International Journal of Biomedical and Clinical Sciences
Vol. 5, No. 3, 2020, pp. 204-216
http://www.aiscience.org/journal/ijbcs

Self-Reported Compliance and Mental Health Concerns Towards COVID-19 Pandemic: Malaysian Undergraduate Student's Perspective

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Abstract

Amidst the COVID-19 pandemic, the compliance towards the safety measures established are affected by the awareness of provisions, the penalty imposed for breaching MCO rules, the confidence towards government, the support by the government and the severity of influence on economic, and the psychological aspects due to isolation. The mental health of the public is also put under stress due to the numerous propaganda and myths widely spreading in the media. Our study aimed to assess the self-reported compliance and mental health concerns towards the COVID-19 pandemic and find its association with sociodemographic variables among the Malaysian undergraduate students. A cross sectional study was conducted from May to June 2020 in our college, MMMC, Malaysia. Data were collected using an online-administered questionnaire, designed in English which consists of close-ended and multiple-choice questions. The survey items were formulated based on a preprint in Italy with 5 parts, namely 1) demographic profile, 2) self-reported past behaviours, 3) beliefs, perceptions and emotions, 4) future behaviours, and 5) personality battery. Statistical tests (Unpaired t-test and ANOVA) were performed using Epi Info software. Most students are shown to have great compliance towards the safety measures established with a mean score of 87.8. However, there was no significant association between gender, ethnicity, family types, family income and the compliance of MMMC students towards the safety measures of COVID-19. There was a significant association between gender and the mental health concerns where the males had a mean score of 15.2 (SD=3.2), which is slightly lower than females who had a mean score of 16.9 (SD=3.3). However, our study showed no significant association between ethnicity, family types, family incomes and mental health concerns among MMMC students towards COVID-19. These findings thus provide empirical support that the students' gender plays a significant role in determining the mental health concerns

Keywords

Compliance, Mental Health, Students, COVID-19

Received: June 13, 2020 / Accepted: June 29, 2020 / Published online: July 23, 2020

1. Introduction

In November 2019, a new infectious disease known as COVID-19 was discovered which brought about a pandemic caused by SARS-CoV-2, a coronavirus. [1, 2] The place of origin of the outbreak was in Wuhan, China. [3] As of 14th May 2020, there are 4,258,666 confirmed cases and 294,190 deaths worldwide. [2] The novel coronavirus COVID-19 has been confirmed to be transmitted from human to human through respiratory droplets. [4] The mean incubation period of COVID-19 is approximately 5.2 days. With a median of 14 days, it takes around 6 to 41 days from the onset of COVID-19 symptoms to the expiration of the diseased. This interval is highly dependent on the patient's age and their own body immune status. Generally, elderly patients of 70 years and higher have a shorter interval compared to the

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general public. Most commonly, fever, cough, and fatigue are seen during the onset of the disease. However, there have been other symptoms like sputum production, headache, haemoptysis, diarrhoea, dyspnoea, and lymphopenia. [5] In Malaysia, as of 15th May 2020, there are about 36 reported new confirmed cases of COVID-19 in midst of the 6.8 thousand confirmed cases of COVID-19, and 112 total deaths since the beginning. [6, 7]

The rising infectivity of the virus in many countries worldwide has led WHO to take action to prevent the spread of disease by implementing numerous guidelines to restrict movement and prevent group gatherings as there is no specific medical treatment for COVID-19 as of today. [8, 16] A study conducted on the effectiveness of social distancing has shown that the practice of social distancing can prevent around 20% of the cases and 90% of hospital admission caused by this pandemic [9] In Malaysia, Movement Control Order (MCO) was implemented from 18th March 2020 as one of the precautionary measures in effort to break the chain of transmission. [7, 10] In other countries such as Italy, Canada, France, India, the US and the UK, their respective governments have brought upon similar measures like MCO for a definite period. [11] In Hubei province, the place of origin of the virus, the improvements of isolation were without a definite end. [12]

To flatten the curve, the compliance was of utmost importance. The general public have not taken the pandemic seriously due to the natural desire of mankind to engage in socialization and the difficulty of staying in a confined space for an extended period of time. [8] Amidst the COVID-19 pandemic, the compliance towards safety measures are affected by the awareness of provisions, the penalty imposed for breaching MCO rules, the confidence towards government, the support by the government and the severity of influence on economic and the psychological aspects due to isolation. [11] There are little to none available information or articles which are related to the psychosocial effects of the current pandemic and the preventative guidelines that have been established. [8] However, Bekshire Media Malaysia studied the compliance and mental health of Malaysia during MCO based on six primary emotion frameworks that Dr. Paul Ekman used, which consist of love, joy, surprise, anger, sadness and fear. The study showed that 48.67% Malaysians were furious on the first day of MCO and 46.5% Malaysians were in joy. Anger and fear were gradually reduced as the citizens began to adapt and comply with MCO rules. [13, 14]

Public alertness has quickly turned into anxiousness regarding the COVID-19 pandemic. The most feared situation for the public is the virus erratic nature and the uncertainty about the end of the pandemic. [15] Anxiety ridden behaviour such as constantly stocking up sanitizers, gloves and masks are clearly seen in the public. This panic act has caused the frontliners to have a lack of supplies; these workers are also in high risk of contracting the disease due to direct exposure and diminished immune system due to insufficient rest and insomnia. Hand washing is recommended and essential during this pandemic to curb the spread of infection however this can affect the mental health of patients with OCD. [16]

The Ministry of Health of Malaysia also announces daily updates about COVID-19 cases which improves the public awareness. [17, 18] The similarity between COVID-19 and SARS coronavirus and how it had a negative effect on the mental health of people creates anxiety among the current population. It has also been speculated that social distancing, isolation and quarantine experience can lead to anxiety, depression and post-traumatic stress disorder (PTSD). Social stigma and discrimination against certain people who are targeted as the reason for the outbreak has caused fear of contracting the disease among them and to conceal their illness and not seek medical attention immediately. Other than that, discussion about how ethnicity can possibly worsen mental health. [19]

The mental health of people is being affected because of numerous propaganda and myths about the COVID-19 pandemic on the social media and the traditional media. The rising number of morbidity and mortality rate due to this respiratory illness is also displayed on media and ultimately leads to mental stress. However, media, celebrity figures and medical workers have also successfully spread the message and importance of social distancing via social media. [19]

Prevalence of mental health in women and men are almost similar but they both experience different types of mental disorders. During this quarantine, women might experience higher chances of domestic abuse. The study population who are medical students within the age group of 18 to 25 who are considered young adults are both factors that increase the risk of mental stress. [20-22]

Malaysia is a developing country, thus the implementation of MCO can affect the vast majority of the population financially. Financial dispute can occur due to unemployment, wedge in business activities, increased medical expenditure and unending basic needs. Clarifying how the income of a household can affect how the public follows the MCO rules and in turn how it will affect their mental health. [23] Acknowledging this situation, Malaysian government has unveiled a large sum of RM 250 billion worth of economic stimulus package (also known as Bantuan Prihatin) that benefits the right Malaysians during this economically uncertain period. [10, 24] As much as 52.1% of

small and medium-sized enterprise (SME) has stated that this package helped to ease the economic burden on their establishment. [25] On 4th April, 99% of public compliance towards MCO was achieved. [26] A special survey done regarding the effects of COVID-19 on Economy and Individual by the Department of Statistics Malaysia also shows that 96.6% of Malaysians daily life are impacted due to COVID-19 and 92.9% of Malaysian are ready to adapt themselves to this new lifestyle. [25] With the announcement of Conditional MCO (CMCO) on the 4th May and gradual improvement of COVID-19 crisis in Malaysia, we can speculate the self-compliance and mental health of Malaysians currently. [16] In Malaysia, a survey regarding the compliance towards MCO was done among the general public however so far there is no similar survey done on the health science undergraduates. [26] Berkshire Media has only conducted a study after the 1st and 5th day of MCO commencement. Other countries such as Italy and China have conducted similar studies on the compliance and mental health concerns on their respective citizen. [11, 13, 16] Hence, we aim to conduct this study among the undergraduates after 4 phases of MCO and currently involved in the conditional MCO.

The objectives of this study is to assess the self-reported compliance and mental health concerns towards COVID-19 pandemic and find its association with the gender, ethnicity, family type, and family income among the Malaysian undergraduate students of Melaka Manipal Medical College (MMMC), Muar and Melaka campus, Malaysia.

2. Methods

2.1. Study Design, Setting, Time and Population

A cross sectional study was conducted from May 2020 to June 2020 in our college, Melaka Manipal Medical College (MMMC), Malaysia. Our college has two campuses; one is based in Muar, Johor and the other is based in Bukit Baru, Malacca. The Muar campus offers Bachelor of Medicine and Surgery (MBBS) semester 6 and 7, while the Malacca Campus offers (MBBS) semester 8, 9, and 10, Bachelor of Dental Surgery (BDS), Foundation in Science (FIS). The study was aimed to evaluate the self-reported compliance and mental health concerns towards this pandemic from an undergraduate student's perspective, and therefore a study population of 830 students from MMMC was selected.

2.2. Sample Size

Based on a previous study done in Italy, [27] 85.6% of the participants was compliant to the practice of social distancing established during COVID-19. With the formula application software "Epi Info" version 7.2.3.1, the sample size (n) is calculated as below: -

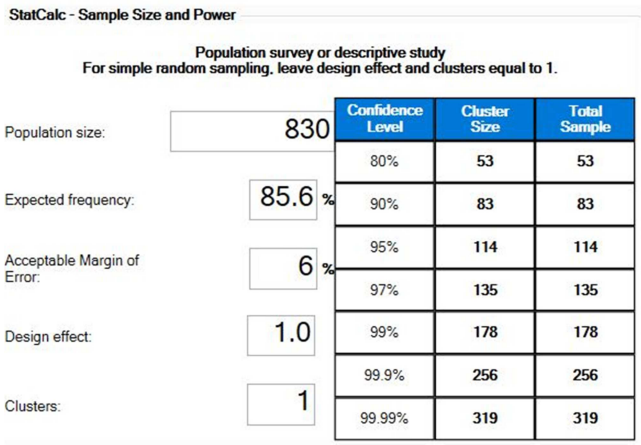

Figure 1. Sample size calculation

The minimum sample size required was 114.

Upon further calculation of sample size (n) using the formula application software "Epi Info" version 7.2.3.1, we then chose to allow non-response of 30% and the calculation is as of below:

$$\text{n(final)} = \frac{\text{n(calculated)}}{1-(non-response)} = \frac{114}{1-0.3} = 162.9 \quad (1)$$

The final sample size obtained for this study was 163.

2.3. Sampling

Purposive sampling was used as the sampling method while conducting the study, which is a non-probability sampling method. The inclusion criteria were MMMC students who voluntarily agreed to participate in this study and the questionnaires must be completed to be considered valid for the research after they filled up the consent form. Meanwhile, as for the exclusion criteria, international students of MMMC are excluded and those who gave an irrelevant and/or incomplete response.

2.4. Data Collection

The data was collected by the distribution of questionnaires via a Google form link to eligible students in MMMC.

Independent variables of this study were gender, ethnicity, family type and family income. Dependent variables were compliance and mental health concerns. Data were collected using an online-administered questionnaire, designed in English which consists of close-ended and multiple-choice questions. The survey items were formulated based on a preprint in Italy. [27]

The questionnaire was divided into 5 parts, namely 1) demographic profile, 2) self-reported past behaviours, 3) beliefs, perceptions and emotions, 4) future behaviours, and

5) personality battery.

In Part 1, the participants were required to fill up their demographic information such as name, age, roll number, gender, ethnicity, religion, batch, family type and their family income.

In Part 2, the participants were enquired about their past behaviours which includes the question such as "I stayed at home", "I did not attend social gathering", etc. The participants are to rate from 0-100 based on the scale 0 being not following at all and 100 being completely following.

In Part 3, the questions were targeted towards the participant's beliefs, perception and emotions. This part is divided into 5 sections, namely personal beliefs, perception of others beliefs, financial sanction, perception on government or public response and anxiety factor. Under personal belief, there are 4 questions about social distancing, closure of non-essential shops and curfew and if the participants are for or against it. Next, the perception of others' beliefs consists of 4 questions which are rated from 0 to 100 in the means of 100 Malaysians and the questions were similar to the first section but in the public point of view. Under financial sanction there were 2 questions such as 'how much is an acceptable fine to pay for social gathering' and the options were given in 5 fixed Ringgit Malaysia values. The following section questioned the participant's perception regarding the government's efficacy and public response with 5 questions in which the participants will rate from 0 to 5. For example, 'Do you think the reaction of the Malaysian government to the current coronavirus outbreak is appropriate, too extreme, or not sufficient? (0 = Not sufficient; 5 = Too extreme)'. Under the anxiety factor, 5 questions were asked about the participants mental state like nervousness, worrisome and relaxation followed by options that range from strongly disagree to strongly agree.

In Part 4, the participants were asked about their future behaviours. There were 3 questions to be answered such "Do you need to leave home for the next 5 days", reasons for leaving home and negative impacts of staying at home.

In Part 5, a set of 10 questions to assess personality of participants using a Likert Scale which contains 5 options, range from strongly disagree to strongly agree. Participants will answer based on personality traits in the questions like "extroverted, enthusiastic", "critical, quarrelsome", etc.

2.5. Data Processing & Data Analysis

The data collected from our distributed Google Form was processed using Microsoft Excel. The obtained data was then statistically analysed using Epi Info version 7.2.3.1.

In this study, qualitative data such as gender, religion, ethnicity, education level, family types, and family income and questions about compliances and mental health concerns were analysed to derive frequency and percentage. For quantitative data like age and questions about perceptions, beliefs and emotion was analysed to derive mean, median and range. Standard deviation (SD) was then calculated from mean. The level of significance was set at p = 0.05.

Following statistical test was used in our study:

Table 1. Statistical tests used for data analysis.

Independent variable	Dependant variable	Statistical test
Gender	Compliances	Unpaired T test
Ethnicity	Compliances	ANOVA
Family types	Compliances	Unpaired T test
Family income	Compliances	ANOVA

Independent variable	Dependant variable	Statistical test
Gender	Mental health concerns	Unpaired T test
Ethnicity	Mental health concerns	ANOVA
Family types	Mental health concerns	Unpaired T test
Family income	Mental health concerns	ANOVA

2.6. Ethical Consideration

Participants were made aware that entering the research study was completely voluntary. Written informed consent was taken from each participant and we explained that they were able to withdraw from the study at any time without any given reason. All information obtained was kept anonymous and confidentiality was maintained. This research was approved by the Research Ethics Committee, Faculty of Medicine, Melaka-Manipal Medical College, Malaysia.

3. Results

Table 2. Demographic profile of MMMC students.

Variable	Frequency (%)
Age group	
<22	45 (22.6)
22-25	151 (75.9)
>25	3 (1.5)
Mean (SD)	22.1 (2)
Minimum-Maximum	16-23
Gender	
Female	144 (72.4)
Male	55 (27.6)
Ethnicity	
Chinese	67 (33.7)
Malay	36 (18.1)
Indian	86 (43.2)
Others	10 (5)
Religion	
Islam	39 (19.6)
Hindu	73 (36.7)
Buddhist	52 (26.1)
Christian	28 (14.1)
Others	7 (3.5)
Program	
MBBS	109 (54.8)

Variable	Frequency (%)
BDS	58 (29.2)
FIS	32 (16.1)
Family types	
Nuclear family	166 (83.4)
Extended family	33 (16.6)
Family income	
< RM 4360	30 (15.1)
RM 4360 – RM 9619	100 (50.3)
>RM 9619	69 (34.7)

A questionnaire consisting of 45 questions were distributed to the students in MMMC and a total of 199 responses were received. Table 2 shows the frequency and percentage of different variables such as age group, gender, ethnicity, religion, program, family type and average monthly household income. Of those that responded, 151 (75.9%) of the participants were in the age group of 22-25 which gives rise to a mean of 22.1 years of age in our sample size. Out of the total number of responses recorded most were females with 144 responses (72.4%) leaving 55 responses from males (27.6%). From the different ethnic groups that responded the majority of the responses came from the Indian community (43.2%) and most of the responses came from Hindus (36.7%). The second highest ethnic group was the Chinese community (33.7%) followed by the Malay community (18.1%) and others (5%). The second highest religion from those who responded were Buddhists (26.1%) followed by Islam (19.6%), Christian (14.1%) and others (3.5%). The greater number of responses came from students in the MBBS program (54.8%) followed by BDS (29.2%) and FIS (16.1%). The family types and family incomes were also recorded and from those who responded (83.4%) came from a nuclear family and the rest coming from an extended family (16.6%). Furthermore, the majority of students came from a family with an income of RM 4,360 – RM 9,619 (50.3%) followed by students from family with an income of more than RM 9,619 (34.7%) and finally by students from family with an income of less than RM 4,360 (15.1%).

Table 3. Compliance or Self-Reported Past Behaviour of MMMC students towards the safety measure of COVID-19.

Description	Mean (SD)	Median	Min-Max
I stayed at home (0-100)	90 (16.7)	95	0-100
I did not attend social gatherings (0-100)	95.5 (22.9)	100	0-100
I washed my hands more frequently than last month (0-100)	85.4 (20.1)	100	20-100
I kept a distance of a least 2 meters to other people (0-100)	84.4 (21.3)	95	0-100
If I had exhibited symptoms of the disease (COVID -19), I would have immediately informed the people around me (0-100)	96.6 (13.9)	100	0-100
Total score (0 -100)	87.8 (11.1)	92	42-100

Table 3 shows the compliance of MMMC students towards the safety measures of COVID-19. There are 5 questions in which the participants will have to rate from the scale 0-100 with 0 being the lowest and 100 being the highest score. Those who stayed at home have a mean score of 90 (SD=16.7) and the median was 95. Those who did not attend social gathering have a mean and median higher than those who stayed at home with the mean score being 95.5 (SD=22.9) and the median of 100. Those who washed their hands more frequently than last month have a mean score of 85.4 (SD=20.1) and the median of 100. Furthermore, those who kept a distance of a least 2 meters to other people have a mean score of 84.4 (SD=21.3) and the median of 95. For the statement "If I had exhibited symptoms of the disease (COVID -19), I would have immediately informed the people around me" have a mean score of 96.6 (SD=13.9) and median of 100. Lastly, the mean of total score was 87.8 (SD=11.1) and the median of the total score was 92

Table 4. Personal beliefs and perceptions of MMMC students towards the corona virus safety measures.

Statement	Yes N (%)	No N (%)
Should people in Malaysia cancel participation in social gatherings because of corona virus right now?	196 (98.5)	3 (1.5)
Should people in Malaysia not shake other people's hands because of corona virus right now?	190 (95.5)	9 (4.5)
Should non-essential shops in Malaysia be closed because of corona virus right now?	157 (78.9)	42 (21.1)
Should there be a general curfew in Malaysia because of corona virus right now?	172 (86.4)	27 (13.6)

Table 4 reflects the personal beliefs of MMMC students towards the corona virus pandemic safety measures. There are 4 questions in which the students respond with Yes or No. 196 out of 199 number of the participants do believe that participation in social gatherings among Malaysians should be cancelled during this period (98.5%). However, 3 participants (1.5%) do not agree to this. In the query of if Malaysians should not shake hands with others during this pandemic, 190 participants agree to this statement (95.5%) while 9 of them believe otherwise (4.5%). The next question, 'Should non-essential shops in Malaysia be closed because of corona virus right now?' got an exceptional response in which 157 participants said Yes to this (78.9%) but 42 participants said No to this (21.1%). When the participants are questioned if the general curfew in Malaysia is agreeable, 172 of them concurred with it (86.4%) while 27 of them disagree to the curfew implementation (13.6%).

Table 5. Perception of others beliefs regarding the corona virus safety measures.

Statement	Mean (SD)	Median	Min-Max
How many of 100 Malaysians do you think believe people in Malaysia should cancel participation in social gatherings because of corona virus right now?	72.8 (22.1)	80	0-100
How many of 100 Malaysians do you think believe people in Malaysia should not shake other people's hands because of corona virus right now?	77.3 (20.4)	80	20-100
How many of 100 Malaysians do you think believe non-essential shops in Malaysia should be closed because of corona virus right now?	61.7 (23.1)	60	0-100
How many of 100 Malaysians do you think believe there should be a general curfew in Malaysia because of corona virus right now?	60.6 (25.6)	60	0-100

Table 5 discusses about the participants' perception about others' beliefs regarding the safety measures taken during the corona virus pandemic from the point of view of 100 Malaysians with 0 being the lowest value, disagreeing to the statement and 100 being the highest value, completely agreeing to the statement. A mean of 72.8 (SD=22.1) shows that the participants think participation in social gatherings because of corona virus right now should be cancelled with the median of 80. The question 'How many of 100 Malaysians do you think believe people in Malaysia should not shake other people's hands because of corona virus right now?', received a mean score of 77.3 (SD-20.4) proves that the participants agree to this with the median of 80. The question 'How many of 100 Malaysians do you think believe non-essential shops in Malaysia should be closed because of corona virus right now?', held a mean score of 61.7 (SD=23.1) with median of 60. A mean score of 60.6 (25.6) for the general curfew in Malaysia with the median of 60.

Table 6. Opinion of MMMC students on financial sanctioning of risky behaviours in Ringgit Malaysia.

Statement	Mean (SD)	Median	Min-Max
How much would you fine participation of social gatherings? (RM)	767.8 (308.7)	1000	0-1000
How much would you fine going out despite symptoms of corona virus? (RM)	813.6 (300.1)	1000	0-1000

Table 6 talks about the participants' opinion on financial sanctioning of risky behaviours. 5 fixed values were assigned to state an appropriate Ringgit Malaysia value to the given statement. A mean score of RM 767.8 (SD=308.7) was rendered when asked about the amount of fine for participation in social gatherings. The question on 'How much would you fine going out despite symptoms of corona virus?', received a mean of RM 813.6 (SD=300.1). The median for both statements is 1000.

Table 7. Perceptions of MMMC students towards government/public response & efficacy.

Statement	Median (Q1,Q3)
Do you think the reaction of the Malaysian government to the current corona virus outbreak is appropriate, too extreme, or not sufficient?	3 (3,3)
How much do you trust the Malaysian government to take care of its citizen?	4 (3,5)
How factually truthful do you think the Malaysian government has been about the corona virus outbreak?	3 (3,4)
Do you think the reaction of the Malaysian public is appropriate, too extreme, or not sufficient?	3 (2,3)
How effective are social distancing measures (e.g. through a general curfew) to slow down the spread of the corona virus?	4 (3,5)

Table 7 shows the perceptions of MMMC students towards government/public response & efficacy. There are 5 questions in which the participants will have to rate from 0 to 5 where 0 = Not sufficient; 5 = Too extreme. The median (IQR) for "Do you think the reaction of the Malaysian government to the current corona virus outbreak?" was 3 (3,3); for 'How much do you trust the Malaysian government to take care of its citizen? 'was 4 (3,5); for 'How factually truthful do you think the Malaysian government has been about the corona virus outbreak? "was 3 (3,4); for 'Do you think the reaction of the Malaysian public is appropriate, too extreme, or not sufficient?' was 3 (2,3); for 'How effective are social distancing measures (e.g. through a general curfew) to slow down the spread of the corona virus?' was 4 (3,5).

Table 8. Anxiety/stress/worry battery (mental health concerns) of MMMC students.

Statement	Strongly disagree N (%)	Disagree N (%)	Neutral N (%)	Agree N (%)	Strongly agree N (%)
I am nervous when I think about current circumstances.	8 (4)	33 (16.6)	93 (46.7)	49 (24.6)	16 (8)
I am calm and relaxed.	9 (4.5)	20 (10.1)	77 (38.7)	75 (37.7)	18 (9.1)
I am worried about my health.	7 (3.5)	28 (14.1)	73 (36.7)	66 (33.2)	25 (12.6)
I am worried about the health of my family members.	1 (0.5)	4 (2)	21 (10.6)	93 (46.7)	80 (40.2)
I am stressed about leaving my house.	15 (7.5)	37 (18.6)	83 (41.7)	50 (25.1)	14 (7)

Table 8 answered our objective to find out the mental health concerns towards COVID-19 pandemic among undergraduate medical students of MMMC. Table 7 shows the anxiety/stress/worry battery consisting of 5 elements. Out of 199 students, for 'I'm nervous when I think about current circumstances' 8 students with percentage of 4% strongly disagree, 33 students with percentage of 16.6% disagree, 93 students with percentage of 46.7% neutral, 49 students with percentage of 24.6% agree and 16 students with percentage of 8% strongly agree; for 'I am calm and relaxed.', 9 students with percentage of 4.5% strongly disagree, 20 students with percentage of 10.1% disagree, 77 students with percentage of 38.7% neutral, 75 students with percentage of 37.7% agree and 18 students with percentage of 9.1% strongly agree; for 'I am worried about my health.',7 students with percentage of 3.5% strongly disagree, 28 students with percentage of 14.1% disagree, 73 students with percentage of 36.7% neutral, 66 students with percentage of 33.2% agree and 25 students with percentage of 12.6% strongly agree; for 'I am worried about the health of my family members.', 1 students with percentage of 0.5% strongly disagree, 4 students with percentage of 2% disagree, 21 students with percentage of 10.6% neutral, 93 students with percentage of 46.7% agree and 80 students with percentage of 40.2% strongly agree; for 'I am stressed about leaving my house', 15 students with percentage of 7.5% strongly disagree, 37 students with percentage of 18.6% disagree, 83 students with percentage of 41.7% neutral, 50 students with percentage of 25.1% agree and 14 students with percentage of 7% agree

Table 9. Future behaviours of MMMC students.

Statement	N (%)
Do you need to leave home in the next 5 days?	
Yes	61 (30.7)
No	138 (69.4)
The reasons to leave their home	
Procuring food for yourself or family	139 (69.9)
Going to the pharmacy	75 (37.7)
Going to the hospital/receiving medical treatments	54 (27.1)
Doing physical activity (e.g. exercising, jogging)	46 (23.1)
Getting tired of being inside of the house	24 (12.1)
Getting bored	24 (12.1)
Meeting friends or relatives	22 (11.1)
Exercising my freedom	15 (7.5)
Walking a pet	14 (7)
Taking care of dependents	14 (7)
Getting some adrenaline (from breaking the law)	6 (3)
Buying grocery	5 (2.5)
Nothing	2 (1)
Car maintenance	2 (1)
Bank	1 (0.5)
License removal	1 (0.5)
Family business	1 (0.5)
Work	1 (0.5)
Funeral	1 (0.5)
Opinion on the main negative sides of complying with the stay home requirement	
Boredom	134 (67.3)
Lack of social activities	121 (60.8)
Lack of exercise	101 (50.8)
Online learning	99 (49.8)
Lack of fresh air	94 (47.2)
Conflicts in the family	62 (31.2)
Lack of freedom	60 (30.2)
Loneliness	59 (29.7)
Stress	1 (0.5)
Assignments	1 (0.5)

Table 9 shows the future behaviours of MMMC students. According to our study, 61 students with the percentage of 30.7% needed to leave home in the next 5 days whereas 138 students with the percentage of 69.4% did not need to leave home in the next 5 days.

Among the reasons to leave their home, 139 students with the percentage of 69.9% chose 'Procuring food for yourself or family', 75 students with the percentage of 37.7% chose 'Going to the pharmacy', 54 students with the percentage of 27.1% chose 'Going to the hospital/receiving medical treatments', 46 students with the percentage of 23.1% chose 'Doing physical activity (e.g. exercising, jogging)', 24 students with the percentage of 12.1% chose 'Getting tired of being inside of the house'. 24 students with the percentage of 12.1% chose ' Getting bored', 22 students with the percentage of 11.1% chose ' Meeting friends or relatives', 15 students with the percentage of 7.5% chose ' Exercising my freedom', 14 students with the percentage of 7% chose 'Walking a pet', 14 students with the percentage of 7% chose 'Taking care of dependents', 6 students with the percentage of 3% chose 'Getting some adrenaline (from breaking the law)', 5 students with the percentage of 2.5% chose 'Buying grocery', 2 students with the percentage of 1% chose 'Nothing', 2 students with the percentage of 1% chose 'Car maintenance', 1 students with the percentage of 0.5% chose 'Bank', 1 students with the percentage of 0.5% chose 'License removal',1 students with the percentage of 0.5% chose 'Family business', 1 students with the percentage of 0.5% chose 'Work', 1 students with the percentage of 0.5% chose 'Funeral'.

Among the opinion on the main negative sides of complying with the stay home requirement, 134 students with the percentage of 67.3% chose 'Boredom', 121 students with the percentage of 60.8% chose 'Lack of social activities', 101 students with the percentage of 50.8% chose 'Lack of exercise', 99 students with the percentage of 49.8% chose 'Online learning', 94 students with the percentage of 47.2% chose 'Lack of fresh air', 62 students with the percentage of 31.2% chose 'Conflicts in the family', 60 students with the percentage of 30.2% chose 'Lack of freedom', 59 students with the percentage of 29.7% chose 'Loneliness', 1 students

with the percentage of 0.5% chose 'Stress', 1 students with the percentage of 0.5% chose 'Assignments'.

Table 10. Personal battery of MMMC students.

Description	Strongly Disagree N (%)	Disagree N (%)	Neutral N (%)	Agree N (%)	Strongly Agree N (%)
Extroverted, enthusiastic	13 (6.5)	39 (19.6)	84 (42.2)	48 (24.1)	15 (7.5)
Critical, quarrelsome	15 (7.5)	60 (30.2)	76 (38.2)	45 (22.6)	3 (1.5)
Dependable, self-disciplined	4 (2)	13 (6.5)	79 (39.7)	90 (45.2)	13 (6.5)
Anxious, easily upset	9 (4.5)	57 (28.6)	62 (31.2)	53 (26.6)	18 (9.1)
Open to new experiences, complex	2 (1)	5 (2.5)	64 (32.2)	95 (47.7)	33 (16.6)
Reserved, quiet	14 (7)	42 (21.1)	60 (30.2)	52 (26.1)	31 (15.6)
Sympathetic, warm	0 (0)	3 (1.5)	63 (31.7)	104 (52.3)	29 (14.6)
Disorganized, careless	18 (9.1)	68 (34.2)	68 (34.2)	37 (18.6)	8 (4)
Calm, emotionally stable	6 (3)	19 (9.6)	84 (42.2)	76 (38.2)	14 (7)
Conventional, uncreative	21 (10.6)	59 (29.7)	73 (36.7)	41 (20.6)	5 (2.5)

Table 10 shows the personal battery of MMMC students which consists of 10 descriptions. Out of 199 students, for 'Extroverted, enthusiastic', 13 students with the percentage of 6.5% strongly disagree, 39 students with the percentage of 19.6% disagree, 84 students with the percentage of 42.2% are neutral, 48 students with the percentage of 24.1% agree, and 15 students with the percentage of 7.5% strongly agree with it. For 'Critical, quarrelsome' 15 students with the percentage of 7.5% strongly disagree, 60 students with the percentage of 30.2% disagree, 76 students with the percentage of 38.2% are neutral, 45 students with the percentage of 22.6% agree, and 3 students with the percentage of 1.5% strongly agree with it. For 'Dependable, self-disciplined' 4 students with the percentage of 2% strongly disagree, 13 students with the percentage of 6.5% disagree, 79 students with the percentage of 39.7% are neutral, 90 students with the percentage of 45.2% agree, and 13 students with the percentage of 6.5% strongly agree with it. For 'Anxious, easily upset' 9 students with the percentage of 4.5% strongly disagree, 57 students with the percentage of 28.6% disagree, 62 students with the percentage of 31.2% are neutral, 53 students with the percentage of 26.6% agree, and 18 students with the percentage of 9.1% strongly agree with it. For 'Open to new experiences, complex' 2 students with the percentage of 1% strongly disagree, 5 students with the percentage of 2.5% disagree, 64 students with the percentage of 32.2% are neutral, 95 students with the percentage of 47.7% agree, and 33 students with the percentage of 16.6% strongly agree with it. For 'Reserved, quiet' 14 students with the percentage of 7% strongly disagree, 42 students with the percentage of 21.1% disagree, 60 students with the percentage of 30.2% are neutral, 52 students with the percentage of 26.1% agree, and 31 students with the percentage of 15.6% strongly agree with it. For 'Sympathetic, warm' 0 students with the percentage of 0% strongly disagree, 3 students with the percentage of 1.5% disagree, 63 students with the percentage of 31.7% are neutral, 104 students with the percentage of 52.3% agree, and 29 students with the percentage of 14.6% strongly agree with it. For 'Disorganized, careless' 18 students with the percentage of 9.1% strongly disagree, 68 students with the percentage of 34.2% disagree, 68 students with the percentage of 34.2% are neutral, 37 students with the percentage of 18.6% agree, and 8 students with the percentage of 4% strongly agree with it. For 'Calm, emotionally stable' 6 students with the percentage of 3% strongly disagree, 19 students with the percentage of 9.6% disagree, 84 students with the percentage of 42.2% are neutral, 76 students with the percentage of 38.2% agree, and 14 students with the percentage of 7% strongly agree with it. For 'Conventional, uncreative', 21 students with the percentage of 10.6% strongly disagree, 59 students with the percentage of 29.7% disagree, 73 students with the percentage of 36.7% are neutral, 41 students with the percentage of 20.6% agree, and 5 students with the percentage of 2.5% strongly agree with it.

Table 11. Association between gender, ethnicity, family types, family income, and the self-reported compliance among MMMC students towards the safety measures of COVID-19.

Independent variables	Compliance score Mean (SD)	Mean difference (95% CI)	P value
Gender			
Male	90.4 (10.2)	0.9 (-2.6 to 4.4)	0.621
Female	89.5 (11.5)		
Ethnicity			
Chinese	89.5 (11.3)		
Malay	88.7 (11.8)	-	0.766
Indian	90.1 (11.2)		
Others	92.7 (5.7)		
Family types			
Nuclear family	89.9 (11.3)	0.9 (-3.3 to 5.1)	0.662

Independent variables	Compliance score Mean (SD)	Mean difference (95% CI)	P value
Extended family	89 (10.1)		
Family income			
< RM 4360	89.7 (13.2)		
RM 4360 – RM 9619	90.6 (9.9)	-	0.551
>RM 9619	88.7 (11.8)		

Table 11 shows the association between gender, ethnicity, family types, family income, and the self-reported compliance among MMMC students towards the safety measures of COVID-19. Males have a mean score of 90.4 (SD=10.2), which is slightly higher than females which have a mean score of 89.5 (SD=11.5). The mean difference of these two are 0.9 with 95% CI ranging from -2.6 to 4.4. The calculated p value is 0.621 which indicates that there is no significant association between gender and the compliance score. Chinese have a mean score of 89.5 (SD=11.3), Malays have a mean score of 88.7 (SD=11.8), Indians have a mean score of 90.1 (SD=11.2) and other races such as Punjabis and Kadazan have a score of 92.7 (SD=5.7). The calculated p value is 0.766 which indicates that there is no significant association between ethnicity and the compliance score. Participants with stays with a nuclear family have a mean score of 89.9 (SD=11.3), which is slightly higher than participants which stays with an extended family which have a mean score of 89 (SD=10.1). The mean difference of these two are 0.9 with 95% CI ranging from -3.3 to 5.1. The calculated p value is 0.662, which indicates that there is no significant association between family types and the compliance score. Participants with average monthly household income less than RM 4,360 have a mean score of 89.7 (SD=13.2), participants with average monthly household income between RM 4,360 to RM 9,619 have a mean score of 90.6 (SD=9.9), and the participants with average monthly household income more than RM 9,619 have a mean score of 88.7 (SD=11.8). The calculated p value is 0.551 which indicates that there is no significant association between average monthly household income and the compliance score.

Table 12. Association between gender, ethnicity, family types, family income, and the mental health concerns among MMMC students towards COVID-19.

Independent variables	Mental Health Concerns Mean (SD)	Mean difference (95% CI)	P value
Gender			
Male	15.2 (3.2)	-1.7 (-2.8 to -0.7)	<0.001
Female	16.9 (3.3)		
Ethnicity			
Chinese	16.1 (3.3)		
Malay	15.4 (3.3)	-	0.051
Indian	17.1 (3)		
Others	16.6 (5.7)		
Family types			
Nuclear family	16.4 (3.3)	-0.5 (-1.7 to 0.8)	0.469
Extended family	16.8 (3.4)		
Family income			
< RM 4360	16.7 (3.5)		
RM 4360 – RM 9619	16.8 (3.2)	-	0.134
>RM 9619	15.8 (3.4)		

Table 12 shows the association between gender, ethnicity, family types, family income, and the mental health concerns among MMMC students towards COVID-19. Males have a mean score of 15.2 (SD=3.2), which is slightly lower than females which have a mean score of 16.9 (SD=3.3). The mean difference of these two are -1.7 with 95% CI ranging from -2.8 to -0.7. The calculated p value is <0.001 which indicates that there is significant association between gender and the mental health concerns. Chinese have a mean score of 16.1 (SD=3.3), Malays have a mean score of 15.4 (SD=3.3), Indians have a mean score of 17.1 (SD=3) and other races such as Punjabis and Kadazan have a score of 16.6 (SD=5.7). The calculated p value is 0.051 which indicates that there is no significant association between ethnicity and the mental health concerns. Participants with stays with a nuclear family have a mean score of 16.4 (SD=3.3), which is slightly lower than participants which stays with an extended family which have a mean score of 16.8 (SD=3.4). The mean difference of these two are -0.5 with 95% CI ranging from -1.7 to 0.8. The calculated p value is 0.469, which indicates that there is no significant association between family types and the mental health concerns. Participants with average monthly household income less than RM 4,360 have a mean score of 16.7 (SD=3.5), participants with average monthly household income between RM 4,360 to RM 9,619 have a mean score of 16.8 (SD=3.2), and the participants with average monthly household income more than RM 9,619 have a mean score of 15.8 (SD=3.4). The calculated p value is 0.134 which indicates that there is no significant association between average monthly household income and the mental health concerns.

4. Discussion

We conducted this cross-sectional study to assess the self-reported compliance and mental health concerns towards COVID-19 pandemic and their association with the gender, ethnicity, family type and family income among the Malaysian undergraduates of MMMC Muar and Melaka campus, Malaysia. Through this study we found that there was a good compliance or self-reported past behaviour of MMMC students toward the safety measures of COVID-19 with a total mean score of 87.8. The mean score of students who stayed at home was 90 while it was 95.5 for those who did not attend any social gatherings. The mean for those who washed their hands more frequently than last month was 85.4 and 84.4 for everyone who kept a distance of at least 2 meters to other people. The mean score for students who claimed they would have immediately informed people around them if they had exhibited symptoms of the disease (COVID 19) was 96.6. In a cross-sectional study carried out on the general public of Italy by Barari S et al., there was a mean score of 85.6 for those who kept social distance of 2m from others and a mean score of 88.6 for those who washed their hands more frequently. While the mean for those who stayed at home was 88.8 while it was 91.5 for everyone who avoided social gatherings. A mean of 94.7 was recorded for everyone who would immediately inform others if they ever experienced any symptoms of the disease (COVID-19). [27] In a web-based cross-sectional study conducted among the English speakers of Netherlands by Kuiper M et al., they have found that 99% of their participants practice social distancing of 1.5 meters from each other, and 87% of their respondents stayed at home if they do not feel well. [28] Based on another cross-sectional study done among the adult population of Israel to study the compliance in the era of COVID-19 influenced by compensation, 94% of respondent stated that they would comply to the 2-week quarantine indicated by the medical official if a state sponsored compensation for lost wages was given. Nevertheless, the compliance rate dropped to a 57% when monetary compensation was removed. [29]

For the aspect the mental health concerns, our study shows that about 32.6% students agree that they are nervous when think about current circumstances, however most of them (46.7%) are having neutral response towards this statement. 46.8% of the students agree that they are calm and relaxed. Our study also shows that 45.8% students are worried about their health and 86.9% of the students are worried the health of their family members. 41.7% among the students have neutral response for the statement they are stressed about leaving their houses and 32.1% students agree this statement. Interestingly, a cross-sectional study conducted among social media users in Malaysia by Shayaa S et al. shows that 48.67% of Malaysians were in anger, 16.65% were in fear, 17.47% were in sadness after first day of Movement Control Order (MCO) announcement. However, it was observed the reduction in fear and anger among Malaysians on the 5th day since the MCO announcement where the percentage of anger has reduced to 16.08% and the percentage of fear has reduced to 8.15% but the percentage of sadness increased to 25.54%. [14] A web-based cross-sectional study conducted among the mainstream social platform users in China by Huang Y et al. demonstrated about the mental health burdens during this pandemic among the participants where 35.1% of them were anxious, 20.1% were having depressive features and 18.2% were having sleeping difficulties. [16] Another cross-sectional study which is conducted by Deblina Roy et al. involving adult Indians showed that mental health care is needed in more than 80% of the participants during the COVID-19 outbreak. [19] A cross-sectional study carried out on the general public of Italy by Barari S et al. showed that average anxiety levels among participants are 73.9%. [27]

This study showed that there was no significant association between gender, ethnicity, family types, family income and the compliance of MMMC students towards the safety measures of COVID-19. In a cross-sectional study conducted by Brouard S et al. among the general population of France, they found that females are more likely to change their behaviour compared to males in order to comply with the public health measures. [30]

We found out that there was a significant association between gender and mental health concerns among MMMC students towards COVID-19. In our study, male had an average score of 15.2 for the mental health concerns while the female had an average score of 16.9. This shows that females have a higher amount of mental health concerns compared to males. Besides that, our study showed no significant association between ethnicity, family types, family incomes and mental health concerns among MMMC students towards COVID-19. In a web-based cross-sectional study conducted among the mainstream social platform users in China by Huang Y et al., they have found that there was no significant association between gender and the presence of anxiety related disorders. [16] In another cross-sectional study conducted by Reznik A et al. among the population of 3 university in Russia and Belarus shows that females are significantly more fearful of COVID-19 compared to males. [31]

When we were studying about the personal beliefs and perceptions of MMMC students regarding the safety measures of COVID-19, a large number of them heeded and agreed to the rules imposed on them. 98.5% and 95.5% participants agreed to the public health measures such as

avoiding social gathering and handshaking respectively. Another cohort study in Wuhan, China by Lau H et al. was conducted to see the impact of lockdown on COVID-19 outbreak among China population based on various database. In this study, it is found that the correlation between local gatherings and COVID-19 spread became less after the lockdown, therefore proving that the lockdown measures taken can reduce the spread of the disease. [13] A cross-sectional study conducted on the general public of Italy by Barari S et al. also showed similar results in which 94.7% and 95.2% participants agree to avoid social gathering and handshaking respectively. Among the 4 questions, the least popular one is the closure of non-essential shops in which 78.9% participants agree to this while 21.1% disagreed; however, the number of participants that agree is more remarkable. In the similar Italian study, the results were similar to our study in which 89% participants agreed to the closure of non-essential shops. The general curfew implemented was compiled by 86.4% of the participants similarly in Italy a big number of the participants, 93.1% agreed to their general curfew. [27] From this study among the MMMC students, the majority of the participants believe that the public health measure taken is complaisant, thus has a positive perception towards the safety measures of COVID-19 established by the government.

Regarding the perception of MMMC students towards the government response and efficacy to current coronavirus outbreak, median score of 3 is observed which shows that the students had neutral response that there is appropriate response showed by the government. We observed that with a median score 4, the students agree that the Malaysian government are taking care of their citizens. The students also think that the reaction of the Malaysian public is appropriate (median score of 3). Furthermore, the students agree that social distancing measures are effective with a median score of 4 observed. A cross-sectional study conducted among the adult population in India by Deblina Roy et al. showed that 98% participants agreed that social distancing is important to break the chain of COVID-19 transmission. [19] A cross-sectional study by Barari S et al. conducted among the general population of Italy showed that 78% respondents thought social distancing is an essential safety measure, 62% agreed that the government's reaction on COVID-19 outbreak was appropriate, 36% agreed that the public reaction was appropriate, and 51% participants trust the Italian government. [27]

Regarding the compliance with the stay home notice imposed during MCO, among the students of MMMC, only 30.7% needed to leave home in the next 5 days. When the reason to leave their home was studied, the respondents most often cite their reason for leaving home is to procure food for themselves or for their family which makes up 69.9%. The next highest reason was to go to the pharmacy which was made up by 37.7% of the students. 27.1% of students cited going to the hospital or receiving medical treatment and 23.1% of students cited doing physical activity such as exercising and jogging. A cross-sectional study carried out among the general population of Italy by Barari S et al. showed the 62% respondents needed to leave home. The respondents stated that they most often left their home for essential reasons such as procuring food and retrieving medicine rather than non-essential reasons such as because of boredom and meeting theirs friends. [27]

In this study, most students are shown to have great compliance rate towards the safety measures established for this pandemic with a mean score of 87.8 but concurrently are also having some underlying mental health concerns for the same. Hence, they can follow the WHO recommendations to reduce mental stress such as avoiding any sort of pandemic related media, having a healthy well-balanced diet, performing regular exercises, having adequate sleep and most importantly, communicating with others. Accordingly, future researchers could include various other settings to access the same qualitative research to explore the self-reported compliance and mental health concerns in populations of that respective setting.

Unfortunately, several limitations were encountered during our study. To name a few, we have only conducted this cross-sectional study for a short duration of 6 weeks which only allowed us to observe the participants at one point in time. Therefore, we were unable to observe the temporal effect on the changes in the participants' self-reported compliance, their mental health concerns, their perceptions, beliefs, and their future behaviour. Besides that, our study was only done in a single setting which may not be representative of other settings.

5. Conclusion

In this study, self-reported compliance towards the safety measures of COVID-19 and the influence of this pandemic on mental health among the Malaysian undergraduate students of MMMC, Muar and Melaka campus, Malaysia was discussed. Regarding the compliances, the students shown a remarkable compliance rate with mean score of 87.8 towards the safety measures established. However, it is found that gender plays a role on the mental health among the students. There was a significant association between gender and the mental health concerns. The calculated p value was <0.001. As this was only done in a single private medical college, we hope that future researchers would take the opportunity to use the same qualitative survey items to assess the populations in other groups so more knowledge about

compliance and mental health concerns can be established in order to take necessary actions.

Acknowledgements

We would like to express our utmost sincere gratitude to the Dean of Faculty of Medicine, MMMC who is also the Head of Department for Community Medicine MMMC, Professor Dr Adinegara Lutfi Abas, our lecturer who guided us through this study patiently, Professor Dr Htoo Htoo Kyaw Soe, Associate Professor Dr Sujata Khobragade and Assistant Professor Dr Mila Nu Nu Htay from the Department of Community Medicine, MMMC Muar Campus, as well as the Research Ethics Committee, Faculty of Medicine, MMMC, Malaysia. Lastly, we would also like to thank the volunteers who has agreed to participate in our study.

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