the form. The first reminder email was sent on the 3rd day and the final email on the 6th day. The survey was closed after 10 days. Ethical approval was taken from the Institutional Review Committee (IRC) of the Patan Academy of Health Science (PAHS). The participation was voluntary and only those who agreed to participate could move further in the questionnaire. This was accepted as consent for the study. The option in the google form for limiting only one response per respondent was implemented to eliminate the possibility of duplicate entry from the study participants. Anonymity and confidentiality of the participants were maintained, as the form collected neither individual identification nor personal information.

Excel data obtained were descriptively analyzed as per the stated objectives. Knowledge and perception were scored as adequate if equal to or above 75% correct responses, the average for 50–75% correct response, and inadequate if below 50%. The score was set one point for one correct response.³ There was no negative marking. Mean and standard deviation (SD) for both total and subgroups of the percentage of knowledge and perception were calculated.

Result

Out of over 250 emails sent out, 50 did not respond by the end of the 2nd reminder, and a

Medical College in Janakpur completed the survey. A total of 200 (80%), 106 (53%) from National Medical College in Birgunj, and 94 (47%) from Janaki Medical College in Janakpur with a 130 (65%) male to 70 (35%) female ratio partook in the survey. Final year medical students were 104 (52%) and intern 96 (48%). Since the pandemic, 131 (65.5 %) had been living with their parents, 35 (17.5%) in the hostel, and 34 (17%) with friends. Total of 52 (26%) students, 52 (26%) friends and 29 (14.5%) relatives contracted infection, Table 1.

In the knowledge domain, 196 (98%) answered correctly for the etiology, 193 (96.5%) for most common, and 183 (91.5%) on less common symptoms of COVID-19. On preventive measure 196 (98%) knew about hand hygiene,

disease severity, and treatment guidelines including Polymerase Chain Reaction (PCR) for case detection, Table 2. On perception, 74 (37%) mentioned that COVID-19 is fatal, 99 (49.5%) thought preparedness in their institution was sufficient to manage the outbreak and 133 (66.5%) believed current medical supplies and PPE (Personal Protective Equipment) were sufficient. Also, 177 (88.5%) had their family’s support to work in a hospital during the pandemic, Table 3.

Overall, 185 (92.50%) participants had an adequate level of knowledge with a mean score of 8.5 ± 1.62 and a median of 8.0 on a 15-item questionnaire. Nearly half of the respondents, 93 (46.50%) had a good level of perception, Table 4, Figures 1 and 2.

Table 1. Socio-demographic profile of final year medical students and interns toward COVID-19

Characteristics	N	%
Janaki Medical College, Janakpur	94	47.0
National Medical College, Birgunj	106	53.0
Female	70	35.0
Male	130	65.0
Final year	104	52.0
Intern	96	48.0
Infected with COVID-19Self, yes	52	26.0
Infected with COVID-19Self, No	148	74.0

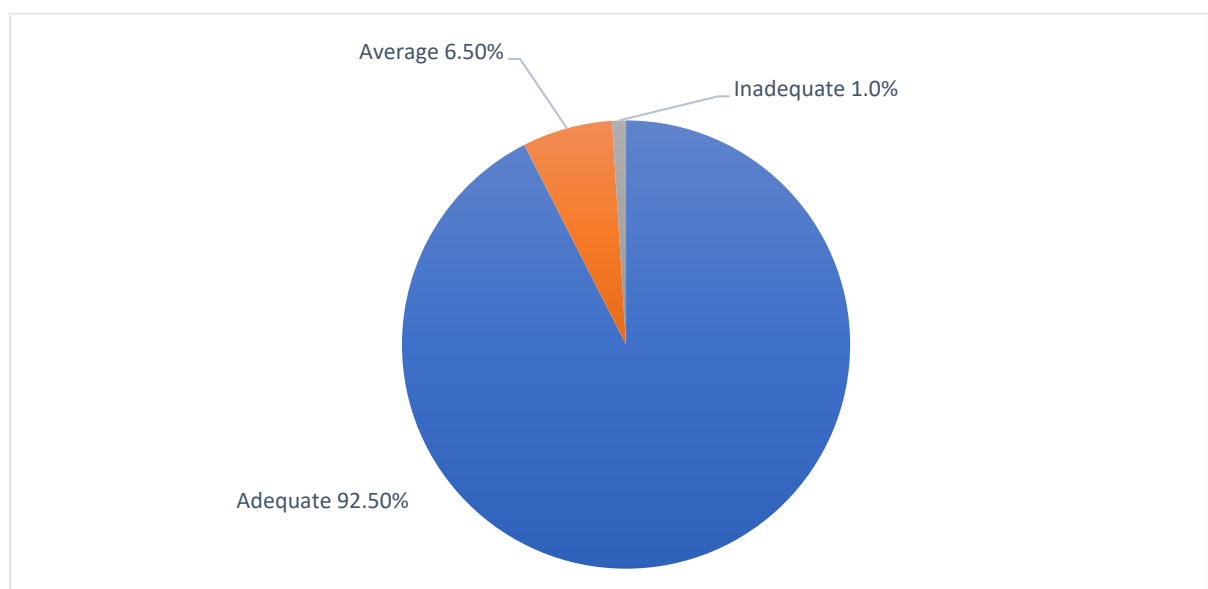


Figure 1. Knowledge level among the final year medical students and intern towards COVID- 19, N=200

Table 2. Knowledge among the final year medical students and interns towards COVID-19, N=200

Characteristics	N	%	Mean	SD
COVID -19 is caused by a novel coronavirus (SARS Coronavirus 2)			0.98	0.14
Yes	196	98.0		
No	3	1.5		
Don't know	1	0.5		
The most common symptoms of COVID -19 is fever			0.96	0.18
Yes	193	96.5		
No	7	3.5		
Don't know	0	0		
Less common symptoms of COVID -19 is difficulty in breathing			0.92	0.21
Yes	184	92.0		
No	12	6.0		
Don't know	4	2.0		
Hand washing must be practiced before and after caring for a sick person			0.98	0.14
Yes	196	98.0		
No	4	2.0		
Don't know	0	0		
Minimum conc. of alcohol in hand-sanitizers to kill the virus should be 70%			0.98	0.16
Yes	195	97.5		
No	4	2		
Don't know	1	0.5		
One should take precautionary measures during			0.96	0.21
Yes	191	95.5		
No	8	4		
Don't know	1	0.5		
Training for donning and doffing is required			0.94	0.14
Yes	181	90.5		
No	15	7.5		
Don't know	4	2		
PCR is the recommended test for active case-detection of COVID-19 infection			0.98	0.12
Yes	197	98.5		
No	2	1		
Don't know	1	0.5		
COVID-19 treatment guidelines have been developed for healthcare professionals			0.96	0.19
Yes	192	96.0		
No	6	3		
Don't know	2	1		

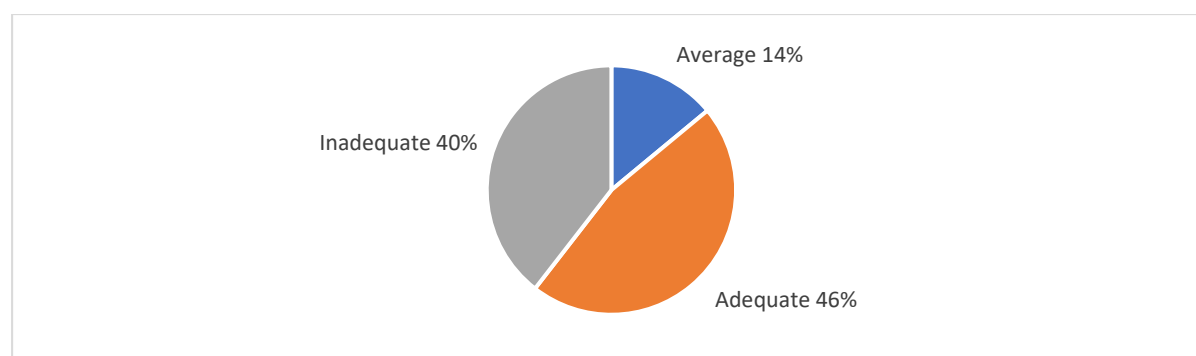
Note: AGP-aerosol-generating procedure, polymerase Chain Reaction(PCR)

Table 3. The perception among the final year medical students and interns towards COVID-19, N=200

Study variables	N	%	Mean	SD
COVID -19 is fatal?			0.37	0.48
Yes	74	37		
No	123	61.5		
Don't know	3	1.5		
Preparedness in my institution is sufficient to manage the COVID-19 outbreak			0.50	0.50
Yes	99	49.5		
No	100	50		
Don't know	1	0.5		
Patient should share their recent travel history with healthcare providers?			0.94	0.23
Yes	99	49.5		
No	101	50.5		
Don't know	0	0		
Current medical supplies and PPE are sufficient for the possible outbreak			0.66	0.47
Yes	133	66.5		
No	60	30		
Don't know	7	3.5		
One should not go for any postings in a hospital without a clear COVID-19 infection control policy			0.90	0.31
Yes	179	89.5		
No	18	9		
Don't know	2.0	1		
Family support to work in hospital			0.88	0.30
Yes	177	88.5		
No	23	11.5		
Don't know	0	0		
All doctors from various department actively involved in COVID-19 pandemic			0.46	0.50
Yes	92	46		
No	105	52.5		
Don't know	3	1.5		

Table 4. Knowledge and perception score among the participants, N=200

	Knowledge scale	Perception scale
Mean	8.5	6.11
Std. deviation	1.62	2.02
Median	8	6

**Figure 2. Perception level among the final year medical students and intern towards COVID- 19, N=200**

Discussion

This study found that out of the 200 participants, the majority (92%) of final year medical students and interns from the two medical colleges in Province-2, Nepal, had an adequate level of knowledge on a 15-item questionnaire regarding COVID-19. The majority (>95%) were aware of the etiology, common symptoms, the importance of hand-washing, severity, and vulnerability of the disease in immune-compromised chronic disease conditions and precautionary measures. They also knew Polymerase Chain Reaction (PCR) for case-detection and treatment guidelines, and the importance of training on donning and doffing of PPE. A recent study from Pakistan had similar findings reporting the majority of students (97.4%) being aware of the viral causes of the disease.⁷

The primary mode of spread of the SARS-CoV-2 virus is by droplet transmission and the virus can last for hours or even days on various surfaces, e.g. 4 h on copper, 24 h on cardboard, and 2–3 days on less porous surfaces of plastic and stainless steel.^{12,13} These indirect sources of transmission play an important role when we touch these objects and then unconsciously touch our faces (mouth, nose, or eyes).

We found that 1/4th of the total 200 participants (26%) themselves and their friends (26%), as well as some relatives (14.5%), had contracted coronavirus. Nearly 2/3rd (65.5 %) were living with parents, and some in the hostel (17.5%) and with friends (17%). Interestingly, 2/3rd (63%) believed that COVID-19 is not serious and half (49.5%) thought preparedness in their institution was sufficient to manage the outbreak.

These issues require a well-coordinated and clear policy from medical schools and hospitals, with regular provision of briefings to prepare the students and HCWs to better deal with the pandemic. This pivotal role in the importance and preparedness from the very beginning on how to manage life during the COVID-19 pandemic is highlighted by the students from medical schools in the populous

city of Shanghai, China.¹⁴ The medical students and interns were briefed on COVID-19 by the school, in coordination with the Center for Disease Control and Prevention. This early-on preliminary orientation played an important role in increasing their awareness of the disease and educating them on the guidelines on social-distancing, the proper method of wearing surgical face masks, maintenance of hygiene by frequently washing hands with soap or sanitizer and avoid touching face, appropriate management of clothes and shoes after returning home, routine temperature checks, online classes, and a requirement for daily reporting on personal health status to a designated authority in the school via electronic record.¹⁴ There was a lack of such a coordinated approach, briefing, and continuous support for the students from the institutions in the present study. There is a lack of published data on such practices in other institutions in the country, which is worth exploring.

Medical students and interns are future HCWs and need to be aware of the high-risk cases during pandemics. The national program is best mitigated at the local level, and medical schools can play an important role in educating their students, thereby helping them to manage their own lives and possibly others in the community. The initial response of Nepal was slow, but given the weak health system and porous borders with India, plans for lockdown and quarantine were implemented as the virus continued to spread.¹⁵

As per the guidelines by WHO and Ministry of Health and Population in Nepal, suspected cases with a high risk of infection, e.g. highly mobile population, returnees from other countries or high-transmission areas, or contacts of the confirmed cases, or people from high-risk zone, or suspected of having COVID-19 and symptomatic persons were prioritized for testing and contact tracing.¹⁶ Nepal has established 40 laboratories across the country for COVID-19 PCR testing.¹⁷ However, adequate testing and tracing have been a challenge in Nepal. Quarantine and restrictive measures, together with prevention

and control, and specialized centers for COVID-19 patients have been successful in the management and control of COVID-19 in China and other Asian countries; unlike in Europe and America.¹⁸ This reflects the need of optimizing the knowledge and resources in a planned and coordinated policy approach. During this pandemic, stress and anxiety have been reported among medical students and HCWs, raising the need for proper guidance and counseling. During the shut-down, medical students and as many as 1/3 of HCWs on COVID-19 duty in Nepal suffered anxiety and/or depression.^{9,10,19} Thus, it is of utmost importance that medical students and interns be briefed and made aware to care for themselves and the community in times of disasters, like the ongoing COVID-19.

On the practice of hand-washing, the majority (95%) of the 200 participants in the present study had an adequate level of knowledge. Hand hygiene is an important aspect in the prevention and control of transmission of COVID-19. Studies have proven that handwashing with soap water for 20 seconds or use of 70% alcohol-based sanitizers are effective to kill the virus and prevent transmission.^{20,21} Soap can achieve this goal via inactivation of the virus by its action on the lipid layer, and a cleansing action by lowering the surface tension of water.

Medical students and interns should be aware of strategic planning and management for the vulnerable population in the community. Non-communicable chronic diseases like diabetes, Chronic Obstructive Pulmonary Disease (COPD) are known to weaken the immune system; increasing the morbidity and mortality from COVID-19.²²⁻²⁴ Unlike children who are less affected and have mild symptoms with a shorter course of the disease, the elderly are more impacted by COVID-19.^{25, 26} There is a need for specific interventions to meet the requirements of elders for assisted living environments to maintain good health, and survive the disaster like coronavirus pandemic.²⁷

The majority of medical students and interns, 95% out of 200 participants in the present study, knew about the precautionary measure applied during aerosol-generating procedures (AGPs). We found that the majority of medical students and interns (97.5%) were aware that improper doffing of PPE after a procedure of COVID-19 case may transmit the virus in the form of an aerosol. Improper doffing of PPE produces a virus-containing aerosol that can contaminate others in the room, and thus training for donning and doffing protocol is important. The procedure which includes reaming, burring, hammering, drilling, use of electrocautery, and pulsatile lavage, can produce a high concentration of aerosol, e.g., during orthopedics surgery. Thus, adequate measures are important to prevent transmission and infection during such procedures. Most orthopaedic surgeons perceive AGPs as a high-risk procedure, and thus extra care should be placed while doffing of PPE.²⁸

This study found that the majority (98%) of 200 participants knew about PCR testing for case-detection of COVID-19. The SARS-CoV-2 virus has an incubation period of 2-14 days, and although PCR is most sensitive within 2-7 days of contact, the possibility of transmission from an asymptomatic carrier remains a risk. Moreover, poor sampling technique, improper handling of samples, etc. contribute to the RT-PCR results.²⁹ Regarding the use of antibiotics, 1/3^d responded wrongly for its use for coronavirus. But, a majority (98%) correctly mentioned a lack of specific treatment and were aware (96.0%) of COVID-19 treatment guidelines developed for healthcare professionals in Nepal. In contrast, another study from Nepal found that only 31% of respondents were aware of such guidelines.⁷ The discrepancy between these 2 studies could be because the latter study included all medical and dental students from first to final year. An online survey on knowledge regarding COVID-19 reported a low response rate from 181 (25%) out of 724 HCWs including medical, dental, nursing, and allied health sciences from a medical college in central Nepal. This study found adequate knowledge regarding

pandemic in only 41 (22.7%).⁸ Travel history where COVID-19 has been detected is important, as reported in a study on clinical characteristics of suspected cases admitted to the isolation ward in a hospital.³⁰ These findings support the need for more educational interventions regarding COVID-19.

On the perception, nearly 2/3rd (63%) of participants believed that COVID-19 was not fatal, yet the majority (90%) believed that they should not go for postings in a hospital without a clear control policy. This is an area of concern and may reflect the attitude of the population in Province-2 in control and prevention measures. Medical students are at risk themselves and also a potential vector because they require frequent rotations in various departments in the hospitals. For final year medical students and interns, a reduced clinical exposure due to readjustment or cancellation of regular programs or shifting to online learning during pandemic poses a concern and is an area of research.^{14,31} The role of medical students and their involvement during such pandemics has been a subject of debate. This is because of unnecessary exposure of risks to students themselves, or patients as well as other clinicians, which cannot merely be justified in the name of medical education. But on the other hand, students' clinical roles early in the pandemic may prepare them better than to wait for a crisis and have them fill in for the shortage of HCWs.³¹⁻³⁴

The majority of 200 participants (88.5%) felt that they were supported by their family to work in a hospital during the pandemic. Similarly, a study from Pakistan found that the majority of HCWs had a positive attitude and perception (88.7%) towards COVID-19. The hospital incident command system is an important pillar in the management of disasters like coronavirus pandemic, as reported by Patan Hospital, Nepal.³⁵ The perception and understanding regarding COVID-19 among doctors in this hospital revealed that areas of case definition, transmission classification, diagnostic tests need to be reinforced.³⁶ Having separate

emergencies, non-COVID and COVID, and a system for primary and secondary triage is important.³⁷ With community transfer and an increasing number of cases, hospitals need to have a surge plan, and willingness of doctors to work in demanding environments.³⁸ Hospitals also need to have in place health information and intelligence center for collecting the right information at the right time to deliver it to the right target as a part of the hospital incident command system.³⁹ Community involvement, for example, innovation and supply of material like PPE to mitigate the growing shortages is important.⁴⁰ Doctors and nurses have reported positive attitude and good practice which is useful for behavioral changes and promotion of safe practices for maternity care.⁴¹ The changing case definition from sporadic cases to community transmission requires awareness and adaptation plan to deal with the rapid transmission of COVID-19.⁴² These issues are helpful and should be included in the teaching and training of medical students and interns to help them grow and to embrace challenges required for HCWs to lobby for the strategic planning in the society.

Some of the limitations of this study may be changing information regarding the COVID-19 pandemic as new findings emerge on the protocols and recommendations. Still, this study reflects an overview during a period of the survey regarding knowledge and perception of medical students and interns in Province-2 which may be helpful in strategic planning to manage the disaster situation like the current coronavirus pandemic.

Conclusion

The majority of the final year students and interns from two medical colleges in Province-2, Nepal, had an adequate level of knowledge and good perceptions regarding COVID-19. The important pillars of breaking the transmission chain which include hand hygiene, and precautionary measures like training on donning and doffing of PPE, and Polymerase Chain Reaction test for case-detection were well appreciated, and are crucial in the management of a pandemic like COVID-19.

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Conflict of Interest

None

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Author Contribution

Concept, design, planning- JNS, BP, Sushma, Sabita, Jenifei; Literature review JNS, Sushma; Data collection/analysis:BP,Sushma. Draft manuscript: JNS, Sushma, BP, Sabita, Jenifei. All authors approved the final manuscript.

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Supplement

Proforma

An information sheet provided with the questionnaire in the Google form

Namaste!

You are most welcome. We are conducting this research to find out the “Knowledge and perceptions among final year undergraduate medical students and interns toward coronavirus disease 2019 (COVID-19) in Province 2, Nepal. We assure you that the information provided by you is strictly confidential and will only be used for this research.

Purpose of the Research- This research aims to assess the information that will be of benefit in the future planning for the benefit of medical students which will ultimately benefit society to better manage pandemic like COVID in Province 2 Nepal

Research Methods- In this research, we will ask you to fill out an online questionnaire form, which will take about 10 to 12 minutes to finish.

Confidentiality- If you agree to the survey, please go ahead we are not collecting personal identification details; as the Google form is self-coded.

Ethical Approval of the study has been taken from the IRC-Patan Academy for Health Sciences.

Questionnaire

A. Socio-demographic profile

1. Name of the college
 - a) Janaki Medical College, Janakpur
 - b) National Medical College, Birgunj
2. Gender
 - a) Female
 - b) Male
3. Level of Education (Undergraduate medical school)
 - a) Final year
 - b) Intern
4. Place of stay since lockdown
 - a) Home
 - b) With friends
 - c) Hostel
5. Infected with COVID-19 since the pandemic.
 - i. Self
 - a) Yes
 - b) No
 - ii. friends
 - a) Yes
 - b) No
 - iii. Relative
 - a) Yes
 - b) No
 - iv. family members
 - a) Yes
 - b) No

B. Knowledge on COVID-19:

1. COVID-19 is caused by the novel coronavirus (Severe Acute Respiratory Syndrome coronavirus 2)
 - a) Yes b) No c) Don't know
2. The most common symptoms of COVID-19 are
 - i. Fever a) Yes b) No c) Don't know
 - ii. dry cough a) Yes b) No c) Don't know
 - iii. headache a) Yes b) No c) Don't know
3. Less common symptoms of in COVID-19
 - i. tiredness a) Yes b) No c) Don't know
 - ii. diarrhea a) Yes b) No c) Don't know
 - iii. smell a) Yes b) No c) Don't know
 - iv. difficulty in breathing a) Yes b) No c) Don't know
 - v. Sneezing a) Yes b) No c) Don't know
 - vi. runny nose a) Yes b) No c) Don't know
 - vii. stuffy nose a) Yes b) No c) Don't know
4. Hand hygiene must be practiced
 - i. visiting a public place a) Yes b) No c) Don't know
 - ii. blowing your nose a) Yes b) No c) Don't know
 - iii. coughing a) Yes b) No c) Don't know

- iv. touching surfaces a) Yes b) No c) Don't know
- v. caring for a sick person a) Yes b) No c) Don't know
- 5. The minimum concentration of alcohol in hand sanitizers to kill the virus should be 70%.
a) Yes b) No c) Don't know
- 6. The majority of COVID-19 infected patients will not develop severe illness but elderly patients having a chronic illness like Diabetes Mellitus, Chronic Obstructive Pulmonary Disease (COPD), etc. are likely to develop severe illness.
a) Yes b) No c) Don't know
- 7. One should take precautionary measures during aerosol-generating procedures like endotracheal intubation, noninvasive ventilation, tracheostomy, cardiopulmonary resuscitation, etc. on COVID-19 patients
a) Yes b) No c) Don't know
- 8. Currently, there is no specific treatment for COVID 19, the early symptomatic and supportive treatment can help most of the patient recover from infection
a) Yes b) No c) Don't know
- 9. Training for donning and doffing of full PPE is required
a) Yes b) No c) Don't know
- 10. Asymptomatic carriers can spread the coronavirus disease
a) Yes b) No c) Don't know
- 11. Polymerase Chain Reaction (PCR) is the recommended test for active case detection of COVID-19 infection
a) Yes b) No c) Don't know
- 12. COVID-19 treatment guidelines have been developed for healthcare professionals by the Health ministry in Nepal.
a) Yes b) No c) Don't know
- 13. Mild cases of COVID-19 improve in a few days on their own and need to be isolated to curb transmission
a) Yes b) No c) Don't know
- 14. Antibiotics are the treatment of choice for COVID-19
a) Yes b) No c) Don't know
- 15. Remdesivir antiviral drug is still in a clinical trial for COVID-19.
a) Yes b) No c) Don't know

C. Perception related questions:

- 1. Do you think COVID-19 is fatal?
a) Yes b) No c) Don't know
- 2. Do you think the preparedness in your institution is sufficient to manage the COVID-19 outbreak?
a) Yes b) No c) Don't know
- 3. Should the patient share their recent travel history with healthcare providers?
a) Yes b) No c) Don't know
- 4. Do you think symptoms of COVID-19 often resolve in time and not require any special treatment?
a) Yes b) No c) Don't know
- 5. Do you think current medical supplies and PPE are sufficient for the possible COVID-19 outbreak in your community?
a) Yes b) No c) Don't know
- 6. You should not go for any postings in a hospital without a clear COVID-19 infection control policy during this pandemic.
a) Yes b) No c) Don't know
- 7. Do you think Nepal could win the battle against COVID-19?
a) Yes b) No c) Don't know
- 8. Does your family support you to work in hospitals during a pandemic?
a) Yes b) No c) Don't know
- 9. Are all the doctors from various departments actively involved in COVID-19 pandemic response?
a) Yes b) No c) Don't know

-X-