The knowledge, attitudes, and practices of a Philippine university students towards COVID-19 during the enhanced community quarantine

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Abstract *- The first cases of the novel coronavirus disease COVID-19 were confirmed in the Philippines as early as January 2020. By March 2020, Metro Manila was placed under an enhanced community quarantine (ECQ) for the first time from March 17 to May 31, 2020. This study aims to determine the level of knowledge, attitudes, and practices (KAP) of students in a state university towards COVID-19 during the first ECQ. An online survey was conducted from April 5 to May 5, 2020, during the ECQ. The tool used was designed to collect students' KAP towards COVID-19. About six hundred fifty-eight (658) respondents participated in the online survey. The students were highly aware of the information about the severity, symptoms, transmission, and preventive measures of COVID-19. The students also strongly agreed with the preventive practices (i.e., quarantine, hygiene, social distancing, etc.). Exceptional practice scores were observed among female respondents, especially in items related to hygiene. Student respondents agreed with the attitudes expected in a calamity such as the pandemic. Most of the KAP items were found independent of the respondent's age. This paper shows a high level of KAP among students in a Philippine state university. Health agencies are encouraged to update the knowledge on COVID-19 to improve attitudes and preventive practices of students as the world prepares for future surges of the disease.*

Keywords *- Attitudes, COVID-19, knowledge, practices, quarantine, students*

INTRODUCTION

COVID-19, also known as the Coronavirus disease of 2019, has been declared a pandemic by the World Health Organization [1]. This disease is caused by a new coronavirus first reported in patients with pneumonia in Wuhan, China, in December 2019. The disease symptoms include fever, dry cough, fatigue, myalgia, and dyspnea [2]-[4]. In the Philippines, the first confirmed case was reported on January 30, 2020, from a 38-year-old female Chinese tourist [5]. By March 2020, local transmission of COVID-19 in the Philippines was confirmed, and the country, including Metro Manila, was placed under a "community quarantine" [6]. With the growing number of cases, it escalated the community quarantine to the "enhanced community quarantine (ECQ)" in Metro Manila and the entire Luzon Island, which started on March 17, 2020 [7]. The ECQ in Metro Manila was eased on May 16, 2020 (61 days), reverting the quarantine policy to the 'modified, enhanced community quarantine (MECQ) [8,9] and later to 'general community quarantine' (GCQ) in June 2020 [10]. The ECQ is the highest level of quarantine synonymous with a "total lockdown" imposed by the Philippine government to mitigate the surge of COVID-19 cases in the country.

In the academic sector, class suspensions started as early as March 9, 2020, in compliance with the community quarantine imposed by the government. Educational institutions in the country conduct classes online, correspondence, and blended learning modes following the quarantine guidelines [11]. The success of the quarantine policies to avert the growing number

of cases is yet to be seen. It has linked compliance with the control measures with the improved knowledge, attitudes, and practices (KAP) of individuals in disease-afflicted communities [12,13]. The panic adversely affected the knowledge and attitudes of individuals experiencing disease outbreaks, aggravating compliance to disease control measures [14,15]. This paper describes students' knowledge, attitudes, and practices (KAP) toward COVID-19 in a Philippine state university. The findings in this study could be utilized in designing information campaigns for COVID-19 prevention in the academic sector in preparation for the resumption of face-to-face classes.

OBJECTIVES OF THE STUDY

To assess the Knowledge, Attitude, and Practices (KAP) toward COVID-19 pandemic of the university students in a Philippine university.

METHODOLOGY

Research Design

The study's design was qualitative, which was composed of descriptive, cross-section, and exploratory research design tools. The descriptive design allowed the researchers to obtain information regarding the status of the phenomenon; experimental design enables the researchers to be familiarized with basic details, settings, and insights about the problem that was not studied yet.

Participants of the Study

The required sample size of 663 was calculated on the following assumptions: 50% response rate, 99% confidence interval, 5% margin of error, and 70,000 student population of the university.

Data Gathering Instrument

The questionnaire was composed of two parts: 1.) respondent's demographics; and 2.) knowledge, attitudes, and practices (KAP) questions. Demographic variables included in the questionnaire are age, sex, and the respondents' status. The KAP questionnaire was based on a survey conducted by Zhong et al. (2020) with some modifications. The response to each item was rated using the 5-point Likert scale. The knowledge questions measure the respondents' awareness of the symptoms, incubation period, disease severity, disease carriers, infection routes, zoonotic association, and preventive measures for COVID-19. There were 14 knowledge questions scaled as 5 - extremely aware, 4 – moderately aware, 3 - somewhat aware, 2 – slightly aware, and 1 – not at all aware. Fifteen (15) attitude questions measure the respondents' agreement with the attitudes expected in a health crisis. These include the feelings of getting infected by COVID-19, of necessity to act in preventing infections, optimism towards recovery, etc. The attitude responses were scaled as 5 – strongly agree, 4 – agree, 3 – neither agree nor disagree, 2 – disagree and 1 – strongly disagree. Twenty-two (22) practice questions measure the respondent's agreement with the hygiene practices, preventive measures, and the guidelines given by the Philippine government to prevent the spread of COVID-19 in the community. The practice responses were scaled as 5 – strongly agree, 4 – agree, 3 – neither agree nor disagree, 2 – disagree and 1 – strongly disagree. Before the actual survey, the internal consistency (Cronbach's alpha) of the items was estimated using a small number (>10) of respondents. The KAP questions were modified to attain the acceptable alpha of 0.70 [16].

Data Gathering Procedure

This cross-sectional survey was conducted from April 5 to May 5, 2020, a week before the end of the first Enhanced Community Quarantine (ECQ) for the island of Luzon, including Metro Manila. The authors collected the data online since an actual survey is not allowed during the quarantine period. The survey was posted as a one-page recruitment page on the university website The web page contained a brief introduction to the background, objective, procedures, voluntary nature of participation, declarations of anonymity and confidentiality, and

notes for filling out the questionnaire. Student respondents, ages 16 years old and above, who understood the content of the survey recruitment and agreed to take part in the study were led to the online questionnaire. The online survey was also intended for the rest of the university community, including faculty and administrative staff, which will be analyzed in another paper. The institutional research committee of the university approved the study protocol and questionnaire before data collection.

Data Analysis

All statistical analyses were done in R version 3.6.3 with the psych package ver. 1.9.12.31 [17]. The data were checked for completeness and consistency. Data cleaning was done by removing outliers detected using the Mahalanobis D2 measures [18, 19]. The removal of outliers reduced the number of responses analyzed from 783 to 658. Descriptive and statistics were

reported from the cleaned data. The dependence of the KAP scores on the respondent's sex and age was tested using the Kruskal-Wallis Chi-Square ($\chi 2$) test. An alpha of <0.05 was considered statistically significant for all tests.

RESULTS AND DISCUSSION

The demographic profile of the 658 respondents is shown in Table 1. A large proportion of the respondents were females (69%) and belonged to the 18-24 years old age group (80.7%). Mostly, the respondents were undergraduate and senior high school students.

Student respondents were extremely aware (4.6 ± 0.4) of the symptoms, transmission, and preventive measures against COVID-19 infection (Table 2).

Table 1. Demographics of the Study Respondents.

VARIABLES	N	(%)
No. respondents	658	100
SEX		
Female	454	69.0
Male	204	31.0
AGE GROUP		
under 18 years old	531	80.7
18 - 24 years old	68	10.3
25 - 34 years old	8	1.2
35 and above	51	7.8
LEVEL		
Basic Education (JHS & SHS)	54	8.2
Diploma Programs	8	1.2
Graduate School	93	14.1
Undergraduate	492	74.8
not disclosed	11	1.7

Table 2. Level of Awareness to COVID-19 Knowledge.

Item	Alpha	Std. Alpha	Score (Mean ± SD	Interpretation
k1. The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and muscle aches	0.83	0.92	4.8 ± 0.4	Extremely Aware
k2. Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID-19 virus	0.84	0.92	4.1 ± 1	Moderately Aware
k3. Emergency warning signs for COVID-19 which need immediate medical attention include difficulty of breathing, persistent pain or pressure in the chest	0.83	0.92	4.7 ± 0.6	Extremely Aware
k4. The symptoms may appear 2-14 days after exposure to the COVID-19 virus	0.84	0.92	4.8 ± 0.5	Extremely Aware
k5. Not all persons with COVID-19 will develop to severe cases	0.84	0.92	4.6 ± 0.7	Extremely Aware
k6. COVID-19 virus may be passed on to others even if the carrier does not have a fever or is not displaying any of the symptoms	0.84	0.92	4.8 ± 0.6	Extremely Aware
k7. The COVID-19 virus spreads through respiratory droplets of infected individuals	0.84	0.92	4.9 ± 0.4	Extremely Aware
k8. There is currently no effective cure for COVID-19, but early testing and supportive treatment can help most patients recover from infection	0.84	0.92	4.8 ± 0.4	Extremely Aware
k9. Eating or having physical contacting with wild animals may result into an infection as severe as COVID-19.	0.84	0.92	3.7 ± 1.3	Moderately Aware
k10. Individuals who wear protective masks may totally prevent the infection of the COVID-19 virus	0.84	0.92	4.2 ± 1.2	Moderately Aware
k11. To prevent being infected by the COVID-19 virus, individuals should avoid going to crowded places as well as taking public transportations	0.84	0.92	4.9 ± 0.2	Extremely Aware
k12. Isolation and treatment of people who are infected with the COVID-19 virus are effective ways to reduce the spread of the virus	0.83	0.92	4.9 ± 0.3	Extremely Aware
k13. People who have had contact with someone infected with the COVID-19 virus should immediately follow the self-quarantine procedures	0.83	0.92	5 ± 0.2	Extremely Aware
k14. Ensuring a healthy diet, proper hygiene, frequent washing of hands with soap and water, use of disinfectants, wearing face masks are preventive measures against COVID	0.84	0.92	5 ± 0.2	Extremely Aware
KNOWLEDGE SCORE			**4.6 ± 0.4**	**Extremely Aware**

This level of awareness could be attributed to the availability of information through various media (i.e., social media, television, and radio), similar to the observation of the findings of Lau et al. [20]. In a study in Jordan [21], undergraduate college students have good knowledge about COVID-19. This high awareness of students on the knowledge of COVID-19 was also expected due to the persistent media release by the Philippine government on COVID-19-related information.

The moderate awareness of the knowledge items about 1.) the differences between COVID-19 to the common cold; 2.) the linkage between the disease and wild animal contact, and 3.) the total prevention of

protective masks against the condition reflects the novelty of the disease during the time of the survey. The knowledge of the protective benefits of face masks had moderate awareness among the respondents in a study conducted in Malaysia [22]. The attention on the protective benefits of wearing face masks could be improved with the availability of information showing effectiveness in preventing COVID-19 in the community [23]. The students were highly aware of the COVID-19 pandemic situation and all the news revolving around the pandemic. The university students are primarily engaged in social networking sites wherein access to information is easy.

Table 3. COVID-19 Knowledge is dependent on the respondent's sex.

Items	Male	Female	Kruskal-Wallis $\chi 2$	p-value
k1. The main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and muscle aches	4.81 ± 0.46	4.87 ± 0.36	7.94	< 0.01
k2. Unlike the common cold, stuffy nose, runny nose, and sneezing are less common in persons infected with the COVID	4 ± 0.96	4.14 ± 0.96	4.62	0.03
k3. Emergency warning signs for COVID-19 which need immediate medical attention include difficulty of breathing, persistent pain or pressure in the chest	4.65 ± 0.61	4.75 ± 0.52	4.61	0.03
k11. To prevent being infected by the COVID-19 virus, individuals should avoid going to crowded places as well as taking public transportation	4.92 ± 0.27	4.95 ± 0.21	7.20	0.01
k13. People who have had contact with someone infected with the COVID-19 virus should immediately follow the self-quarantine procedures	4.93 ± 0.28	4.96 ± 0.19	5.83	0.02
k14. Ensuring a healthy diet, proper hygiene, frequent washing of hands with soap and water, use of disinfectants, wearing face masks are preventive measures against COVID-19 infection	4.93 ± 0.25	4.98 ± 0.15	11.15	< 0.01

Female respondents significantly scored higher than males in six (6) knowledge items related to the disease symptoms and preventive measures (Table 3). The male gender has been considered a significant predictor of poor epidemiological knowledge [24, 25]. Female respondents appeared more knowledgeable about COVID-19 information in a survey conducted Al-Hanawi et al. [26]. The knowledgeability of the university students about the pandemic was expected because they are primarily trained to conduct research, and the information is already given to the public through international institutions such as the World Health Organization and local government bodies and units such as the Philippine Department of Health (DOH). The result is also a good indicator that university students are eager to know the nature of the COVID-19 disease to prevent its infection.

The respondents agreed (4.2 ± 0.4) with the expected attitudes towards COVID-19 (Table 4). Specifically, the respondents strongly agreed with mindfulness on preventive actions in preventing infection; 2.) feeling the need to maintain enough supplies at home during the quarantine period. Similar feelings of anxiety towards the scarcity of food sources and financial security were also noted in the study of Baloran [27]. These attitudes were expected since lockdown was implemented during the ECQ.

The respondents also felt bothered by the increase in COVID-19 deaths and felt hopeful about the increasing number of recoveries. Most of the students expressed confidence and optimism towards the immediate end of the pandemic. Since the COVID-19 pandemic is still new at that time, the respondents might be speculative about the outcome of the pandemic. Positive information on the pandemic reflects positive feelings, i.e., hopefulness and confidence in the respondents. Despite these positive attitudes felt by the student respondents, they also were bothered by an increasing number of COVID-19 fatalities. Lee [28] affirmed that these negative feelings of students' towards COVID-19 are caused by the uncertainties brought by the current pandemic. The online survey of Montano [29] revealed the adverse effects of the pandemic on Filipinos' mental health, showing signs of anxiety and depression. Roy et al. [30] also reported that their survey respondents worried about themselves and their families regarding the pandemic. The university students showed the expected attitude based on the questions provided.

Table 4. Level of Agreement to COVID-19 Attitudes

Item	Alpha	Std. Alpha	Score (Mean ± SD)	Interpretation
a1. I always keep in mind the necessary actions to take to prevent myself from getting infected by the COVID-19 virus	0.83	0.92	4.9 ± 0.3	Strongly Agree
a2. I feel that there is a need to maintain enough food, groceries, medicines and other supplies at home to avoid going out of the house during the quarantine period	0.83	0.92	4.8 ± 0.4	Strongly Agree
a3. I feel confident that I can prevent myself from becoming infected with the COVID-19 even if it becomes more widespread in the Philippines	0.84	0.92	3.7 ± 1	Agree
a4. I am troubled that I'm likely to get infected by the COVID-19 virus	0.84	0.92	3.4 ± 1.1	Neither Agree or Disagree
a5. I am worried about getting infected by the COVID-19 virus	0.84	0.92	4.1 ± 1	Agree
a6. I always keep in mind the necessary actions to take to prevent possible transfer of the COVID-19 virus to my family members	0.83	0.92	4.8 ± 0.4	Strongly Agree
a7. My family feels that there is a need to maintain enough food, groceries, medicines and other supplies at home to avoid going out of the house during the quarantine period	0.83	0.92	4.7 ± 0.5	Strongly Agree
a8. I feel confident that my family members can prevent themselves from being infected with the COVID-19 even if it becomes more widespread in the Philippines	0.84	0.92	3.7 ± 1	Agree
a9. My family members are troubled that they are likely to get infected by the COVID-19 virus	0.84	0.92	3.7 ± 1	Agree
a10. I am worried about my family members getting infected by the COVID-19 virus	0.84	0.92	4.4 ± 0.8	Agree
a11. I feel uneasy whenever hearing news about increasing number of patients infected with COVID-19	0.84	0.92	4.3 ± 0.9	Agree
a12. I feel bothered whenever there is an increase in the death rate due to COVID-19	0.83	0.92	4.6 ± 0.7	Strongly Agree
a13. I feel hopeful as the number of patients recovering from COVID-19 are reported	0.83	0.92	4.6 ± 0.7	Strongly Agree
a14. I believe that COVID-19 will finally be successfully controlled	0.84	0.92	4.1 ± 1	Agree
a15. I am confident that the Philippines can win the battle against the COVID-19	0.84	0.92	4.2 ± 1	Agree
ATTITUDE SCORE			**4.2 ± 0.4**	***Agree***

Six (6) attitude questions depended on the respondent's sex (Table 5). Female respondents expressed mindfulness in preventing infection, felt uneasy with the increasing number of cases, and felt hopeful with patients' recoveries. On the other hand, Males expressed confidence in preventing disease for themselves and their families, troubled by the likelihood of getting infected.

Table 5. COVID-19 Attitudes dependent on respondent's sex.

Items	Male	Female	Kruskal-Wallis $\chi 2$	*p-value*
a3. I feel confident that I can prevent myself from becoming infected with the COVID-19 even if it becomes more widespread in the Philippines	3.81 ± 1.04	3.71 ± 0.97	5.1649	0.02
a4. I am troubled that I'm likely to get infected by the COVID-19 virus	3.52 ± 1.05	3.3 ± 1.05	6.0597	0.01
a8. I feel confident that my family members can prevent themselves from being infected with the COVID-19 even if it becomes more widespread in the Philippines	3.85 ± 0.97	3.68 ± 1.01	4.894	0.03
a6. I always keep in mind the necessary actions to take to prevent possible transfer of the COVID-19 virus to my family members	4.75 ± 0.46	4.81 ± 0.41	4.5139	0.03
a11. I feel uneasy whenever hearing news about increasing number of patients infected with COVID-19	4.13 ± 1.01	4.41 ± 0.75	12.168	< 0.01
a13. I feel hopeful as the number of patients recovering from COVID-19 are reported	4.48 ± 0.82	4.61 ± 0.64	5.7646	0.02

The respondents strongly agreed (4.9 ± 0.3) with the practices during the COVID-19 pandemic (Table 6). These practices include proper and regular hand washing, bathing, disinfectants, physical

distancing, and abiding by the prescribed quarantine protocols. In a similar survey, around 90% of the respondents agreed to follow strict personal protective measures, and about 80% avoided public places to prevent COVID-19 infection [27]. A similar agreement was seen with stringent infection control practices, standard precautions, and minimized public exposure has been observed with other viral outbreaks such as the Ebola and MERS-CoV [31, 32]. This exceptionally high agreement to preventative practices was explained in the study of Peng [33], where undergraduate students who received effective health education become well-informed, develop positive attitudes, and are motivated in taking proper actions and practices in preventing COVID-19 infection. Similarly, the student respondents in this study already received COVID-19 information from the government health agencies through various forms, i.e., television, radio, print, and social media.

This survey has shown that female respondents scored significantly higher than all COVID-19 practices. De la Vega et al. [34] have shown that women had greater adherence to the prevention of COVID-19 disease. Al-Hanawi et al. [26], on the other, demonstrated that men were significantly less likely to take preventive and protective measures than women during the COVID-19 pandemic. This difference in the practice scores between male and female respondents could be explained by the generally accepted notion that men are more likely to be risk-takers than women [35].

Table 6. Level of agreement to the practices related to COVID-19

Item	Alpha	Std. Alpha	Score (Mean ± SD)	Interpretation
p1. Basic proper hygiene starts with washing hands using soap for 20 seconds	0.83	0.92	4.9 ± 0.3	Strongly Agree
p2. Wash your hands after touching personal items of someone who has a cough and/or cold	0.83	0.92	4.9 ± 0.2	Strongly Agree
p3. Wash your hands after touching any plastic, paper or metal from sources such as groceries or wet markets	0.83	0.92	4.9 ± 0.3	Strongly Agree
p4. Wash your hands after holding anything that was delivered to you in the house	0.83	0.92	4.9 ± 0.3	Strongly Agree
p5. Wash your hands after touching doorknobs	0.83	0.92	4.8 ± 0.4	Strongly Agree
p6. Wash your hands after touching tabletops, counters, remote controls or any other surfaces touched by others	0.83	0.92	4.8 ± 0.4	Strongly Agree
p7. Wash your hands before, during and after food preparation	0.83	0.92	4.9 ± 0.3	Strongly Agree
p8. Wash your hands before and after using the toilet	0.83	0.92	4.9 ± 0.3	Strongly Agree
p9. Take a bath every day. If you ran errands outside the house, make sure to immediately take a bath as well	0.83	0.92	4.9 ± 0.3	Strongly Agree
p10. Eat nutritious foods such as vegetables and fruits to keep my body healthy	0.83	0.92	4.9 ± 0.3	Strongly Agree
p11. Use disinfectants or hand gel to sanitize hands	0.83	0.92	4.9 ± 0.3	Strongly Agree
p12. Disinfect cellphones, headsets, laptops, and all other gadgets that are frequently used	0.83	0.92	4.8 ± 0.4	Strongly Agree
p13. Refrain from touching the face, eyes, nose and mouth	0.83	0.92	4.9 ± 0.3	Strongly Agree
p14. Handshake and kissing (beso-beso) should be -avoided	0.83	0.92	4.9 ± 0.3	Strongly Agree
p15. Social distancing should be strictly observed	0.83	0.92	4.9 ± 0.3	Strongly Agree
p16. Wear a face mask when leaving home	0.83	0.92	4.9 ± 0.3	Strongly Agree
p17. Support the government-imposed mandatory isolation procedures for those who are showing symptoms of COVID-19	0.83	0.92	4.9 ± 0.4	Strongly Agree
p18. Support the government-imposed mandatory home quarantine for up to 2 weeks for people who have been in contact with someone who has been tested positive for COVID-19	0.83	0.92	4.9 ± 0.3	Strongly Agree
p19. Support postponing or canceling mass gatherings such as concerts, festivals, or sporting events	0.83	0.92	4.9 ± 0.3	Strongly Agree
p20. Observe policies on temporary school closure to prevent transmission of the COVID-19 virus	0.83	0.92	4.9 ± 0.3	Strongly Agree
p21. Strictly follow policies on temporarily closing of workplaces and businesses to keep employees safe from the virus	0.83	0.92	4.9 ± 0.4	Strongly Agree
p22. If and when exposed to someone infected with the virus, observe self-quarantine for 2 weeks	0.83	0.92	4.9 ± 0.3	Strongly Agree
PRACTICE SCORE			**4.9 ± 0.3**	**Strongly Agree**

Age-dependent KAP responses were seen in several items (Table 7). For the knowledge items, younger students (18 years old and below) were moderately aware of the progression of COVID-19

infection to severity. Meanwhile, student respondents from the 24-35 years old group were moderately aware of the total protection of masks in preventing infection. Even after a year of the pandemic, it is also evident that individuals are still hesitant in wearing face masks. This moderate awareness of the use of acts observed in this study could be attributed to some beliefs that could be explored in future studies. An optimistic attitude toward the sacksful control of the pandemic was observed with the younger respondents (18 years old and below) of this study. In contrast, the older age group (35 y/o and above) expressed uneasy and worried feelings for themselves and their families in getting infected. These feelings could be explained by the responsibilities of young adults in their families and society. Respondents 35 years old and above agreed less on eating nutritious foods as a preventive practice against COVID-19.

Several studies have shown age-dependence in the susceptibility to COVID-19 infection where children are less likely to be infected [36]. This observation was not observed in the present study. The paper of Liang et al. [41] mentioned that younger students have more tendency to experience psychological problems due to the lockdowns imposed for COVID-19 prevention; the student respondents in the youngest age group expressed hope, confidence, and belief towards recovery and success of the Philippines in controlling the pandemic. However, students from the older age groups expressed worry and feelings of being troubled about the likelihood of contracting the disease. The marked differences in the attitudes of younger and older students are due to the possible roles of the group in their respective households. Older students have more responsibilities in their families.

Table 7. COVID-19 Knowledge, Attitudes and Practices (KAP) dependent on respondent's age.

Items	Age group (years)				Kruskal-Wallis $\chi 2$	p-value
	under 18	19-24	25-34	35 above		
k5. Not all person with COVID-19 will develop to severe cases	4.39 ± 0.83	4.59 ± 0.65	4.59 ± 0.72	4.5 ± 0.53	8.53	0.04
k10. Individuals who wear protective masks may totally prevent the infection of the COVID-19 virus	4.53 ± 0.73	4.23 ± 1.11	3.79 ± 1.58	4.1 ± 1.46	9.80	0.02
a4. I am troubled that I'm likely to get infected by the COVID-19 virus	3.12 ± 1.03	3.32 ± 1.04	3.79 ± 1.11	4.2 ± 0.46	12.98	< 0.01
a9. My family members are troubled that they are likely to get infected by the COVID-19 virus	3.33 ± 0.97	3.67 ± 0.98	3.93 ± 1.08	4.2 ± 0.71	10.97	0.01
a14. I believe that COVID-19 will finally be successfully controlled	4.51 ± 0.7	4.15 ± 0.99	3.71 ± 1.2	3.9 ± 0.64	12.90	< 0.01
p10. Eat nutritious foods such as vegetables and fruits to keep my body healthy	4.84 ± 0.37	4.93 ± 0.26	4.87 ± 0.34	4.6 ± 0.52	10.66	0.01

In terms of the respondent's knowledge, most are knowledgeable that not all people with COVID-19 disease will develop into severe cases (Knowledge question 5), and wearing a protective mask will prevent the spread of the disease (Knowledge question 10). In terms of their knowledge, the university students exhibit readiness to face the COVID-19 pandemic. The university students could also share their knowledge with their parents, who may not be active in gathering information about the COVID-19 pandemic. The accuracy of their knowledge can also be used to counter misinformation that may victimize their older parents or relatives. The attitude of the university students was as expected; most were troubled that they may be infected by the disease (Attitude question 4) and worried for their families (Attitude question 9), Filipinos are generally family-oriented, and they care first for their loved ones as a result in attitude have shown. As ordinary people would do, they are also anxious about getting infected, this attitude demonstrated in this survey shows us that the university students are caring for their health and the welfare of their fellow, and this is evident as it was observed that most of the university students followed the safety and health protocol implemented by the Philippine Department of Health. Furthermore, many university students are hopeful that the pandemic will be eventually resolved (Attitude question 14); this shows the positivity of the Filipinos even in times of crisis and their capacity to adapt to a changing situation; Filipinos

are genuinely resilient. Since there were no vaccines yet at the start of the pandemic, many have engaged in a healthy diet to increase their fighting chance against the COVID-19 infection (Practice question 10). Overall, the university students were knowledgeable about the pandemic situation. They have shown a positive attitude toward the situation and agreed to most practices implemented to prevent infections or the spread of the disease, all backed by the survey results generated from this study.

CONCLUSION AND RECOMMENDATIOn

In this study, students in a Philippine state university have shown extreme awareness of COVID-19 knowledge, including the possible origins of the pandemic, modes of transmission, and preventive measures. The students also agreed to the attitudes expected in a crisis such as pandemics. The strong agreement to positive attitudes of hopefulness in the recovery of patients, keeping in mind the necessary preparations for the needed quarantine, and feeling bothered by the increasing death rates may be attributable to the knowledge about the disease at that time. The agreement on the practices to prevent infection was also strong, highlighting the importance of handwashing as an essential practice to avoid the spread of the infection. These positive points in the knowledge, attitudes, and practices (KAP) of the university students are due to the efforts of both the local and national government and the media in spreading available information about the pandemic. Also, the Enhanced Community Quarantine (ECQ) imposed on Metro Manila, and the rest of Luzon also raised the KAP of the student respondents. Due to the growth of information about COVID-19, this KAP model generated suggests that constant knowledge dissemination should be made to improve the preventive practices of students while the pandemic is still occurring.

It is recommended that another study of the same design must be conducted on the employees of the Philippine state university in order to assess the knowledge, attitude, and practices of the employees during the pandemic.

SUPPLEMENTARY DATA

The data gathered and used in the study was uploaded in Mendeley Data (DOI: 10.17632/bz9s6xkyyz.1). The data in Mendeley is available to the public for academic purposes.

REFERENCES

[1] World Health Organization (WHO). WHO Director-General's opening remarks at the media briefing on COVID19 - 11 March 2020. 2020.

[2] Lu, R., Zhao, X., Li, J., Niu, P., Yang, B., Wu, H., ... & Tan, W. (2020). Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding. *The lancet*, *395*(10224), 565-574.

[3] Wu, F., Zhao, S., Yu, B., Chen, Y. M., Wang, W., Song, Z. G., ... & Zhang, Y. Z. (2020). A new coronavirus associated with human respiratory disease in China. *Nature*, *579*(7798), 265-269.

[4] Zhu, N., Zhang, D., Wang, W., Li, X., Yang, B., Song, J., ... & Tan, W. (2020). A novel coronavirus from patients with pneumonia in China, 2019. *New England journal of medicine*.

[5] Department of Health (DOH). (2020). DOH confirms the first 2019-NCoV case in the country; assures the public of intensified containment measures.

[6] Proclamation No. 922. Declaring a state of public health emergency throughout the Philippines. Official Gazette of the Republic of the Philippines. 2020 Mar 8.

[7] Proclamation No. 929. Declaring a state of calamity throughout the Philippines due to coronavirus disease 2019. Official Gazette of the Republic of the Philippines. 2020 Mar 16.

[8] Executive Order No. 112. Imposing an enhanced community quarantine in high-risk geographical areas of the Philippines and a general community quarantine in the rest of the country from 01 to 15 May 2020, adopting the omnibus guidelines on the implementation. Official Gazette of the Republic of the Philippines. 2020 May 1.

[9] Inter-Agency Task Force (IATF) for the Management of Emerging Infectious Diseases. Resolution No. 37 s. 2020. Official Gazette of the Republic of the Philippines. 2020 May 15.

[10] Inter-Agency Task Force (IATF) for the Management of Emerging Infectious Diseases. Resolution No. 41 s. 2020. Official Gazette of the Republic of the Philippines. 2020 May 29.

[11] Inter-Agency Task Force (IATF) for the Management of Emerging Infectious Diseases. Omnibus Guidelines on the Implementation of Community Quarantine in the Philippines. Official Gazette of the Republic of the Philippines. 2020 May;

[12] Tachfouti, N., Slama, K., Berraho, M., & Nejjari, C. (2012). The impact of knowledge and attitudes on adherence to tuberculosis treatment: a case-control study in a Moroccan region. *Pan African Medical Journal*, *12*(1).

[13] Ajilore, K., Atakiti, I., & Onyenankeya, K. (2017). College students' knowledge, attitudes and adherence to public service announcements on Ebola in Nigeria: Suggestions for improving future Ebola prevention

education programmes. *Health Education Journal*, *76*(6), 648-660.
[14] Tao, N. (2003). An analysis on reasons of SARS-induced psychological panic among students. *Journal of Anhui Institute of Education*, *21*(2), 78-79.
[15] Person, B., Sy, F., Holton, K., Govert, B., & Liang, A. (2004). Fear and stigma: the epidemic within the SARS outbreak. *Emerging infectious diseases*, *10*(2), 358.
[16] Santos, J. R. A. (1999). Cronbach's alpha: A tool for assessing the reliability of scales. *Journal of extension*, *37*(2), 1-5.
[17] Revelle, W. (2012). Procedures for psychological, psychometric, and personality research. *Acesso em*, *9*.
[18] Johnson, R. A., & Wichern, D. W. (2014). *Applied multivariate statistical analysis* (6). London, UK:: Pearson.
[19] Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* 5, 481-498. Boston, MA: pearson.
[20] Lau, L. L., Hung, N., Go, D. J., Ferma, J., Choi, M., Dodd, W., & Wei, X. (2020). Knowledge, attitudes and practices of COVID-19 among income-poor households in the Philippines: A cross-sectional study. *Journal of global health*, *10*(1).
[21] Olaimat, A. N., Aolymat, I., Shahbaz, H. M., & Holley, R. A. (2020). Knowledge and information sources about COVID-19 among university students in Jordan: a cross-sectional study. *Frontiers in public health*, *8*, 254.
[22] Azlan, A. A., Hamzah, M. R., Sern, T. J., Ayub, S. H., & Mohamad, E. (2020). Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia. *Plos one*, *15*(5), e0233668.
[23] MacIntyre, C. R., & Chughtai, A. A. (2020). A rapid systematic review of the efficacy of face masks and respirators against coronaviruses and other respiratory transmissible viruses for the community, healthcare workers and sick patients. *International Journal of Nursing Studies*, *108*, 103629.
[24] Bawazir, A., Al-Mazroo, E., Jradi, H., Ahmed, A., & Badri, M. (2018). MERS-CoV infection: mind the public knowledge gap. *Journal of infection and public health*, *11*(1), 89-93.
[25] Al-Mohrej, O. A., Al-Shirian, S. D., Al-Otaibi, S. K., Tamim, H. M., Masuadi, E. M., & Fakhoury, H. M. (2016). Is the Saudi public aware of Middle East respiratory syndrome?. *Journal of infection and public health*, *9*(3), 259-266.
[26] Al-Hanawi, M. K., Angawi, K., Alshareef, N., Qattan, A., Helmy, H. Z., Abudawood, Y., ... & Alsharqi, O. (2020). Knowledge, attitude and practice toward COVID-19 among the public in the Kingdom of Saudi Arabia: a cross-sectional study. *Frontiers in public health*, *8*, 217.
[27] Baloran, E. T. (2020). Knowledge, attitudes, anxiety, and coping strategies of students during COVID-19 pandemic. *Journal of loss and trauma*, *25*(8), 635-642.
[28] Lee, J. (2020). Mental health effects of school closures during COVID-19. *The Lancet Child & Adolescent Health*, *4*(6), 421.
[29] Montano, R. L. T., & Acebes, K. M. L. (2020). Covid stress predicts depression, anxiety and stress symptoms of Filipino respondents. *International Journal of Research in Business and Social Science (2147-4478)*, *9*(4), 78-103.
[30] Roy, D., Tripathy, S., Kar, S. K., Sharma, N., Verma, S. K., & Kaushal, V. (2020). Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population during COVID-19 pandemic. *Asian journal of psychiatry*, *51*, 102083.
[31] Faye, O., Andronico, A., Faye, O., Salje, H., Boëlle, P. Y., Magassouba, N. F., ... & Sall, A. A. (2015). Use of viremia to evaluate the baseline case fatality ratio of Ebola virus disease and inform treatment studies: a retrospective cohort study. *PLoS medicine*, *12*(12), e1001908.
[32] Khalid, I., Khalid, T. J., Qabajah, M. R., Barnard, A. G., & Qushmaq, I. A. (2016). Healthcare workers emotions, perceived stressors and coping strategies during a MERS-CoV outbreak. *Clinical medicine & research*, *14*(1), 7-14.
[33] Peng, Y., Pei, C., Zheng, Y., Wang, J., Zhang, K., Zheng, Z., & Zhu, P. (2020). A cross-sectional survey of knowledge, attitude and practice associated with COVID-19 among undergraduate students in China. *BMC public health*, *20*(1), 1-8.
[34] De La Vega, R., Ruíz-Barquín, R., Boros, S., & Szabo, A. (2020). Could attitudes toward COVID-19 in Spain render men more vulnerable than women?. *Global public health*, *15*(9), 1278-1291.
[35] Harris, C. R., & Jenkins, M. (2006). Gender differences in risk assessment: why do women take fewer risks than men?.*Judgm Decis Mak.* 1(1):48–63.
[36] Davies, N. G., Klepac, P., Liu, Y., Prem, K., Jit, M., & Eggo, R. M. (2020). Age-dependent effects in the transmission and control of COVID-19 epidemics. *Nature medicine*, *26*(8), 1205-1211.
[37] Liang, L., Ren, H., Cao, R., Hu, Y., Qin, Z., Li, C., & Mei, S. (2020). The effect of COVID-19 on youth mental health. *Psychiatric quarterly*, *91*(3), 841-852.