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

Shahrina Ismail *, Sharifah Fairuz Syed Mohamad 1, Fatin Ahza Rosli 2, Noor ‘Adilah Ibrahim 1, Sharifah Najwa Syed Mohamad 3

1 Faculty of Science and Technology, Universiti Sains Islam Malaysia, Bandar Baru Nilai, 71800 Nilai, Negeri Sembilan, Malaysia
2 Department of Chemistry, Faculty of Science, Universiti Putra Malaysia, UPM, 43000 Serdang, Selangor, Malaysia
3 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
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 25th of January in 2020, which was first found among travellers coming from China through Singapore after the COVID-19 outburst 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 16th of March 2020, it was reported that the virus was spread in each state of the country. Later, on 13th of March 2020, a live nationwide announcement was made by Malaysia’s Prime Minister which indicated actions to reduce the spreading of virus. By 16th 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 18th 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%).
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 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 toward 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.

| Variable | N  | Min  | Max  | Mean  | S.D  | Poor | Moderate | 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%.
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 Mean | SD | Sig. | Attitude Mean | SD | Sig. | Practice Mean | SD | Sig. |
|-----------------|----|----|----------------|----|------|---------------|----|------|---------------|----|------|
| Gender          |    |    |                |    |      |               |    |      |               |    |      |
| 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 | 0.000* | 22.24 | 2.777 | 0.159 | 18.86 | 3.105 | 0.000* |
| State           |    |    |                |    |      |               |    |      |               |    |      |
| Perlis          | 32 | 1.6 | 27.56 | 3.732 | 0.590 | 22.66 | 3.219 | 0.159 | 19.13 | 2.904 | 0.000* |
| Kedah           | 220 | 10.7 | 27.59 | 3.648 | 0.590 | 22.65 | 2.674 | 0.159 | 18.40 | 3.250 | 0.000* |
| Pulau Pinang    | 57 | 2.8 | 28.25 | 3.572 | 0.590 | 21.98 | 2.303 | 0.159 | 19.44 | 2.598 | 0.000* |
| Perak           | 157 | 7.6 | 27.17 | 3.595 | 0.590 | 21.11 | 2.876 | 0.159 | 18.80 | 3.073 | 0.000* |
| Selangor        | 473 | 23.0 | 27.33 | 3.811 | 0.590 | 21.78 | 2.976 | 0.159 | 19.34 | 3.072 | 0.000* |
| Kuala Lumpur    | 55 | 2.7 | 26.53 | 3.746 | 0.590 | 22.69 | 2.574 | 0.159 | 18.95 | 3.033 | 0.000* |
| Melaka          | 80 | 3.9 | 27.71 | 3.749 | 0.590 | 22.04 | 2.592 | 0.159 | 19.11 | 3.174 | 0.000* |
| Negeri Sembilan| 103 | 5.0 | 27.79 | 4.826 | 0.590 | 22.00 | 2.668 | 0.159 | 19.08 | 3.508 | 0.000* |
| Johor           | 177 | 8.6 | 27.27 | 3.894 | 0.590 | 22.20 | 2.739 | 0.159 | 18.92 | 3.146 | 0.000* |
| Kelantan        | 336 | 16.3 | 27.28 | 4.032 | 0.590 | 22.46 | 2.802 | 0.159 | 18.75 | 3.337 | 0.000* |
| Terengganu      | 184 | 8.9 | 27.69 | 4.013 | 0.590 | 22.13 | 3.006 | 0.159 | 18.55 | 3.111 | 0.000* |
| Pahang          | 134 | 6.5 | 27.57 | 3.750 | 0.590 | 22.27 | 2.966 | 0.159 | 18.73 | 3.679 | 0.000* |
| Sabah           | 28 | 1.4 | 28.21 | 3.985 | 0.590 | 21.79 | 3.804 | 0.159 | 19.29 | 3.589 | 0.000* |
| Sarawak         | 25 | 1.2 | 27.20 | 4.103 | 0.590 | 22.76 | 2.891 | 0.159 | 19.76 | 3.320 | 0.000* |

Faculty
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 |
|-----------|----------|----------|
| Knowledge | 1        | .023     | .119*    |
| Attitude  | .023     | 1        | .105**   |
| Practice  | .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 | 95.0% Confidence Interval for B |
|----------------|-----------------------------|---------------------------|-------------------------------|
|                | B              | Std. Error | Beta | t     | Sig. | 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        |

Table 6. Attitude Multiple Regression Analysis

|                | Unstandardised Coefficients | Standardised Coefficients | 95.0% Confidence Interval for B |
|----------------|-----------------------------|---------------------------|-------------------------------|
|                | B              | Std. Error | Beta | t     | Sig. | 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  | 4.87   | .000 | -.024       | .040        |

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

Table 7. Practice Multiple Regression Analysis

|                | Unstandardised Coefficients | Standardised Coefficients | 95.0% Confidence Interval for B |
|----------------|-----------------------------|---------------------------|-------------------------------|
|                | B              | Std. Error | Beta | t     | Sig. | 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: 0.105; R²: 0.11; Adjusted R²: 0.010; SEE: 2.844; F (2, 2058): 11.538

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.

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### SUPPLEMENTARY DATA

#### Knowledge

| 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 |

#### Attitude

| 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. Are you aware of the right source of information/updates on COVID-19 (number of new deaths/numbers of new infectious) in your region? |
| A8 | I will move somewhere with no coronavirus. |
| A9 | I will stock up and stay indoors. |
| A10 | It will not be as bad as predicted. |
| A11 | There is nothing we can do about it. |
| A12 | I will just have to accept it. |
| A13 | Medication will quickly be provided. |
| A14 | It will not happen to me. |

#### Practice

| 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. |
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.

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

| KAP Component | Socio-demographic item | p-value | Null hypothesis rejected (or fail to reject) – 5% |
|---------------|------------------------|---------|---------------------------------------------|
| 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                                    |