

Knowledge about COVID-19 among university students before the implementation of the enhanced community quarantine in Philippines

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ABSTRACT

The purpose of this study was to determine the knowledge of the students about Coronavirus Disease-2019 (COVID-19) before the Philippines government implements the enhanced community quarantine in Luzon. A descriptive research design was conducted among the students of Nueva Ecija University of Science and Technology, San Isidro Campus. The sample size was computed by using the Epi-Info version 2000 Computer Programme. Questionnaire was used to collect data that was composed of the profile, questions regarding their knowledge about COVID-19 and their source of knowledge. Permission to conduct and informed consent was obtained before the respondent answer the questionnaire. Data were analyzed using various statistical tools. Majority of the respondents had an average and good knowledge while sex was the only variable that differs significantly in their knowledge about COVID-19. Social media and seminars in the school were among their primary source of knowledge. It is concluded that students' knowledge about COVID-19 was sufficient. However, the absence of vaccines against COVID-19, prevention and control of the disease was the only way to fight it which requires organizing health education campaigns in different communities to disseminate more information on how everybody can effectively deal with this pandemic.

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1. INTRODUCTION

Coronaviruses are a large family of viruses that are commonly found in the community and can be transmitted through birds and mammals [1]. COVID-19 caused by the new coronavirus is a new disease, that has not previously been seen in humans and is not the same as the coronaviruses that commonly circulate among humans and cause mild illness, like the common cold. The virus that causes COVID-19 was formerly known as “2019-nCoV or 2019 novel coronavirus” and was then called as syndrome coronavirus 2 (SARS-

CoV-2) by the International Committee on Taxonomy of Viruses (ICTV) [2]. It was believed that the infections originate in Wuhan, one of the major transport hubs in China [3]. There is a probability that the virus that causes COVID-19 come out from an animal source [4]. The first case was uncovered by Chinese state media on the 31st of December after 44 individuals in Wuhan were confirmed to be infected. It was first referred to as “mystery viral pneumonia,” as infected people have flu-like symptoms. Strict screening measures for people moving out in the city were implemented by Wuhan officials [5]. The first mortality due to COVID-19 was a 61-year-old man exposed to the seafood market [6]. As of January 2020, there were confirmed cases in all regions of China. COVID-19 also extended in other countries which include South Korea, Japan, the Philippines, and the US, with most cases confirmed had traveled in Wuhan, China [7].

On January 30, 2020, the International Health Regulations Emergency Committee of the World Health Organization declared the outbreak a “Public Health Emergency of International Concern” [6, 8]. On February 2, 2020, in the middle of the continuous increase of death in China, the first death outside China was reported in the Philippines which is a Chinese man from Wuhan. On the eleventh day of March 2020, WHO characterized COVID-19 as a pandemic where 114 countries around the world were affected. Pandemic is an outbreak of disease globally. It happens when a new virus emerges to infect people and can spread between people sustainably [8].

As of March 11, 2020, more than a hundred thousand COVID-19 cases were recorded and more than four thousand deaths, according to the Johns Hopkins Whiting School of Engineering's Centers for Systems Science and Engineering. Italy, which has seen its outbreak worsen in recent days, now has 10,149 cases [9]. The Philippines reported 3 new confirmed cases on March 12, making the total number of infected to 52. Of the 52 patients-two deaths were recorded: a 44-year-old Chinese man who traveled to the Philippines from Wuhan, China, and a 67-year-old Filipina woman with no travel history outside the country and the Philippines' first local fatality due to COVID-19 [10]. Because of the pandemic, the Philippines imposes the travel ban to all countries which have localized transmission of the viral disease. The entry of people from countries with local transmissions will be prohibited, except for Filipino citizens, their foreign spouse, and children, permanent residents, and holders of diplomatic visas. The World Health Organization identified that 65 countries, including the Philippines, South Korea, Japan, and the US, have local transmissions of the viral disease [11].

COVID-19 patients may have mild to severe respiratory illness with symptoms such as fever, cough and shortness of breath. As of now, there is no specific antiviral treatment or vaccine to protect against COVID-19. The best way to prevent infection is to avoid being exposed to the virus which can be done by avoiding close contact with people who are sick. Washing hands often with soap and water for at least 20 seconds and the use of an alcohol-based hand sanitizer can also prevent an individual to be exposed to the virus. To keep someone who is exposed and suspected to have COVID-19 from spreading it to others, he/she should stay home when sick, cover cough or sneeze with a tissue, then throw the tissue in the trash and clean and disinfect frequently touched objects and surfaces [4].

The battle against the COVID-19 pandemic is continuing in the Philippines. To beat this pandemic, the participation of all individuals is essential and their knowledge is one that is affected [12]. The SARS outbreak in 2003 taught people around the world that knowledge towards infectious diseases has something to do with their emotions which can further complicate attempts to prevent the spread of the disease [13]. Also, [14] states that face-to-face health education on knowledge for a certain infectious disease can improve their awareness and gives a positive effect on their health education towards the control and prevention of the said diseases. Since face-to-face discussion is not an option nowadays, social media become an alternative way of educating the public since important information are readily available, especially in times when timely information is critical, e.g., during health crisis like COVID-19 pandemic [15]. With this, health authorities are maximizing this opportunity to disseminate timely and critical information especially during the time of pandemic the whole world is dealing with [16, 17].

Knowledge regarding this pandemic is associated with positive attitudes and applicable practices suggesting that health education programs aimed at improving COVID-19 knowledge help encourage optimistic attitudes and maintain safe practices [18]. However, [19] state that better knowledge does not necessarily lead to better practice. Thus, everyone must gain the best knowledge and information as possible to efficiently face this pandemic. When every individual was equipped with sufficient knowledge about COVID-19, the battle against this unseen enemy will soon be over. Therefore, to determine if everyone especially those whose age was below 20 and were considered vulnerable to this pandemic, it is necessary to assess their knowledge about COVID-19. Evaluating their knowledge about COVID-19 will help the health authorities to address common concerns related to COVID-19. Thru the collective effort and participation of everyone, the fight in this contagion will soon be over. This study specifically aimed to determine the knowledge of the students of Nueva Ecija University of Science and Technology San Isidro Campus about COVID-19, the difference among their various socio-demographic factors and their source of knowledge. Findings from this study would provide useful baseline information about the present knowledge of the respondents about COVID-19.

2. RESEARCH METHOD

Descriptive quantitative research design was used to assess the knowledge of the students before the implementation of the enhanced community quarantine regarding COVID-19 and was conducted in Nueva Ecija University of Science and Technology, San Isidro Campus, which is located at the province of Nueva Ecija, at the heart of municipal of San Isidro. It was initiated in January 2020 and completed in March 2020 before the Philippine government put the entire Luzon under Enhanced Community Quarantine due to the local transmission of the said disease. Epi-Info version 2000 Computer Programme was used to compute the sample size. An error of 2.5%, a 5% level of significance, and a 95% confidence interval allowed indicate that a sample size of 500 subjects would be required to complete the objectives of our study. The target population was students of all programs and year level. Out of 500 respondents approached, only 481 participate and provided consent to participate in the study.

The questionnaire made by [20] for SARS and [21] for the Dengue virus was adapted for the study. The questionnaire was revised for content and wording following an extensive review of the literature published and expert opinions. The questionnaire was made up of three main parts: the first part consists of questions regarding socio-demographic status (sex, type of residence, highest educational attainment and occupation of parents and monthly income; the second part is about their knowledge about COVID-19 was comprised of the general knowledge, transmission, sign and symptoms and prevention of COVID-19. The last part was about the source of knowledge where the respondents obtained their information about COVID-19. Before the questionnaire was used in the main study, it was pre-tested among the students of the said campus which were not included in the final analysis. Cronbach's Alpha [22] was used to assess the reliability coefficient which is a measure of the internal consistency of the questionnaire. The result showed that Cronbach's Alpha coefficients were 0.96. The acceptable minimum value of reliability was 0.7 [23, 24]. During the distribution of the questionnaires, a certain precautionary measure such as social distancing, use of face mask, and disinfection was done. Permission was sought to the Campus Director and informed consent was given first before the respondent answer the questionnaire. Adequate time was given and voluntary participation was highlighted. The anonymity of the subjects and confidentiality of information was maintained and assured that the study will not harm the participants in any way.

All completed questionnaires were double-checked and verified for completeness and consistency. The data was then entered in Microsoft Excel and statistical packages for social sciences (SPSS). The responses to the knowledge questions were coded with one (1) for correct answers and zero (0) for incorrect and "do not know" answers, with a maximum of 10 points for each category and 40 overall. The response was defined as correct if it was valid. "Do not know (DNN)" responses are equivalent to wrong answers which is a conventional practice as responses either come from the least knowledgeable respondents or the vast majority of those saying "DNN" really do not know [25]. Treating "DNN" as a wrong answer appears reasonable and justifiable in the study although it is a conservative strategy [26]. In contrast, dropping "DNN" responses from the data set reduces the sample size, may introduce sample selection bias and result in a serious loss of information [26]. Hence, it was not excluded "DNN" in the analyses. Further, knowledge for each category and the overall knowledge of students was calculated in percent, and the level of knowledge was classified as Very Poor (<20%), Poor (21-40%), Average (41-60%), Good (61-80%), and Very Good (81-100%) based on 20% cut-off point. For instance, with a total of 40 questions for overall knowledge, a respondent obtaining scores between 40 and 32 was categorized as having very good knowledge, scores between 31 and 24 have good knowledge, scores between 23 and 16 have average knowledge, scores between 15 and 8 have poor knowledge and scores between 7 and 0 have very poor knowledge. For the 10 questions for each category, a respondent securing score between 10 and 9 were categorized as having very good knowledge, scores between 8 and 7 have good knowledge, scores between 6 and 5 have average knowledge, scores between 4 and 3 have poor knowledge and scores between 2 and 0 have very poor knowledge. For the socio-demographic profile, frequency and percentage were computed. Other statistical tools used were One-way Analysis of Variance (ANOVA) Single Factor and T-test for two sample assuming unequal variances to determine whether significant differences existed in their profile concerning their level of knowledge regarding COVID-19.

3. RESULTS AND DISCUSSION

3.1. Socio-demographic profile of the respondents

A total of 481 respondents were selected to participate in a study consisting of 270 (56.10%) females and 211 (43.90%) males. Many of them or 438 (91.10%) were residents of a rural area and their father or 224 (46.6%) and mother or 218 (45.30%) were High School graduates. Many of the occupations of their father or 185 (38.5%) and mother or 173 (36%) were unskilled. The majority of them or 191 (39.70%) had a family monthly income below P7890.00 as shown in Table 1.

Table 1. Socio-demographic profile of the respondents

Socio-demographic profile	Frequency (f)	Percentage(%)
Sex		
Male	211	43.90
Female	270	56.10
Residence		
Rural	438	91.10
Urban	43	8.90
Educational attainment of father		
College	174	36.20
High school	224	46.60
Elementary	83	17.30
Educational attainment of mother		
College	180	37.40
High school	218	45.30
Elementary	83	17.30
Occupation of father		
Professional	62	12.90
Skilled	183	38.00
Unskilled	185	38.50
Unemployed	51	10.60
Occupation of mother		
Professional	86	17.90
Skilled	86	17.90
Unskilled	173	36.00
Housewife	136	38.30
Monthly gross family income		
P7,890 and below	191	39.70
P7,891-P 15,780	144	29.90
P15,781-P31,560	120	24.90
P31,561-P78,900	15	3.10
P P78,900 and above	11	2.30

3.2. Knowledge of the respondents regarding COVID-19

Results showed that very good knowledge was found in 4 (0.83%) respondents, good in 111 (23.08%), average in 307 (63.83%), poor in 49 (10.19%), and 9 (0.02%) respondents had very poor knowledge regarding COVID-19. The present study reveals that the majority of the respondents had average and good knowledge about COVID-19. According to [27], most of the respondents' level of knowledge about COVID-19 was between averages to good knowledge because their awareness as social responses simultaneously appeared as an epidemic develops. Raising the level of knowledge in all aspects of diseases like COVID-19 which includes its origin, transmission, signs and symptoms and prevention could not only help the general population protect themselves, but also promote those suspected from being infected to seek medical help early and treat more completely as shown in Table 2 [28].

Table 2. Knowledge scores of the respondents regarding COVID-19

Socio-demographic profile	Criteria	Frequency (f)	Percentage (%)
Very good	32-40	4	0.83
Good	24-31	111	23.08
Average	16-23	307	63.83
Poor	8-15	49	10.19
Very poor	0-7	9	0.02

3.3. Knowledge of the respondents regarding COVID-19 in different category

In terms of their mean score regarding their general knowledge about COVID-19, the result revealed that many or 388 (80.80%) of them got the correct answer on item statement 1 "2019-nCoV belongs in a large family of viruses called coronavirus". However, only a quarter or 118 (24.60%) of the respondents answered correctly the item statement 2 "2019-nCov is the same virus that causes Severe Acute Respiratory Syndrome". Most of them had a wrong answer because they mistakenly perceived that the pathogen that causes COVID-19 and SARS was the same as shown in Table 3.

Their knowledge about the transmission of COVID-19 showed that majority or 411 (85.60%) of them got the correct answer on item statement 1 "COVID-19 can be transmitted from person to person, usually after close contact with an infected patient". However, most or 392 (81.70%) of them got the wrong answer in statement 8 that companion animals or pets have been infected or have spread COVID-19" as shown in Table 4.

Their knowledge about the sign and symptoms of COVID-19 revealed that more than three parts or 365 (76%) of the respondents got the correct answer on item statement 3 “Cough is one of the symptoms of COVID-19”. Meanwhile, more than three parts or 361 (75.20%) of the respondents got wrong answers in statement 10 “The sign and symptoms of COVID-19 will appear before the incubation period” as shown in Table 5.

Table 3. Mean scores of the respondents regarding their general knowledge about COVID-19

Item statements	Mean score/ S.D.	Correct answer		Wrong answer	
		F	%	F	%
1. 2019-nCoV belongs to a large family of viruses called coronavirus.	0.81±0.39	389	81.00	91	19.00
2. 2019-nCov is the same virus that causes Severe Acute Respiratory Syndrome or (SARS-COV).	0.25±0.43	118	24.60	362	75.40
3. A novel coronavirus is a new strain of coronavirus and had not previous by detected before the outbreak was reported in Wuhan, China in December 2019.	0.81±0.39	388	80.80	92	19.20
4. It is safe to receive a package from China or any other place where the virus has been identified.	0.43±0.69	194	40.50	286	59.50
5. Infection with 2019-nCov can cause mild symptoms and can lead to pneumonia.	0.63±0.48	189	39.40	291	60.60
6. Antibiotics are effective in treating COVID-19.	0.39±0.49	388	80.80	92	19.20
7. COVID-19 can be more severe and fatal for some persons.	0.61±0.49	294	61.20	186	38.80
8. The incubation period of 2019-nCov could be up to 24 to 48 hours.	0.39±0.49	187	39.00	293	61.00
9. Preliminary information suggests that 2019-nCov may survive a few hours or home on surfaces.	0.41±0.49	195	40.60	285	59.40
10. The new coronavirus was deliberately created or release by people.	0.37±0.48	176	36.70	304	63.30

Legend: f = frequency, % = percentage, S.D. = standard deviation

Table 4. Mean scores of the respondents regarding their knowledge about the transmission of COVID-19

Item statements	Mean score/ S.D.	Correct answer		Wrong answer	
		F	%	f	%
1. COVID-19 can be transmitted from person to person, usually after close contact with an infected patient.	0.86±0.35	411	85.60	69	14.40
2. 2019-nCov spread through respiratory droplets generated when a person cough or sneeze.	0.81±0.39	389	81.00	91	19.00
3. People who have symptoms of COVID-19 are causing the majority of virus spread.	0.81±0.39	390	81.20	90	18.80
4. The consumption of undercooked animal products can transmit COVID-19.	0.73±0.45	348	72.50	132	27.50
5. Health workers are at higher risk of getting infected by COVID-19.	0.63±0.48	324	67.80	154	32.20
6. Someone who has been released from COVID-19 quarantine is still considered a risk for spreading the virus to others.	0.29±0.45	137	28.50	343	71.50
7. 2019-nCov is an airborne virus that can spread through the air.	0.31±0.46	148	30.80	332	69.20
8. At present, there is evidence that companion animals or pets such as cats and dogs have been infected or have spread COVID-19.	0.18±0.39	88	18.30	392	81.70
9. Covering your mouth and nose when coughing and sneezing does not prevent the spread of the virus.	0.33±0.47	156	32.50	324	67.50
10. A simple cough or sneeze n to your hands is not enough to contaminate objects or people that you touch.	0.35±0.48	166	34.60	314	65.40

Legend: f = frequency, % = percentage, S.D. = standard deviation

Table 5. Mean scores of the respondents regarding their knowledge about the sign and symptom of COVID-19

Item statements	Mean score/ S.D.	Correct answer		Wrong answer	
		F	%	f	%
1. Fever is one of the symptoms of COVID-19.	0.75±0.43	359	74.90	121	25.10
2. Shortness or difficulties in breathing is one of the symptoms of COVID-19.	0.54±0.50	262	54.50	218	45.50
3. Cough is one of the symptoms of COVID-19.	0.76±0.43	365	76.00	115	24.00
4. Sore throat is one of the symptoms of COVID-19.	0.68±0.47	327	68.30	152	31.70
5. People who show imaging features of coronavirus on x-ray or CT scan are none likely to be infected.	0.32±0.47	155	32.20	325	67.80
6. Travelers from places where the outbreak locations are more likely to have the infection.	0.64±0.48	305	63.40	174	36.30
7. Confirmatory tests for COVID-19 are not required if the patient has flu-like symptoms.	0.38±0.48	180	37.50	300	62.50
8. The symptoms may appear 48 hours after exposure.	0.26±0.44	127	26.50	353	73.50
9. Muscle pain is not a symptom of COVID-19.	0.32±0.47	153	31.90	327	68.10
10. COVID-19's sign and symptoms will appear before the incubation period.	0.25±0.43	119	24.80	361	75.20

Their knowledge about the prevention of COVID-19 showed that most or 384 (37.70%) of the respondents know that wearing a face mask can help limit the spread of COVID-19. Statements which includes the sign and symptoms of COVID-19 will appear before the incubation period and using essential

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oils, water, ethanol or other substances can prevent one of having COVID-19 were not answered by the respondents correctly maybe due to lack of information. Everyone must know all the facts of this pandemic. According to [29], it is important to provide health education and create awareness during such situations for effective prevention of the spread of disease as shown in Table 6.

Table 6. Mean scores of the respondents regarding their knowledge about the prevention of COVID-19

Item statements	Mean score/ S.D.	Correct answer		Wrong answer	
		F	%	f	%
1. Washing hands frequently with soap and water eliminates the virus if it is on your hands.	0.76±0.42	367	76.50	113	23.50
2. Maintain at least 1-meter (3-feet) distance between yourself and other people.	0.74±0.44	354	73.70	126	26.30
3. Wearing a medical mask can help limit the spread of COVID-19.	0.80±0.40	384	80.20	95	19.80
4. If you have a fever, cough, and difficulty breathing, seek medical care early.	0.77±0.42	371	77.30	109	22.70
5. Clean and disinfect frequently touched objects and surfaces.	0.74±0.44	355	74.00	125	26.00
6. Using medical mask alone guaranteed to stop infections.	0.34±0.47	161	33.50	319	66.50
7. Taking acetic acid or steroids can protect you from having COVID-19.	0.34±0.47	163	33.70	317	66.30
8. Using essential oils, water, ethanol or other substances can prevent you from having COVID-19.	0.28±0.49	133	27.70	347	72.30
9. Taking traditional herbal tea can help prevent COVID-19.	0.29±0.45	139	29.00	341	71.00
10. Do not use alcohol-based because it cannot eliminate the virus in your hands.	0.45±0.50	215	44.90	264	55.10

3.4. Difference between the profile of the respondents to their knowledge about COVID-19

Results revealed that males had a mean score of 21.42 ± 5.35 which was higher than the mean score of females which was 20.19 ± 4.97 . The difference between the sex (p-value= 0.006) to their overall knowledge about COVID-19 was significant. The study of [30, 31] was in contrast to the result of the study since males had a higher mean score than females. In the study of [30] about gender differences in health literacy about tuberculosis (TB) which is also an infectious disease like COVID-19, [30] noted that females were more aware than males. Gender is a significant factor affecting infectious disease prevention behavior of students. One probable reason for their difference was that female was more delicate than male and giving more attention to personal health care [31]. Also, [32] noted that men often are unwilling and lack the motivation to engage with health-related information both in times of stressful life events and in everyday life. Also, women gain more information and may spend more time watching TV programs [33]. The other variable had no significant difference in their overall knowledge about COVID-19 as shown in Table 7.

Table 7. Difference between the profile of the respondents and their knowledge scores regarding COVID-19

Socio-demographic profile	Knowledge scores mean \pm S.D.	Percentage(%)
Sex		
Male	21.42 \pm 5.35	0.0061*
Female	20.19 \pm 4.97	
Residence		
Rural	20.81 \pm 4.82	0.2047
Urban	19.84 \pm 5.39	
Educational attainment of father		
College	20.18 \pm 4.93	0.5060
High school	20.93 \pm 4.40	
Elementary	20.72 \pm 5.38	
Educational attainment of mother		
College	20.65 \pm 4.87	0.1904
High school	20.33 \pm 4.61	
Elementary	21.22 \pm 5.16	
Occupation of father		
Professional	21.15 \pm 4.54	0.4133
Skilled	21.07 \pm 4.71	
Unskilled	20.38 \pm 5.17	
Unemployed	20.24 \pm 4.76	
Occupation of mother		
Professional	21.32 \pm 4.03	0.1412
Skilled	20.62 \pm 4.48	
Unskilled	20.10 \pm 5.36	
Housewife	21.20 \pm 4.91	
Monthly gross family income		
P7,890 and below	20.30 \pm 4.84	0.3969
P7,891-P 15,780	20.94 \pm 4.97	
P15,781-P31,560	21.22 \pm 5.05	
P31,561-P78,900	19.53 \pm 3.80	
P P78,900 and above	21.45 \pm 3.27	

In terms of their source of knowledge about COVID-19, the result showed that the topmost source or 437 (91%) of them get information from the seminar from the school and social media. The least source of knowledge was from observation and personal experience. Today, social media such as Twitter, Facebook and Instagram, have become primary sources of information [15]. That the roles of social media played during a pandemic were as a source of information and can influence public response to the outbreak [34]. Moreover, majority of the available information available was in the English language making it more comprehensible for the respondents since they learn better when the medium of language used was English [35]. Besides, [36] state that conducting school health education like seminars in the school can effectively slow the spread of infectious disease and provides students with right knowledge and behavior toward infectious diseases like COVID-19 as shown in Table 8.

Table 8. Source of knowledge of the respondents about COVID-19

Item statements	Yes	Percent
1. from news and reports from the television	425	88.50
2. from radio	420	87.50
3. awareness campaign in your community	431	89.80
4. from your teacher	422	87.90
5. from your relatives	424	88.30
6. from observation and personal experiences	413	86.00
7. from newspaper	427	87.00
8. from seminar awareness in your school	437	91.00
9. from social media	437	91.00
10. from your friends	431	89.80

4. CONCLUSION

It was concluded that the majority of the respondents had average and good knowledge regarding COVID-19 and the only socio-demographic profile that differ significantly in their overall knowledge was sex. Last, social media and seminars in the school were among the primary source of knowledge or information about COVID-19. In the absence of an effective vaccine for COVID-19, the prevention and control of the disease mainly depended upon the epidemiological surveillance and implementation of effective health protocol measures such as social distancing, wearing of face mask, and frequent washing of hands with water and soap. Therefore, organizing health education campaigns in different communities is necessary to disseminate more information on how everybody can effectively deal with this pandemic.

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