



COVID-19 in Malaysia: Knowledge, Threat Perception, Response Efficacy and Practice in Precautionary Behavior

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ABSTRACT

Introduction: Susceptibility perceptions have been extensively studied but COVID-19 severity has been largely neglected. As susceptibility and severity may not co-occur, it is necessary to examine both components of disease threat.

Objective: To examine the knowledge, threat perception, response efficacy, and associations with intended and concurrent COVID-19 preventive measures during a period of receding cases in Malaysia.

Methods: An online survey of 230 respondents was conducted from 1 to Jul 15 2020 using a 50-item questionnaire to study intention for COVID-19 preventive measures. Snowball sampling technique and the 2-step factor analysis of data was done.

Results: Good knowledge of the disease acquired mainly from the mass media and internet rather than family and friends were reported among the respondents. Severity of COVID-19 compared to other flu-like diseases was acknowledged, but a low perception of risk and likelihood of contracting the disease was observed. Beliefs in the efficacy of public preventive measures (quarantine, physical distancing, movement restriction and screening) were high. Face mask and personal hygiene ranked as the most effective individual preventive measures. Intentions for self-quarantine and testing were strong if flu symptoms were perceived. Perceived susceptibility is moderately associated with perceived severity and efficacy of recommended preventive measures. A stronger relationship was found between perceived efficacy of preventive measures and intended and concurrent health-protective measures.

Conclusion: The findings suggest that perceptions of disease threat need to focus on susceptibility and severity, and perceptions of severity need to consider perceived severity for self and others.

Key Words: COVID-19, Malaysia, Protection Motivation Theory, Public perception, Preventive measures

INTRODUCTION

Coronavirus Disease 2019, abbreviated as COVID-19, was initially referred to as the 2019 novel coronavirus (2019-nCoV)¹ and the pathogen involved is known as the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2).² Soon after its first detection in Wuhan, China, the World Health Organization declared COVID-19 as a global pandemic in March 2020.³ On Mar 18 2020, Malaysia enforced the Movement Control Order (MCO) under the Prevention and Control of Infectious Diseases Act 1988 and the Police Act 1967.⁴ The number of cases recorded in Malaysia on Mar 18 was 790 with two deaths.⁵ The MCO (also referred to as semi-lockdown measure) restricted inter-district travel, permitted only essential staff to go to workplaces, and

confined people to their homes, allowing them to go out for buying essential items and medical reasons. The MCO was relaxed from Jun 9 2020, but tightened only in areas with a spike in cases. On Jan 23 2021, the largest number of daily new coronavirus cases was recorded (4,275), and a number of cases in Malaysia has reached 180,455, with 667 deaths.⁶

In Malaysia, the regular updates by the Ministry of Health Malaysia and public service announcements create health literacy to control the spread of the disease. The public is also informed about the prevalence of asymptomatic (do not show symptoms) and pre-symptomatic (yet to show symptoms) individuals who can transmit COVID-19 to people in close contact with them.⁷⁻¹² However, the daily reports by the Defense Ministry, Malaysia show the large number of people who violate standard operating procedures (SOPs) for

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controlling COVID-19 transmission. For example, on Nov 15 2020, 568 were arrested, 527 given compounds, and 49 remanded for violations. The actual number of people who do not adhere to SOPs but are not caught is even higher. Thus far, research has shown varying knowledge levels on COVID-19 symptoms, transmission modes and incubation period. The people lacked accurate knowledge on COVID-19 threat in Japan¹³ and Bangladesh.¹⁴ Adherence to SOPs on COVID-19 depends on a few factors: knowledge, perceptions of disease severity, perceived risk of getting infected, and perceived efficacy of recommended preventive measures.^{15,16}

Even educated people and healthcare personnel have only a moderate level of knowledge on COVID-19 in India.¹⁵ Understanding of COVID-19 had significant direct effects on perceived vulnerability and perceived severity in the Philippines,¹⁶ Europe, America and Asia¹⁷ and on preventive measures in Nigeria¹⁸ and the United States¹⁹ but not in Malaysia.²⁰ In the week before MCO, females, the younger people and students were found to be more inclined to adopt good hand hygiene practices.²⁰

Accurate public perceptions of personal and societal risk factors are critical to effectively manage public health risks. Risk perception refers to an individual's intuitive evaluations of the negative consequences of hazards that they are or might be exposed.²¹ Awareness of infection risk is higher among frequent users of social media in Vietnam²² and those who frequently receive information on the virus from family and friends,¹⁷ and have direct personal experience with the virus.²³ Al-Hasan et al.,¹⁹ found that social influence (friends, families, doctors, and social media sources) is more impactful in shaping new social norms than newspaper and television in South Korea, Kuwait, and the United States. Studies on social determinants of risk perceptions are consistent on females and older people feeling more vulnerable to COVID-19^{17,24}, and richer and educated individuals.¹⁴ Trust in science and medical practitioners' management of the COVID-19 crisis reduces risk perceptions.¹⁸ Conversely, lack of confidence in the government's management of the COVID-19 crisis causes the disease to be perceived as posing high risk.^{17,23,25}

Ultimately, COVID-19 perception studies aim to identify factors that influence adherence to COVID-19 precautionary behaviour. According to the protection motivation theory,²⁶ threat appraisals is an important determinant of attitude change towards recommended responses. Suppose the public appraises the severity and likelihood of being infected by the COVID-19 virus to be high, and are confident in the efficacy of recommended responses to reduce the threat. In that case, they have stronger intentions to adopt health-protective measures. Their intention is also stronger if they have self-efficacy (i.e., belief in their capability to adopt the preventive measure).²⁷ Studies examining risk perceptions on intended

or concurrent behaviors to prevent spread of COVID-19 have investigated only the threat appraisal's susceptibility component and linked it to personal efficacy and knowledge,^{17,26} intention to adopt epidemic prevention measures^{28,29} and geographic closeness to COVID-19 infection areas.³⁰ In comparison to susceptibility, COVID-19 severity has been largely neglected. A study showed that in Turkey, individuals who perceived a high risk of getting COVID-19 also viewed the disease as more deadly, and low self-efficacy to engage in COVID-19 coping behaviors.³¹ In Belgium, a study revealed that although the Belgians perceived the disease as deadly, the stay-home order could have led them to believe that they are unlikely to contract the disease and lowered intention to adopt contact tracing applications.³² Therefore, it is necessary to examine perceptions towards the susceptibility and severity components of disease threat separately because they may not co-occur.

In Malaysia, there is still a lack of findings on COVID-19 threat apart from the fear of getting tested for COVID-19³³ and the public reporting good knowledge of the disease but having poor adherence to preventive measures.²⁰ Other non-clinical studies are on the lockdown, causing anxiety to university students³⁴, stress, and stigma to health workers.³⁵ The study aimed to examine the knowledge, perceived threat and response efficacy on COVID-19 during a period of receding cases immediately after the reopening of lockdown measures in Malaysia.

MATERIALS AND METHOD

The questionnaire on factors affecting intention to take COVID-19 preventive measures was formulated based on the protection motivation theory.^{26,36} The constructs examined were knowledge of disease (7 items), risk (9 items), severity (6 items), efficacy of preventive measures (18 items), intention to undertake preventive measures (3 items), and concurrent precautionary behavior (2 items). Each item's responses ranged from 1-5, representing strongly disagree, disagree, neutral, agree, and strongly agree. The Cronbach Alpha value for the questionnaire is 0.846, indicating high internal consistency.

Data were collected using an online questionnaire on 1-15 July 2020, during the Recovery MCO period in Malaysia when daily COVID-19 cases were single-digit figures. For example, Jul 1 2020 recorded one new case, a total of 8,640 cases, of which 144 were active cases and there had been 121 deaths.³⁷ On Jul 15 2020, there were five new cases, a total of 8,734 cases, of which 86 were active cases and there had been 122 deaths.³⁸ This context is important when interpreting the results of the study because there was a surge in cases in October to November 2020, reaching the highest record of 2,188 new cases on Nov 24 2020.

The respondents read information about the study, including assurance of confidentiality of responses in reports on the study. Written consent was obtained from respondents who agreed to participate in the study. Ethical approval was not required as this was a low-risk study. To address the concerns and safety of respondents, the researchers' contact information was provided. There were no participants under 16 years old in the study.^{27,28}

Factor analysis was run to identify underlying factors and the percentage of variance explained by the factors. The Principal Component Analysis (PCA) with varimax rotation was conducted to identify underlying factors within the data collected and to develop a better measure. The test variables are inter-correlated, as indicated by a Kayser-Meyer-Olkin (KMO) index of 0.745, above the commonly recommended value of .6, while Bartlett's Test of Sphericity was significant ((990) = 4340.519, $p < 0.05$). This indicates that the 14 underlying factors with eigenvalues exceeding one which together explain 67.58% of variance in variables, with personal hygiene measures emerging as the main predictor (17.03%), followed by susceptibility (8.29%) and knowledge of the disease (6.20%). The other factors account for less than 5% each of the variance.

RESULTS

Respondents

The study involved 230 respondents aged 14 to 67 ($M=27.05$, $SD=10.74$). A majority of the respondents were female, students, and university graduates (Table 1). No particular segment of the society was excluded in the study as everyone was susceptible to COVID-19 infection.

Table 1: Demographic characteristics of respondents (N=230)

Demographic characteristic		Frequency	Percentage
Gender	Female	158	68.70
	Male	72	31.30
Ethnic background	Chinese	94	40.87
	Malay	75	32.61
	Iban	55	23.90
	Indian	6	2.61
Occupation	Students	159	69.13
	Salaried employees	50	21.74
	Self-employed	15	6.52
	Unemployed	6	2.61
Monthly income	No income	147	63.91

Table 1: (Continued)

Demographic characteristic		Frequency	Percentage
	Less than RM4,000	43	18.70
	RM4,000-RM5,999	11	4.78
	RM4,000-RM7,999	14	6.09
	RM8,000-RM9,999	3	1.30
	RM10,000-RM11,999	4	1.74
	RM12,000-RM13,999	0	0
	RM14,000-RM15,999	3	1.30
	RM16,000-RM17,999	0	0
	RM18,000-RM19,999	0	0
	More than RM20,000	5	2.17
Educational background	Primary 6 or lower	2	0.87
	Form 3	2	0.87
	Form 5	4	1.74
	Form 6	57	24.78
	Diploma	22	9.57
	Degree and higher	143	62.17

Knowledge of COVID-19 disease

Table 2 shows that the respondents believed that they have good knowledge of COVID-19 disease (average $M=3.87$, $SD=0.96$). They were more likely to get information about the disease from newspapers, television, and internet sources rather than from people around them, such as family and friends. They kept up with the daily updates on COVID-19 cases given by the Ministry of Health, Malaysia, and apparently understood the medical findings such as the viral load and its connection to the seriousness of the disease. However, as their sources of information were similar, they were only slightly confident that they have more knowledge about COVID-19 than other people.^{28,29}

Table 2: Respondents' knowledge of COVID-19 disease (N=230)

Knowledge of COVID-19 disease	Mean	SD
I have been getting a lot of information about the COVID-19 disease from newspapers, TV and internet sources.	4.74	0.49
I keep myself informed of the daily global and national statistics of the COVID-19 pandemic.	4.07	0.95
I have been getting a lot of information about the COVID-19 disease from people around me (e.g., family and friends).	3.87	1.00
I understand the medical findings on the COVID-19 disease such as the viral load and its connection to the disease's seriousness.	3.84	0.89
I know a lot about the COVID-19 disease.	3.81	0.75
The COVID-19 disease is easy* [too complicated] for me to understand.	3.52	1.01
I know more about the COVID-19 disease than other people (e.g., my family and friends).	3.27	0.86
Average	3.87	0.96

Note: *Reversed. The original words are shown in square brackets.

Perceptions on COVID-19 disease threat

Perceived severity and perceived susceptibility constitute the threat posed by a disease. Table 3 shows moderate perceived risk of COVID-19 (average $M=3.09$, $SD=1.13$). They felt that they would be safe from COVID-19 infection as long as they take the necessary precautions. They believed that people with underlying chronic illnesses are more susceptible. The respondents had the right understanding of their susceptibility to COVID-19 disease because they knew that being healthy or Asian did not lower their chances of getting the disease and everyone was at risk of contracting it. In this study, respondents were not asked to evaluate their risk using numbers and probabilities because individuals are usually unable to make such risk assessments. Still, instead, they were asked to evaluate how safe they felt from COVID-19 infection.³⁹

Table 3: Respondents' perceived susceptibility and severity of COVID-19 disease (N=230)

	Mean	SD
Susceptibility to COVID-19 disease	3.09	1.13
As long as I take the necessary precautions, I will be safe from the COVID-19 disease, even if I go out often.	3.92	0.97

Table 3: (Continued)

People with underlying chronic illnesses (e.g., high blood pressure, diabetes, kidney failure, asthma, and cancer) have a higher chance of getting the COVID-19 disease.	3.92	1.13
10. I have enough facts about this disease; therefore, I am safe from it.	2.54	1.08
11. I think everyone has the same chance of getting the COVID-19 disease.	3.59	1.20
12. I think my family is safe from the COVID-19 infection.	3.43	1.07
13. I think I am safe from the COVID-19 infection.	3.33	1.05
14. I am healthy, so I believe that I am safe from the COVID-19 disease.	2.50	1.20
15. I believe the COVID-19 disease affects Westerners more than Asians, so I should be safer from it.	2.37	1.28
16. I believe that it is a matter of bad luck only if I get the disease.	2.17	1.21
Severity of COVID-19 disease	3.40	1.07
17. I think that the COVID-19 disease is more dangerous than the common flu.	4.73	0.56
18. I think the COVID-19 disease has infected more people than other flu diseases.	3.77	1.28
19. I think that those with underlying chronic illnesses (e.g., high blood pressure, diabetes, kidney failure, asthma, and cancer) will die if they get the COVID-19 disease.	3.71	0.98
20. I think the COVID-19 disease has killed more people than other flu diseases.	3.69	1.28
21. If I am infected with COVID-19 disease, I think I will suffer a serious* [mild] flu.	2.82	1.12
22. If I get the COVID-19 disease, I believe I cannot* [can] get better.	1.67	1.18

Note: *Reversed. The original words are shown in square brackets.

Table 3 shows that the respondents perceived the COVID-19 disease as mildly serious (average $M=3.40$, $SD=1.07$). They believed that it is more dangerous than the common flu and the infection rate is higher than other flu diseases. They knew that it has killed more people than other flu, particularly those with underlying chronic illnesses, but they would recover without ill-effects if they were infected with COVID-19 disease.

Perceptions on perceived efficacy of COVID-19 preventive measures

Six types of COVID-19 preventive measures were examined, and the results showed policy support on the Malaysian

government's handling of the disease. Table 4 shows that the respondents had the greatest confidence in quarantine measures ($M=4.79$), and the least confidence in implementation of SOPs at public places (average $M=4.07$). The mean scores about four show the respondents' confidence in the effectiveness of all the preventive measures.

The respondents strongly believed that COVID-19 positive individuals should be quarantined to contain the spread of COVID-19 disease. They also strongly believed that lessening contact with people potentially carrying the COVID-19 virus such as physical distancing of one metre, staying at home, and avoiding places with crowds would protect them from the disease. The Ministry of Health daily updates and repeated emphasis on observing the 3Cs (avoiding crowded places, confined spaces, and close conversations) seemed to have worked because the respondents believed in the importance of these preventive measures.³⁰⁻³²

Table 4: Respondents' perceptions on effectiveness of COVID-19 preventive measures (N=230)

	Perceptions on effectiveness of COVID-19 preventive measures	Mean	SD
	Quarantine	4.79	
23.	People who show symptoms of the COVID-19 disease should be quarantined (i.e., kept in a place away from other people) to stop the spread of the disease.	4.79	0.50
	Physical distancing	4.40	
24.	I feel that avoiding crowded places (e.g., eating in restaurants/coffee shops, and going to markets) will protect me from getting the COVID-19 disease.	4.66	0.56
25.	I believe that avoiding gatherings (e.g., wedding, funeral, religious and conference events) will protect me from getting the COVID-19 disease.	4.66	0.55
26.	I think that staying at home most of the time, and only going out for essentials (food and medicine) will protect me from the COVID-19 disease.	4.49	0.65
27.	I think that working from home is the best way to keep me safe from getting the COVID-19 disease.	4.39	0.76
28.	I think that social or physical distancing (i.e. standing or sitting at least 1 metre away from others) will keep me safe from the COVID-disease.	4.35	0.77
	MCO	4.22	
29.	I believe that the Movement Restriction Order (MCO) imposed by the government protects me from getting the COVID-19 disease	4.54	0.72

Table 4: (Continued)

30.	I believe that the relaxing of the MCO now will increase my chance of getting the COVID-19 disease.	4.20	0.81
31.	I think that the MCO should be longer (until the end of the year 2020) to protect us from the COVID-19 disease.	3.92	1.02
	COVID-19 testing	4.21	
32.	I believe that mass testing (i.e., testing as many as people) in a country can also help to fight the COVID-19 disease.	4.21	0.96
	Personal hygiene	4.13	
33.	I believe that wearing a face mask all the time when I am outside my house will keep me safe from the COVID-19 disease.	4.49	0.65
34.	Keeping myself clean (e.g., taking bath regularly) will keep me safe from the COVID-19 disease.	4.20	0.81
35.	I believe that washing my hands with soap many times a day keeps me safe from the COVID-19 disease.	4.15	0.83
36.	I believe that rubbing my hands with hand sanitizer many times a day will keep me safe from the COVID-19 disease.	3.90	0.88
37.	At the petrol station, I believe that wearing a disposal plastic glove when holding the petrol pump will keep me safe from the COVID-19 disease.	3.90	1.09
	SOPs at public premises	4.07	
38.	I think it is important for me to write down my name and contact number before entering shops or office buildings as a way to control the spread of the COVID-19 disease.	4.37	0.91
39.	Using the MySejahtera apps is important to keep me safe from the COVID-19 disease.	3.94	1.06
40.	I think that it is important to check my temperature regularly so that I know whether I have been infected with the COVID-19 disease.	3.90	0.98

In addition, the respondents also believed that government initiatives such as imposing MCO and COVID-19 testing would keep the disease at bay. The relaxing of the MCO on Jun 9 2020 led the public to believe that the COVID-19 disease was no longer in the community, and compliance with wearing of masks and physical distancing became lax. Alarm was raised when there was a sudden spike in COVID-19 cases after the Sabah election on Sept 26 2020. Subsequently, a Conditional MCO was imposed in selected states when daily new cases exceeded 1,000 in November 2020.

The respondents acknowledged the importance of SOPs like temperature checks, using MySejahtera contact tracing application, and recording of name and contact detail at public places, but these were perceived as less effective than quarantine, physical distancing and MCO in controlling disease spread. In fact, lack of health literacy has led to non-compliance, as indicated by the large number of people served with compounds for violation of SOPs by the Ministry of Defence. The lack of adherence is worse in places where government monitoring is relaxed, such as in workplaces, smaller towns, and public premises which are not in city centres. In Belgium, Walrave et al.³²⁻³⁵ found weak intentions to use the contract tracing application due to low perceived benefits and self-efficacy (i.e., unfamiliarity), perceived barriers, and weak cues to action. They suggested that the media can present stronger cues to action in the areas of self-efficacy and perceived benefits to increase adoption of health-protective measures.³⁶⁻⁴⁰

Concurrent and Intended health protection behaviour

Table 5 shows that respondents were taking personal hygiene measures to protect themselves from COVID-19. They were aware of the importance of decontaminating themselves and their clothes and minimizing the chances of passing the virus to their family members. The COVID-19 virus can be detected in aerosols for up to three hours and on plastic and stainless-steel surfaces for up to three days.⁴⁰ In addition, they reported that they would stay at home if they suspect COVID-19 infection. They may delay COVID-19 screening until they were sure that they might be infected with COVID-19, that is, when they have difficulty breathing rather than when they only had influenza-like symptoms. This means that the disease would be treated at an advanced stage and may compromise treatment outcomes.

Table 5: Respondents' perceptions on intended and concurrent health protection behaviour (N=230)

	Perceptions on intended and concurrent health protection behaviour	Mean	SD
41.	When I come back from work or activities outside, I take a shower to stay safe from the COVID-19 disease.	4.64	0.62
42.	I would quarantine myself at home for two weeks if I suspect that I have the disease.	4.63	0.67
43.	When I come back from work or activities outside, I wash all my clothes (or soak them in detergent) to stay safe from the COVID-19 disease.	4.44	0.81
44.	I would go for COVID-19 testing if I have difficulty in breathing.	4.41	0.81
45.	I would go for COVID-19 testing if I show flu symptoms (e.g., sore throat, dry cough, fever).	4.29	0.86
	Average	4.48	

Correlation of health protection components

Table 6 shows the Pearson's correlation results indicating a significant relationship between perceived susceptibility and perceived severity at a moderate level ($r=0.431$, $p<.05$). Perceived susceptibility is also significantly correlated with perceived efficacy of recommended preventive measures, but the relationship is weak ($r=0.346$, $p<.05$). A moderately strong relationship was found between perceived efficacy of recommended preventive measures and intended and concurrent health-protective measures ($r=0.477$, $p<.05$). The findings suggest that public adherence to preventive measures may be better with an accurate understanding of the COVID-19 threat, and infection control. With 70% of COVID-19 cases being asymptomatic in Malaysia,⁴¹ health literacy becomes even more crucial because people can unintentionally pass the disease to others.

Table 6: Correlation of health protection components with respect to COVID-19

	Knowledge of COVID-19 disease	Perceived severity	Perceived susceptibility	Perceived efficacy of preventive measures	Intended and concurrent health-protective measures
Knowledge	1				
Perceived severity	0.100	1			
Perceived susceptibility	-0.016	0.431	1		
Perceived efficacy of preventive measures	0.142	0.293	0.346	1	
Intended and concurrent health-protective measures	0.274	0.097	0.102	0.477	1

DISCUSSION

This paper reports the first study in Malaysia involving the general public and at a time of receding cases when public complacency on the dangers of COVID-19 may be present. The study shows that the literacy level of COVID-19 disease is high among Malaysians, gained mainly from the mass media and social media. The high level of perceived literacy on COVID-19 disease can be interpreted as an outcome of frequent Ministry of Health Malaysia updates and public service announcements. The study was conducted after the disease had been reported in the media for about six months, which may account for the respondents' good knowledge of the disease. The results confirm the previous findings on Malaysians having good knowledge of COVID-19.²⁰ Elsewhere, studies conducted in March in India¹⁵ and Japan¹³ showed poor to moderate levels of knowledge but studies conducted in April and May showed good public knowledge of COVID-19 in Bangladesh¹⁴, the Philippines,¹⁶ and Nigeria.¹⁸ However, there is poor knowledge of COVID-19 in the United States in April 2020 when community transmission was beginning.¹⁹ Generally, with the passage of time, the public develops a better understanding of COVID-19.

Our study revealed perceived mild threat from COVID-19, as the respondents believed that the disease has severe consequences for others but not for themselves. The denial of disease severity suggests that good knowledge of the COVID-19 may not necessarily lead to the adoption of protective health measures because of the assumption that one is safe from the disease. This is a novel finding on the health threat posed by COVID-19 and adds to what is known about how disease threat is perceived. A positive relationship between perceived risk and perceived severity is reported.³¹ Our findings showed no significant relationship between perceived risk and perceived severity, similar to Walrave et al.³² Considering that the findings are mixed on the association between susceptibility and severity components on disease threat, it is certainly not sufficient to study risk perceptions alone. In fact, our findings suggest that perceptions of disease severity need to take into account perceived severity for self and others.

CONCLUSION

The study on COVID-19 perceptions showed good knowledge of the disease, moderate susceptibility, moderate severity, strong response efficacy, and strong intentions and concurrent practice of preventive measures during a period of receding cases immediately after the reopening of lockdown measures in Malaysia. Our study has found a correlation between perceived efficacy of preventive measures and perceived susceptibility as well as with intended and concurrent health-protective behaviours. We assessed COVID-19

knowledge based on the respondents' self-reports and not questions testing their knowledge. Since our study is among the few empirically-based evidence of COVID-19 knowledge, the self-reports can provide an indication of the public's understanding of the disease until further studies testing their biological knowledge are conducted. In addition, future research on COVID-19 should be observational studies on guideline adherence in public places because this will produce data on actual health-protective behaviour on compliance with SOPs. These directions in future research on COVID-19 will add to knowledge on possible changes in perceptions of threat and efficacy of coping responses during public health epidemics. Public adherence to preventive measures of COVID-19 is better with an accurate understanding of the threat and infection control.

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Author contribution

SHT and EUHS conceived of the study design. UHS constructed the instrument and carried out data collection. SHT analysed and interpreted the data. SHT and EUHS wrote the manuscript.

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