Knowledge and Attitudes Not Strongly Related to COVID-19 Prevention, Behaviors, and Vaccination Among Filipino College Students

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Abstract

The effects of the COVID-19 pandemic across various sectors are far-reaching, and the education sector is not an exemption. Approved and recognized vaccines are clinically proven to provide protection and have been considered one of the primary mitigations against the virus. Knowledge, attitude, and related practices (henceforth KAP) toward the virus is widely considered to be an essential cognitive key in public health for health intervention, prevention, and promotion. Previous studies revealed a positive correlation between knowledge and attitude. This study investigated the KAP and their relationship among the 857 college students in one state college in the Philippines using an online survey. Using descriptive statistics, the findings showed that the majority of the respondents have been fully vaccinated against COVID-19. Respondents were shown to be knowledgeable about COVID-19, specifically about its transmission, clinical symptoms, treatment, risk groups, isolation, prevention, and control. Positive attitudes toward individual and governmental mitigation and control of the virus were shown. Their scores on practices revealed that they always exhibit protective and preventive behavioral practices. Pearson correlation revealed a weak significant relationship between knowledge and practice, and a fair significant relationship between attitude and practice. No significant relationship is found between knowledge and attitude. This study hopes to

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find its place in the literature worthy of consideration as empirical support toward understanding a specific group's perceptive risk and preventive behavior toward the virus, policy making, and health intervention and promotion.

Keywords: college students, COVID-19, KAP, Philippines, risk communication

A novel virus was reported to have emerged in the latter weeks of December 2019 in Wuhan, China (Peng et al., 2019; Santiago & Santos, 2021). It has been called the coronavirus disease 2019 (COVID-19), whose cause can be traced to the severe acute respiratory syndrome, coronavirus 2, also known as SARS-COV-2 (Ferdous et al., 2020). Experts believe that the virus is easily transmissible upon inhalation of small droplets containing the virus, which is released via coughing, sneezing, or speaking. However, it is believed that other transmission processes are possible (World Health Organization, 2020). According to the World Health Organization (WHO), the outbreak of COVID-19 has rapidly evolved into becoming a worldwide concern (Zhang et al., 2020), and WHO enjoined the countries from across the globe to exert collaborative efforts for the prevention of its proliferation (Ferdous et al., 2020).

The effects of the virus across various sectors are far-reaching, and the education sector is not an exemption. Simply put, it has caused many agencies to be disrupted. Due to the wide-ranging effects of COVID-19 in the world and the Philippines in particular, President Rodrigo Roa Duterte signed Proclamation No. 1218 which sought to extend the State of Calamity in the entire Philippines on account of the foregoing disease for one more year—that is from September 13, 2021, until September 12, 2022. For this reason, face-to-face classes were suspended.

After more than a year of holding flexible learning classes, as it is deemed the optimal option for the educative process to carry on, there had been a move to permit in-person classes. The Joint Memorandum Circular No. 2021-001 (2021) by the Commission on Higher Education (henceforth CHED) and the Department of Health in the Philippines intended to delineate the guidelines on the gradual reopening of campuses in the Higher Education Institutions (HEIs) to hold limited face-to-face classes amidst the pandemic. On September 28, 2021, a circular has been issued to

allow programs such as engineering and technology programs, hospitality/hotel and restaurant management, tourism/travel management, marine engineering, and marine transportation to conduct in-person classes (CHED, 2021).

However, the CHED strictly required that only fully vaccinated students shall be allowed to attend the classes. Although a high vaccination level is not seen as related to a low number COVID-19 cases (Subramanian & Kumar, 2021), approved and recognized vaccines are clinically proven to provide protection against COVID-19 and can still be considered as one of the primary mitigations against the virus. Vaccines are also shown to decrease the effects of the virus in the body, especially among senior citizens and individuals with comorbidities, and can prevent serious illness, hospitalization, and death (Moghadas et al., 2021; WHO, 2022a). Mendoza et al. (2021) asserted that the COVID-19 vaccination prospect of the Philippine government is likely affected by the controversy surrounding Dengvaxia, a dengue vaccine that emerged in 2017, which allegedly caused the death of hundreds of children and impacted the public trust in vaccines, resulting in vaccine hesitancy. In fact, a dramatic drop in vaccine confidence from 2015 to 2018 had been reported (Larson et al., 2019). Framed from a social ecological model, challenges to COVID-19 vaccination have been linked to individual's perceptions which are believed to be affected by exposure to misinformation amplified by the media, the community, and the health system (Amit et al., 2022).

It can be noted that research in the area of KAP has been investigated as evidenced in some of the research output that have been published. KAP is widely considered to be an essential cognitive key in public health for health intervention, prevention, and promotion. In an online survey among 100 employed Filipino workers in the National Capital Region (NCR), Bautista et al. (2020) claimed that the knowledge of the select workers was relatively high at 92%, while their attitude was found to be positive in regards to the necessity for health education and COVID-19 seriousness. In terms of practice, the respondents manifested strict adherence to the protocol. In a similar vein, specifically in the academic setting, Quisao et al. (2021) reported high knowledge scores of nursing students in Manila almost in all knowledge items, exhibiting a positive attitude and dynamic practice throughout the pandemic, using a

cross-sectional design involving 314 individuals. The same findings were also reported by Santiago and Santos (2021) in an online survey conducted during the Luzon lockdown among 179 university students of Nueva Ecija University of Science and Technology, San Isidro Campus. Superio's et al. (2021) findings from an online cross-sectional survey among the 228 undergraduate students was noteworthy because, while the majority of the students were knowledgeable about the basic and factual information about COVID-19, they were still inclined to believe myths and misinformation about the pandemic.

Indeed, research has shown that, resonating with the previously mentioned studies, there is a relatively approbatory KAP among the respondents in the Philippines. This finding, however, is not devoid of research that somewhat runs counter to it. For instance, in a cross-sectional online survey of 1,634 healthy members of the population in the Philippines, knowledge on COVID-19 was seen to be low, although their attitude was positive and their exhibited practices were compliant with the preventive measures (Tuppal et al., 2021).

Among the previously mentioned studies in the Philippines, only Tuppal et al.'s (2021) study investigated the relationship between KAP, and while they found a statistically significant correlation between KAP scores related to COVID-19 though, the correlation between knowledge and practice, and attitude and practice was low. This finding is similar with the study of Jemal et al. (2021) and Padmanaban et al. (2021) who found a significant correlation between KAP scores related to COVID-19 among Ethiopian healthcare workers and higher education students in India, respectively. It should be noted that study of Aceret et al. (2021) involved other nationalities, and thus does not entail results purely from the Philippine view. To date, no other correlational study between KAP in the Philippine context is available to the best of our knowledge. Other correlational studies outside the Philippines typically show positive correlation between knowledge and attitude (e.g., Yousaf, 2020; Afzal et al., 2021; Reuben et al., 2021), knowledge and practice (e.g., Yousaf, 2020; Afzal et al., 2021), attitude and practice (e.g., Peng et al., 2020; Yousaf, 2020).

Thus, this paper is basically propelled by three impetuses: (1) Up until now, studies on KAP in the Philippine context and academic setting were mostly

comparative across different variables such as gender, family income, year level, etc., which ultimately leaves the area on correlational study to be a fertile ground for an investigation that needs to be addressed for its timeliness and relevance; (2) The findings of this current investigation may be a great contribution in the scholarship in that the variables examined in this paper may shed light as to how KAP works in the Philippine context and the academic setting; and (3) COVID-19 remains an impediment to customary social and physical exchanges and conduct of transactions in manifold forms, and this insinuates that any scholarly contribution addressing this issue is not only timely and relevant but is likewise consequential. Therefore, this study sought to assess the KAP of the Filipino college students toward COVID-19 disease, and to determine whether there is a significant relationship in their KAP scores toward COVID-19.

Methods

This study utilized descriptive-correlational design through an online survey in investigating the KAP of the Filipino college students toward COVID-19, considering that quantifiable information is needed to address the objectives of the study. Total enumeration sampling technique was employed, albeit it was anticipated that not all would participate for some valid reasons and ethical considerations. It was necessary to use this technique to allow us to gather as much data as possible in order to achieve valid conclusions. While it was estimated that 1,835 students from the first year to fourth year would be participating in the study, only 857 (46.7%) participated in the actual survey which was conducted from November 19, 2021 to February 11, 2022 during the first semester, including 457 students from the hospitality management program and 400 from the maritime programs. These programs were selected by the institution to return to in-person classes and, so far, have not been the subjects in the previously conducted studies on KAP.

Anchored on the guidelines on COVID-19 of the U.S. Centers for Disease Control and Prevention (CDC), the World Health Organization (WHO), Department of Health (DOH) of the Philippines, and current COVID-19 KAP studies, a modified and

redesigned online survey questionnaire was developed and adopted from different KAP studies mentioned in this study (i.e., Al-Hanawi et al., 2020; Bautista et al., 2020; Ferdous et al., 2020; Santiago & Santos, 2021; Tuppal et al., 2021). The questionnaire was not translated into local languages, considering that it was administered to the college students who have an adequate knowledge of the English language. The questionnaire consists of four parts.

The first part consists of the purpose of the study, an informed consent, and basic information such as socio-demographic (course, year level, age, sex) and vaccination profile. The second part is a two-point Likert scale survey on the knowledge of the students of COVID-19, specifically on the following aspects: transmission, clinical symptoms, treatment, risk groups, isolation, prevention, and control. In this part, the students were asked to indicate whether the statements about COVID-19 are true or false. The third part is a five-point Likert scale on the attitude of the students toward COVID-19, in which they were asked of their level of agreement or disagreement on the attitudinal statements. The last part consists of three-point Likert scale survey items on related practices against COVID-19 in which the students were asked about their extent of practicing precautionary measures to combat COVID-19. The modified scale items were based on the previous studies on KAP (e.g., Bautista et al., 2020).

Due to the unavailability of some medical experts because of the surge of COVID-19 infections, only one medical specialist from a government general hospital committed and validated the content of the instrument. No major issues have been found; however, three items on knowledge of COVID-19 were asked to be rephrased as they were understood to be attitudinal. Cronbach's alpha results for KAP were .839, .986, and .934 respectively indicating a robust internal consistency for knowledge, and excellent internal consistency for attitude and practice (Taber, 2018).

For ethical considerations, the study sought approval from the College President and recommendation from the research office as regards the purpose of the study and its conduct. Both the management and the students were assured that no physical, psychological, or any forms of harm shall inflict the school and the students, and that utmost confidentiality would be employed in handling all information. As

such, informed consent was provided to the respondents. Since the survey was conducted online, the consent indicated that by proceeding to the survey, the students were agreeing to participate in the study. However, their participation was completely voluntary; hence, they were informed that they were free to withdraw at any time. Frequencies and percentages were utilized to determine the number of students who got the correct and wrong answers for each item in the knowledge about COVID-19. Mean and standard deviation were used to analyze and interpret their scores on KAP toward COVID-19 using Bloom's cut-off point (see Feleke et al., 2021).

Finally, to determine whether there is a significant relationship between KAP scores, Pearson correlation test was used. Correlation between KAP scores was interpreted using Cohen's (1992) guidelines: 0 to 0.25 = weak correlation, 0.25 to 0.5 = fair correlation, 0.5 to 0.75 = good correlation, above 0.75 = excellent correlation. These guidelines are used in several correlational KAP studies on COVID-19 (e.g., Yousaf et al., 2020; Jemal et al., 2021; Tuppal et al., 2021).

Results and Discussion

Vaccination Profile

The findings of this study show that the majority of the participants ($N = 758$, 88.5%) have already been fully vaccinated against COVID-19, while a few of them have partially vaccinated ($N = 75$, 8.6%) or are unvaccinated ($N = 24$, 2.8%). Those who have not been vaccinated yet cited some reasons: 1) They were still waiting for their vaccination schedule on a first come (i.e., first to register), first served basis, except for senior citizens and those with comorbidities; 2) They were not qualified due to health reasons; 3) Their parents do not want them to get vaccinated; and 4) They just don't want to get vaccinated.

The finding indicates a preventive behavioral practice among the respondents which may be linked to the CHED's requirement for and may indicate that the respondents are eager to attend the face-to-face classes. Similarly, undergraduate nursing students at one university in the Philippines demonstrated a high intention to attend limited face-to-face classes (Oducado et al., 2022). On the contrary, this finding

runs counter to a previously conducted study on COVID-19 vaccination where a prevalence of vaccine hesitancy is persistent among Filipino emerging adults, especially those who perceive themselves to be healthy (Cleofas & Oducado, 2022). However, the study manifests a similar finding to Caple's et al. (2022) study among demographically undetermined Filipino participants, in that 62.5% of the 7,193 respondents were willing to be vaccinated against COVID-19.

Knowledge About COVID-19

As presented in Table 1, this study revealed that the majority of the respondents were knowledgeable about COVID-19, indicating that they are very well-informed about its transmission, clinical symptoms, treatment, risk groups, isolation, prevention, and control. Many of them demonstrated moderate knowledge about the virus, while relatively few showed poor knowledge about it. While the overall findings show an acceptable level of knowledge, it can be alarming that there were respondents with poor and/or moderate knowledge levels, especially as they are likely to be either vulnerable to transmission or the source of transmission if they are infected due to their limited-to-moderate knowledge about the virus.

Table 1

Knowledge Scores of the Respondents on COVID-19 (N = 857)

Level of Knowledge	Criteria	*n*	%
Poor	Less than 60%	99	11.55
Moderate	60% - 79%	246	28.70
Good	80% - 100%	512	59.74

Looking closer, Table 2 shows that the majority of the respondents got correct answers on the majority of the items regarding COVID-19 except on items regarding the transmissibility of COVID-19 among asymptomatic individuals (item 8), degree of risk to children and adult individuals (item 15), and the need to wear a mask (item 19).

Table 2

Knowledge Scores of the Respondents on COVID-19 (N = 857)

Item Statements	Correct Answer		Wrong Answer	
	n	%	*n*	%
COVID-19 is a contagious disease.	718	83.8	139	16.2
COVID-19 can be deadly.	783	91.4	74	8.6
COVID-19 spreads from person-to-person within close distance of each other.	806	94.1	51	6.5
COVID-19 spreads through respiratory droplets, which occur when infected people cough and sneeze.	771	90.0	86	10.0
COVID-19 can be contracted by touching a surface or object on which the virus is attached, and then touching one's mouth, nose, or, perhaps, eyes.	778	90.8	79	9.2
COVID-19 infection can either be symptomatic (with symptoms) or asymptomatic (without symptoms).	747	87.2	110	12.8
COVID-19 main symptoms include fever, common cold, cough, shortness of breath, and fatigue.	802	93.6	55	6.42
COVID-19 is not transmissible among asymptomatic individuals.	360	42.0	497	58.0
Wearing of any kinds of face mask can totally protect a person from being infected with COVID-19.	597	69.7	260	30.3
COVID-19 vaccines can minimize the effects of COVID-19.	751	87.6	106	12.4
Eating healthy food and exercising regularly can help reduce the risk of being infected with COVID-19.	789	92.1	68	7.9
Senior citizens and people with comorbidities have high risk of developing serious complications.	727	84.8	130	15.2
Not all people with COVID-19 have severe cases. Only older adults with chronic illnesses tend to be more severe.	499	58.2	358	41.8
Pregnant women are more susceptible to infections than non-pregnant women.	482	56.2	375	43.8
Children do not appear to be at higher risk for COVID-19 than adults.	417	48.7	440	51.3
Handwashing with soap and water for at least 20 seconds or using hand sanitizer containing at least 60% alcohol after being in a public place, after nose-blowing, coughing or sneezing is an example of precautionary measure.	809	94.4	48	5.6
People should avoid touching their eyes, nose, and mouth with unwashed hands.	800	93.1	57	6.7
Ordinary residents can wear general medical masks to prevent the SARS-CoV-2 infection.	706	82.2	151	17.6
People should only wear a mask if they are infected with the virus, or if they are caring for someone with suspected COVID-19 infection.	375	43.7	482	56.2
People in contact with someone infected with COVID-19 should be immediately quarantined in an appropriate location for a general observation period of 14 days.	783	91.4	74	8.6
To prevent transmission of COVID-19, people must avoid going to crowded places and avoid taking public transportation.	786	91.7	71	8.1
Mean	**680**	**79.4**	**177**	**20.6**

Previous research studies also revealed that a high percentage of students had acceptable to very good knowledge of the virus (e.g., Hatabu et al., 2020; Peng et al., 2020; Prasad et al., 2020; Saefi et al., 2020; Naseef et al., 2021). The result of this study in this respect needs to be seriously acted upon through an orientation prior to the opening of limited face-to-face classes, for all students, because those who believe that COVID-19 is not transmissible among asymptomatic individuals (item 8) may be the source of spread if they are exposed to a COVID-19 patient but remain asymptomatic. Besides, asymptomatic individuals are hard to identify until they are tested. Chen et al. (2020) revealed that symptomatic and asymptomatic infections have the same infectivity. Several studies have also reported the possibility of COVID-19 transmission from the asymptomatic individuals (e.g., Byambasuren et al., 2020; Pollock & Lancaster, 2020; Yu & Yang, 2020; Gao et al., 2021). The students might have thought that the virus is not active since no symptoms have manifested.

As for the belief that children do not appear to be at a higher risk for COVID-19 than adults (item 15), the explanation can be perhaps that respondents either misunderstood it as effects rather than transmission of the virus or believe that children's resistance is higher than adults. Either way is wrongly understood about the behavior of the virus, as both older and younger people can be at a higher risk for COVID-19 (WHO, 2022b).

Meanwhile, it is quite alarming to know that the majority of the respondents believe that masks should be worn only when they are infected. This could mean that they wear masks solely for compliance with the Inter-Agency Task Force (IATF) for the Management of Emerging Infectious Diseases and local government mandate and not necessarily for protection. This will likely result in complacency during the face-to-face classes in that they could just remove the mask when they are with their classmates. Depending on the type, a mask can provide 20% (for very weak mask) up to 80% protection from viral transmission (Eikenberry et al., 2020).

Attitude Toward COVID-19

Table 3 presents the results of the level of attitude of the students toward COVID-19. The findings imply that the respondents show a positive attitude toward

individual and governmental mitigation and control of the virus. The results of this study are consistent with other studies on KAP among the students from the Philippines (e.g., Santiago & Santos, 2021) and other countries (e.g., Alzoubi et al., 2020; Hatabu et al., 2020).

Table 3

Attitude of the Students Toward COVID-19 (N = 857)

Item Statements	Strongly Disagree n(%)	Disagree n(%)	Neutral n(%)	Agree n(%)	Strongly Agree n(%)
It is important to keep my distance from others to avoid the spread of the virus.	235(27.4)	23(2.7)	106(12.4)	184(21.5)	309(36.1)
Handwashing is essential to protect myself from COVID-19.	237(27.7)	20(2.3)	86(10.0)	191(22.3)	323(37.7)
To protect myself from COVID-19 exposure, I should stay home if I am sick, unless I am receiving medical care.	235(27.4)	18(2.1)	103(12.0)	197(23.0)	304(35.5)
All people should be vaccinated against COVID-19.	210(24.5)	40(4.7)	161(18.8)	201(23.5)	245(28.6)
COVID-19 will eventually be successfully controlled, if not totally end.	202(23.6)	68(7.9)	201(23.5)	238(27.8)	148(17.3)
Zamboanga City strict measures can help win the battle against COVID-19.	221(25.8)	25(2.9)	156(18.2)	224(26.1)	211(24.7)
It is important to comply with the precautionary measures of the Department of Health and City Government to prevent the spread of COVID-19.	213(24.9)	37(4.3)	115(13.4)	234(27.3)	256(29.9)
It is important to wear mask not only to protect myself, but also others.	229(26.7)	25(2.9)	89(10.4)	194(22.7)	320(37.3)
It is important to self-isolate when having a close contact with someone who has tested positive of COVID-19.	223(26.0)	37(4.3)	93(10.9)	210(24.5)	294(34.3)
It is important to stay at home except only for important errands.	218(25.4)	41(4.8)	105(12.3)	210(24.5)	283(33.0)
Mean	**222.3(25.9)**	**33.4(3.9)**	**121.5(14.2)**	**208.3(24.3)**	**269.3(31.4)**

Related Practices Against COVID-19

As shown in Table 4, this study also revealed that the majority of the respondents always avoid cultural behaviors that involve physical contact and exhibited preventive and protective behavioral practices which are helpful in combatting or preventing COVID-19 infection. This finding is consistent with other students in other universities in the Philippines (e.g., Santiago & Santos, 2021) and abroad (e.g., Hatabu et al., 2020; Prasad et al., 2020).

Table 4

Related Practices of the Students Toward COVID-19 (N = 857)

Item Statements	Never n(%)	Sometimes n(%)	Always n(%)
I avoid cultural behaviors that involve physical contact such as shaking hands, hugging, kissing, etc.	91(10.6)	334(39.0)	432(50.4)
I practice physical distancing.	58(6.8)	214(25.0)	585(68.3)
I wear mask outside the house and in public places.	59(6.9)	110(12.8)	688(80.3)
I wash my hands with soap for 20 seconds especially after handling or touching anything that is also being touched by others such as doorknob, money, etc.	64(7.5)	214(25.0)	579(67.6)
I disinfect my hands using 70% or better alcohol especially after handling or touching anything that is also being touched by others such as doorknob, money, etc.	58(6.8)	161(18.8)	638(74.5)
I take a bath before getting inside the house especially when I came from the market, grocery store, or public places.	80(9.3)	288(33.6)	489(57.1)
I take vitamin C or multi-vitamins to boost my immune system.	112(13.1)	277(32.3)	468(54.6)
I eat healthy food especially fruits and vegetables.	67(7.8)	227(26.5)	563(65.7)
I don't touch my mouth, nose and eyes when I am outside or in public places.	74(8.6)	303(35.4)	480(56.0)
I obey the government or IATF guidelines and health protocols.	88(10.3)	158(18.4)	613(71.5)
Mean	**75.1(8.8)**	**228.6(26.7)**	**553.5(64.6)**

Relationship Between Respondents' KAP Toward COVID-19

Finally, this study revealed that knowledge and attitude have no significant relationship, r (855) = .000, p > .001, which means that having a high level of knowledge may not necessarily mean having a negative or positive attitude toward COVID-19 mitigation and control. This finding may be due to the high number of respondents who strongly disagreed with the attitudinal statements. Previous studies on the relationship between knowledge and attitude clearly suggest differing results, depending on the population. For instance, there was a moderate correlation among the people of Addis Ababa, Ethiopia (Desalegn et al., 2021). A weak relationship between knowledge and attitude was observed among Indonesian undergraduate students (Saefi et al., 2020), and among the general population of Jammu and Kashmir, India (Yousaf et al., 2020).

However, a similar finding with the present study was reported among Filipino, Thai, and Malaysian Medical Technologist students (Aceret et al., 2021). This and the present study seem to negate previous studies on risk communication on COVID-19 and other diseases. For instance, it was claimed that risk perception is determined and influenced by risk communication (Gerrard et al., 1999; Dryhurst et al., 2020; Heydari et al., 2021).

In addition, the findings revealed that knowledge and practice have a positive significant correlation, r (855) = .101, p < .001. This means that these variables tend to increase together (i.e., greater knowledge is associated with greater practice). However, the magnitude or strength of the association is weak (see Table 5). The same finding was also reported among Indonesian undergraduate students (Saefi et al., 2020), and among the general population in Ethiopia (Desalegn et al., 2021).

Likewise, the results showed that attitude and practice have a positive significant relationship, r (855) = .303, p < .001. While these variables tend to increase together (i.e., having a positive attitude toward COVID-19 mitigation and control is associated with greater practice), the magnitude of the association is fair. This finding shows similarity to the undergraduate students in China who were shown to have a fair correlation between these two indicators (Peng, et al., 2020). A weak relationship

was reported among undergraduate students of Indonesia (Saefi et al., 2020). With regards to other population, a weak correlation was also reported among a healthy population in the Philippines (Tuppal et al., 2021), and among Pakistani residents (Afzal et al., 2020), and India (Yousaf et al., 2020).

Table 5

Correlation Between KAP Scores Toward COVID-19

	M	*SD*		Knowledge	Attitude	Practice
Knowledge	16.7	4.1	Pearson Correlation		.000	.101**
			Sig. (2-tailed)		.981	.003
Attitude	3.4	1.6	Pearson Correlation	.000		.303**
			Sig. (2-tailed)	.981		.000
Practice	1.6	0.6	Pearson Correlation	.101**	.303**	
			Sig. (2-tailed)	.003	.000	

Note. ** = Correlation is significant at the 0.01 level (2-tailed).

In line with risk communication, previous studies on COVID-19 (e.g., Parket al., 2021; Tee et al., 2020; Wang, Pan, Wan, Tan, Xu, Ho et al., 2020; Wang, Pan, Wan, Tan, Xu, McIntyre, et al., 2020; Heydari et al., 2021) and other infectious diseases (e.g., Renner et al., 2015; Schmälzle, et al., 2018) suggest that protective and preventive behaviors are associated with risk perception in that the latter positively affects the former. If the correlation between risk perception and preventive and protective behaviors is expected to be stronger, then the finding of this present study, however, suggests that in some circumstances risk perception has no big effect on the behaviors. This means that these behaviors may still take place even when the attitude about the efficacy of the actions does not have a big effect.

Limitations of the Study

The study has potential limitations such as participants who are unlikely to be representative of all Filipino college students, and the online data gathering procedure. The validity of the instrument is also a potential limitation, since only one medical expert and practitioner validated it. Another limitation is that this study was conducted during an extreme surge of COVID-19 infections. As such, the preventive practices may not necessarily be consistent throughout the pandemic. For instance, one study showed that the students' practice of preventive health behaviors are not consistently done after more than a year into a pandemic (Rabacal et al., 2022). Hence, future researchers must consider these limitations in their approach to study the vaccination rate and KAP of a certain population.

Conclusion

The findings of this study provide evidence that indicates high confidence and less hesitancy towards the vaccines among Filipino college students as the majority of the respondents have been fully vaccinated against COVID-19. This preventive behavioral practice may be associated with their eagerness to attend, and the CHED's requirement for, face-to-face classes. The majority of the respondents have good knowledge on the concepts of and are very cautious about COVID-19, including some knowledge regarding transmission, clinical symptoms, treatment, risk groups, isolation, prevention, and control. They exhibited a positive attitude toward individual and governmental mitigation and control of the virus and displayed preventive behaviors and strict adherence to protocols.

Further, a weak correlation between knowledge and practice, and fair correlation between attitude and practice were statistically evident; however, no significant association between knowledge and attitude was seen, which negates some findings in previous studies on KAP and risk communication.

It can be concluded that the students showed strong adherence to personal precautionary measures and to the national and local healthcare authorities, such as the IATF and the city government. The findings are pivotal in understanding specific

population's perceptive risk and preventive behaviors toward the virus, policy making, and health promotion. Schools in the Philippines are recommended to strictly monitor and frequently remind the students of the minimum health protocols to achieve consistent exhibit of preventive and protective behavioral practices.

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