

## KAP towards COVID-19: A Case Study of Undergraduate Students in Malaysia

Shahrina Ismail <sup>\*1</sup>, Sharifah Fairuz Syed Mohamad <sup>1</sup>, Fatin Ahza Rosli<sup>2</sup>, Noor 'Adilah Ibrahim <sup>1</sup>, Sharifah Najwa Syed Mohamad <sup>3</sup>

<sup>1</sup> Faculty of Science and Technology, Universiti Sains Islam Malaysia, Bandar Baru Nilai, 71800 Nilai, Negeri Sembilan, Malaysia

<sup>2</sup> Department of Chemistry, Faculty of Science, Universiti Putra Malaysia, UPM, 43000 Serdang, Selangor, Malaysia

<sup>3</sup> Faculty of Medicine & Health Sciences, Universiti Sains Islam Malaysia, Bandar Baru Nilai, 71800 Nilai, Negeri Sembilan, Malaysia

\* Corresponding author: shahrinaismail@usim.edu.my

### Abstract

Higher educational centres with significant numbers of young people will become acute disease hubs during a pandemic. Owing to the sizeable population of young adults, more direct social interaction, and unrestricted boundaries, universities have the capacity to become volatile, centrifugal outbreak hubs. This research examines the university student's knowledge, attitude, and practice towards the COVID-19 pandemic in Universiti Sains Islam Malaysia (USIM), Nilai. A self-administered questionnaire was distributed to obtain the data and analysed utilising SPSS software with a sample size of 2061 USIM students. Descriptive statistics, Likert scale analysis, multiple linear regression, as well as Pearson correlation, were used to identify the relationship between KAP. It was discovered that most of the USIM's students have an excellent knowledge (85%) and attitude (73.8%) towards COVID-19. However, they moderately practice the right steps to prevent themselves from virus infection. This is very likely due to unpreparedness in responding

Manuscript Received Date: 08/10/21

Manuscript Acceptance Date: 5/12/21

Manuscript Published Date: 25/12/21

©The Author(s) (2020). Published by USIM Press on behalf of the Universiti Sains Islam Malaysia. This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact: [usimpress@usim.edu.my](mailto:usimpress@usim.edu.my)

DOI: 10.33102/uj.vol33noS4.421



to a critical situation such as this pandemic. In other words, it can be said that although students have a pretty good knowledge on the matter, still, attitude and practice have much room for improvement. The study finds significant relationship between practice and both knowledge and attitude.

**Keywords:** COVID-19 pandemic, KAP survey, knowledge, practice, attitude

## 1.0 Introduction

The COVID-19 outbreak in Malaysia can be tracked back to 25<sup>th</sup> of January in 2020, which was first found among travellers coming from China through Singapore after the COVID-19 outbreak in Hubei, China (Ahmad et al., 2020; Islam et al. 2020a). Before the arrival of localized clusters which appeared in March 2020, reported cases appeared comparatively low and restricted mostly to imported cases. The fastest-growing cluster was connected to a religious gathering of Tabligh Jamaat held towards the end of February and early March of 2020, in Sri Petaling, Kuala Lumpur, resulting in huge increment of both local and export cases (Islam et al. 2020b; Moon & Hadlet, 2020). Within several weeks, Malaysia reported the highest COVID-19 cases in Southeast Asia [4], rising from less than 30 cases at the beginning of the month to 2000 inactive cases towards the end of March 2020. By 16<sup>th</sup> of March 2020, it was reported that the virus was spread in each state of the country. Later, on 13<sup>th</sup> of March 2020, a live nationwide announcement was made by Malaysia's Prime Minister which indicated actions to reduce the spreading of virus. By 16<sup>th</sup> March, a Movement Control Order (MCO) was announced, which was designed to slow the spreading of the virus specifically through campaigns involving social distancing that would last for two whole weeks starting 18<sup>th</sup> of March 2020.[5][6][7].

## 2.0 Problem Statement

More than ever, the COVID-19 pandemic has lately affected the wellbeing of the global population. To deter the dissemination of this virus and deter a pandemic, non-pharmaceutical steps are essential, whilst vaccines are being established. This survey is performed to investigate the understanding of knowledge, attitudes, and practices (KAP) with regards to COVID-19 pandemic among undergraduate students of Universiti Sains Islam Malaysia (USIM), Nilai, Malaysia. Effective pandemic treatment requires an understanding of the factors that influence preventive behaviour to report on predictors of students' preventive behaviours during pandemic COVID-19.

The primary outcomes of this research aimed to determine USIM undergraduate students' level of KAP towards the COVID-19 pandemic, as well as to determine the relationship between the KAP components. Our secondary outcome was to evaluate how USIM undergraduate students gained information and responded to the COVID-19 pandemic. These objectives were analysed through both descriptive and inferential statistics.

## 3.0 Literature Review

In a pandemic like MerSCov, SaRS, Ebola, H1N1, youth are more likely to become sick, raising universities' ability to be hubs for explosive disease outbreaks. Most young adults

are asymptomatic despite them being infected with the COVID-19 virus, which makes them invisible potential agents of the disease compared to the elderly. According to a recent report from the British Medical Journal publication, 78 % of people with COVID-19 had no symptoms [8]. The results are consistent with reports at the epicentre of the epidemic from an Italian village demonstrating that 50 - 75 percent were asymptomatic but constituted a great contagion source [9]. Current Icelandic research also found that about 50 % of those tested positive for COVID-19 were asymptomatic in a large-scale screening procedure held [10].

Meanwhile, a WHO study reported that 80% of infections are moderate or asymptomatic, 15% are serious infections, while 5% are acute infections. Although we do not know what percentage of the 80 % are solely asymptomatic or precisely how the cases were counted, a vast number of instances refuse to be checked in the hospital. To minimise the effects on both the organisation and the wider population, disease control is important. Because universities are potential hubs for COVID-19 virus transmission, it is important to consider the control of outbreaks in the higher education surroundings.

In early 2020, the COVID-19 pandemic created a great opportunity to explore how university students gain and interpret information about disaster preparedness during the height of the outbreak. Provided their boundaries permeability of the universities' activities that possess an effect on the social interaction with its participants, university systems are unique. Universities are susceptible to natural or humanmade disasters, and experience with them has shown that consistency during and after these events is crucial. Such institutions have to align academic continuity with outbreak prevention during a pandemic and minimise morbidity.

## **4.0 Methodology**

### **4.1 Sampling**

This study was carried out between April 2020 to June 2020 among the undergraduate students, excluding the foundation and postgraduate students of Universiti Sains Islam Malaysia (USIM) in Nilai, Negeri Sembilan. The total population of students in USIM is 10189. Using a 95% confidence interval and 5% margin error, the total respondents required to answer the questionnaire are 371. However, a total of 2061 respondents participated in the survey.

### **4.2 Instrument**

Participants accessed an online self-administered questionnaire via a Google form link distributed to all USIM undergraduate students. Upon completion and submission of the questionnaire, approval would be inferred. The surveys submitted were compiled in a directory and categorised before analysis. A pilot study on 30 respondents was conducted using the questionnaire developed according to the World Health Organization World Health Survey Instruments and Related Documents [21]. The questionnaire's first section included questions on socio-demographics: gender, state, faculty, study year, and COVID-19 related health background. Students were also asked questions related to COVID-19,

such as the major source they referred to for news on the issue and their activities during the MCO period at the end of this section.

There are 17 items on knowledge, 15 items under attitude, and 14 items related to practice. Participants were asked to rate their knowledge level (from very strong to very weak on a three-category scale) on COVID-19 through the questionnaire. Each of the variables involved has specific items to measure them, as portrayed in **Supplementary data (S1)**. Items in each of the KAP components are added to generate a score for each category. In general, scores of 70%, 35 – 70%, and below 35% denote ‘excellent’, ‘moderate’ and ‘poor’. In terms of attitude, the questionnaire covered the participants’ acceptance of the government’s implementations with 15 items. In contrast, 14 practice items comprised the respondents’ preventive measures and restrictions during the pandemic to reduce transmission. The Cronbach’s Alpha reliability coefficient obtained for the items were 0.647, 0.531, and 0.651 for knowledge, attitude, and practice, respectively.

### 4.3 Data Analysis

The study implemented the SPSS (version 26) for the analysis. This includes data regarding the significance of the variables, correlation among variables, and the relationship between dependent and independent variables. More specifically, all the information was summarised using descriptive statistics to get a broad picture of the data concerning socio-demographic information, knowledge, attitude, and practice towards COVID-19. Pearson correlation was used to measure the correlation and direction of two variables. The final part is to examine the relationship between the variables involved, as well as hypothesis testing. These two analyses were done using multiple linear regression, at a significance level of alpha 5%.

## 5.0 Results

### 5.1 Socio-Demographic Background

A total of 2061 respondents were categorised in terms of socio-demographic profiles, including gender, the state they live in, faculty, and their year of study. **Figure 1** shows the percentages of respondents according to the socio-demographic profiles. More than two-thirds of the respondents in this study comprised of females (76%). It can also be seen that many of the respondents live in Selangor (23%) and a small percentage live in either Perlis, Sabah, or Sarawak. Most of the respondents are represented by students from the Faculty of Science and Technology (16.6%), with almost a third of them are currently in their third year (30.4%).

KAP towards COVID-19: A Case Study of Undergraduate Students in Malaysia

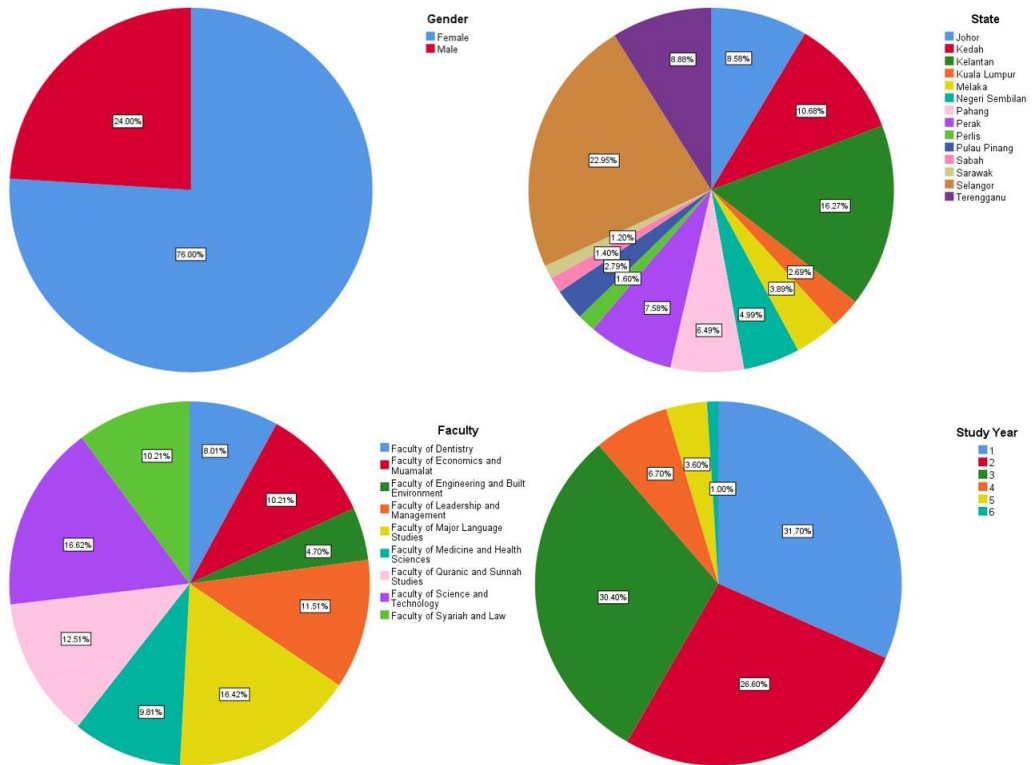


Figure 1. Socio-demographic background of respondents

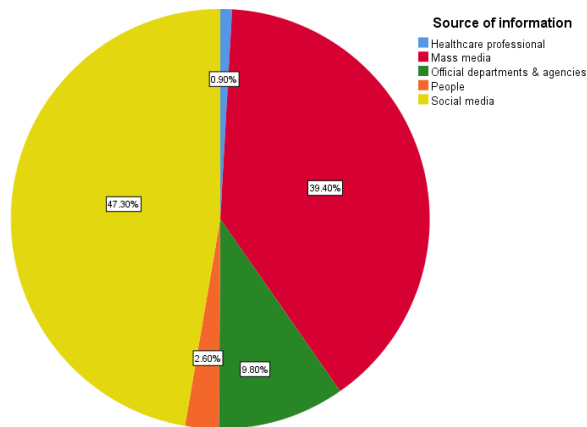


Figure 2. The preferred source of COVID-19 information

**Figure 2** shows that the source of information for COVID-19 updates preferred among USIM undergraduate students is social media (including WhatsApp, Telegram, Facebook, Instagram, and Twitter), with 47.3% of the respondents choosing this option. The next largest source is mass media, with a total of 39.4%. Choosing Social Media is common among primary news source as it is the current platform to obtain information.

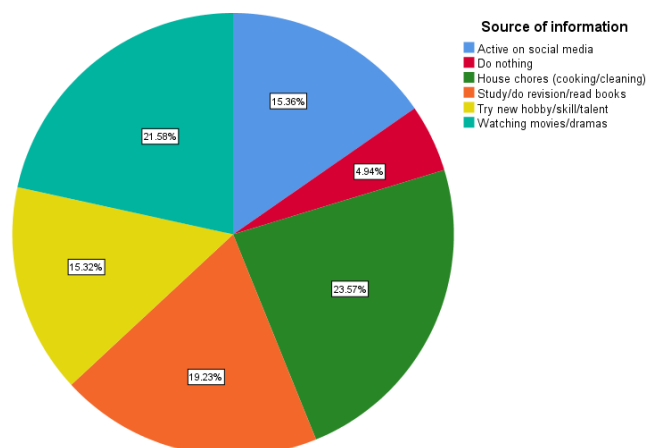


Figure 3. Student’s activities during Movement Control Order (MCO)

**Figure 3** portrays the students’ activities during the MCO, where most students busied themselves with house chores (23.57%). More than a fifth of the students spent time watching movies/dramas (21.58%), while nearly another fifth spent the time studying or revising (19.23%) as part of their activities during MCO. Apart from that, smaller portions of the students spent their time trying out new hobbies or skills (15.32%), as well as spent their time actively on social media (15.36%).

### 5.2 Knowledge, Attitude, and Practice Level

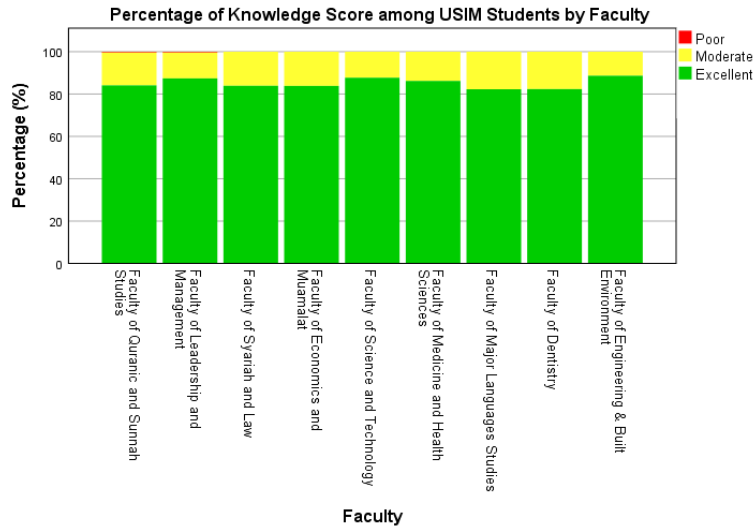
A mean score of 80.69 is observed for the knowledge variable, and about 85% of USIM students had excellent knowledge towards COVID-19 with excellent scores, 14.9% had moderate knowledge. In terms of attitude, a mean score of 73.95 is seen. 73.8% showed excellent attitude scores towards COVID-19, while 26.1% of them have moderate attitude scores. A mean score of 67.60 is observed for practice, and the result shows that most of the students (54.8%) have moderate practice scores, while 44.9% have excellent practice scores, followed by only 0.3% with poor practice.

Table 1. Questionnaire Items and Levels of Knowledge, Attitude and Practice

Variable	N	Min	Max	Mean	S.D	Level %, N = 2061		
						Poor	Mode-rate	Excellent
Knowledge	17	14.71	100.00	80.69	11.43	0.1	14.9	85.0
Attitude	15	33.33	100.00	73.95	9.53	0.0	26.1	73.8
Practice	14	0.00	100.00	67.60	11.49	0.3	54.8	44.9

### 5.3 Knowledge, Attitude, and Practice Level across Faculty

**Figure 4** illustrates the comparison of knowledge, attitude, and practice in percentages across faculties in USIM. Based on this figure, it is clearly seen that the percentage of knowledge categorised in the ‘excellent’ category is much higher than that of attitude and practice. More specifically, all faculties reached over 80% in terms of knowledge than the other two variables. For knowledge, it is observed that the Faculty of Engineering & Built Environment has the most percentage of ‘excellent’ level at 89%, followed by the Faculty of Science and Technology and Faculty of Leadership and Management at 87.39%. Meanwhile, for attitude levels, the Faculty of Leadership and Management make a lead at 79.83 %, followed closely by the Faculty of Quranic and Sunnah Studies at 79.07%. Finally, for practice, the Faculty of Medicine and Health Sciences leads at 59.61%, followed by a tie of 50% from the Faculty of Science and Technology and Faculty of Dentistry. Overall, if viewed from the sciences vs non-sciences stream in faculties, both knowledge and practice are higher in terms of ‘excellent’ levels in the sciences stream compared to non-sciences. However, in terms of attitude, the non-sciences group took the lead with an average of 77.068% compared to the sciences group of 67.48%.



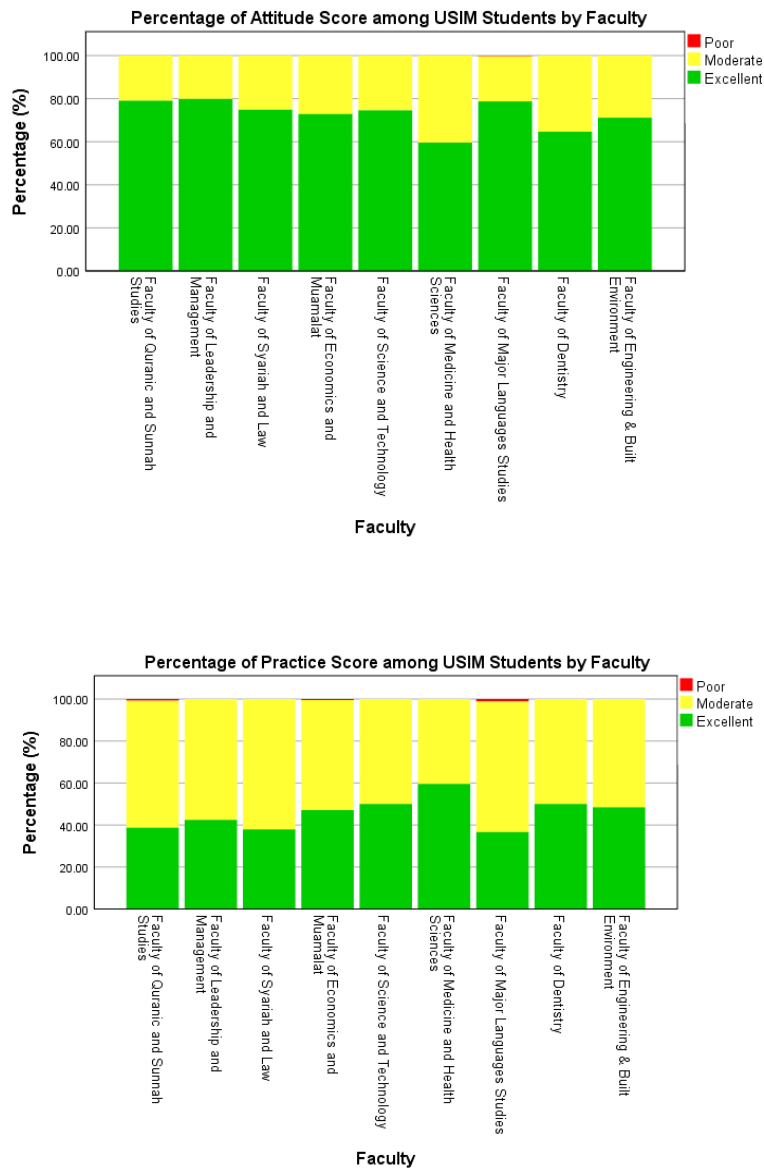


Figure 4. Comparison of Knowledge, Attitude and Practice across Faculties in USIM

#### 5.4 Knowledge, Attitude, and Practice across Socio-demographic Background

As for knowledge, the mean score of 80.69 was observed where the majority of the students in USIM has an excellent level of knowledge, with 85% of them scored more than 70%. In comparison, the rest of them acquired moderate and poor knowledge, with 14.9% and 0.1%, respectively. As in **Figure 1**, 76% of the participants were female, and they significantly scored higher in the knowledge part compared to males. The results are presented in **Table II** using the Chi-Square goodness of fit test. Most participants perceived that they have moderate knowledge (80.6%), and the least of them rated themselves having an excellent



level of knowledge (6.5%). The  $p$ -value indicates there is a substantial difference in the proportion of knowledge score between the poor and excellent level of knowledge identified in the total questionnaire score as compared with the value of that obtained from what has been perceived by the students,  $\chi^2(2, n = 2061) = 21074.645, p < 0.05$ .

Table 2. Chi-Square Goodness of Fit

Knowledge Level	Expected N	Individual rate (%)	Observed N	Questionnaire score (%)	Residual
Poor	266	12.9	2	0.1	-264.0
Moderate	1662	80.6	307	14.9	-1355.0
Excellent	133	6.5	1752	85.0	1619.0
Total	2061	100.0	2061	100.0	

Asymp. Sig. = 0.000

For knowledge, the mean scores across gender and year of the study show a significant difference having a  $p$ -value less than 0.05, as seen in Table 3. The post-hoc Turkey test indicates that female students have a higher mean (27.64) than males (26.78); however, the effect size is small. The seniors scored higher in knowledge than juniors, while for attitude, the juniors significantly differ from the seniors. Across states, the students from Kedah (22.65) scored higher in attitude than those in Selangor (21.78), while across faculties, attitude score for social science students is seen higher than science majors. As for practice, there is a substantial difference across states where the mean score for Selangor (19.34) is slightly higher than Kedah (18.40). Those with a science background, especially medical students, have higher practice scores than social science students.

Table 3. Knowledge, Attitude, and Practice Mean score with significant value for ANOVA and  $t$ -test based on the Socio-Demographic Background at a significance level of 0.05.

Characteristics	N	%	Knowledge			Attitude			Practice		
			Mean	SD	Sig.	Mean	SD	Sig.	Mean	SD	Sig.
<b>Gender</b>											
Male	495	24.0	26.78	4.091	0.000*	22.02	3.099	0.159	19.15	3.541	0.097
Female	1566	76.0	27.64	3.797		22.24	2.777		18.86	3.105	
<b>State</b>											
Perlis	32	1.6	27.56	3.732	0.590	22.66	3.219	0.000*	19.13	2.904	0.000*
Kedah	220	10.7	27.59	3.648		22.65	2.674		18.40	3.250	
Pulau Pinang	57	2.8	28.25	3.572		21.98	2.303		19.44	2.598	
Perak	157	7.6	27.17	3.595		22.11	2.876		18.80	3.073	
Selangor	473	23.0	27.33	3.811		21.78	2.976		19.34	3.072	
Kuala Lumpur	55	2.7	26.53	3.746		22.69	2.574		18.95	3.033	
Melaka	80	3.9	27.71	3.749		22.04	2.592		19.11	3.174	
Negeri Sembilan	103	5.0	27.79	4.826		22.00	2.668		19.08	3.508	
Johor	177	8.6	27.27	3.894		22.20	2.739		18.92	3.146	
Kelantan	336	16.3	27.28	4.032		22.46	2.802		18.75	3.337	
Terengganu	184	8.9	27.69	4.013		22.13	3.006		18.55	3.111	
Pahang	134	6.5	27.57	3.750		22.27	2.966		18.73	3.679	
Sabah	28	1.4	28.21	3.985		21.79	3.804		19.29	3.589	
Sarawak	25	1.2	27.20	4.103		22.76	2.891		19.76	3.320	
<b>Faculty</b>											

Faculty of Quranic and Sunnah Studies	258	12.5	27.50	4.251		22.74	2.884		18.43	3.463	
Faculty of Leadership and Management	238	11.5	27.34	4.013		22.75	2.785		18.80	3.158	
Faculty of Syariah and Law	211	10.2	27.29	3.742		22.10	2.970		18.67	2.896	
Faculty of Economics and Muamalat	210	10.2	27.51	3.825		22.31	2.775		18.90	3.192	
Faculty of Science and Technology	342	16.6	27.82	3.740	0.227	21.97	2.746	0.000*	19.14	2.966	0.000*
Faculty of Medicine and Health Sciences	203	9.8	27.78	3.826		21.23	2.600		20.04	2.853	
Faculty of Major Language Studies	338	16.4	26.98	3.827		22.65	2.938		18.23	3.587	
Faculty of Dentistry	164	8.0	27.24	4.064		21.46	2.838		19.58	2.751	
Faculty of Engineering and Built Environment	97	4.7	27.46	3.446		21.62	2.655		19.41	3.466	
<b>Study Year</b>											
1	654	31.7	27.23	3.761		22.34	2.779		18.85	3.181	
2	548	26.6	27.21	3.922		22.30	2.791		18.71	3.191	
3	626	30.4	27.73	4.015	0.027*	22.27	2.919	0.000*	19.12	3.417	0.000*
4	139	6.7	27.39	3.739		21.32	2.998		18.74	2.655	
5	74	3.6	28.47	3.786		21.01	2.777		19.81	2.865	
6	20	1.0	27.80	3.397		21.35	2.777		19.45	2.800	
<b>Chronic Illness</b>											
Yes	25	1.2	28.08	3.605	0.404	21.88	2.977	0.591	18.24	3.218	0.283
No	2036	98.8	27.43	3.890		22.19	2.857		18.94	3.216	
<b>Perception towards COVID-19</b>											
Terrifying	393	19.1	27.82	3.811		22.05	2.915		18.95	3.221	
Serious	1049	50.9	27.39	3.933	0.066	22.12	2.879	0.202	18.81	3.244	0.276
Not so serious	30	1.5	26.27	4.820		22.07	3.383		19.53	3.491	
Getting better	589	28.6	27.32	3.786		22.40	2.748		19.09	3.147	
<b>Environment infected with COVID-19</b>											
Yes, confirmed	171	8.3	27.16	3.681		21.84	2.969		19.10	3.293	
Yes, suspected but not confirmed by a test	57	2.8	27.46	3.942		22.25	2.893		19.04	3.190	
No, tested and the result was negative	323	15.7	27.25	4.029	0.533	22.15	2.734	0.560	19.33	3.110	0.112
No	1305	63.3	27.55	3.810		22.22	2.873		18.84	3.168	
Don't know	205	9.9	27.24	4.279		22.29	2.856		18.71	3.582	
<b>Are you infected?</b>											
Yes, suspected but not confirmed by a test	3	0.1	27.33	2.309		23.67	2.082		18.33	3.215	
No, tested and the result was negative	81	3.9	27.79	4.221	0.690	21.85	3.017	0.342	19.37	3.455	0.434
No	1914	92.9	27.41	3.886		22.21	2.833		18.90	3.206	
Don't know	63	3.1	27.84	3.502		21.78	3.377		19.32	3.222	

Concerning differences across the year of study, an option for up to 6 years of total study was given. Significant differences are seen in all three variables across the year; however, both knowledge and practice have a minimal effect size of 0.01, although the mean scores generally increase from year 1 to year 6. While for attitude, results are quite contrary as mean scores for junior students are higher than their seniors. In summary, only four out of the twelve hypotheses fail to reject the null hypothesis, as tabulated in **Supplementary Data (S2)**.

Table 4. Correlation between Knowledge, Attitude, and Practice

	Knowledge	Attitude	Practice
<b>Knowledge</b>	1	.023	.119**
<b>Attitude</b>	.023	1	.105**
<b>Practice</b>	.119**	.105**	1

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

A correlation test was conducted to see the correlation between the three variables involved (Table 4). All values are below 0.5, which means variables significantly have a weak positive correlation with one another.

Table 5. Knowledge Multiple Regression Analysis

	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	24.416	.795		30.731	.000	22.858	25.974
Attitude	.015	.030	.011	.487	.626	-.044	.073
Practice	.142	.027	.118	5.357	.000	.090	.195

R: 0.119; R2: 0.14; Adjusted R2: 0.013; SEE: 3.860; F (2, 2058): 14.902

Table 6. Attitude Multiple Regression Analysis

	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	20.228	.549		36.879	.000	19.152	21.304
Practice	.092	.020	.103	4.687	.000	.053	.130
Knowledge	.008	.016	.011	.487	.626	-.024	.040

R: 0.105; R2: 0.11; Adjusted R2: 0.010; SEE: 2.844; F (2, 2058): 11.538

Table 7. Practice Multiple Regression Analysis

	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	13.730	.730		18.814	.000	12.299	15.161
Knowledge	.097	.018	.117	5.357	.000	.061	.132
Attitude	.115	.025	.102	4.687	.000	.067	.163

R: 0.157; R2: 0.025; Adjusted R2: 0.024; SSE: 3.178; F (2, 2058): 0.924

**Tables 5-7** provide the regression results to identify the relationship between the three variables: knowledge, attitude, and practice. From these results, there are significant relationships between practice and both knowledge and attitude. However, since the R2 is relatively low, many other factors are excluded in the regression model that could explain the dependent variable. For example, in **Table 7**, the R2 is 0.025, which implies that knowledge and attitude only explain 2.5% of the variable 'practice', and 97.5% comes from other variables not included in this regression. Its p-value, however, is very small for both knowledge and attitude. This strongly rejects the null hypothesis that these two independent variables are not affecting the dependent variable.

## 6.0 Discussion

This study is strikingly different from other studies as it is among the pioneer in representing an Islamic based public university in Malaysia, in response to COVID-19. From this study, it is found that students mostly preferred social media (including WhatsApp, Telegram, Facebook, Instagram, and Twitter) for the COVID-19 updates or information, which comprises of 47.3% of the respondents. Social media is common

among primary news sources in some studies. It is the current platform to obtain information, as some of these respondents spent their time actively on social media during the MCO (Moon & Hadley, 2014). In order to successfully engage students with emergency information to prevent misleading and infodemic information, universities must depend on mediated and interpersonal communication from trustworthy sources (A. K. M. N. Islam et al., 2020; M. S. Islam et al., 2020; Nguyen & Nguyen, 2020) [12]. Apart from that, students should consider the emergency related to health, the risk of the emergency, the appropriate measures to avert it, and specific signs for intervention. The overabundance of this evidence will cause students to reduce the relative value of knowledge about prevention.

Consequently, in the pre-, early, and mid-outbreak phases, reactions to a pandemic are subject to revision. Lessons for the institutions to brace for a third wave and potential COVID-19 outbreaks involve encouraging healthy public health habits among young people and students. Despite the high levels of contact in a university environment, they need to learn about disease transmission and infection risk. It is important to stress that they may face a real risk from the pandemic disease. Protecting themselves from infection is crucial so that the safety measures can be efficient. As seen in our study, the majority depended on social media; thus, the authorities need to control the misleading information from circling among the public. New policies have to be established to engage students' attention to using various scientific-based sources of information.

### *6.1 Knowledge Assessment*

It was observed that 85% of the students in USIM has an excellent level of knowledge scored more than 70%, while the rest of them acquired moderate (14.9%), and only a few students with poor knowledge (0.1%). Overall, if viewed from the sciences vs non-sciences stream in faculties, knowledge level is higher in terms of 'excellent' levels in the sciences stream compared to non-sciences. This finding is similar to [15], where medical students outperformed non-medical students (medical students were more informed and accepting). This may be due to most science students have basic knowledge of how the virus spread. Females significantly scored higher in the knowledge part compared to males. The seniors (5th and 6th year, mostly from medical and dental students) also significantly have a higher knowledge score than students in junior years (1st - 4th year).

### *6.2 Attitude Assessment*

More than half of USIM students (73.8%) react positively towards COVID-19 with excellent scores, and the rest moderately with 26.1% who have moderate attitude scores. 77.07% of the non-sciences group scored excellently across the faculties, leading slightly from the sciences group, with only 67.48% of them achieved excellent scores. This could be due to the non-science students knowing their knowledge of science-related stuff like COVID-19 is less than the science students. Thus, to look after themselves and their family members' safety, they have to put extra effort in looking for information and knowledge on COVID-19. In contrast with knowledge, the juniors significantly have a higher mean attitude score from the seniors. This could be due to junior students have completed pre-

university studies and have just entered university life. Thus, they are more flexible in complying with new norms. Across states, the students from Kedah scored higher in attitude than those in Selangor. In contrast, across faculties, attitude scores for social science students are seen higher than science majors. Higher attitude score from students who live in Kedah may be due to the first local transmission happens to be in Kedah, which causes them to be highly aware of COVID-19 (Ahmad et al., 2020).

The result shows that slightly more than half of the students (54.8%) have moderate practice scores, and 44.9% have excellent practice scores, followed by 0.3% with poor practice. There is a substantial difference across states where the mean score for Selangor is slightly higher than Kedah. Those with a science background, especially medical students, have higher practice scores than social science students. This finding was again supported by [15].

## 7.0 Conclusion

Most of USIM's students appear to have excellent knowledge and attitude towards COVID-19. However, the practice score is relatively low, most likely due to the unpreparedness to face this pandemic's critical situation. In other words, it can be said that although students have a pretty good level of knowledge on the matter, attitude, and practice still have much room for improvement. The Pearson correlation test portrays that all variables have a weak positive correlation with one another. In addition, it was found that the practice has a significant relationship with both knowledge and attitude. However, knowledge is insignificant towards attitude. In the future, awareness campaigns and modules to encourage good health behaviour and practice among university students should be established when planning management strategies concerning outbreaks or pandemics in institutions of higher education. While this is advocated to be compatible with international guidelines, it also must play a sustainable role to be implemented during any world pandemics or national disasters.

---

## Acknowledgement

The authors acknowledge those who have helped in carrying out this research.

---

## References

- Akan, H., Gurol, Y., Izbirak, G., Ozdatli, S., Yilmaz, G., Vitrinel, A., Hayran, O. (2010). Knowledge and attitudes of university students toward pandemic influenza: a cross-sectional study from Turkey. *BMC Public Health*, 10: 413. doi: 10.1186/1471-2458-10-413.
- Ahmad, N. A., Lin, C. Z., Rahman, S. A., Haikal, M., Nadzari, E. E., Zakiman, Z., Redzuan, S., Taib, S., Shaiful, M., Kassim, A., Noraini, W., & Mohamed, W. (2020). First Local Transmission Cluster of COVID-19 in Malaysia: Public Health Response. *International Travel Medicine*

*Center and Global Health*, 8(3), 124–130. <https://doi.org/10.34172/ijtmgh.2020.21>

- Bunyan, J. (2020). PM: Malaysia under movement control order from Wed until 31st March, all shops closed except for essential services. *The Malay Mail*. Archived from the original on 16th March 2020. Retrieved on 16th March 2020.
- Cauchemez, S., Kerkhove, M. D. V., Archer, B. N., Cetron, M., Cowling, B. J., Grove, P., Hunt, D., Kojouharova, M., Kon, P., Ungchusak, K., Oshitani, H., Pugliese, A., Rizzo, C., Saour, G., Sunagawa, T., Uzicanin, A., Wachtel, C., Weisfuse, I., Yu, H., Nicoll, A. (2014). School closures during the 2009 influenza pandemic: national and local experiences. *BMC Infect Dis*, 14: 207.
- Day, M. (2020a). Covid-19: Four-fifths of cases are asymptomatic, China figures indicate. *British Medical Journal*, 369:m1375 doi: 10.1136/bmj.m1375. Published 2nd April 2020.
- Day, M. (2020b). Covid-19: Identifying and isolating asymptomatic people helped eliminate the virus in the Italian village. *British Medical Journal*, 368:m1165 doi: 10.1136/bmj.m1165. Published 23rd March 2020.
- GardaWorld. (2020). Malaysia: First cases of 2019-nCoV confirmed 25th January. Archived from the original on 18th February 2020. Retrieved on 18th February 2020.
- Griffiths, S. M., Wong, A. H., Kim, J. H., Yung, T. K. C., Lau, J. T. F. (2010). Influence of country of study on student responsiveness to the H1N1 pandemic. *Public Health*, 124(8): 460–466. doi: 10.1016/j.puhe.2010.03.027.
- Hussain, Z. A., Hussain, S. A., Hussain, F. A. (2012). Medical students' knowledge, perceptions, and behavioral intentions towards H1N1 influenza, swine flu, in Pakistan: A brief report. *American Journal of Infection Control* 40, e11-e13.
- Islam, A. K. M. N., Laato, S., Talukder, S., & Sutinen, E. (2020). Misinformation sharing and social media fatigue during COVID-19: An affordance and cognitive load perspective. *Technological Forecasting and Social Change*, 159(May), 120201. <https://doi.org/10.1016/j.techfore.2020.120201>
- Islam, M. S., Sarkar, T., Khan, S. H., Mostofa Kamal, A.-H., Hasan, S. M. M., Kabir, A., Yeasmin, D., Islam, M. A., Amin Chowdhury, K. I., Anwar, K. S., Chughtai, A. A., & Seale, H. (2020). COVID-19–Related Infodemic and Its Impact on Public Health: A Global Social Media Analysis. *The American Journal of Tropical Medicine and Hygiene*, tpm200812. <https://doi.org/10.4269/ajtmh.20-0812>
- Kate, Ng. (2020). Coronavirus: Malaysia cases rise by 190 after mosque event as imams urge online services. *The Independent*. Archived from the original on 5th April 2020. Retrieved on 5th April 2020.
- Koskan, A, C Foster, J Karlis, A Tanner, Characteristics and influences of H1N1 communication on college students. (2012). *Disaster Prevention and Management: An International Journal*,

21(4), pp. 418-432.

- Moon, S. J., & Hadley, P. (2014). Routinizing a New Technology in the Newsroom: Twitter as a News Source in Mainstream Media. *Journal of Broadcasting and Electronic Media*, 58(2), 289–305. <https://doi.org/10.1080/08838151.2014.906435>
- Nguyen, H., & Nguyen, A. (2020). Covid-19 Misinformation and the Social (Media) Amplification of Risk: A Vietnamese Perspective. *Media and Communication*, 8(2), 444–447. <https://doi.org/10.17645/mac.v8i2.3227>
- Panovska-Griffiths, J. (2020). Study suggests 78% of those with coronavirus don't show symptoms—here's what that could mean. Medical Press. Retrieved on 25th June 2020.
- Sharifirad, G., Yarmohammadi, P., Sharifabad, M. A. M., Rahaei, Z. (2014). Determination of preventive behaviors for pandemic influenza A/H1N1 based on protection motivation theory among female high school students in Isfahan, Iran. *J Educ Health Promot*; 3: 7. Published online 2014 21st February. doi: 10.4103/2277-9531.127556.
- Seale, H., Mak, J. PI., Razee, H., MacIntyre, C. R. (2012). Examining the knowledge, attitudes, and practices of domestic and international university students towards seasonal and pandemic influenza. *BMC Public Health*, 12:307.
- Sipalan, J., Holmes, S. (2020). Malaysia confirms first cases of coronavirus infection. Reuters. Archived from the original on 18th February 2020. Retrieved on 18th February 2020.
- Sukumaran, T. (2020). Coronavirus: Malaysia in partial lockdown from 18th March to limit outbreak. South China Morning Post. Archived from the original on 16th March 2020. Retrieved on 16th March 2020.
- Tan, X., Pan, J., Zhou, D., Wang, D., Xie, C. (2007). HIV/AIDS Knowledge, Attitudes and Behaviors Assessment of Chinese Students: A Questionnaire Study. *Int. J. Environ. Res. Public Health*, 4(3), 248-253.
- The Straits Times. (2020). Coronavirus: Malaysia records eight deaths; 153 new cases bring total to 1,183. Archived from the original on 5th April 2020. Retrieved on 5th April 2020.
- Van D, McLaws ML, Crimmins J, MacIntyre R, Seale H. (2010). University life and pandemic influenza: Attitudes and intended behaviour of staff and students towards pandemic (H1N1) 2009. *BMC Public Health*, 10:130.
- Wilson, S. L., Huttlinger, K. (2010). Pandemic flu knowledge among dormitory housed university students: a need for informal social support and social networking strategies. *Rural and Remote Health*. 10: 1526.
- Wern Jun, Soo. (2020). Movement control order not a lockdown, says former health minister. The Malay Mail. Archived from the original on 17th March 2020. Retrieved on 17th March 2020.
- World Health Organization. (2019). Coronavirus disease (COVID-19) technical guidance: infection

prevention and control / WASH, Coronavirus Dis., Nov. 2019, <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/infection-prevention-and-control>. Retrieved on 20th May, 2020.



**SUPPLEMENTARY DATA**

<b>Knowledge</b>	
K1	The main clinical symptoms of COVID-19 are fever, fatigue, and dry cough.
K2	There currently is no effective cure for COVID-19, but early symptoms and treatment can help most patients to recover.
K3	The COVID-19 virus spreads via respiratory droplets of infected individuals.
K4	Ordinary residents can wear general medical masks to prevent the infection by the COVID-19 virus.
K5	To prevent the infection by COVID-19, individuals should avoid going to crowded places.
K6	Isolation and treatment of infected people with the COVID-19 virus are effective ways to reduce the spread of the virus.
K7	People who have contact with someone infected with the COVID-19 virus should be immediately isolated in the proper place for 14 days.
K8	Fever can be symptoms of the COVID-19
K9	Cough can be symptoms of the COVID-19
K10	Shortness of breath can be symptoms of the COVID-19
K11	Sore throat can be symptoms of the COVID-19
K12	Runny or stuffy nose can be symptoms of the COVID-19
K13	Muscle or body aches can be symptoms of the COVID-19
K14	Headaches can be symptoms of the COVID-19
K15	Fatigue (tiredness) can be symptoms of the COVID-19
K16	Diarrhoea can be symptoms of the COVID-19
K17	Loss of taste and smell can be symptoms of the COVID-19
<b>Attitude</b>	
A1	Do you agree that COVID-19 will finally be successfully controlled?
A2	Do you have confidence that Malaysia will win the battle against the COVID-19 virus?
A3	Due to the spreading of COVID-19, I tend to avoid and not meet people.
A4	I have obeyed the Movement Control Order (MCO) as ordered by my government and am fully staying at home.
A5	I double-check the information that I received regarding COVID-19 to ensure that I do not spread the wrong information.
A6	I know how to protect myself from coronavirus.
A7	I follow the recommendations from authorities in my country to prevent the spread of COVID-19.
A8	Are you aware of the right source of information/updates on COVID-19 (number of new deaths/numbers of new infectious) in your region?
A9	I will move somewhere with no coronavirus.
A10	I will stock up and stay indoors.
A11	It will not be as bad as predicted.
A12	There is nothing we can do about it.
A13	I will just have to accept it.
A14	Medication will quickly be provided.
A15	It will not happen to me.
<b>Practice</b>	
P1	Hand washing for at least 20 seconds to prevent infection from the COVID-19.
P2	Avoiding touching your eyes, nose, and mouth with unwashed hands to prevent infection from the COVID-19.

P3	Use of hand sanitiser to clean hands when soap and water is not available for washing hands to prevent infection from the COVID-19.
P4	Staying home when you were sick or when you had a cold to prevent infection from the COVID-19.
P5	Covering your mouth and nose when you cough or sneeze to prevent infection from the COVID-19.
P6	Wearing a face mask to prevent infection from the COVID-19.
P7	Social distancing to prevent infection from the COVID-19.
P8	Self-isolation/quarantine to prevent infection from the COVID-19.
P9	After the peak of the pandemic, only people over the age of 70 should stay at home.
P10	After the peak of the pandemic, the restrictions should be upheld in towns and cities, but not rural areas.
P11	After the peak of the pandemic, the smaller children should be able to return to school, but not the older ones who can take care of themselves at home.
P12	After the peak of the pandemic, restrictions should be lifted in the countries where less people are infected, but not in countries where more people are infected.
P13	Current restrictions should not be lifted, even beyond the peak of the pandemic.
P14	After the peak of the pandemic, everyone should be obligated to wear a mask in public.

## S2 Results of hypothesis testing for socio-demographic variables and KAP components

<b>KAP Component</b>	<b>Socio-demographic item</b>	<b>p-value</b>	<b>Null hypothesis rejected (or fail to reject) – 5%</b>
Knowledge	Gender	0.000	Rejected
	State	0.590	Fail to reject
	Faculty	0.227	Fail to reject
	Year of Study	0.025	Rejected
Attitude	Gender	0.159	Fail to reject
	State	0.000	Rejected
	Faculty	0.000	Rejected
	Year of Study	0.000	Rejected
Practice	Gender	0.097	Fail to reject
	State	0.000	Rejected
	Faculty	0.000	Rejected
	Year of Study	0.000	Rejected