

# Knowledge, awareness, attitudes, and standard operating procedures (SOPs) towards practices for COVID-19 infection prevention in Sarawak, Malaysia

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**Background:** The coronavirus disease pandemic is a viral disease that is spreading globally. In Malaysia, the government has contributed much effort in preventing the spread of the disease. However, the confirmed cases have kept increasing over the past year. Hence, there is a need to study the factors affecting the practices of the coronavirus disease prevention.

**Methods:** A total of 1,515 datasets were collected from the respondents of 13-year-old and above within the whole Sarawak. Preliminary data analysis was performed by Statistical Package for the Social Sciences 26.0, then partial least squares structural equation modelling analysis were performed using WarpPLS 7.0 to investigate the relationship of general public knowledge, public awareness, attitude and opinions of standard operating procedures toward practices of the coronavirus disease prevention. Besides, the analysis of the responses for each of the measurement item was reported.

**Results:** The result indicated that general public knowledge, public attitude and opinions of standard operating procedures were significantly impacting the practices of the coronavirus disease prevention. The study further revealed that public awareness was not impacting practices of the coronavirus disease prevention.

**Conclusions:** It is imperative for the government to educate the public on the coronavirus disease knowledge. Besides, the public should do their part to coordinate with the government in preventing the coronavirus disease from the spread.

**Keywords:** Coronavirus disease prevention; general public knowledge; public awareness; attitude; standard operating procedures

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## Introduction

The coronavirus disease (COVID-19) is a viral disease that transmits from one infected person to another. To date, the disease has claimed 6.04 million lives and has been

announced by World Health Organization (WHO) as a global public health emergency as it spread rapidly to most of the countries in the world (1,2). WHO further declared it as a pandemic after the confirmed cases exceeded 200,000 and the death of more than 8,000 across 160 countries (3).

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The common symptoms of COVID-19 include acute respiratory disorders like coughing, fever, shortness of breath, etc. The quarantine period of COVID-19 is not more than 14 days, and in severe cases, it can lead to pneumonia, acute respiratory syndrome, kidney failure, and ultimately death (4).

The first COVID-19 case in Malaysia was confirmed on 25th January 2020 by 3 Chinese nationals from China who entered Malaysia from Singapore (5). Since the outbreak of COVID-19 in Malaysia, the Malaysian government carefully evaluated the standard operation procedure (SOP) set by WHO to prevent the further spread of COVID-19 (6). The Ministry of Health Malaysia has developed guidelines for COVID-19 management in Malaysia in response to the pandemic. Besides, Malaysia is also implementing Movement Control Order (MCO)—social quarantine coupled with social distancing and other SOPs to “flatten the curve” of COVID-19 (7). As for the Sarawak state, the outbreak of COVID-19 was delayed due to the prevention work from the Sarawak Disaster Management Committee (SDMC) and only became serious after the third wave of COVID-19 infection (8). However, Sarawak has become one of Malaysia’s states with high confirm cases (9).

Ever since the outbreak of the COVID-19 pandemic, the prevention of being infected by COVID-19 has become a popular topic among scholars and one of the major considerations among professionals and governments. Besides, the major gadgets used to prevent the disease include surface disinfection, personal protective equipment, and hand hygiene as the major transmission of the disease through the surface to surface, droplets, and airborne (10). Vaccination is the most effective means to control the COVID-19 pandemic among the preventive measures. Nevertheless, vaccination could not stop the infection and transmission of the COVID-19 but can reduce the death rate (11).

As of August 2021, Malaysia has accumulated approximately 1.79 million confirmed cases with 17 thousand deaths (12). Moreover, Sarawak, a state of Malaysia, has reported approximately 131,000 confirmed cases and 564 deaths accumulatively as of 5th September 2021 (13). Despite the implementation of strict SOPs in Malaysia, the confirmed cases are increasing drastically over the past year resulting in having six daily cases on 31st August 2020 to 20,897 daily cases on 31st August 2021 (14). Hence, there is a need in figuring out the factor to the practices of COVID-19 prevention to control the spreading of the disease and taking more lives. To date,

there is limited literature available to examine the factors affecting COVID-19 prevention. Therefore, this study aims to examine the relationship between the general public’s knowledge, public awareness, the attitude of the public, and opinions about SOPs on practices of COVID-19 prevention. In addition, the current study is expected to provide a basis for policymakers and practitioners to manage COVID-19 better and act as a reference for future public health crisis management. From theoretical perspectives, the current study has added value to the body of knowledge in public health issues especially in terms of disease prevention in the future.

In order to prevent COVID-19 transmission, creating awareness among the public is imperative (15). Moreover, it is essential to understand people’s perception of SOPs in preventing COVID-19 (16). Furthermore, the general public’s knowledge and attitude of COVID-19 may also affect the preventive practices (17). Hence, four hypotheses were developed as below:

H1: Adequate general public knowledge about COVID-19 can ensure appropriate practices for infection prevention.

H2: Adequate public awareness about COVID-19 can ensure appropriate practices for infection prevention.

H3: Adequate attitude of the public about COVID-19 can ensure appropriate practices for infection prevention.

H4: Adequate opinions about COVID-19’s SOPs can ensure appropriate practices for infection prevention.

We present the following article in accordance with the SURGE reporting checklist (available at <https://jphe.amegroups.com/article/view/10.21037/jphe-22-25/rc>).

## Methods

### *Sampling procedure and participants*

The current study was conducted from May 2021 to August 2021 across 12 divisions and 40 districts of Sarawak state. In order to collect diversified data with various age groups and ethnicities, the participants were set to be anyone above 13 years old who volunteered to participate. The reason to collect more diversified data from the samples is to obtain more comprehensive responses from a different perspective. Besides, the questionnaire was designed using a google form to minimise physical contact to ensure the researchers’ safety. The employed sampling method is snowball sampling. The researchers have approached the representatives from each division and asked their help to

collect the data by sending the google form's link and QR code to the potential respondents' mobile phones. The representatives will then be asking the favour from the respondents to share among their friends and family. These are the precaution steps to ensure the minimum physical contact among researchers and respondents in order to avoid the transmission of COVID-19. The purpose of the research was introduced to the respondents prior to answering the questionnaire via phone calls and WhatsApp text. The respondents then can answer the questionnaire voluntarily. Besides, each of the measurement items in google form was set as required questions to avoid missing values. To identify the sample size needed, a stand-alone power analysis software—G\*power 3.1 was used (18). According to the power analysis, the power must be at least 0.80 (>0.80) to confirm the relationship of the constructs (19). Based on the G\*Power analysis with 5% of the level of significance, power of 80%, 0.15 effect size with 4 predictors, the minimum sample size required is 85.

This study was conducted based on the perception of the public with regards to COVID-19 knowledge, awareness, attitude, and SOP toward the COVID-19 prevention during the Movement Control Order imposed by government of Malaysia. The research was conducted through survey questionnaire and did not involve any human experiments and the respondents voluntarily participate in answering the questionnaire. Hence, the approval from Institutional Review Board (IRB) is not necessary. Besides, this study was conducted in accordance with the Declaration of Helsinki (as revised in 2013).

### Measures

The questionnaire consists of two sections, including profiling questions in Section A and measurement of each variable in Section B. Section A consists of the demographic profile, including sociodemographic information such as gender, age, race, occupation, division, district, and residential location. Section B consists of five subsections which included (I) general public knowledge of COVID-19; (II) public awareness of COVID-19; (III) public attitudes towards COVID-19 disease; (IV) opinions on standard operating procedures (SOPs); (V) practices in COVID-19 prevention.

In order to measure residents' knowledge of COVID-19, three measurement items (yes, maybe, or no) were asked to ensure whether residents understand and are aware of the differences in the regulations and SOPs of the current

stages in Sarawak. Besides, public awareness of COVID-19 has been measured by using eight measurement items to study whether residents are aware of the exposure and prevention of COVID-19 (yes, maybe, or no). Moreover, 12 measurement items (disagree, neutral, or agree) were assessed to examine residents' attitudes towards COVID-19 and their ability to reduce the outspread of COVID-19. Residents' opinions on the standard operating procedures (SOPs) have been measured using 13 measurement items and practices for COVID-19 infection prevention have been measured by using 14 measurement items with the yes/sometimes/no scales. A total of 50 measurement items were adapted from past studies (20–23). The items selected were based on the suitability of the current study and slightly amended to cater to the Sarawak context.

### Statistical analysis

This study was carried using quantitative approach through data collection from survey questionnaires. Statistical Package for Social Science (SPSS) 26.0 was used for the process of data cleaning, including the elimination of straight-lining response among the data collected. A two-stage approach partial least squares structural equation modelling (PLS-SEM) analysis was performed. The analysis started with measuring the constructs' reliability and validity. Then, the relationships between the constructs as proposed were evaluated (24). The PLS-SEM analysis was assessed by WarpPLS 7.0 (25), and the result is presented in the next section.

## Results

### Profile of respondents

A total of 2,500 questionnaires were distributed, but only 1,721 were filled, indicating 68.84% of the response rate which is more than the minimum sample size requirement of 85. After the preliminary data analysis using Statistical Package for Social Science (SPSS) 26.0, 206 data were deleted due to straight-lining issues. Hence, the remaining 1,515 data were valid for further analysis. The respondents' characteristics are shown in *Table 1*.

As indicated in *Table 1*, most respondents were female (55.2%), while 44.8% were male. Many respondents were between the age of 18–29 years old (49.5%), followed by respondents aged between 30–49 years old (31.4%), whereas 11.7% whose age is above 50 years old and only

**Table 1** Demographic of profile respondents

| Profile    | Category                | N=1,515 | %    |
|------------|-------------------------|---------|------|
| Gender     | Male                    | 679     | 44.8 |
|            | Female                  | 836     | 55.2 |
| Age, years | 13–17                   | 112     | 7.4  |
|            | 18–29                   | 750     | 49.5 |
|            | 30–49                   | 476     | 31.4 |
|            | Above 50                | 177     | 11.7 |
| Race       | Malay                   | 465     | 30.7 |
|            | Chinese                 | 333     | 22.0 |
|            | Indian                  | 7       | 0.5  |
|            | Iban                    | 359     | 23.7 |
|            | Bidayuh                 | 78      | 5.1  |
|            | Melanau                 | 251     | 16.6 |
|            | Orang Ulu               | 22      | 1.5  |
| Occupation | Student                 | 386     | 25.5 |
|            | Employed—Public sector  | 255     | 16.8 |
|            | Employed—Private sector | 325     | 21.5 |
|            | Self-employed—Business  | 211     | 13.9 |
|            | Not employed            | 131     | 8.6  |
|            | Housewife               | 137     | 9.0  |
|            | Retiree                 | 70      | 4.6  |
| Divisions  | Kuching                 | 207     | 13.7 |
|            | Samarahan               | 206     | 13.6 |
|            | Serian                  | 76      | 5.0  |
|            | Sri Aman                | 56      | 3.7  |
|            | Betong                  | 156     | 10.3 |
|            | Sarikei                 | 124     | 8.2  |
|            | Sibu                    | 172     | 11.4 |
|            | Mukah                   | 189     | 12.5 |
|            | Bintulu                 | 124     | 8.2  |
|            | Kapit                   | 96      | 6.3  |
|            | Miri                    | 4       | 0.3  |
|            | Limbang                 | 105     | 6.9  |

7.4% of respondents whose age is between 13–17 years old. In this study, the respondents consist of 7 ethnics group from Sarawak, which is Malay (465 respondents or 30.7%),

Iban (359 respondents or 23.7%), Chinese (333 respondents or 22%), Melanau (251 respondents or 16.6%), Bidayuh (78 respondents or 5.1%), Orang Ulu (22 respondents or 1.5%) and Indian (7 respondents or 0.5%).

Furthermore, the majority of the respondents were students, with a total of 386 (25.5%). Subsequently, employees who worked in public and private sectors contributed a total of 255 (16.8%) and 325 (21.5%), respectively. There are a total of 211 respondents who are self-employed with their own business (13.9%), followed by 131 of the unemployed respondents (8.6%), 137 were housewives (9%), and the remaining were retirees (4.6%). This study has a full coverage of division in Sarawak, which consists of Kuching (13.7%), Samarahan (13.6%), followed by Mukah (12.5%), Sibu (11.4%), and Betong (10.3%). Sarikei and Bintulu contributed a total of 124 respondents (8.2%), respectively. Additionally, Limbang contributed 105 respondents (6.9%), followed by Kapit contributed 96 respondents (6.3%), Serian contributed 76 respondents (5%), and Sri Aman contributed a total of 56 respondents (3.7%). Lastly, the remaining respondents were from Miri, contributing 4 respondents (0.3%).

### *Assessment of the measurement model*

In order to assess the measurement model, individual item reliability, construct reliability, convergent validity and discriminant validity were examined (26). Besides, *Table 2* below indicated all factor loadings are greater than 0.70, which signified the internal consistency. Besides, the Cronbach Alpha value should be above 0.60 (27). Moreover, according to Hair *et al.* (24), construct reliability is considered adequate if each construct's composite reliability (CR) is between 0.70 and 0.95. For satisfactory convergent validity, the average variances extracted (AVE) should be more than 0.50. As presented in *Table 2*, all AVE values have exceeded the threshold value of 0.50 (28,29). Lastly, the discriminant validity was tested by the Fornell-Larcker criterion, in which the AVE's square root for each construct (represented in bolded values) was found to be greater than the absolute value of inter-construct correlations (30). *Table 3* shows that all constructs have met the requirement of discriminant validity.

### *Assessment of the structural model*

The structural model was assessed based on the significance of the structural path coefficients, the  $R^2$  values, the

**Table 2** Results of the measurement model

| Construct                                   | Items  | Loadings | Cronbach's Alpha | CR    | AVE   |
|---|--------|----------|------------------|-------|-------|
| General public knowledge                    | PK1    | 0.710    | 0.685            | 0.827 | 0.616 |
|   | PK2    | 0.857    |                  |       |       |
|   | PK3    | 0.780    |                  |       |       |
| Public awareness                            | PA6    | 0.721    | 0.602            | 0.790 | 0.557 |
|   | PA9    | 0.783    |                  |       |       |
|   | PA10   | 0.734    |                  |       |       |
| Attitudes                                   | A1     | 0.762    | 0.848            | 0.887 | 0.568 |
|   | A2     | 0.768    |                  |       |       |
|   | A4     | 0.800    |                  |       |       |
|   | A5     | 0.726    |                  |       |       |
|   | A6     | 0.748    |                  |       |       |
|   | A10    | 0.716    |                  |       |       |
| Opinions about SOPs                         | SOP1   | 0.778    | 0.786            | 0.862 | 0.610 |
|   | SOP2   | 0.766    |                  |       |       |
|   | SOP9   | 0.791    |                  |       |       |
|   | SOP10  | 0.788    |                  |       |       |
| Practices for COVID-19 infection prevention | PICP1  | 0.760    | 0.807            | 0.866 | 0.565 |
|   | PICP3  | 0.707    |                  |       |       |
|   | PICP5  | 0.787    |                  |       |       |
|   | PICP11 | 0.746    |                  |       |       |
|   | PICP14 | 0.755    |                  |       |       |

CR, composite reliability; AVE, average variance extracted; PK, public knowledge; PA, public awareness; A represents attitudes; SOPs, standard operating procedures; PICP, practices for COVID-19 infection prevention.

**Table 3** Discriminant validity of the measurement model

| Construct                                   | General public knowledge | Public awareness | Attitudes | Opinions about SOPs | Practices for COVID-19 infection prevention |
|---|--------------------------|------------------|-----------|---------------------|---|
| General public knowledge                    | 0.785                    | –                | –         | –                   | –   |
| Public awareness                            | –0.005                   | 0.746            | –         | –                   | –   |
| Attitudes                                   | 0.339                    | 0.022            | 0.754     | –                   | –   |
| Opinions about SOPs                         | 0.462                    | 0.028            | 0.407     | 0.781               | –   |
| Practices for COVID-19 infection prevention | 0.490                    | –0.026           | 0.434     | 0.615               | 0.751                                       |

SOPs, standard operating procedures.



**Table 4** Summary of path coefficients and hypothesis testing

| Hypotheses | Relationship | $\beta$ | Std. error | P value  | VIF   | $f^2$ | Decision      |
|------------|--------------|---------|------------|----------|-------|-------|---------------|
| H1         | PK → PIP     | 0.237   | 0.025      | <0.001** | 1.332 | 0.119 | Supported     |
| H2         | PA → PIP     | -0.033  | 0.026      | 0.101    | 1.000 | 0.001 | Not supported |
| H3         | ATTD → PIP   | 0.183   | 0.025      | <0.001** | 1.268 | 0.082 | Supported     |
| H4         | SOP → PIP    | 0.426   | 0.025      | <0.001** | 1.429 | 0.262 | Supported     |

\*\*P<0.01: highly statistically significant.  $\beta$  represents path coefficient;  $f^2$  represents effect size. Std., standard; VIF, variance inflation factor; PK, public knowledge; PA, public awareness; ATTD, attitudes, SOPs, standard operating procedures; PICP, practices for COVID-19 infection prevention.

**Table 5** General public knowledge of COVID-19

| Measurement items   | General public knowledge, n (%) |            |          |
|---|---------------------------------|------------|----------|
|   | Yes                             | Maybe      | No       |
| Do you know what COVID-19 is?   | 1,427 (94.2)                    | 77 (5.1)   | 11 (0.7) |
| Do you know the terminology of MCO, CMCO, RMCO and EMCO?                                      | 1,305 (86.1)                    | 188 (12.4) | 22 (1.5) |
| Are you aware of the differences on the regulations and SOPs during MCO, CMCO, RMCO and EMCO? | 1,124 (74.2)                    | 327 (21.6) | 64 (4.2) |

MCO, Movement Control Order; CMCO, Conditional Movement Control Order; RMCO, Recovery Movement Control Order; EMCO, Enforcement Movement Control Order; SOPs, standard operating procedures.

effect size of  $f^2$  and collinearity. *Table 4* shows the result of hypothesis testing and path analysis, respectively. Out of four hypotheses, three hypotheses were supported. Specifically, the results of the statistical analysis support Hypothesis 1 ( $\beta=0.237$ ,  $P<0.001$ ), Hypothesis 3 ( $\beta=0.183$ ,  $P<0.001$ ), and Hypothesis 4 ( $\beta=0.426$ ,  $P<0.001$ ). In addition, the results show that practices for COVID-19 infection prevention ( $R^2=0.464$ ) have a moderate  $R^2$  value (24). In terms of effect sizes ( $f^2$ ), all constructs had shown weak (0.001) to medium (0.262) on COVID-19 infection prevention. On top of that, the variation inflation factor (VIF) values were obtained to test multicollinearity issues among the constructs. *Table 4* showed that multicollinearity is not a concern in this study as all the VIF values are below the threshold of 5 (31).

## Discussion and conclusions

### Discussion

COVID-19 infection is spreading worldwide and has become the most important global concern for the past 2 years and it is still a major concern at the moment for certain area at the moment. An alarming response has been

made across the globe due to its high infectiousness and death rate (32). To guarantee the final success of the battle against COVID-19 and future public health issue, the public's adherence to those control measures is essential, which is highly affected by their knowledge, awareness, attitudes on the prevention of COVID-19 (33). Besides, the implementation of effective SOP might also lead to appropriate practices for COVID-19 infection prevention. The present study examines the public's knowledge, awareness, attitudes, and opinions about SOPs practices for COVID-19 infection prevention in Sarawak. To answer the developed hypotheses, the findings suggested that public knowledge, attitude, and the opinion about SOPs is significantly related to the COVID-19 infection prevention whereby public awareness did not impact much on the prevention of the COVID-19 infection. Besides, the result discovered that more than 80% of the residents have optimistic attitudes toward COVID-19. *Tables 5-9* indicated the result of the measurement items for each construct analysed by SPSS 26.0.

As expected, the results showed that adequate general knowledge about COVID-19 can ensure appropriate practices for COVID-19 infection prevention. There

**Table 6** Public awareness of COVID-19

| Measurement items   | Public awareness, n (%) |            |           |
|---|-------------------------|------------|-----------|
|   | Yes                     | Maybe      | No        |
| Wearing a face mask                                       | 1,205 (79.5)            | 270 (17.8) | 40 (2.6)  |
| Washing your hands with soap or hand sanitiser frequently | 1,180 (77.9)            | 301 (19.9) | 34 (2.2)  |
| Visiting a healthcare professional if you feel sick       | 1,050 (69.3)            | 344 (22.7) | 121 (8.0) |
| Avoiding public spaces, gatherings and crowds             | 1,024 (67.6)            | 382 (25.2) | 109 (7.2) |
| Avoiding contact with people who could be high-risk       | 1,203 (79.4)            | 273 (18.0) | 39 (2.6)  |
| Avoiding hospitals and clinics                            | 1,251 (82.6)            | 227 (15.0) | 37 (2.4)  |
| Avoiding restaurants                                      | 1,177 (77.7)            | 294 (19.4) | 44 (2.9)  |
| Avoiding public transport                                 | 1,130 (74.6)            | 335 (22.1) | 50 (3.3)  |

**Table 7** Public attitudes towards COVID-19 disease

| Measurement items   | Public attitudes, n (%) |            |              |
|---|-------------------------|------------|--------------|
|   | Disagree                | Neutral    | Agree        |
| Maintain social distancing  | 10 (0.7)                | 105 (6.9)  | 1,400 (92.4) |
| Avoid crowded places or gathering                                 | 12 (0.8)                | 112 (7.4)  | 1,391 (91.8) |
| Avoid close contact with people who are sick                      | 10 (0.7)                | 125 (8.3)  | 1,380 (91.1) |
| Cover your mouth and nose during coughing and sneezing            | 19 (1.3)                | 155 (10.2) | 1,341 (88.5) |
| Avoid touching your eyes, nose, and mouth                         | 29 (1.9)                | 219 (14.5) | 1,267 (83.6) |
| Clean and disinfect frequently touched objects and surfaces       | 23 (1.5)                | 178 (11.7) | 1,314 (86.7) |
| Wash your hands often with soap and water for at least 40 seconds | 61 (4.0)                | 295 (19.5) | 1,159 (76.5) |
| Always take away lunch or dinner instead of dining in             | 53 (3.5)                | 246 (16.2) | 1,216 (80.3) |
| Avoid sharing your mobile phone and personal belongings           | 37 (2.4)                | 268 (17.7) | 1,210 (79.9) |
| Avoid travelling to other cities                                  | 36 (2.4)                | 192 (12.7) | 1,287 (85.0) |
| Close all education institutions                                  | 82 (5.4)                | 392 (25.9) | 1,041 (68.7) |
| Stay at home during festivals or celebration                      | 41 (2.7)                | 196 (12.9) | 1,278 (84.4) |

are more than 90% of the residents understand and have adequate knowledge about COVID-19. They are also aware of the differences in the regulations and SOPs set at the different stages. This finding has clearly shown that the general public's knowledge of COVID-19 can provide insights into the effectiveness of the outbreak's preventive measures. Individuals with higher knowledge of COVID-19 are more willing to follow public health recommendations for infection prevention. Besides, the statistical results indicated that adequate public awareness on COVID-19 ensures appropriate practices for COVID-19 infection

prevention. There are 82.6% of the residents think that avoiding hospitals or clinics can prevent and control the outspread of COVID-19. In comparison, 8.2% of the residents disagree that visiting a healthcare centre will get infected by COVID-19. More than half of the residents agreed that wearing a face mask, washing hands with soaps or sanitiser, avoiding public spaces, avoiding contact with people at high risk, and avoiding public transport could prevent the continuous outbreak of COVID-19.

More than 90% of the residents agreed that adequate attitudes of the public about COVID-19 ensure the

Table 8 Opinions on SOPs

| Measurement items   | Opinions on SOPs, n (%) |            |              |
|---|-------------------------|------------|--------------|
|   | No                      | Sometimes  | Yes          |
| Do you follow the SOPs released from MKN or SDMC?   | 27 (1.8)                | 260 (17.2) | 1,228 (81.1) |
| Are you keeping track of changes of the SOP in regular basis?                                       | 68 (4.5)                | 382 (25.2) | 1,065 (70.3) |
| The SOP provided from MKN and SDMC is clear and straightforward.                                    | 142 (9.4)               | 554 (36.6) | 819 (54.1)   |
| Do you think the people around you are strictly following the SOP?                                  | 142 (9.4)               | 750 (49.5) | 623 (41.1)   |
| Do you think the premises are strictly adhered to SOP?  | 150 (9.9)               | 713 (47.1) | 652 (43.0)   |
| Do you think the people around you wear their mask properly?  | 111 (7.3)               | 649 (42.8) | 755 (49.8)   |
| Do you wear mask if relatives/friends visit to your house?  | 191 (12.6)              | 537 (35.4) | 787 (51.9)   |
| Do you wear mask while collecting your food from food deliveries such as FoodPanda and GrabFood?    | 158 (10.4)              | 381 (25.1) | 976 (64.4)   |
| Do you wear mask in your workplace/during meeting?  | 56 (3.7)                | 275 (18.2) | 1,184 (78.2) |
| Do you practice social distancing at your workplace?  | 51 (3.4)                | 315 (20.8) | 1,149 (75.8) |
| Does your workplace be regularly sanitised?   | 161 (10.6)              | 449 (29.6) | 905 (59.7)   |
| Does your workplace prepare MySejahtera QR Code, logbook, hand sanitiser, and infrared thermometer? | 39 (2.6)                | 160 (10.6) | 1,316 (86.9) |
| Do you shop for essential goods only when necessary?  | 41 (2.7)                | 261 (17.2) | 1,213 (80.1) |

SOPs, standard operating procedures; MKN, Malaysian National Security Council (Majlis Keselamatan Negara); SDMC, State Disaster Management Committee; QR, quick response.

Table 9 Practices in COVID-19 prevention

| Measurement items  | Practices, n (%) |            |                 |
|--|------------------|------------|-----------------|
|  | No               | Sometimes  | Very frequently |
| Do you sanitise with hand sanitiser or wash your hands with soap frequently?                     | 37 (2.4)         | 415 (27.4) | 1,063 (70.2)    |
| Do you often touch your eyes, nose and mouth?  | 352 (23.2)       | 796 (52.5) | 367 (24.2)      |
| Do you cover your mouth and nose during coughing and sneezing?                                   | 32 (2.1)         | 334 (22.0) | 1,149 (75.8)    |
| Do you wear a mask when you are in public places and crowded placed?                             | 12 (0.8)         | 174 (11.5) | 1,329 (87.7)    |
| Do you keep social distancing for at least 1 meter?  | 29 (1.9)         | 303 (20.0) | 1,183 (78.1)    |
| Are you having enough rest?  | 98 (6.5)         | 654 (43.2) | 763 (50.4)      |
| Are you taking vitamins or supplements to increase your immune system?                           | 242 (16.0)       | 541 (35.7) | 732 (48.3)      |
| Have you been exercising routinely?  | 235 (15.5)       | 727 (48.0) | 553 (36.5)      |
| Do you drink enough water?   | 27 (1.8)         | 453 (29.9) | 1,035 (68.3)    |
| Do you prefer to cook at home or take away your food than dining in?                             | 52 (3.4)         | 418 (27.6) | 1,045 (69.0)    |
| Do you immediately change your clothes or bath after you come back home from outside?            | 50 (3.3)         | 393 (25.9) | 1,072 (70.8)    |
| Do you eat the appropriate amount of vegetables and fruits?                                      | 70 (4.6)         | 579 (38.2) | 866 (57.2)      |
| Do you prefer to not celebrate festivals with relatives and friends?                             | 174 (11.5)       | 486 (32.1) | 855 (56.4)      |
| Do you follow the recommendations from MKN and SDMC to prevent the spread of COVID-19 infection? | 38 (2.5)         | 370 (24.4) | 1,107 (73.1)    |

MKN, Majlis Keselamatan Negara; SDMC, Sarawak Disaster Management Committee.



appropriate practices for infection prevention. The majority of the residents agreed that maintaining social distancing (92.4%), avoiding crowded places or gatherings (91.8%), and avoiding close contact with people who are sick (91.1%) could prevent infection of COVID-19. A minority of the resident disagreed that wash hands with soaps and water for at least 40 seconds could avoid any infection prevention (4.0%). In terms of knowledge and behaviour, residents' attitudes in Sarawak play a significant role in shaping their practices and controlling the spread of disease during this pandemic. Hence, positive attitudes (e.g., maintaining social distancing, covering the mouth and nose during coughing and sneezing, avoiding crowded places or gatherings, and sanitising the hands frequently) can reduce the spread of COVID-19.

In addition, the result also discovered that adequate opinions about SOP ensure appropriate practices for COVID-19 prevention. The statistical result has shown that most of the residents in Sarawak complied with the SOPs released by MKN and SDMC (81.1%). There are 86.9% of the residents obeys the government's SOPs, such as preparing MySejahtera QR Code, logbook, hand sanitiser, and infrared thermometer in the workplace. In contrast, 12.6% of the residents stated that they did not wear a mask when relatives or friends visited their house. According to the Ministry of Health Malaysia (34), the public should comply with the SOP as it is a key to controlling and preventing the transmission of COVID-19. The public is urged to adhere to the SOPs and adopt a new norm to avoid putting themselves at higher risk for COVID-19. Therefore, the findings of this research proved that if the public strictly follows the SOPs set by the government, the COVID-19 infection can be effectively prevented.

Furthermore, practices in COVID-19 should be obeyed and applied constantly for infection prevention. Residents agreed that practices such as wearing a mask frequently in a public and crowded place (87.7%), kept social distancing for at least 1 meter (78.1%), covering mouth and nose during coughing and sneezing (75.8%), followed the recommendations from MKN and SDMC (73.1%), changed clothes or bath right after back home from outside (70.8%) can prevent COVID-19 infection. Sarawak's Deputy Premier Datuk Amar Douglas Uggah has announced that Sarawak will follow the federal government's decision to enter transition to endemicity starting from 1st April 2022. It has proven that practices should be maintained, and residents should have the self-discipline to prevent future outbreaks.

Surprisingly, the statistical results showed that adequate public awareness about COVID-19 could not ensure appropriate practices for COVID-19 infection prevention. One of the plausible reasons could be the public ignorance over COVID-19 awareness, which means the public is aware of the consequence of COVID-19 infection but chose to ignore it. A recent study has stated that the public choose to neglect and disobey health protocol because they are aware of the COVID-19 consequence but not fully aware of the COVID-19 pandemic condition (35). Moreover, another plausible explanation could be the lack of clear, timely and effective risk communication by health authorities during an early stage, which failed to raise appropriate levels of public awareness (36). Therefore, insufficient public awareness has prevented the public from realizing the risk of the COVID-19 and take personal protection measures seriously.

### *Conclusions, limitations, and implications*

To conclude, the objectives of the study are fulfilled by the result as the research shows significant results in enhancing practices of COVID-19 prevention. General public knowledge, public attitude, and opinions to SOPs significantly influence the prevention of COVID-19. Hence, it is advisable that the government further educate the public in the general knowledge of COVID-19 infection. Besides, the public's attitude should be more positive and coordinate with the government to fight the pandemic. In order to coordinate with the government, the public needs to be more disciplined in preventing the disease. Last but not least, the SOPs are suggested to be strict in implementation to further control the people who are unwilling to comply and coordinate with the authorities in fighting COVID-19.

This study has encountered two limitations. Firstly, the study is limited in terms of the scope of the study. There are more variables that will affect the prevention of COVID-19, such as the enforcement of authority, the effectiveness of SOP, health resources, protective equipment, and so on. Hence, it is recommended to further the study in other factors. Besides, the current study is limited in terms of the sites of the studies. There were many states in Malaysia encountered similar issues. Thus, it is suggested to conduct such studies in other parts of Malaysia too.

The current study is expected to understand the root causes of COVID-19 prevention by the policymaker to control and "flatten the curve" in the occasion of public

health crisis. This study has provided insight and evidence in the public's perception toward factors for COVID-19 prevention to ease the decision-making process of the policymakers. It is critically important to understand the perception of the public when there are public health issues in order to create best policy to prevent the spreading of the disease. Besides, practitioners can benefit from this study by understanding the perceptions of the public toward COVID-19 pandemic and further treating the patients or providing appropriate suggestions to the public in the future public health crisis based on the current study. Furthermore, this paper can advantage the scholars from the perspective of the public's perception toward COVID-19 prevention and further conduct future research on the other factors that affect COVID-19 prevention, such as the enforcement of the authorities, the effectiveness of SOP, availability of COVID-19 information, and so on. The aforementioned variables are believed to impacted on the prevention of COVID-19 infection and add value to the public health management in future. Although many places are entering the endemic stage, this study can act as a guideline for the places that currently still preventing the spread of the disease and a reference for the future public health issues in controlling the virus spread.

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## Footnote

*Reporting Checklist:* The authors have completed the SURGE reporting checklist. Available at <https://jphe.amegroups.com/article/view/10.21037/jphe-22-25/rc>

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*Conflicts of Interest:* All authors have completed the ICMJE uniform disclosure form (available at <https://jphe.amegroups.com/article/view/10.21037/jphe-22-25/coif>). All authors report that the funding of this project was provided by the Malaysian National Security Council. The initiative of this study is to understand the perception of the public toward the Movement Control Order (MCO) imposed by the Malaysian government and its effectiveness in

preventing the infection of the COVID-19 infection. The authors have no other conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The research was conducted through survey questionnaire and did not involve any human experiments and the respondents voluntarily participate in answering the questionnaire. Hence, the approval from Institutional Review Board (IRB) is not necessary. Besides, this study was conducted in accordance with the Declaration of Helsinki (as revised in 2013).

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