



**UNIVERSITI PUTRA MALAYSIA**

***THE IMPACT OF THE COVID-19 PANDEMIC ON THE MENTAL  
HEALTH AMONG THE MALAYSIAN POPULATION***

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HEALTH AMONG THE MALAYSIAN POPULATION**

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# THE IMPACT OF THE COVID-19 PANDEMIC ON MENTAL HEALTH AMONG THE MALAYSIAN POPULATION

NALINI ANUKSHI GUNAWARDANA

## ABSTRACT

**Introduction:** Following the increase of COVID-19 cases, the Malaysian government has implemented a Movement Control Order (MCO) starting on 18<sup>th</sup> March 2020. It is a set of quarantine and sanitary regulations imposed by the Malaysian government to prevent the transmission of COVID-19, mainly to flatten the epidemiologic curve. During this period, all Malaysians are advised to stay at home, maintain physical distance, and be restricted within 10 km of their residential area. Previous studies have revealed that staying at home for prolonged periods of crisis during the COVID-19 outbreak significantly increased mental health problems. However, the psychological impact of the MCO on the general population in Malaysia is mainly unexplored yet.

**Objective:** This study aimed to determine the impact of the COVID-19 disease outbreak on the mental health of the Malaysian adult population. **Methodology:** To determine the impact of MCO implementation on mental health during the COVID-19 outbreak, a cross-sectional study among Malaysian adult citizens (18 years old and above) who were at the current residence during the MCO was included. However, respondents categorised as frontliners, COVID-19 positive patients, individuals who have been or are being quarantined, and a person under investigation were excluded from this study. The Depression Anxiety Stress Scale (DASS-21) was used to assess depression, anxiety, and stress. A multivariate logistic regression model was used to assess the association between demographic factors and psychological responses such as depression, anxiety, and stress during MCO. **Results:** A total of 497 respondents were collected, whereby a majority of the participants were female (62.4%), between 36-45 years old (35.6%), Malay ethnicity (93.6%), and married (22.1%) with monthly income below MYR4, 360 (43.1%). The majority of the respondents (91.5%) did not have any chronic diseases and perceived good mental health (97.8%), and were not undergoing or receiving any medication for mental illness (99%). The findings revealed that the 26-35-year-old group (OR = 1.123, 95% CI 0.453-2.785) recorded a higher probability of developing depression than other age groups. Likewise, females (OR 1.664, 95% CI 0.997- 2.776) respondents were also 1.7 times more likely to exhibit depressive disorder than males. For stress symptoms, the findings revealed that the individuals living in a household of more than 3-5 members (OR 1.356, 95% CI 0.543-3.338) had the greatest risk of developing stress. However, the type of housing was the strongest predictor for depression and anxiety symptoms. Individuals living in townhouses are more likely to develop depression (OR 24.000, 95% CI 1.989-289.602) and anxiety (OR 192.000, 95% CI 10.504-3509.451). **Conclusion:** According to sociodemographic variables, young adults, individuals living in larger households, and females were more susceptible to mental health problems such as depression, anxiety, and stress. These findings highlight the importance of monitoring the mental health disorders in the general population during the COVID-19 pandemic and then offering targeted therapies for the variables that showed the most significance and association with mental health problems.

*Keywords: COVID-19 pandemic, DASS-21, mental health, Malaysian population*

# IMPAK PANDEMIK COVID-19 TERHADAP KESIHATAN MENTAL DALAM KALANGAN PENDUDUK MALAYSIA

NALINI ANUKSHI GUNAWARDANA

## ABSTRAK

**Pengenalan:** Berikutan peningkatan kes COVID-19, kerajaan Malaysia telah melaksanakan Perintah Kawalan Pergerakan (PKP) bermula daripada 18 Mac 2020. Ini adalah satu peraturan kuarantin yang dikenakan oleh kerajaan Malaysia untuk mencegah penularan COVID-19, terutamanya untuk meratakan lengkung epidemiologi. Sepanjang tempoh ini, semua rakyat Malaysia disarankan untuk tinggal di rumah, menjaga jarak fizikal, dan hanya keluar dalam jarak 10 km dari kawasan perumahan mereka. Kajian sebelumnya telah menunjukkan bahawa tinggal di rumah untuk jangka masa yang panjang semasa krisis wabak COVID-19 telah meningkatkan masalah kesihatan mental secara signifikan. Walau bagaimanapun, kesan psikologi PKP terhadap populasi rakyat Malaysia masih belum diterokai. **Objektif:** Kajian ini bertujuan untuk mengetahui kesan wabak penyakit COVID-19 terhadap kesihatan mental penduduk dewasa di Malaysia. **Kaedah:** Untuk menentukan implikasi pelaksanaan PKP terhadap kesihatan mental semasa wabak COVID-19, satu kajian keratan rentas di kalangan warganegara dewasa Malaysia (berumur 18 tahun ke atas) yang berada di kediaman sepanjang tempoh PKP, telah digunakan. Walau bagaimanapun, responden yang dikategorikan sebagai barisan hadapan, pesakit positif COVID-19, individu yang telah atau sedang dikuarantin dan seseorang yang sedang disiasat untuk COVID-19, dikeluarkan daripada kajian ini. Skala *Depression Anxiety Stress* (DASS-21) digunakan untuk menilai kemurungan, keresahan dan tekanan. Model regresi logistik multivariat telah digunakan untuk menilai hubungan diantara faktor demografi dan tindak balas psikologi seperti kemurungan, keresahan dan tekanan semasa PKP. **Keputusan:** Sebanyak 497 responden telah dikumpulkan, di mana majoriti peserta adalah wanita (62.4%), berumur antara 36-45 tahun (35.6%), etnik Melayu (93.6%) dan telah berkahwin (22.1%) dengan pendapatan bulanan di bawah RM4,360 (43.1%). Majoriti responden (91.5%) tidak mempunyai penyakit kronik dan mempunyai kesihatan mental yang baik (97.8%), dan tidak menjalani atau menerima sebarang ubat untuk penyakit mental (99%). Keputusan menunjukkan bahawa kumpulan yang terdiri daripada individu berumur 26-35 tahun (OR = 1.123, 95% CI 0.453-2.785) merekodkan kemungkinan yang lebih tinggi untuk mengalami kemurungan berbanding dengan kumpulan umur yang lain. Selain itu, wanita (OR 1.664, 95% CI 0.997- 2.776) menghadapi kemurungan sebanyak 1.7 kali lebih tinggi daripada lelaki. Untuk simptom tekanan, keputusan menunjukkan bahawa individu yang tinggal bersama lebih daripada 3 ke 5 orang isi rumah (OR 1.356, 95% CI 0.543-3.338), mempunyai risiko yang lebih untuk menghadapi tekanan. Walau bagaimanapun, jenis perumahan didapati memainkan peranan penting dalam meramalkan kemungkinan bagi simptom kemurungan dan keresahan. Individu yang tinggal di perumahan dalam kawasan bandar mempunyai kebarangkalian yang lebih tinggi untuk menghadapi kemurungan (OR 24.000, 95% CI 1.989-289.602) dan keresahan (OR 192.000, 95% CI 10.504-3509.451). **Kesimpulan:** Berdasarkan sociodemografik, individu yang muda, tinggal serumah dengan ramai individu dan wanita, adalah mudah untuk menghadapi masalah kesihatan mental. Hasil kajian ini menekankan kepentingan untuk memantau penyakit masalah mental yang wujud

dalam kalangan masyarakat semasa pandemik COVID-19 dan menyediakan terapi yang berkenaan untuk faktor-faktor yang menunjukkan kebarangkalian dan kaitan yang tinggi untuk menghadapi masalah kesihatan mental.

*Kata kunci: Pandemik COVID-19, DASS-21, kesihatan mental, penduduk Malaysia*



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## ABBREVIATIONS

|           |                                                                                    |
|-----------|------------------------------------------------------------------------------------|
| APA       | American Psychological Association                                                 |
| ATM       | Malaysian Armed Forces                                                             |
| BNDF      | Brain-derived neurotrophic factor                                                  |
| CMCO      | Conditional movement control order                                                 |
| COVID-19  | Coronavirus 2019 disease                                                           |
| DASS      | Depression Anxiety and Stress Scales                                               |
| GAD       | Generalized Anxiety Disorder                                                       |
| JKEUPM    | Universiti Putra Malaysia's Ethics Committee for Research Involving Human Subjects |
| KKM       | Kementerian Kesihatan Malaysia                                                     |
| MCO       | Movement Control Order                                                             |
| MENA      | Middle East/North Africa                                                           |
| MOH       | Ministry of Health                                                                 |
| OCD       | Obsessive-compulsive disorder                                                      |
| PANAS     | Positive and Negative Affect Schedule                                              |
| PDRM      | Royal Malaysian Police                                                             |
| PHQ       | Patient Health Questionnaire                                                       |
| PKP       | <i>Perintah Kawalan Pergerakan</i>                                                 |
| PTSD      | Post-traumatic stress disorder                                                     |
| PUI       | Person under investigation                                                         |
| RMCO      | Recovery movement control order                                                    |
| SAD       | Social anxiety disorder                                                            |
| SAR-CoV-2 | Severe acute respiratory syndrome coronavirus                                      |
| SOP       | Standard operating procedures                                                      |
| SPSS      | Statistical Program for Social Sciences                                            |

## CHAPTER 1

### INTRODUCTION

#### 1.1 Study Background

Coronavirus 2019 disease (COVID-19) is an emerging global health concern caused by the severe acute respiratory syndrome coronavirus 2 (SAR-CoV-2) (Ciotti *et al.*, 2020). This global pandemic has recently resulted in 129 million cases and 2.83 million fatalities worldwide (Aw *et al.*, 2021). A 15-fold increase in disease incidence was recently reported in the middle age population than individuals less than 50 years of age (Biswas *et al.*, 2020). In line with global COVID-19 cases, Malaysia is responsible for 345500 cases and 1272 deaths, as reported by the Kementerian Kesihatan Malaysia (KKM) (Aw *et al.*, 2021).

Following the increase of COVID-19 cases, the Malaysian government has implemented a Movement Control Order (MCO), or *Perintah Kawalan Pergerakan* (PKP), starting on 18<sup>th</sup> March 2020. It is a set of quarantine and sanitary regulations imposed by the Malaysian government to prevent the transmission of COVID-19, mainly to flatten the epidemiologic curve. During this period, all Malaysians are advised to stay at home, maintain physical distance, and go outside within 10 km of their residential area. Only several services are allowed to operate, such as food, energy, communication, and healthcare. All interstate travel was banned, and the borders were closed effectively (Shah *et al.*, 2020).

Consequently, zero local transmissions of COVID-19 cases were achieved during the first MCO due to these strict measures taken by the government from July to September 2020 (Lim *et al.*, 2021).

However, staying at home for prolonged periods of crisis can pose a significant challenge to an individual, especially to the mental health impacts (Brook *et al.*, 2020). The scenario also led to the loss of employment, closure of businesses, schools, and restaurants, which led to a significant mental health issue, harming the well-being of people globally (Xiong *et al.*, 2020). The majority of them suffer from anxiety, stress, and confusion, with longer durations of seclusion worsening these effects (Brook *et al.*, 2020). A longitudinal study conducted in the United Kingdom revealed an 8.4% increment of mental health issues after the lockdown was implemented compared to before the lockdown, with a higher incidence of psychological problems among adolescents, women, and those living with small children during the pandemic were observed (Pierce *et al.*, 2020).

Several studies conducted during the lockdown suggest that mental health issues have arisen since the beginning of the pandemic. A study carried out in the Middle East/North Africa (MENA) region found that the majority of the participants (45%–62%) felt helpless and nervous due to COVID-19. The study was conducted among the general population in the MENA region, with a higher psychological impact recorded among females, participants aged 26–35 years (Al-Dhaheri *et al.*, 2021). This is because women are more susceptible to stress and anxiety disorders in the aftermath of stressful experiences, whereas men show greater resilience (McLean *et al.*, 2011; Axinn *et al.*, 2013). Lai *et al.* (2020) reported that half of the healthcare workers in

China suffered from depression, while three-quarters and one-third of them suffered from stress and sleeping disorders like insomnia, respectively.

Despite the various studies on the impact of COVID-19 on mental health, there is however a lack of Malaysian data on the effect of the MCO and the uncertainty of the pandemic's duration on the Malaysian population's mental health. Therefore, further investigations among the Malaysian population in the midst of this unprecedented crisis are crucial. Hence, the present study was conducted to look into the socio-psychological well-being among the Malaysian population and understand how the Malaysian population coped with these unexpected circumstances.

## **1.2 Problem Statement**

COVID-19 has resulted in significant and unexpected changes to the Malaysian population. Unlike other recent virus epidemics, COVID-19 has far-reaching repercussions that are unknown and thus difficult to forecast. Social distancing, isolation, and closure of schools and workplaces have forced the public to stay in their homes to help reduce disease transmission (Javed *et al.*, 2020). The gravity of the measures required to suppress the outbreak has increased the mental health problem among the public (Pfefferbaum & North, 2020). As witnessed by previous pandemics such as SARS and Ebola, depression, anxiety, and stress are among the mental health problems faced by the community due to the implementation of lockdown and isolation (Saladino *et al.*, 2020). However, with COVID-19, the quarantine was implemented for a much greater time (Brooks *et al.*, 2020). Thus, there is a possibility to have severe mental health problems among the population. In reviewing the literature, evidence revealed that staying at home for prolonged periods during the COVID-19 outbreak

significantly increased the mental health problems (Wong *et al.*, 2020; Brook *et al.*, 2020; Pierce *et al.*, 2020). A recent study prior to the COVID-19 outbreak, conducted by the Ministry of Health (MOH), revealed that approximately 4.2 million (29%) Malaysian populations were suffered due to mental illness (Hassan *et al.*, 2018), indicates that depression and anxiety disorders had become major disabilities in Malaysia. However, the psychological impact of the MCO on the general population in Malaysia is mainly unexplored yet. These strongly suggested a need to accurately and timely assess the magnitude of mental health outcomes during lockdown measures in the general population in Malaysia.

### **1.3 Significance of Study**

The findings of this study will help understand the Malaysian population's perspectives on mental health and help to evaluate the main factors that play a role in people's mental health downfall amidst the COVID-19 pandemic. This will also benefit public mental health interventions in the near future, especially for those at higher risk.

### **1.4 Research Questions**

The following are the main research questions concerning the impact of coronavirus (COVID-19):

1. What is the impact of the Movement Control Order (MCO) implementation during the COVID- 19 outbreak on the mental health of Malaysian adults?
2. Are there any associations between demographic factors and psychological responses during the COVID-19 outbreak?

### **1.5 Study Objectives**

The general objective of this study is to determine the impact of the COVID-19 disease outbreak on the mental health of the Malaysian adult population.

The specific objectives of this study are:

1. To determine the impact of the Movement Control Order (MCO) implementation on mental health such as anxiety, depression, and stress during the COVID-19 outbreak.
2. To identify associations between demographic factors and psychological responses during the COVID-19 outbreak.

### **1.6 Research Hypothesis**

It is hypothesised that there is an association between demographic factors and physical responses on mental health during the COVID-19 outbreak among Malaysian adults.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 COVID-19 Pandemic

Since the first case of COVID-19 was reported in China in December 2019, the World Health Organization declared COVID-19 a global pandemic (Zhang *et al.*, 2020). This global pandemic has resulted in 129 million cases and 2.83 million fatalities worldwide (Aw *et al.*, 2021). This pandemic had given rise to several challenges due to the prolonged quarantine periods. Some of the challenges include loss of employment, closure of businesses, schools, and restaurants, and harm to mental health (Xiong *et al.*, 2020).

In line with global COVID-19 cases, Malaysia is responsible for 345500 cases and 1272 deaths, as reported by the Kementerian Kesihatan Malaysia (KKM) (Aw *et al.*, 2021). COVID-19 has caused severe disturbances worldwide, including in Malaysia (Wong *et al.*, 2021). The first outbreak case in Malaysia was discovered on January 25<sup>th</sup> 2020, and the incidence has steadily increased since then. The Malaysian government acted quickly and decisively by implementing MCO starting from March 18<sup>th</sup> 2020, by closing district and state borders, as well as conducting active contact tracing for COVID-19. This action taken by the government has contributed to a low fatality rate for a certain period of time (Lim *et al.*, 2021).

Since then, the Malaysian government has enforced different levels of MCO depending on the severity of the situation (Table 2.1). From May 4<sup>th</sup> to June 9<sup>th</sup> 2020, a conditional movement control order (CMCO) was in place, and from June 10<sup>th</sup> to August 31<sup>st</sup> 2020, a recovery movement control order (RMCO) was in effect, with more flexible limitations. The RMCO was then extended until December 31<sup>st</sup> 2020 (Musa *et al.*, 2021). During the pandemic, the Malaysian government has also emphasised the importance of face masks in public places, social distancing, and frequent hand washing (Wong *et al.*, 2021).

**Table 2.1: Type and phase of MCO in Malaysia (Musa *et al.*, 2021).**

| Phase                                                                           | Date                                |
|---------------------------------------------------------------------------------|-------------------------------------|
| <b>Movement Control Order (MCO, 18 March 2020 – 3 May 2020)</b>                 |                                     |
| Phase 1                                                                         | 18 March 2020 – 3 May 2020          |
| Phase 2                                                                         | 1 April 2020 – 14 April 2020        |
| Phase 3                                                                         | 15 April 2020 – 28 April 2020       |
| Phase 4                                                                         | 29 April 2020 – 3 May 2020          |
| <b>Conditional Movement Control Order (CMCO, 4 May 2020 – 31 December 2020)</b> |                                     |
| Phase 1                                                                         | 4 May 2020 – 12 May 2020            |
| Phase 2                                                                         | 13 May 2020 – 31 December 2020      |
| <b>Recovery Movement Control Order (RMCO, 10 June 2020 – 31 March 2021)</b>     |                                     |
| Phase 1                                                                         | 10 June 2020 – 31 August 2020       |
| Phase 2                                                                         | 1 September 2020 – 31 December 2020 |
| Phase 3                                                                         | 1 January 2021 – 31 March 2021      |
| <b>Total Lockdown (1 June 2021 – 28 June 2021)</b>                              |                                     |
| Phase 1                                                                         | 1 June 2021 – 14 June 2021          |
| Phase 2                                                                         | 15 June 2021 – 28 June 2021         |

## 2.2 The Preventative Measures Taken to Restrict the Spread of COVID-19

A recovery rate of 38% and a fatality rate of 1.6% were achieved during the first week of MCO with the application of effective interventions by the Malaysian government (Abdullah *et al.*, 2020). It was accomplished by disseminating COVID-19

information in various ways, including daily media announcements and text messages about the most recent standard operating procedures (SOPs) and raising awareness to reduce the spread of rumours and fake news. A daily press conference by the Health and the Defence Minister was also performed to keep the public updated with the present pandemic situation (Aziz *et al.*, 2020). Furthermore, hospitals and frontliners played a major role in managing the COVID-19 spread by strictly monitoring the positive cases, diagnosing asymptomatic cases during early periods, and utilising combination drug therapy in the process of recovery. During this first MCO, Malaysia also recorded zero local transmissions of COVID-19 cases due to these strict measures from July to September 2020 (Hashim *et al.*, 2021). However, due to the election in Sabah, the cases increased, resulting in a prolonged MCO (Lim *et al.*, 2021).

### **2.3 Impact of Prolonged MCO**

Despite the efforts taken by the government to provide financial aid to many people, many small businesses and companies were closing down and cutting wages by terminating employees as a result of the MCO. This has led Malaysians to suffer from mental illness due to the pandemic and the government's stringent stance (Shanmugam *et al.*, 2020). Losing a job causes feelings of instability and uncertainty, which impairs mental health, causing fear, anxiety, and depression. Therefore, alcohol and drugs have been used to cope with these isolation periods (Shanmugam *et al.*, 2020). A study has shown that people that are highly dependent on licit drugs and alcohol are more likely to have attempted suicide or self-harm due to isolation and loneliness (Mathews *et al.*, 2018).

It is reported that 36% of people felt lonely during the pandemic due to home quarantine and separation from loved ones (Li & Wang, 2020) and highly associated with mental health and suicide (Hunt *et al.*, 2017). Leaning on substances such as alcohol and drugs like marijuana/cannabis, heroin, and cocaine has become a coping mechanism with loneliness for some individuals since being confined indoors due to an ongoing pandemic (Jemberie *et al.*, 2020). Due to this, recent increases in the amount and frequency of alcohol use during the pandemic have been reported (Charles *et al.*, 2021). In contrast, some individuals who could not access alcohol due to the lockdown faced alcohol withdrawal. Consequently, this situation increased suicide rates, especially among those addicted to alcohol and other substances like cannabis, cocaine, and methamphetamine (Verma & Mishra, 2020).

Besides, pandemics also have a devastating influence on the underprivileged and vulnerable communities, particularly people with serious mental illnesses. People with previous mental problems are more likely to relapse due to worry and anxiety (Druss, 2020). Spending extra time at home could be exceedingly stressful if the individual has already been living in a toxic home situation. Shanmugam *et al.* (2020) reported a 57% increase in engagements with domestic abuse victims following the Malaysian government's MCO.

The younger demographic such as adolescence and teenagers, also face many challenges, including current quarantine concerns, future career concerns, and the impact of postponed completion of study (Sahu, 2020). Due to the sudden national lockdown, students living on campus in Malaysian universities were stranded in their colleges for months. As a result, the uncertainty caused by not knowing when the

students would travel home, a fear of isolation, and the concern about a lack of assistance from education administrators are the potential factors that contribute to the increase in students' levels of fear, anxiety, stress, and depression (Liu *et al.*, 2012; Wang *et al.*, 2020 a).

## **2.4 Mental Health**

There is no universal definition of mental illness. For many years, the term of mental health was used as a misnomer for mental disease (Manwell *et al.*, 2015). Mental illness is a major global health problem that can be divided into depression, anxiety, and stress (Hassan *et al.*, 2018). It is reported that 14% of all diseases are associated with mental health disorders (Prince *et al.*, 2007). Recently, approximately 450 million people worldwide have suffered from mental health problems (Marianne & Ramos, 2007). In Malaysia, approximately 4.2 million (29%) Malaysian populations were suffered due to mental illness, suggesting that one in every three Malaysian people will be diagnosed with mental illness (Hassan *et al.*, 2018).

### **2.4.1 Depression**

Depression is the most prevalent mental health disorder and a major cause of morbidity in many countries. It is characterised by the presence of more than five symptoms of depression and mood swings for longer than two weeks. Weight loss, insomnia, feelings of guilt, difficulty focusing, and suicidal thoughts are among the symptoms (Kader Maideen *et al.*, 2014).

Previously, a cross-sectional study was conducted to monitor the prevalence of depression and its associated factors among the adult population in the selected district

(Hulu Langat, Sepang, and Klang) in Selangor, Malaysia (Kader Maideen *et al.*, 2014). They revealed that the prevalence of depression among the participants was 10.3%, where the highest incidence was reported among other ethnic groups (Bumiputera Sarawak and Sabah) (17.6%), followed by Chinese (13.8%), Malays (10.8%), and Indians (6.1%). It was also found that divorcees (43%) recorded a higher prevalence of depression compared to singles (14%), widowers (12%), and married couples (7.8%). Anxiety, domestic violence, and stress were among the major factors contributing to depression.

#### **2.4.2 Stress**

Stress results from the body's response to a threat known as a stressor (Schneiderman *et al.*, 2005). Stress is not identified as a mental disorder. It is regarded as one of the most crucial risk factors contributing to mental illness (Seedat *et al.*, 2009). Feeling fatigued, anxiety and depression are the symptoms of stress that have been shown to impair social interaction. Thus, depression and stress are closely related (Hammen, 2005). Adolescence is a period where individuals experience many emotional and life-changing events. During this period, study pressure, career uncertainty, relationship issues, and financial problems contribute to stress among young adults, resulting in psychological and physical problems (Bhargava & Trivedi, 2018). According to Dissing *et al.* (2019), highly stressed young adults are 60% less likely to have face-to-face interactions with others.

#### **2.4.3 Anxiety**

Anxiety is defined by the American Psychological Association (APA) as any physical changes, troubled thoughts, and behavioural changes that are concerning

(Kamaludin *et al.*, 2020). An anxious individual typically has difficulties concentrating, memorising facts, and creating required relationships between events or people. Anxiety and depression are the most frequent mental health disorders that substantially influence various aspects of life, including profession, social interactions, and health (Brenes, 2007). Despite the fact that anxiety and depression are linked, some differences have been identified. It is reported that anxiety is believed to cause more adverse effects on a person's physical health, causing shortness of breath, chest pain, and dizziness (Adwas *et al.*, 2019) compared to depression. Anxiety is most common among the female population (Baxter *et al.*, 2013). Globally, anxiety affects 7.3% of the population; however, this varies depending on culture, sex, and age (Baxter *et al.*, 2013). While in Malaysia, the prevalence of anxiety was reported to be between 0.4-5.6% (Wong *et al.*, 2016).

## **2.5 Factors Affecting Mental Health during the pandemic**

Besides the physical consequences of COVID-19, the effect on mental health can also be harmful to people. In the history of disease outbreaks, a wide range of psychological impacts were recorded. Individuals were afraid of becoming ill or dying, feeling helpless, and being stereotyped by others (Hall *et al.*, 2008). Therefore, COVID-19 has also negatively impacted the public's mental health, potentially resulting in psychological crises (Xiang *et al.*, 2020). A study conducted in China reported, more than half of the respondents (53.8%) have a moderate-to-severe psychological impact, 84.7% of the respondents have spent 20–24 h per day at home; 75.2% were worried about their family members contracting COVID-19 (Wang *et al.*, 2020 a).

Quarantine is one of the factors that affect mental health (Figure 2.1). According to a recent study, people who are quarantined for a longer period of time will suffer from severe anxiety, rage, disorientation, stress, and depression (Brooks *et al.*, 2020). Besides, social media exposure can also influence mental health during the COVID-19 pandemic (Wang *et al.*, 2020 a). This is due to the increasing amount of misinformed content on social media transferred by the people (Bontcheva *et al.*, 2013).

The lack of information regarding the pandemic also contributes to the increasing mental health problems among people due to the increase in worry for oneself and their loved ones (Das *et al.*, 2021). Additionally, loss of income was also identified to have a severe impact on mental health (Brooks *et al.*, 2020). These factors have caused medical facilities with an exceeding number of deaths due to suicide than the COVID-19 patient, which has led to substantial financial and medical impacts (Kim *et al.*, 2020).

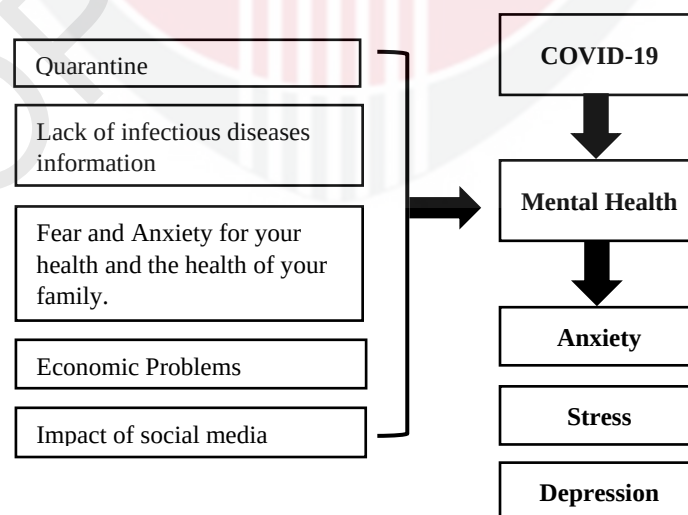


**Figure 2.1: Summary of the impacts of COVID-19 on Mental health.**

## 2.6 Current Treatment and Preventive Measures for Mental Health Problems

Many mental health issues, such as depression, psychosis, and anxiety disorders, require the use of psychiatric drugs. These medications work by regulating the brain's chemical messengers and neurotransmitters to address underlying neuropathological disease processes and restore brain communication (Saha *et al.*, 2019). It includes citalopram (Celexa), Escitalopram oxalate (Lexapro), and fluoxetine (Prozac) (Table 2.2).

**Table 2.2: Drug used to treat mental health illnesses.**

| <b>Drugs</b>        | <b>Description</b>                                                                                                                                                                                                                 | <b>Mechanism of action</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Limitation</b>                                                                                                                                    |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Citalopram (Celexa) | <ul style="list-style-type: none"> <li>An antidepressant drug that used as first-line treatment for depression.</li> <li>Belongs to the family of selective serotonin reuptake inhibitors (SSRI).</li> </ul> <p>(Kupfer, 2005)</p> | <ul style="list-style-type: none"> <li>Selectively reacts on the serotonin reuptake pump by inhibiting the reuptake. It causes an increase in the serotonin level at the cell bodies and dendrites, which consequently reduces depression.</li> </ul> <p>(Norman, 1999)</p>                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>Sexual dysfunction, gastrointestinal discomfort, diarrhoea, and weight gain.</li> </ul> <p>(Kupfer, 2005)</p> |
| Fluvoxamine (Luvox) | <ul style="list-style-type: none"> <li>A selective serotonin reuptake inhibitor (SSRI) is used to treat social anxiety disorder (SAD) and obsessive-compulsive disorder (OCD).</li> </ul> <p>(Irons, 2005)</p>                     | <ul style="list-style-type: none"> <li>Activates presynaptic serotonin (5-HT<sub>3</sub>) receptors, which increases the Ca<sup>2+</sup> concentration.</li> <li>The increase of Ca<sup>2+</sup> concentration via 5-HT<sub>3</sub> receptors causes the activation of sigma-1 receptors, which upregulates the voltage-gated calcium channels. This will increase the calcium production at the synapse and activate the protein kinase C.</li> </ul> <p>(Fu <i>et al.</i>, 2012)</p> | <ul style="list-style-type: none"> <li>Gastrointestinal disorder.</li> </ul> <p>(Irons, 2005)</p>                                                    |

**Table 2.2: Drug used to treat mental health illnesses (cont).**

| Drugs                          | Description                                                                                                                                                                                                                                                                                       | Mechanism of action                                                                                                                                                                                                                                                                                                                                                                                     | Limitation                                                                                                                         |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Fluoxetine (Prozac)            | <ul style="list-style-type: none"> <li>A selective serotonin reuptake inhibitor (SSRI) is used to treat stress-related psychiatric disorders like obsessive-compulsive disorder (OCD) and to prevent relapse in post-traumatic stress disorder (PTSD).</li> </ul> <p>(Li <i>et al.</i>, 2017)</p> | <ul style="list-style-type: none"> <li>Enhances the brain-derived neurotrophic factor (BNDF) expression by elevating the serotonin level in the synaptic cleft and activating the serotonin receptors.</li> <li>Induction of anti-apoptotic and neuroprotective effects, which alleviates stress-associated symptoms by the synergism of serotonin and BNDF.</li> </ul> <p>(Li <i>et al.</i>, 2017)</p> | <ul style="list-style-type: none"> <li>Gastrointestinal disorder, nausea, and sexual dysfunction.</li> </ul> <p>(Kupfer, 2005)</p> |
| Escitalopram oxalate (Lexapro) | <ul style="list-style-type: none"> <li>The most efficient SSRI for the treatment of anxiety, with stable efficacy even with increased severity.</li> </ul> <p>(Jiang <i>et al.</i>, 2017)</p>                                                                                                     | <ul style="list-style-type: none"> <li>It inhibits the function of the serotonin (5-HT) transporter, which mediates the reuptake of serotonin from the synaptic cleft back into the neuron.</li> <li>It increases the serotonin level and consequently reduces anxiety attacks.</li> </ul> <p>(Bræstrup &amp; Sanchez, 2004)</p>                                                                        | <ul style="list-style-type: none"> <li>Tachyphylaxis and sexual disorders.</li> </ul> <p>(Garakani <i>et al.</i>, 2020)</p>        |

**Table 2.2: Drug used to treat mental health illnesses (cont).**

| Drugs                | Description                                                                                                                                                                                                                                                                                                                                                                       | Mechanism of action                                                                                                                                                                                                                                                                                                                                                                                       | Limitation                                                                                                                         |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Paroxetine (Paxil)   | <ul style="list-style-type: none"> <li>A serotonin reuptake inhibitor that is effective for major depression and various anxiety disorders.</li> <li>It also had mild to moderate noradrenergic effects, which help depressed patients with lethargy. It also helps in treating generalised anxiety, panic, post-traumatic stress.</li> </ul> <p>(Nevels <i>et al.</i>, 2016)</p> | <ul style="list-style-type: none"> <li>Enhances serotonergic activity via the inhibition of presynaptic reuptake of serotonin by the serotonin (SERT) receptor. This inhibition raises the level of serotonin in the synaptic cleft, relieving various diseases such as depression and anxiety.</li> </ul> <p>(Davis <i>et al.</i>, 2016)</p>                                                             | <ul style="list-style-type: none"> <li>Gastrointestinal disorder, nausea, and sexual dysfunction.</li> </ul> <p>(Kupfer, 2005)</p> |
| Sertraline (Zoloft). | <ul style="list-style-type: none"> <li>Selective serotonin reuptake inhibitor commonly used to treat several psychiatric disorders including major depressive disorder, panic, generalised and social anxiety disorders as well as obsessive-compulsive disorder (OCD).</li> </ul> <p>(Huddart <i>et al.</i>, 2020)</p>                                                           | <ul style="list-style-type: none"> <li>Selectively inhibits the reuptake of serotonin (5-HT) at the presynaptic neuronal membrane, thereby increasing serotonergic activity</li> <li>It increases the synaptic concentration of serotonin in the CNS, which leads to numerous functional changes associated with enhanced serotonergic neurotransmission.</li> </ul> <p>(Huddart <i>et al.</i>, 2020)</p> | <ul style="list-style-type: none"> <li>Gastrointestinal disorder.</li> </ul> <p>(Irons, 2005)</p>                                  |

Besides drugs, other approaches also have been used as preventive measures for mental health illnesses. The most effective ways for improving people's health are through promotion, prevention, and early intervention. Screening tools and early detection interventions may enable more efficient healthcare routes by intervening long before health issues worsen (Marmot *et al.*, 2008). Besides, understanding which population groups that may be highly affected by various combinations of psychological effects also allow for more targeted interventions, as well as successful treatment and coping techniques for those who are most vulnerable (Schleiden *et al.*, 2013).

Implementing mental health-promoting initiatives such as online group training, exercise challenges with partners, meditation/mindfulness sessions, and counseling visits have shown to be very beneficial (Schlesselman *et al.*, 2020). These group training can help reduce anxiety and the sentiments of isolation expressed by people, especially among the younger demographic. Automated and blended treatment approaches, such as the utilisation of applications and online programs, text messages, and emergency hotlines, have also been valuable methods for treating individuals with mental health problems. Besides, suicide risk assessment for people with clinical anxiety and depression can also be a practical approach in preventing any adverse effects like suicide (Holmes *et al.*, 2020).

Additionally, counselling sessions in controlling stress factors have been shown to reduce the harmful effects of individuals with mental health problems (Crum *et al.*, 2020). These counselling sessions are especially beneficial to younger students, women, pre-existing health workers, people who stay on screens, and individuals with

COVID-19 infected families during and after diagnoses with mental health issues. Simultaneously, their depression, self-harm, anxiety, suicide, and other mental health problems must be monitored and reported to provide effective counselling (Holmes *et al.*, 2020).

Social factors such as education, religion, and family can also significantly prevent mental health problems. They can provide personalised support to accommodate positive relationships and enhance a sense of belonging. This can help the community who is at risk with better daily performance (Harandi *et al.*, 2017). Furthermore, education to eliminate mental health stigmatisation can also help people feel more comfortable in seeking treatment for mental health (Evans *et al.*, 2011).

## **2.7 Survey Instruments for Mental Health**

### **2.7.1 DASS 21**

The Depression Anxiety and Stress Scales (DASS) is one of the most commonly used screening tools that measure depression, anxiety, and stress symptoms. This instrument comprises of three sub-scales: (1) the Depression sub-scale, which measures hopelessness, low self-esteem, and low positive affect; (2) the Anxiety scale, which assesses autonomic arousal, musculoskeletal symptoms, situational anxiety, and subjective experience of anxious arousal; and (3) the Stress scale which assesses tension, agitation, and negative affect. There are two forms of the DASS, the full 42-item, and the short 21-item versions. Both assess the same domains. Both English and non-English versions have high internal consistency (Cronbach's alpha scores of  $> 0.74$ ) (Beaufort *et al.*, 2017).

DASS-21, a 21-item questionnaire with statements reflecting the three subscales of (a) depression, (b) anxiety, and (c) stress (20). Each item has four options that show how much the statement correlates to the respondent over the past week with a scale of '0' (not at all), '1' (rarely), '2' (often), and '3' (very often). Each summed subscale score is multiplied by 2 to give the total subscale score corresponding to the original 42-item DASS. Items 3, 5, 10, 13, 16, 17, and 21 represented a subscale for depression. The overall subscale score for depression was graded as normal (0–9), mild depression (10–13), moderate depression (14–20), severe depression (21–27), and extremely severe depression (28–42). Items 2, 4, 7, 9, 15, 19, and 20 represent the anxiety subscale. The overall anxiety subscale score was classified into normal (0–7), mild anxiety (8–9), moderate anxiety (10–14), severe anxiety (15–19), and extremely severe anxiety (20–42). Finally, items 1, 6, 8, 11, 12, 14, and 18 represented the stress subscale. The overall stress subscale score was classified into normal (0–14), mild stress (15–18), moderate stress (19–25), severe stress (26–33), and extremely severe stress (35–42) (Sinclair *et al.*, 2012).

### **2.7.2 Positive and Negative Affect Scale**

One of the most extensively used scales to measure mood or emotion is the Positive and Negative Affect Schedule (PANAS) (Watson, Clark, & Tellegen, 1988). This 20-item scale includes items that measure positive affect (e.g., enthusiastic, encouraged) and negative affect (e.g., depressed). To evaluate the intensity of the effect experienced in a certain time frame, each item is rated on a five-point Likert Scale, ranging from 1 = very slightly or not at all, to 5 = extremely. It was created to assess the effect in various situations, including the present moment, the previous day, week, and year. As a result, the scale can assess current affect, dispositional or trait affect,

emotional variations across time, or emotional reactions to specific events. The positive and negative affect scales also show good internal consistency, with Chronbach's  $\alpha \geq .84$  for each scale across various time frames. Convergent and discriminant validity are also high on the scales (Tran, 2013).



## **CHAPTER 3**

### **METHODOLOGY**

#### **3.1 Study Location and Duration**

This research was approved by Universiti Putra Malaysia's Ethics Committee for Research Involving Human Subjects (JKEUPM-2020-184). During MCO, respondents from all fourteen states in Malaysia were recruited from West Malaysia to East Malaysia from April 2020 to January 2021. A cross-sectional study with a convenient sampling technique was used in this study. Participation was voluntary, and respondents were informed that they would not receive any gift or incentives, or monetary reward for their help in this study.

#### **3.2 Inclusion and Exclusion Criteria**

Malaysian citizen who was at their current residence during the MCO was eligible to participate in this questionnaire. Adult male and female respondents at age of above 18 years old will be included in this study. However, respondents that categorised as follows were not eligible to participate in this study:

- a) Age less than 18 years old.
- b) Frontliners such as members of the Ministry of Health (MOH), the Royal Malaysian Police (PDRM), the Malaysian Armed Forces (ATM), dispatchers of goods/food.

- c) COVID-19 positive patients.
- d) Individuals who have been or are being quarantined.
- e) A person under investigation (PUI).

### 3.3 Estimated Sample Size Calculation

The estimated sample size for this study was calculated using the Raosoft sample size calculator (<http://www.raosoft.com/samplesize.html>). The formula was adopted using the table for determining sampling size developed by Krecjie and Morgan (1970). The sample size was identified using a margin of error and confidence interval from the previous study (Al-Balas *et al.*, 2020). The total number of Malaysian population was determined from Demographic Statistics First Quarter 2021, Malaysia (Department of Statistics Malaysia, 2021). The sample size was calculated by keeping the margin of error at 5%, confidence interval at 95%, and population size of 22 840 000 (Malaysian population).

Taking the 10% of non-responding rate into consideration;

$$\begin{aligned}\text{Sample size} &= 385 + 10\% \text{ non-response} \\ &= \mathbf{424} \text{ respondents}\end{aligned}$$

### 3.4 Questionnaire

An anonymous and confidential internet-based google form survey was distributed among voluntary participants after they signed a consent statement and pre-participation declarations of anonymity and confidentiality. The questions were presented in Bahasa Malaysia in the survey link. There were three sections to the survey (Section A, B, and C). In Section A, the cohort's demographics and

socioeconomics, including residence during MCO, age, sex, religion, marital status, ethnic background, education level, type of job, and monthly income, were obtained. In section B, questions related to health, history of chronic illness, and mental illness were asked. Finally, information related to the impacts of COVID-19 on their mental health was obtained from section C. Close-ended questions were created for this purpose, using Depression Anxiety Stress Scales (DASS-21). Four options that showed how much the statement for each item in depression, anxiety, and stress correlates to the respondent over the past week, with a scale of '0' (not at all), '1' (rarely), '2' (often) and '3' (very often) were used. Summing the values for the relevant items yielded the scores for depression, anxiety, and stress (Sinclair *et al.*, 2012). Table 3.1 shows the questions assessed included the commonly witnessed symptoms of mental health during the outbreak. Items 3, 5, 10, 13, 16, 17, and 21 assessed the depression scale, items 2, 4, 7, 9, 15, 19, and 20 belonged to the anxiety scale, and items 1, 6, 8, 11, 12, 14, and 18 to the stress scale (González-Rivera *et al.*, 2020). The total number of questions for the respondent's survey was 44 (Refer Appendix A). The maximum amount of time taken to complete the survey would have been 22 minutes.

**Table 3.1: The questions assessed as per the DASS-21 scale.**

| Items             | Questions                                                                                                               |
|-------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Depression</b> |                                                                                                                         |
| 3                 | I can't seem to experience any positive feelings at all.                                                                |
| 5                 | I don't feel motivated to start a situation.                                                                            |
| 10                | I don't think I had what I expected (despair).                                                                          |
| 13                | I feel gloomy and sad.                                                                                                  |
| 16                | I'm not excited at all.                                                                                                 |
| 17                | I feel worthless.                                                                                                       |
| 21                | I don't think this life is meaningful anymore.                                                                          |
| <b>Anxiety</b>    |                                                                                                                         |
| 2                 | I realized my mouth felt dry.                                                                                           |
| 4                 | I have difficulty breathing (for example, breathing too fast, shortness of breath despite not doing physical activity). |
| 7                 | I used to tremble (e.g., hands).                                                                                        |
| 9                 | I was worried there would be a situation where I panicked and behaved stupidly.                                         |
| 15                | I almost panicked.                                                                                                      |
| 19                | I'm scared for no reason.                                                                                               |
| 20                | I don't think this life is meaningful anymore.                                                                          |
| <b>Stress</b>     |                                                                                                                         |
| 3                 | I can't seem to experience any positive feelings at all.                                                                |
| 5                 | I don't feel motivated to start a situation.                                                                            |
| 10                | I feel I don't have anything that I hoped for.                                                                          |
| 13                | I feel gloomy and sad.                                                                                                  |
| 16                | I'm not excited at all.                                                                                                 |
| 17                | I feel worthless.                                                                                                       |
| 21                | I don't think this life is meaningful anymore.                                                                          |

### **3.5 Data Collection from the Participants**

The internet-based Google form survey was used to collect the data on the impact of COVID-19 on mental health among the Malaysian population. The survey was uploaded to Google Surveys ([www.surveys.google.com](http://www.surveys.google.com)), and the survey link was distributed to numerous networks via email and social media platforms (Facebook, WhatsApp, Twitter, and LinkedIn). There was no more than one response per email.

Respondents were required to respond to questions, and the information they provided was automatically recorded in Google Surveys.

### **3.6 Data Analysis**

For analysis, the Microsoft Excel data was then moved to be tabulated using a Statistical Program for Social Sciences (SPSS, IBM, version 25). As some data might be distorted during importation, it is vital to carefully crosscheck the data for completeness and consistency. Duplicate responses along with 37 participants that belonged to the exclusion criteria were removed. For demographic features and responses to questions, frequency and percentages were computed. Categorical data were reported as numbers and percentages. In terms of mental health status, depression, anxiety, and stress were evaluated using the DASS-21 scoring scale (Appendix B). Chi-square tests and multivariate logistic regression models were then conducted to test the association between various factors and depression, anxiety, and stress during MCO. A  $p < 0.05$  was used as the level of significance. A “dummy” value of “1” was given to the reference category. The reference category was selected using the normative categorical method.

## **CHAPTER 4**

### **RESULTS**

#### **4.1 Characteristics of the Respondents**

A total of 497 complete responses were received during the data collection period from April 2020 to January 2021. Table 4.1 shows the demographics of the study participants involved in this study. Among the participants, there was a higher percentage of female respondents (62.4%) than male respondents (37.6%), with a ratio of 1:1.7. The majority of the surveyed individuals were aged between 36–45 years (35.6%), married (22.1%), Malay (93.6%), from Selangor state (40.6%), and were university graduates (40%). Nearly half of the study participants were not working in (48.5%) and belonged to the B40 income group (< MYR4,360) (43.1%). The majority (91.5%) did not have any chronic diseases and perceived their overall mental health as good (97.8%) and not undergoing any medication for mental illness (99%).

**Table 4.1: Sociodemographic characteristics of the participants (n=497).**

| <b>Variables</b>                      | <b>n (%)</b>      |
|---------------------------------------|-------------------|
| <b>Gender</b>                         |                   |
| Female                                | <b>310 (62.4)</b> |
| Male                                  | 187 (37.6)        |
| <b>Age (years old)</b>                |                   |
| 18 – 25                               | 33 (6.6)          |
| 26 – 35                               | 168 (33.8)        |
| 36 – 45                               | <b>177 (35.6)</b> |
| 46 – 55                               | 75 (15.1)         |
| 56 – 65                               | 44 (8.9)          |
| <b>Marital status</b>                 |                   |
| Single/Unmarried                      | <b>366 (73.6)</b> |
| Married                               | 110 (22.1)        |
| Widow/Widower                         | 21 (4.2)          |
| <b>Level of education</b>             |                   |
| Lower secondary (PMR/SRP/PT3)         | 2 (0.4)           |
| Upper secondary (SPM/STPM)            | 75 (15.1)         |
| Diploma or equivalent                 | 115 (23.1)        |
| Bachelor's degree or equivalent       | <b>199 (40.0)</b> |
| Master's degree or equivalent         | 77 (15.5)         |
| Doctor of Philosophy                  | 29 (5.8)          |
| <b>Living area</b>                    |                   |
| Urban                                 | <b>358 (72.0)</b> |
| Rural                                 | 139 (28.0)        |
| <b>Residential state (during MCO)</b> |                   |
| Selangor                              | <b>202 (40.6)</b> |
| Wilayah Persekutuan Kuala Lumpur      | 42 (8.5)          |
| Terengganu                            | 36 (7.2)          |
| Negeri Sembilan                       | 34 (6.8)          |
| Perak                                 | 29 (5.8)          |
| Wilayah Persekutuan Putrajaya         | 27 (5.4)          |
| Kedah                                 | 25 (5.0)          |
| Pahang                                | 22 (4.4)          |
| Sabah                                 | 21 (4.2)          |
| Johor                                 | 19 (3.8)          |
| Kelantan                              | 18 (3.6)          |
| Melaka                                | 9 (1.8)           |
| Pulau Pinang                          | 9 (1.8)           |
| Sarawak                               | 3 (0.6)           |
| Perlis                                | 1 (0.2)           |

The state of respondents were divided into Northern region (Perlis, Kedah, Perak, Penang), Central (Wilayah Persekutuan Kuala Lumpur, Selangor, Negeri Sembilan, Putrajaya), East coast (Terengganu, Kelantan, Pahang) and Southern (Melaka, Johor). Three category of income groups: <sup>1</sup>Top 20% (T20), <sup>2</sup>Middle 40% (M40), <sup>3</sup>Bottom 40% (B40) in Malaysia.

**Table 4.1: Sociodemographic characteristics of the participants (n=497) (cont).**

| <b>Variables</b>                                 | <b>n (%)</b>      |
|--------------------------------------------------|-------------------|
| <b>Type of housing</b>                           |                   |
| Terrace house                                    | <b>199 (40.0)</b> |
| Detached House (Traditional)                     | 85(17.1)          |
| Apartment                                        | 60 (12.1)         |
| Twin House                                       | 43(8.7)           |
| Condominium                                      | 25 (5.0)          |
| Detached House (Luxury Bungalow)                 | 24 (4.8)          |
| Flat                                             | 13 (2.6)          |
| Cluster House                                    | 8(1.6)            |
| Town House                                       | 7 (1.4)           |
| Other                                            | 33(6.6)           |
| - Teacher's flat                                 |                   |
| - Residential college                            |                   |
| <b>Type of job</b>                               |                   |
| Not working                                      | <b>241(48.5)</b>  |
| Retired                                          | 104(20.9)         |
| Private/Government Linked Companies ("GLCs")     | 46(9.3)           |
| Student                                          | 45(9.1)           |
| Government/Statutory Bodies                      | 31(6.2)           |
| Self-employed                                    | 30(6.0)           |
| <b>Ethnicity</b>                                 |                   |
| Malay                                            | <b>465(93.6)</b>  |
| Bumiputera Sabah                                 | 15(3.0)           |
| Chinese                                          | 8(1.6)            |
| Bumiputera Sarawak                               | 3(0.6)            |
| Indian                                           | 3(0.6)            |
| Others                                           | 3(0.6)            |
| <b>Religion</b>                                  |                   |
| Islam                                            | <b>482(97.0)</b>  |
| Buddha                                           | 6(1.2)            |
| Kristian                                         | 6(1.2)            |
| Hindu                                            | 3(0.6)            |
| <b>No. of household members</b>                  |                   |
| 1 – 2                                            | 62(12.5)          |
| 3 – 5                                            | <b>268(53.9)</b>  |
| ≥6                                               | 167(33.6)         |
| <b>Monthly income (individual)</b>               |                   |
| RM 4, 360 and below per month (B40) <sup>1</sup> | 214(43.1)         |
| Between RM4, 361 - RM 9, 619 (M40) <sup>2</sup>  | 187(37.6)         |
| RM 9, 620 and above (T20) <sup>3</sup>           | 26(5.2)           |
| No income                                        | 70(14.1)          |

The state of respondents were divided into Northern region (Perlis, Kedah, Perak, Penang), Central (Wilayah Persekutuan Kuala Lumpur, Selangor, Negeri Sembilan, Putrajaya), East coast (Terengganu, Kelantan, Pahang) and Southern (Melaka, Johor). Three category of income groups: <sup>1</sup>Top 20% (T20), <sup>2</sup>Middle 40% (M40), <sup>3</sup>Bottom 40% (B40) in Malaysia.

**Table 4.1: Sociodemographic characteristics of the participants (n=497) (cont.).**

| <b>Variables</b>                                             | <b>n (%)</b> |
|--------------------------------------------------------------|--------------|
| <b>Any chronic illness?</b>                                  |              |
| Yes                                                          | 42(8.5)      |
| No                                                           | 455(91.5)    |
| <b>Diagnosed with mental health-related illness?</b>         |              |
| Yes                                                          | 11(2.2)      |
| No                                                           | 486(97.8)    |
| <b>Received treatment for mental health-related illness?</b> |              |
| Yes                                                          | 5(1.0)       |
| No                                                           | 492(99)      |

The state of respondents were divided into Northern region (Perlis, Kedah, Perak, Penang), Central (Wilayah Persekutuan Kuala Lumpur, Selangor, Negeri Sembilan, Putrajaya), East coast (Terengganu, Kelantan, Pahang) and Southern (Melaka, Johor). Three category of income groups: <sup>1</sup>Top 20% (T20), <sup>2</sup>Middle 40% (M40), <sup>3</sup>Bottom 40% (B40) in Malaysia.

#### 4.2 The Prevalence of Mental Health Due to COVID-19

The findings revealed that 69.4%, 64.8%, and 84.5% of the study participants did not experience any depression, anxiety, and stress symptoms, respectively, indicating that the majority of the individuals were mentally healthy. However, 17.1%, 19.5%, and 9.2% of the participants experience moderate to extremely severe depressive, anxiety, and stress symptoms, respectively (Table 4.2).

**Table 4.2: The prevalence of mental health status of Malaysian population during COVID-19 pandemic based on DASS 21.**

| <b>Mental status</b> | <b>n (%)</b>  |             |                 |               |                         |
|----------------------|---------------|-------------|-----------------|---------------|-------------------------|
|                      | <b>Normal</b> | <b>Mild</b> | <b>Moderate</b> | <b>Severe</b> | <b>Extremely Severe</b> |
| <b>Depression</b>    | 345 (69.4)    | 67 (13.5)   | 60 (12.1)       | 15 (3.0)      | 10 (2.0)                |
| <b>Anxiety</b>       | 322 (64.8)    | 78 (15.7)   | 47 (9.5)        | 26 (5.2)      | 24 (4.8)                |
| <b>Stress</b>        | 420 (84.5)    | 31 (6.2)    | 25 (5.0)        | 17 (3.4)      | 4 (0.8)                 |

#### 4.3 Association of Mental Health Disorders with Sociodemographic Factors

Chi-square tests and multivariate logistic regression were conducted to test the association between various factors with depression, anxiety, and stress symptoms

during MCO. Table 4.3 shows the percentage of participants with depressive, anxiety, and stress symptoms and their associated sociodemographic factors during the study period. The independent variables include the age of the population, gender, marital status, education, living area, residential state, type of housing, type of job, ethnicity, religion, household members, income, presence of chronic illness, presence of mental illness, and taking treatment for mental health. The prevalence of depression was significantly associated ( $P<0.05$ ) with sociodemographic factors, including gender, ages, marital status, type of housing, ethnicity, and household members.

The findings revealed that the 26-35-year-old group (OR = 1.123, 95% CI 0.453-2.785) recorded a higher likelihood of developing depression than other age groups. Likewise, females (OR 1.664, 95% CI 0.997- 2.776) were also 1.7 times more likely to exhibit depressive disorder than males. Individuals living in a household of more than six members (OR 0.703, 95% CI 0.319-1.551) were associated with a reduction in the likelihood of exhibiting depression disorder. Single and not married individuals were 2.3 times more likely to exhibit depression (OR 2.250, 95% CI 0.618-8.192). Individuals living in townhouses also have higher chances of developing depression (OR 24.000, 95% CI 1.989-289.602).

Meanwhile, only the type of housing of respondents showed to be significant for anxiety ( $P<0.05$ ). Those living in townhouses reported a significantly higher likelihood of having anxiety disorder (OR 192.000, 95% CI 10.504-3509.451). As for stress, sociodemographic factors such as marital status, ethnicity, age, gender, type of housing, and family size were the variables that showed significant factors ( $P< 0.05$ ). The findings revealed that the individuals living in a household of more than 3-5

members (OR 1.356, 95% CI 0.543-3.338) had the most significant risk of developing stress. However, the type of housing was the strongest predictor for depression and anxiety symptoms. Other variables such as ethnicity, religion, and mental treatment were observed with no odds ratio or an odds ratio equal to zero.



**Table 4.3: Association of DASS scores for depression with sociodemographic factors.**

| Variables                          | All<br>N= 497 | DASS score (Depression) n (%) |            |            |          |                     | P<br>value*  | Adjusted OR<br>(95%CI) | P value**    |
|------------------------------------|---------------|-------------------------------|------------|------------|----------|---------------------|--------------|------------------------|--------------|
|                                    |               | Normal                        | Mild       | Moderate   | Severe   | Extremely<br>severe |              |                        |              |
| <b>Gender</b>                      |               |                               |            |            |          |                     |              |                        |              |
| Female                             | <b>310</b>    | 202 (65.2)                    | 47 (15.2)  | 46 (14.8)  | 8 (2.6)  | 7 (2.3)             | <b>0.043</b> | 1.664 (0.997- 2.776)   | 0.051        |
| Male                               | 187           | 143 (76.5)                    | 20 (10.7)  | 14 (7.5)   | 7 (3.7)  | 3 (1.6)             |              | -                      | Ref          |
| <b>Age</b>                         |               |                               |            |            |          |                     |              |                        |              |
| 18-25                              | 33            | 23 (69.7)                     | 3 (9.1)    | 5 (15.2)   | 2 (6.1)  | 0 (0.0)             | <b>0.015</b> | -                      | Ref          |
| 26-35                              | 168           | 102 (60.7)                    | 27 (16.1)  | 23 (13.7)  | 11 (6.5) | 5 (3.0)             |              | 1.123 (0.453-2.785)    | 0.802        |
| 36-45                              | <b>177</b>    | 129 (72.9)                    | 23 (13.0)  | 20 (11.3)  | 1 (0.6)  | 4 (2.3)             |              | 0.611 (0.240-1.557)    | 0.302        |
| 46-55                              | 75            | 51 (68.0)                     | 12 (16.0)  | 11 (14.7)  | 1 (1.3)  | 0 (0.0)             |              | 0.707 (0.251-1.998)    | 0.514        |
| 56-65                              | 44            | 40 (90.9)                     | 2 (4.5)    | 1 (2.3)    | 0 (0.0)  | 1 (2.3)             |              | 0.177 (0.034-0.917)    | <b>0.039</b> |
| <b>Marital status</b>              |               |                               |            |            |          |                     |              |                        |              |
| Single/Not married                 | <b>366</b>    | 271 (74.0)                    | 43 (11.7)  | 42 (11.5)  | 6 (1.6)  | 4 (1.1)             | <b>0.001</b> | 2.250 (0.618-8.192)    | 0.992        |
| Married                            | 110           | 59 (53.6)                     | 21 (19.1)  | 18 (16.4)  | 8 (7.3)  | 4 (3.6)             |              | 0.994 (0.283-3.492)    | <b>0.002</b> |
| Widowed                            | 21            | 15 (71.4)                     | 3 (14.3)   | 0 (0.0)    | 1 (4.8)  | 2 (9.5)             |              | -                      | Ref          |
| <b>Education level</b>             |               |                               |            |            |          |                     |              |                        |              |
| Lower secondary<br>(PMR/SRP/PT3)   | 2             | 1 (50)                        | 0 (0)      | 1 (50)     | 0 (0)    | 0 (0)               | 0.166        | -                      | Ref          |
| Upper secondary<br>(SPM/STPM)      | 75            | 56 (74.70)                    | 12 (16)    | 5 (6.70)   | 2 (2.70) | 0 (0)               |              | 0.154 (0.009-2.661)    | 0.198        |
| Diploma or equivalent              | 115           | 91 (79.10)                    | 9 (7.80)   | 9 (7.80)   | 2 (1.70) | 4 (3.50)            |              | 0.127 (0.008-2.162)    | 0.154        |
| Bachelor's degree or<br>equivalent | <b>199</b>    | 133<br>(66.80)                | 32 (16.10) | 27 (13.60) | 4 (2)    | 3 (1.50)            |              | 0.228 (0.014-3.736)    | 0.300        |
| Master's degree or equivalent      | 77            | 46 (59.70)                    | 14 (18.20) | 12 (15.60) | 3 (3.90) | 2 (2.60)            |              | 1.351 (0.021-5.876)    | 0.466        |
| Doctor of Philosophy               | 29            | 20<br>(69.00)                 | 5 (17.20)  | 2 (6.90)   | 1 (3.40) | 1 (3.40)            |              | 0.160 (0.008-3.106)    | 0.226        |

Results were analyzed using chi-square and logistic regression and are marked as \*, \*\*, respectively. The significance *P*-value is less than 0.05. Nagelkerke R<sup>2</sup> was used. The “-” represents no odds ratio (OR).

**Table 4.3: Association of DASS scores for depression with sociodemographic factors (cont.).**

| Variables                                 | All<br>N= 497 | DASS score (Depression) n (%) |           |           |          |                     | <i>P value*</i> | <i>Adjusted OR<br/>(95% CI)</i> | <i>P value**</i> |
|-------------------------------------------|---------------|-------------------------------|-----------|-----------|----------|---------------------|-----------------|---------------------------------|------------------|
|                                           |               | Normal                        | Mild      | Moderate  | Severe   | Extremely<br>severe |                 |                                 |                  |
| <b>Living area</b>                        |               |                               |           |           |          |                     |                 |                                 |                  |
| Urban                                     | 358           | 253 (70.7)                    | 47 (13.1) | 45 (12.6) | 7 (2.0)  | 6 (1.7)             | 0.186           | 0.802 (0.484-1.330)             | 0.392            |
| Rural                                     | 139           | 92 (66.2)                     | 20 (14.4) | 15 (10.8) | 8 (5.8)  | 4 (2.9)             |                 | -                               | Ref              |
|                                           |               |                               |           |           |          |                     |                 | -                               |                  |
| <b>Residential state (during<br/>MCO)</b> |               |                               |           |           |          |                     |                 |                                 |                  |
| Selangor                                  | 202           | 130 (64.4)                    | 30 (14.9) | 31 (15.3) | 5 (2.5)  | 6 (3.0)             | 0.972           | -                               | 1.000            |
| Wilayah Persekutuan Kuala Lumpur          | 42            | 32 (76.2)                     | 7 (16.7)  | 2 (4.8)   | 1 (2.4)  | 0 (0.0)             |                 | -                               | 1.000            |
| Terengganu                                | 36            | 26 (72.2)                     | 5 (13.9)  | 4 (11.1)  | 1 (2.8)  | 0 (0.0)             |                 | -                               | 1.000            |
| Negeri Sembilan                           | 34            | 25 (73.5)                     | 5 (14.7)  | 3 (8.8)   | 1 (2.9)  | 0 (0.0)             |                 | -                               | 1.000            |
| Perak                                     | 29            | 19 (65.5)                     | 5 (17.2)  | 3 (10.3)  | 1 (3.4)  | 1 (3.4)             |                 | -                               | 1.000            |
| Wilayah Persekutuan Putrajaya             | 27            | 18 (66.7)                     | 4 (14.8)  | 4 (14.8)  | 1 (3.7)  | 0 (0.0)             |                 | -                               | 1.000            |
| Kedah                                     | 25            | 21 (84.0)                     | 2 (8.0)   | 1 (4.0)   | 1 (4.0)  | 0 (0.0)             |                 | -                               | 1.000            |
| Pahang                                    | 22            | 13 (59.1)                     | 4 (18.2)  | 3 (13.6)  | 1 (4.5)  | 1 (4.5)             |                 | -                               | 1.000            |
| Sabah                                     | 21            | 16 (76.2)                     | 3 (14.3)  | 2 (9.5)   | 0 (0.0)  | 0 (0.0)             |                 | -                               | 1.000            |
| Johor                                     | 19            | 15 (78.9)                     | 0 (0.0)   | 2 (10.5)  | 1 (5.3)  | 1 (5.3)             |                 | -                               | 1.000            |
| Kelantan                                  | 18            | 12 (66.7)                     | 2 (11.1)  | 2 (11.1)  | 2 (11.1) | 0 (0.0)             |                 | -                               | 1.000            |
| Melaka                                    | 9             | 6 (66.7)                      | 0 (0.0)   | 2 (22.2)  | 0 (0.0)  | 1 (11.1)            |                 | -                               | 1.000            |
| Pulau Pinang                              | 9             | 9 (100.0)                     | 0 (0.0)   | 0 (0.0)   | 0 (0.0)  | 0 (0.0)             |                 | -                               | 1.000            |
| Sarawak                                   | 3             | 2 (66.7)                      | 0 (0.0)   | 1 (33.3)  | 0 (0.0)  | 0 (0.0)             |                 | -                               | 1.000            |
| Perlis                                    | 1             | 1 (100.0)                     | 0 (0.0)   | 0 (0.0)   | 0 (0.0)  | 0 (0.0)             |                 | -                               | Ref              |

Results were analyzed using chi-square and logistic regression and are marked as \*, \*\*, respectively. The significance *P*-value is less than 0.05. Nagelkerke R<sup>2</sup> was used. The “-” represents no odds ratio (OR).

**Table 4.3: Association of DASS scores for depression with sociodemographic factors (cont.).**

| Variables                                     | All<br>N= 497 | DASS score (Depression) n (%) |           |           |          |                     | P value*     | Adjusted OR<br>(95% CI) | P value**    |
|-----------------------------------------------|---------------|-------------------------------|-----------|-----------|----------|---------------------|--------------|-------------------------|--------------|
|                                               |               | Normal                        | Mild      | Moderate  | Severe   | Extremely<br>severe |              |                         |              |
| <b>Type of housing</b>                        |               |                               |           |           |          |                     |              |                         |              |
| Terrace house                                 | 199           | 124 (62.3)                    | 33 (16.6) | 30 (15.1) | 6 (3)    | 6 (3)               | <b>0.001</b> | 8.561 (1.136-64.485)    | <b>0.037</b> |
| Detached House<br>(Traditional)               | 85            | 52 (61.2)                     | 14 (16.5) | 15 (17.6) | 2 (2.4)  | 2 (2.4)             |              | 9.212 (1.180-71.898)    | <b>0.034</b> |
| Apartment                                     | 60            | 37 (61.7)                     | 9 (15)    | 8 (13.3)  | 4 (6.7)  | 2 (3.3)             |              | 9.739(1.219-77.826)     | <b>0.032</b> |
| Twin house                                    | 43            | 34 (79.1)                     | 6 (14)    | 3 (7)     | 0 (0)    | 0 (0)               |              | 2.400 (0.238-24.189)    | 0.458        |
| Condominium                                   | 25            | 22 (88)                       | 1 (4)     | 2 (8)     | 0 (0)    | 0 (0)               |              | 2.783(0.238-32.554)     | 0.415        |
| Detached House (Luxury<br>Bungalow)           | 24            | 24 (100)                      | 0 (0)     | 0 (0)     | 0 (0)    | 0 (0)               |              | -                       | 0.998        |
| Flat                                          | 13            | 13 (100)                      | 0 (0)     | 0 (0)     | 0 (0)    | 0 (0)               |              | -                       | 0.999        |
| Cluster house                                 | 8             | 6 (75.0)                      | 1 (12.5)  | 0 (0.0)   | 1 (12.5) | 0 (0.0)             |              | 4.571 (0.254-82.250)    | 0.303        |
| Town house                                    | 7             | 2 (28.6)                      | 2 (28.6)  | 1 (14.3)  | 2 (28.6) | 0 (0)               |              | 24.000 (1.989-289.602)  | <b>0.012</b> |
| Other                                         | 33            | 31 (93.9)                     | 1 (3.0)   | 1 (3.0)   | 0 (0.0)  | 0 (0.0)             |              | -                       | Ref          |
| - Teacher's flat                              |               |                               |           |           |          |                     |              |                         |              |
| - Residential college                         |               |                               |           |           |          |                     |              |                         |              |
| <b>Type of Job</b>                            |               |                               |           |           |          |                     |              |                         |              |
| Not working                                   | <b>241</b>    | 167 (69.3)                    | 36 (14.9) | 28 (11.6) | 6 (2.5)  | 4 (1.7)             | 0.096        | 0.458 (0.196-1.070)     | 0.071        |
| Retired                                       | 104           | 67 (64.4)                     | 16 (15.4) | 15 (14.4) | 3 (2.9)  | 3 (2.9)             |              | 0.618 (0.249-1.539)     | 0.301        |
| Private/Government Linked<br>Companies (GLCs) | 46            | 33 (71.7)                     | 4 (8.7)   | 5 (10.9)  | 4 (8.7)  | 0 (0.0)             |              | 0.595 (0.205-1.723)     | 0.338        |
| Student                                       | 45            | 34 (75.6)                     | 4 (8.)    | 4 (8.9)   | 0 (0.0)  | 3 (6.7)             |              | 0.450 (0.147-1.378)     | 0.162        |
| Government/Statutory<br>Bodies                | 31            | 17 (54.8)                     | 5 (16.1)  | 7 (22.6)  | 2 (6.5)  | 0 (0.0)             |              | -                       | Ref          |
| Self-employed                                 | 30            | 27 (90.0)                     | 2 (6.7)   | 1 (3.3)   | 0 (0.0)  | 0 (0.0)             |              | 0.084 (0.010-0.716)     | <b>0.023</b> |

Results were analyzed using chi-square and logistic regression and are marked as \*, \*\*, respectively. The significance *P*-value is less than 0.05. Nagelkerke R<sup>2</sup> was used. The “-” represents no odds ratio (OR).

**Table 4.3: Association of DASS scores for depression with sociodemographic factors (cont.).**

| Variables                                        | All<br>N= 497 | DASS score (Depression) n (%) |           |           |           |                     | P value*     | Adjusted OR<br>(95% CI) | P value** |
|--------------------------------------------------|---------------|-------------------------------|-----------|-----------|-----------|---------------------|--------------|-------------------------|-----------|
|                                                  |               | Normal                        | Mild      | Moderate  | Severe    | Extremely<br>severe |              |                         |           |
| <b>Ethnicity</b>                                 |               |                               |           |           |           |                     |              |                         |           |
| Malay                                            | 465           | 325 (69.9)                    | 60 (12.9) | 57 (12.3) | 15 (3.2)  | 8 (1.7)             | <b>0.042</b> | -                       | 0.999     |
| Bumiputera Sabah                                 | 15            | 11 (73.3)                     | 4 (26.7)  | 0 (0.0)   | 0 (0.0)   | 0 (0.0)             |              | -                       | 1.000     |
| Chinese                                          | 8             | 4 (50.0)                      | 1 (12.5)  | 2 (25.0)  | 0 (0.0)   | 1 (12.5)            |              | -                       | 0.999     |
| Indian                                           | 3             | 2 (66.7)                      | 1 (33.3)  | 0 (0.0)   | 0 (0.0)   | 0 (0.0)             |              | -                       | 1.000     |
| Bumiputera Sarawak                               | 3             | 0 (0.0)                       | 1 (33.3)  | 1 (33.3)  | 0 (0.0)   | 1 (33.3)            |              | -                       | 0.999     |
| Other                                            | 2             | 3 (100.0)                     | 0 (0.0)   | 0 (0.0)   | 0 (0.0)   | 0 (0.0)             |              | -                       | Ref       |
| <b>Religion</b>                                  |               |                               |           |           |           |                     |              |                         |           |
| Islam                                            | 482           | 336 (69.7)                    | 64 (13.3) | 58 (12.0) | 15 (3.1)  | 9 (1.9)             | 0.703        | 1.025 (0.118-8.889)     | 0.982     |
| Buddhism                                         | 6             | 3 (50.0)                      | 1 (16.7)  | 1 (16.7)  | 0 (0.0)   | 1 (16.7)            |              | 2.500 (0.162-38.599)    | 0.512     |
| Christian                                        | 6             | 4 (66.7)                      | 1 (16.7)  | 1 (16.7)  | 0 (0.0)   | 0 (0.0)             |              | -                       | Ref       |
| Hindu                                            | 3             | 2 (66.7)                      | 1 (33.3)  | 0 (0.0)   | 0 (0.0)   | 0 (0.0)             |              | -                       | 0.999     |
| <b>No. of household members</b>                  |               |                               |           |           |           |                     |              |                         |           |
| 1-2                                              | 62            | 38 (61.3)                     | 13 (21.0) | 4 (6.5)   | 4 (6.5)   | 3 (4.8)             | <b>0.040</b> | -                       | Ref       |
| 3-5                                              | 288           | 185 (69.0)                    | 31 (11.6) | 37 (13.8) | 8 9 (3.0) | 7 (2.6)             |              | 1.116 (0.544 -2.290)    | 0.764     |
| >6                                               | 167           | 122 (73.1)                    | 23 (13.8) | 19 (11.4) | 3 (1.8)   | 0 (0.0)             |              | 0.703 (0.319-1.551)     | 0.383     |
| <b>Monthly income (individual)</b>               |               |                               |           |           |           |                     |              |                         |           |
| RM 4, 360 and below per month (B40) <sup>1</sup> | 214           | 152 (71.0)                    | 27 (12.6) | 23 (10.7) | 7 (3.3)   | 5 (2.3)             | 0.308        | 1.075 (0.349-3.313)     | 0.899     |
| Between RM4, 361 - RM 9, 619 (M40) <sup>2</sup>  | 187           | 122 (65.2)                    | 31 (16.6) | 27 (14.4) | 2 (1.1)   | 5 (2.7)             |              | 1.222 (0.395-3.777)     | 0.727     |
| RM 9, 620 and above (T20) <sup>3</sup>           | 26            | 20 (76.9)                     | 2 (7.7)   | 3 (11.5)  | 1 (3.8)   | 0 (0.0)             |              | -                       | Ref       |
| No income                                        | 70            | 51 (72.9)                     | 7 (10.0)  | 7 (10.0)  | 5 (7.1)   | 0 (0.0)             |              | 1.138 (0.331- 3.906)    | 0.837     |

Results were analyzed using chi-square and logistic regression and are marked as \*, \*\*, respectively. The significance P-value is less than 0.05. Nagelkerke R<sup>2</sup> was used. The “-” represents no odds ratio (OR).

**Table 4.3: Association of DASS scores for depression with sociodemographic factors (cont.).**

| Variables                                                    | All<br>N= 497 | DASS score (Depression) n (%) |           |           |          |                     | <i>P value*</i> | <i>Adjusted OR</i><br>(95% CI) | <i>P value**</i> |
|--------------------------------------------------------------|---------------|-------------------------------|-----------|-----------|----------|---------------------|-----------------|--------------------------------|------------------|
|                                                              |               | Normal                        | Mild      | Moderate  | Severe   | Extremely<br>severe |                 |                                |                  |
| <b>Any chronic illness?</b>                                  |               |                               |           |           |          |                     |                 |                                |                  |
| Yes                                                          | 42            | 35 (83.3)                     | 3 (7.1)   | 3 (7.1)   | 0 (0.0)  | 1 (2.4)             | 0.289           | -                              | Ref              |
| No                                                           | 455           | 310 (68.1)                    | 64 (14.1) | 57 (12.5) | 15 (3.3) | 9 (2.0)             |                 | 2.057 (0.714-<br>5.926)        | 0.181            |
| <b>Diagnosed with mental health-related illness?</b>         |               |                               |           |           |          |                     |                 |                                |                  |
| Yes                                                          | 11            | 8 (72.7)                      | 3 (27.3)  | 0 (0.0)   | 0 (0.0)  | 0 (0.0)             | 0.474           | -                              | Ref              |
| No                                                           | 486           | 337 (69.3)                    | 64 (13.2) | 60 (12.3) | 15 (3.1) | 10 (2.1)            |                 | -                              | 0.999            |
| <b>Received treatment for mental health-related illness?</b> |               |                               |           |           |          |                     |                 |                                |                  |
| Yes                                                          | 5             | 4 (80.0)                      | 0 (0.0)   | 1 (20.0)  | 0 (0.0)  | 0 (0.0)             | 0.865           | -                              | Ref              |
| No                                                           | 492           | 341 (69.3)                    | 67 (13.6) | 59 (12.0) | 15 (3.0) | 10 (2.0)            |                 | 0.824 (0.091-<br>7.461)        | 0.863            |

Results were analyzed using chi-square and logistic regression and are marked as \*, \*\*, respectively. The significance *P*-value is less than 0.05. Nagelkerke R<sup>2</sup> was used. The “-“represents no odds ratio (OR).

**Table 4.4: Association of DASS scores for anxiety with sociodemographic factors.**

| Variables                       | All<br>N= 497 | DASS score (Anxiety) n (%) |           |           |           |                     | <i>P value*</i> | <i>Adjusted OR<br/>(95% CI)</i> | <i>P value**</i> |
|---------------------------------|---------------|----------------------------|-----------|-----------|-----------|---------------------|-----------------|---------------------------------|------------------|
|                                 |               | Normal                     | Mild      | Moderate  | Severe    | Extremely<br>severe |                 |                                 |                  |
| <b>Gender</b>                   |               |                            |           |           |           |                     |                 |                                 |                  |
| Female                          | 310           | 200 (64.5)                 | 46 (14.8) | 29 (9.4)  | 18 (5.8)  | 17 (5.5)            | 0.799           | 1.214 (0.762-1.934)             | 0.414            |
| Male                            | 187           | 122 (65.2)                 | 32 (17.1) | 18 (9.6)  | 8 (4.3)   | 7 (3.7)             |                 | -                               | Ref              |
| <b>Age</b>                      |               |                            |           |           |           |                     |                 |                                 |                  |
| 18-25                           | 33            | 22 (66.7)                  | 5 (15.2)  | 1 (3.0)   | 2 (6.1)   | 3 (9.1)             | 0.265           | -                               | Ref              |
| 26-35                           | 168           | 104 (61.9)                 | 28 (16.7) | 12 (7.1)  | 13 (7.7)  | 11 (6.5)            |                 | 1.227 (0.471-3.200)             | 0.675            |
| 36-45                           | 177           | 117 (66.1)                 | 29 (16.4) | 20 (11.3) | 7 (4.0)   | 4 (2.3)             |                 | 0.955 (0.364-2.510)             | 0.926            |
| 46-55                           | 75            | 45 (60.0)                  | 10 (13.3) | 12 (16.0) | 3 (4.0)   | 5 (6.7)             |                 | 1.636 (0.589-4.547)             | 0.345            |
| 56-65                           | 44            | 34 (77.3)                  | 6 (13.6)  | 2 (4.5)   | 1 (2.3)   | 1 (2.3)             |                 | 0.450 (0.116-1.746)             | 0.248            |
| <b>Marital status</b>           |               |                            |           |           |           |                     |                 |                                 |                  |
| Single/Not married              | 110           | 242 (66.1)                 | 59 (16.1) | 35 (9.6)  | 15 (4.1)  | 15 (4.1)            | 0.241           | 3.562 (0.782-16.227)            | 0.342            |
| Married                         | 366           | 65 (59.1)                  | 15 (13.6) | 11 (10.0) | 11 (10.0) | 8 (7.3)             |                 | 2.051 (0.466-9.025)             | 0.101            |
| Widowed                         | 21            | 15 (71.4)                  | 4 (19.0)  | 1 (4.8)   | 0 (0.0)   | 1 (4.8)             |                 | -                               | Ref              |
| <b>Education level</b>          |               |                            |           |           |           |                     |                 |                                 |                  |
| Lower secondary (PMR/SRP/PT3)   | 2             | 0 (0.0)                    | 2 (100.0) | 0 (0.0)   | 0 (0.0)   | 0 (0.0)             | 0.249           | -                               | Ref              |
| Upper secondary (SPM/STPM)      | 75            | 52 (69.3)                  | 11 (14.7) | 6 (8.0)   | 3 (4.0)   | 3 (4.0)             |                 | -                               | 0.999            |
| Diploma or equivalent           | 115           | 79 (68.7)                  | 16 (13.9) | 11 (9.6)  | 4 (3.5)   | 5 (4.3)             |                 | -                               | 0.999            |
| Bachelor's degree or equivalent | 199           | 124 (62.3)                 | 34 (17.1) | 21 (10.6) | 11 (5.5)  | 9 (4.5)             |                 | -                               | 0.999            |
| Master's degree or equivalent   | 77            | 45 (58.4)                  | 14 (18.2) | 6 (7.8)   | 5 (6.5)   | 7 (9.1)             |                 | -                               | 0.999            |
| Doctor of Philosophy            | 29            | 22 (75.9)                  | 1 (3.4)   | 3 (10.3)  | 3 (10.3)  | 0 (0.0)             |                 | -                               | 0.999            |

Results were analyzed using chi-square and logistic regression and are marked as \*, \*\*, respectively. The significance *P*-value is less than 0.05. Nagelkerke R<sup>2</sup> was used. The “-” represents no odds ratio (OR).

**Table 4.4: Association of DASS scores for anxiety with sociodemographic factors (cont.).**

| Variables                             | All<br>N= 497 | DASS score (Anxiety) n (%) |           |           |          |                     | <i>P value*</i> | <i>Adjusted OR</i><br>(95% CI) | <i>P value**</i> |
|---------------------------------------|---------------|----------------------------|-----------|-----------|----------|---------------------|-----------------|--------------------------------|------------------|
|                                       |               | Normal                     | Mild      | Moderate  | Severe   | Extremely<br>severe |                 |                                |                  |
| <b>Living area</b>                    |               |                            |           |           |          |                     |                 |                                |                  |
| Urban                                 | 358           | 230 (64.2)                 | 57 (15.9) | 38 (10.6) | 19 (5.3) | 14 (3.9)            | 0.384           | 1.075 (0.653 -1.771)           | 0.776            |
| Rural                                 | 139           | 92 (66.2)                  | 21 (15.1) | 9 (6.5)   | 7 (5.0)  | 10 (7.2)            |                 | -                              | Ref              |
| <b>Residential state (during MCO)</b> |               |                            |           |           |          |                     |                 |                                |                  |
| Selangor                              | 202           | 122 (60.4)                 | 33 (16.3) | 24 (11.9) | 12 (5.9) | 11 (5.4)            | 0.370           | -                              | 1.000            |
| Wilayah Persekutuan Kuala Lumpur      | 42            | 28 (66.7)                  | 10 (23.8) | 3 (7.1)   | 0 (0.0)  | 1 (2.4)             |                 | -                              | 1.000            |
| Terengganu                            | 36            | 27 (75.0)                  | 5 (13.9)  | 1 (2.8)   | 2 (5.6)  | 1 (2.8)             |                 | -                              | 1.000            |
| Negeri Sembilan                       | 34            | 25 (73.5)                  | 4 (11.8)  | 0 (0.0)   | 2 (5.9)  | 3 (8.8)             |                 | -                              | 1.000            |
| Perak                                 | 29            | 19 (65.5)                  | 3 (10.3)  | 4 (13.8)  | 1 (3.4)  | 2 (6.9)             |                 | -                              | 1.000            |
| Wilayah Persekutuan Putrajaya         | 27            | 16 (59.3)                  | 2 (7.4)   | 6 (22.2)  | 3 (11.1) | 0 (0.0)             |                 | -                              | 1.000            |
| Kedah                                 | 25            | 20 (80.0)                  | 4 (16.0)  | 0 (0.0)   | 0 (0.0)  | 1 (4.0)             |                 | -                              | 1.000            |
| Pahang                                | 22            | 14 (63.6)                  | 4 (18.2)  | 2 (9.1)   | 0 (0.0)  | 2 (9.1)             |                 | -                              | 1.000            |
| Sabah                                 | 21            | 13 (61.9)                  | 3 (14.3)  | 3 (14.3)  | 2 (9.5)  | 0 (0.0)             |                 | -                              | 1.000            |
| Johor                                 | 19            | 11 (57.9)                  | 3 (15.8)  | 1 (5.3)   | 3 (15.8) | 1 (5.3)             |                 | -                              | 1.000            |
| Kelantan                              | 18            | 13 (72.2)                  | 2 (11.1)  | 1 (5.6)   | 0 (0.0)  | 2 (11.1)            |                 | -                              | 1.000            |
| Melaka                                | 9             | 5 (55.6)                   | 1 (11.1)  | 2 (22.2)  | 1 (11.1) | 0 (0.0)             |                 | -                              | 1.000            |
| Pulau Pinang                          | 9             | 8 (88.9)                   | 1 (11.1)  | 0 (0.0)   | 0 (0.0)  | 0 (0.0)             |                 | -                              | 1.000            |
| Sarawak                               | 3             | 1 (33.3)                   | 2 (66.7)  | 0 (0.0)   | 0 (0.0)  | 0 (0.0)             |                 | -                              | 1.000            |
| Perlis                                | 1             | 0 (0.0)                    | 1 (100.0) | 0 (0.0)   | 0 (0.0)  | 0 (0.0)             |                 | -                              | Ref              |

Results were analyzed using chi-square and logistic regression and are marked as \*, \*\*, respectively. The significance *P*-value is less than 0.05. Nagelkerke R<sup>2</sup> was used. The “-” represents no odds ratio (OR).

**Table 4.4: Association of DASS scores for anxiety with sociodemographic factors (cont.).**

| Variables                                  | All<br>N= 497 | DASS score (Anxiety) n (%) |           |           |          |                     | P<br>value*  | Adjusted OR<br>(95% CI)   | P value**    |
|--------------------------------------------|---------------|----------------------------|-----------|-----------|----------|---------------------|--------------|---------------------------|--------------|
|                                            |               | Normal                     | Mild      | Moderate  | Severe   | Extremely<br>severe |              |                           |              |
| <b>Type of housing</b>                     |               |                            |           |           |          |                     |              |                           |              |
| Terrace house                              | 199           | 123 (61.8)                 | 31 (15.6) | 21 (10.6) | 13 (6.5) | 11 (5.5)            | <b>0.001</b> | 9.351 (1.243-70.339)      | <b>0.030</b> |
| Detached House (Traditional)               | 85            | 53 (62.4)                  | 13 (15.3) | 8 (9.4)   | 4 (4.7)  | 7 (8.2)             |              | 9.212 (1.180-71.898)      | <b>0.034</b> |
| Apartment                                  | 60            | 36 (60.0)                  | 9 (15.0)  | 9 (15.0)  | 4 (6.7)  | 2 (3.3)             |              | 10.667 (1.340-84.901)     | <b>0.025</b> |
| Twin house                                 | 43            | 24 (55.8)                  | 10 (23.3) | 6 (14.0)  | 1 (2.3)  | 2 (4.7)             |              | 8.471 (1.015-70.685)      | <b>0.048</b> |
| Condominium                                | 25            | 22 (88.0)                  | 3 (12.0)  | 0 (0.0)   | 0 (0.0)  | 0 (0.0)             |              | -                         | 0.998        |
| Detached House (Luxury Bungalow)           | 24            | 22 (91.7)                  | 2 (8.3)   | 0 (0.0)   | 0 (0.0)  | 0 (0.0)             |              | -                         | 0.998        |
| Flat                                       | 13            | 10 (76.9)                  | 3 (23.1)  | 0 (0.0)   | 0 (2.3)  | 0 (4.7)             |              | -                         | 0.999        |
| Cluster House                              | 8             | 2 (25)                     | 4 (50)    | 1 (12.5)  | 1 (12.5) | 0 (0.0)             |              | 10.667 (0.830-137.145)    | 0.069        |
| Town house                                 | 7             | 1 (14.3)                   | 0 (0.0)   | 2 (28.6)  | 2 (28.6) | 2 (28.6)            |              | 192.000 (10.504-3509.451) | <b>0.010</b> |
| Other                                      | 33            | 29 (87.9)                  | 3 (9.1)   | 0 (0.0)   | 1 (3.0)  | 0 (0.0)             |              | -                         | Ref          |
| - Teacher's flat                           |               |                            |           |           |          |                     |              |                           |              |
| - Residential college                      |               |                            |           |           |          |                     |              |                           |              |
| <b>Type of Job</b>                         |               |                            |           |           |          |                     |              |                           |              |
| Not working                                | 241           | 145 (60.2)                 | 40 (16.6) | 33 (13.7) | 14 (5.8) | 9 (3.7)             | 0.331        | 0.695 (0.307-1.577)       | 0.385        |
| Retired                                    | 104           | 68 (65.4)                  | 21 (20.2) | 4 (3.8)   | 6 (5.8)  | 5 (4.8)             |              | 0.367 (0.107-1.255)       | 0.110        |
| Private/Government Linked Companies (GLCs) | 46            | 34 (73.9)                  | 4 (8.7)   | 3 (6.5)   | 2 (4.3)  | 3 (6.5)             |              | 0.557 (0.299 -1.039)      | 0.066        |
| Student                                    | 45            | 32 (71.1)                  | 5 (11.1)  | 3 (6.7)   | 1 (2.2)  | 4 (8.9)             |              | 0.964 (0.394-2.354)       | 0.935        |
| Government/Statutory Bodies                | 31            | 20 (64.5)                  | 4 (12.9)  | 2 (6.5)   | 2 (6.5)  | 3 (9.7)             |              | -                         | Ref          |
| Self-employed                              | 30            | 23 (76.7)                  | 4 (13.3)  | 2 (6.7)   | 1 (3.3)  | 0 (0.0)             |              | 0.714 (0.314-1.623)       | 0.422        |

Results were analyzed using chi-square and logistic regression and are marked as \*, \*\*, respectively. The significance P-value is less than 0.05. Nagelkerke R<sup>2</sup> was used. The “-” represents no odds ratio (OR).

**Table 4.4: Association of DASS scores for anxiety with sociodemographic factors (cont.).**

| Variables                                        | All<br>N= 497 | DASS score (Anxiety) n (%) |           |           |          |                     | P<br>value* | Adjusted OR<br>(95% CI) | P value** |
|--------------------------------------------------|---------------|----------------------------|-----------|-----------|----------|---------------------|-------------|-------------------------|-----------|
|                                                  |               | Normal                     | Mild      | Moderate  | Severe   | Extremely<br>severe |             |                         |           |
| <b>Ethnicity</b>                                 |               |                            |           |           |          |                     |             |                         |           |
| Malay                                            | 465           | 301 (64.7)                 | 72 (15.5) | 45 (9.7)  | 25 (5.4) | 22 (4.7)            | 0.834       | -                       | 0.999     |
| Bumiputera Sabah                                 | 15            | 10 (66.7)                  | 3 (20.0)  | 1 (6.7)   | 1 (6.7)  | 0 (0.0)             |             | -                       | 0.999     |
| Chinese                                          | 8             | 5 (62.5)                   | 2 (25.0)  | 0 (0.0)   | 0 (0.0)  | 1 (12.5)            |             | -                       | 0.999     |
| Indian                                           | 3             | 2 (66.7)                   | 0 (0.0)   | 0 (0.0)   | 0 (0.0)  | 1 (33.3)            |             | -                       | 0.999     |
| Bumiputera Sarawak                               | 3             | 1 (33.3)                   | 1 (33.3)  | 1 (33.3)  | 0 (0.0)  | 0 (0.0)             |             | -                       | 0.999     |
| Other                                            | 2             | 2 (100.0)                  | 0 (0.0)   | 0 (0.0)   | 0 (0.0)  | 0 (0.0)             |             | -                       | Ref       |
| <b>Religion</b>                                  |               |                            |           |           |          |                     |             |                         |           |
| Islam                                            | 482           | 311 (64.5)                 | 76 (15.8) | 47(9.8)   | 26 (5.4) | 22 (4.6)            | 0.342       | -                       | 0.999     |
| Buddhism                                         | 6             | 3 (50.0)                   | 2 (33.3)  | 0 (0.0)   | 0 (0.0)  | 1 (16.7)            |             | -                       | 0.999     |
| Christian                                        | 6             | 6 (100.0)                  | 0 (0.0)   | 0 (0.0)   | 0 (0.0)  | 0 (0.0)             |             | -                       | Ref       |
| Hindu                                            | 3             | 2 (66.7)                   | 0 (0.0)   | 0 (0.0)   | 0 (0.0)  | 1 (33.3)            |             | -                       | 0.999     |
| <b>No. of household members</b>                  |               |                            |           |           |          |                     |             |                         |           |
| 1-2                                              | 62            | 35 (56.5)                  | 10 (16.1) | 9 (14.5)  | 4 (6.5)  | 4 (6.5)             | 0.421       | -                       | Ref       |
| 3-5                                              | 288           | 169 (63.1)                 | 49 (18.3) | 22 (8.2)  | 14 (5.2) | 14 (5.2)            |             | 0.607 (0.321-1.148)     | 0.125     |
| >6                                               | 167           | 118 (70.7)                 | 19 (11.4) | 16 9.6)   | 8 (4.8)  | 6 (3.6)             |             | 0.580 (0.293-1.148)     | 0.118     |
| <b>Monthly income (individual)</b>               |               |                            |           |           |          |                     |             |                         |           |
| RM 4, 360 and below per month (B40) <sup>1</sup> | 214           | 137 (64.0)                 | 36 (16.8) | 19 (8.9)  | 9 (4.2)  | 13 (6.1)            | 0.281       | 0.995 (0.354-2.797)     | 0.993     |
| Between RM4, 361 - RM 9, 619 (M40) <sup>2</sup>  | 187           | 119 (63.6)                 | 29 (15.5) | 23 (12.3) | 12 (6.4) | 4 (2.1)             |             | 1.107 (0.392-3.122)     | 0.848     |
| RM 9, 620 and above (T20) <sup>3</sup>           | 26            | 16 (61.5)                  | 5 (19.2)  | 2 (7.7)   | 0 (0.0)  | 3 (11.5)            |             | -                       | Ref       |
| No income                                        | 70            | 50 (71.4)                  | 8 (11.4)  | 3 (4.3)   | 5 (7.1)  | 4 (5.7)             |             | 0.869 (0.273-2.762)     | 0.812     |

Results were analyzed using chi-square and logistic regression and are marked as \*, \*\*, respectively. The significance *P*-value is less than 0.05. Nagelkerke R<sup>2</sup> was used. The “-” represents no odds ratio (OR).

**Table 4.4: Association of DASS scores for anxiety with sociodemographic factors (cont.).**

| Variables                                                    | All<br>N= 497 | DASS score (Anxiety) n (%) |           |           |          |                     | <i>P</i><br><i>value</i> * | <i>Adjusted OR</i><br>(95% CI) | <i>P value</i> ** |
|--------------------------------------------------------------|---------------|----------------------------|-----------|-----------|----------|---------------------|----------------------------|--------------------------------|-------------------|
|                                                              |               | Normal                     | Mild      | Moderate  | Severe   | Extremely<br>severe |                            |                                |                   |
| <b>Any chronic illness?</b>                                  |               |                            |           |           |          |                     |                            |                                |                   |
| Yes                                                          | 42            | 25 (59.5)                  | 10 (23.8) | 1 (2.4)   | 2 (4.8)  | 4 (9.5)             | 0.155                      | -                              | Ref               |
| No                                                           | 455           | 297 (65.3)                 | 68 (14.9) | 46 (10.1) | 24 (5.3) | 20 (4.4)            |                            | 1.233 (0.530-2.866)            | 0.627             |
| <b>Diagnosed with mental health-related illness?</b>         |               |                            |           |           |          |                     |                            |                                |                   |
| Yes                                                          | 11            | 6 (54.5)                   | 4 (36.4)  | 1 (9.1)   | 0 (0.0)  | 0 (0.0)             | 0.357                      | -                              | Ref               |
| No                                                           | 486           | 316 (65.0)                 | 74 (15.2) | 46 (9.5)  | 26 (5.3) | 24 (4.9)            |                            | 2.462 (0.311-19.463)           | 0.393             |
| <b>Received treatment for mental health-related illness?</b> |               |                            |           |           |          |                     |                            |                                |                   |
| Yes                                                          | 5             | 4 (80.0)                   | 0 (0.0)   | 0 (0.0)   | 0 (0.0)  | 1 (20.0)            | 0.390                      | -                              | Ref               |
| No                                                           | 492           | 318 (64.6)                 | 78 (15.9) | 47 (9.6)  | 26 (5.3) | 23 (4.7)            |                            | 0.970 (0.107-8.774)            | 0.978             |

Results were analyzed using chi-square and logistic regression and are marked as \*, \*\*, respectively. The significance *P*-value is less than 0.05. Nagelkerke R<sup>2</sup> was used. The “-“represents no odds ratio (OR).

**Table 4.5: Association of DASS scores for stress with sociodemographic factors.**

| Variables                          | All<br>N= 497 | DASS score (Stress) n (%) |          |          |          |                     | <i>P</i><br>value* | Adjusted OR<br>(95%CI) | <i>P</i> value** |
|------------------------------------|---------------|---------------------------|----------|----------|----------|---------------------|--------------------|------------------------|------------------|
|                                    |               | Normal                    | Mild     | Moderate | Severe   | Extremely<br>severe |                    |                        |                  |
| <b>Gender</b>                      |               |                           |          |          |          |                     |                    |                        |                  |
| Female                             | 310           | 255 (82.3)                | 25 (8.1) | 16 (5.2) | 12 (3.9) | 2 (0.6)             | 0.224              | 1.145 (0.606-2.163)    | 0.676            |
| Male                               | 187           | 165 (88.2)                | 6 (3.2)  | 9 (4.8)  | 5 (2.7)  | 2 (1.1)             |                    | -                      | Ref              |
| <b>Age</b>                         |               |                           |          |          |          |                     |                    |                        |                  |
| 18-25                              | 33            | 25 (75.8)                 | 4 (12.1) | 4 (12.1) | 0 (0.0)  | 0 (0.0)             | 0.056              | -                      | Ref              |
| 26-35                              | 168           | 137 (81.5)                | 8 (4.8)  | 9 (5.4)  | 12 (7.1) | 2 (1.2)             |                    | 1.150 (0.370-3.575)    | 0.809            |
| 36-45                              | 177           | 155 (87.6)                | 12 (6.8) | 5 (2.8)  | 3 (1.7)  | 2 (1.1)             |                    | 0.434 (0.128-1.477)    | 0.182            |
| 46-55                              | 75            | 63 (84.0)                 | 4 (5.3)  | 7 (9.3)  | 1 (1.3)  | 0 (0.0)             |                    | 0.866 (0.241-3.104)    | 0.825            |
| 56-65                              | 44            | 40 (90.9)                 | 3 (6.8)  | 0 (0.0)  | 1 (2.3)  | 0 (0.0)             |                    | 0.169 (0.018-1.586)    | 0.120            |
| <b>Marital status</b>              |               |                           |          |          |          |                     |                    |                        |                  |
| Single/Not married                 | 110           | 85 (77.3)                 | 10 (9.1) | 8 (7.3)  | 5 (4.5)  | 2 (1.8)             | <b>0.042</b>       | 0.497 (0.138-1.791)    | 0.285            |
| Married                            | 366           | 317 (86.6)                | 21 (5.7) | 17 (4.6) | 10 (2.7) | 1 (0.3)             |                    | 0.947 (0.249-3.611)    | 0.937            |
| Widowed                            | 21            | 18 (85.7)                 | 0 (0.0)  | 0 (0.0)  | 2 (9.5)  | 1 (4.8)             |                    | -                      | Ref              |
| <b>Education level</b>             |               |                           |          |          |          |                     |                    |                        |                  |
| Lower secondary<br>(PMR/SRP/PT3)   | 2             | 2 (100.0)                 | 0 (0.0)  | 0 (0.0)  | 0 (0.0)  | 0 (0.0)             | 0.878              | -                      | Ref              |
| Upper secondary<br>(SPM/STPM)      | 75            | 68 (90.7)                 | 3 (4.0)  | 2 (2.7)  | 2 (2.7)  | 0 (0.0)             |                    | -                      | 0.999            |
| Diploma or equivalent              | 115           | 98 (85.2)                 | 9 (7.8)  | 3 (2.6)  | 3 (2.6)  | 2 (1.7)             |                    | -                      | 0.999            |
| Bachelor's degree or<br>equivalent | 199           | 168 (84.4)                | 11 (5.5) | 13 (6.5) | 6 (3.0)  | 1 (0.5)             |                    | -                      | 0.999            |
| Master's degree or equivalent      | 77            | 59 (76.6)                 | 7 (9.1)  | 6 (7.8)  | 4 (5.2)  | 1 (1.3)             |                    | -                      | 0.999            |
| Doctor of Philosophy               | 29            | 25 (86.2)                 | 1 (3.4)  | 1 (3.4)  | 2 (6.9)  | 0 (0.0)             |                    | -                      | 0.999            |

Results were analyzed using chi-square and logistic regression and are marked as \*, \*\*, respectively. The significance *P*-value is less than 0.05. Nagelkerke R<sup>2</sup> was used. The “-” represents no odds ratio (OR).

**Table 4.5: Association of DASS scores for stress with sociodemographic factors (cont.).**

| Variables                                 | All<br>N= 497 | DASS score (Stress) n (%) |          |          |         |                     | P<br>value* | Adjusted OR<br>(95% CI) | P value** |
|-------------------------------------------|---------------|---------------------------|----------|----------|---------|---------------------|-------------|-------------------------|-----------|
|                                           |               | Normal                    | Mild     | Moderate | Severe  | Extremely<br>severe |             |                         |           |
| <b>Living area</b>                        |               |                           |          |          |         |                     |             |                         |           |
| Urban                                     | 358           | 304 (84.9)                | 23 (6.4) | 19 (5.3) | 9 (2.5) | 3 (0.8)             | 0.495       | 0.784 (0.409-1.501)     | 0.462     |
| Rural                                     | 139           | 116 (83.5)                | 8 (5.8)  | 6 (4.3)  | 8 (5.8) | 1 (0.7)             |             | -                       | Ref       |
| <b>Residential state (during<br/>MCO)</b> |               |                           |          |          |         |                     |             |                         |           |
| Selangor                                  | 202           | 163 (80.7)                | 19 (9.4) | 8 (4.0)  | 9 (4.5) | 3 (1.5)             | 0.321       | -                       | 1.000     |
| Wilayah Persekutuan Kuala Lumpur          | 42            | 37 (88.1)                 | 2 (4.8)  | 2(4.8)   | 1 (2.4) | 0 (0.0)             |             | -                       | 1.000     |
| Terengganu                                | 36            | 33 (91.7)                 | 2 (5.6)  | 1 (2.8)  | 0 (0.0) | 0 (0.0)             |             | -                       | 1.000     |
| Negeri Sembilan                           | 34            | 30 (88.2)                 | 1 (2.9)  | 3 (8.8)  | 0 (0.0) | 0 (0.0)             |             | -                       | 1.000     |
| Perak                                     | 29            | 23 (79.3)                 | 2 (6.9)  | 3 (10.3) | 1 (3.4) | 0 (0.0)             |             | -                       | 1.000     |
| Wilayah Persekutuan Putrajaya             | 27            | 21 (77.8)                 | 1 (3.7)  | 5 (18.5) | 0 (0.0) | 0 (0.0)             |             | -                       | 1.000     |
| Kedah                                     | 25            | 23 (92.0)                 | 0 (0.0)  | 1 (4.0)  | 1 (4.0) | 0 (0.0)             |             | -                       | 1.000     |
| Pahang                                    | 22            | 20 (90.9)                 | 0 (0.0)  | 1 (4.5)  | 1 (4.5) | 0 (0.0)             |             | -                       | 1.000     |
| Sabah                                     | 21            | 21 (100.0)                | 0 (0.0)  | 0 (0.0)  | 0 (0.0) | 0 (0.0)             |             | -                       | 1.000     |
| Johor                                     | 19            | 15 (78.9)                 | 2 (10.5) | 0 (0.0)  | 2(10.5) | 0 (0.0)             |             | -                       | 1.000     |
| Kelantan                                  | 18            | 15 (83.3)                 | 0 (0.0)  | 1 (5.6)  | 2(11.1) | 0 (0.0)             |             | -                       | 1.000     |
| Melaka                                    | 9             | 7 (77.8)                  | 1 (11.1) | 0(0.0)   | 0(0.0)  | 1 (11.1)            |             | -                       | 1.000     |
| Pulau Pinang                              | 9             | 9 (100.0)                 | 0(0.0)   | 0(0.0)   | 0(0.0)  | 0 (0.0)             |             | -                       | 1.000     |
| Sarawak                                   | 3             | 2 (66.7)                  | 1 (33.3) | 0(0.0)   | 0(0.0)  | 0 (0.0)             |             | -                       | 1.000     |
| Perlis                                    | 1             | 1 (100.0)                 | 0(0.0)   | 0(0.0)   | 0(0.0)  | 0 (0.0)             |             | -                       | Ref       |

Results were analyzed using chi-square and logistic regression and are marked as \*, \*\*, respectively. The significance *P*-value is less than 0.05. Nagelkerke R<sup>2</sup> was used. The “-” represents no odds ratio (OR).

**Table 4.5: Association of DASS scores for stress with sociodemographic factors (cont.).**

| Variables                                     | All<br>N= 497 | DASS score (Stress) n (%) |          |          |          |                     | P<br>value* | Adjusted OR<br>(95% CI) | P value** |
|-----------------------------------------------|---------------|---------------------------|----------|----------|----------|---------------------|-------------|-------------------------|-----------|
|                                               |               | Normal                    | Mild     | Moderate | Severe   | Extremely<br>severe |             |                         |           |
| <b>Type of housing</b>                        |               |                           |          |          |          |                     |             |                         |           |
| Terrace house                                 | 199           | 163 (81.9)                | 17 (8.5) | 10 (5)   | 8 (4)    | 1 (0.5)             | 0.305       | -                       | 0.998     |
| Detached House<br>(Traditional)               | 85            | 66 (77.6)                 | 7 (8.2)  | 6 (7.1)  | 5 (5.9)  | 1 (1.2)             |             | -                       | 0.998     |
| Apartment                                     | 60            | 46 (76.7)                 | 3 (5)    | 7 (11.7) | 2 (3.3)  | 2 (3.3)             |             | -                       | 0.998     |
| Twin house                                    | 43            | 39 (90.7)                 | 2 (4.7)  | 1 (2.3)  | 1 (2.3)  | 0 (0)               |             | -                       | 0.998     |
| Condominium                                   | 25            | 25 (100)                  | 0 (0)    | 0 (0)    | 0 (0)    | 0 (0)               |             | -                       | 1.000     |
| Detached House (Luxury<br>Bungalow)           | 24            | 24 (100)                  | 0 (0)    | 0 (0)    | 0 (0)    | 0 (0)               |             | -                       | 1.000     |
| Flat                                          | 13            | 13 (100)                  | 0 (0)    | 0 (0)    | 0 (0)    | 0 (0)               |             | -                       | 1.000     |
| Cluster house                                 | 8             | 8 (100.0)                 | 0 (0.0)  | 0 (0.0)  | 0 (0.0)  | 0 (0.0)             |             | -                       | 1.000     |
| Town house                                    | 7             | 4 (57.1)                  | 1 (14.3) | 1 (14.3) | 1 (14.3) | 0 (0.0)             |             | -                       | 0.998     |
| Other                                         | 33            | 32 (97.0)                 | 1 (3.0)  | 0 (0.0)  | 0 (0.0)  | 0 (0.0)             |             | -                       | Ref       |
| - Teacher's flat                              |               |                           |          |          |          |                     |             |                         |           |
| - Residential college                         |               |                           |          |          |          |                     |             |                         |           |
| <b>Type of Job</b>                            |               |                           |          |          |          |                     |             |                         |           |
| Not working                                   | 241           | 206 (85.5)                | 10 (4.1) | 15 (6.2) | 9 (3.7)  | 1 (0.4)             | 0.349       | 0.823 (0.272-2.487)     | 0.730     |
| Retired                                       | 104           | 87 (83.7)                 | 8 (7.7)  | 5 (4.8)  | 3 (2.9)  | 1(1.0)              |             | 0.000                   | 0.998     |
| Private/Government Linked<br>Companies (GLCs) | 46            | 40 (87.0)                 | 2 (4.3)  | 1 (2.2)  | 3 (6.5)  | 0 (0.0)             |             | 0.819 (0.368-1.820)     | 0.623     |
| Student                                       | 45            | 38 (84.4)                 | 3 (6.7)  | 1 (2.2)  | 2 (4.4)  | 1 (2.2)             |             | 1.280 (0.414-3.958)     | 0.668     |
| Government/Statutory<br>Bodies                | 31            | 22 (71.0)                 | 5 (16.1) | 3 (9.7)  | 0 (0.0)  | 1 (3.2)             |             | -                       | Ref       |
| Self-employed                                 | 30            | 27 (90.0)                 | 3 (10.0) | 0 (0.0)  | 0 (0.0)  | 0 (0.0)             |             | 0.843 (0.279-2.550)     | 0.762     |

Results were analyzed using chi-square and logistic regression and are marked as \*, \*\*, respectively. The significance *P*-value is less than 0.05. Nagelkerke R<sup>2</sup> was used. The “-” represents no odds ratio (OR).

**Table 4.5: Association of DASS scores for stress with sociodemographic factors (cont.).**

| Variables                                        | All<br>N= 497 | DASS score (Stress) n (%) |          |          |          |                     | P<br>value*  | Adjusted OR<br>(95% CI) | P value** |
|--------------------------------------------------|---------------|---------------------------|----------|----------|----------|---------------------|--------------|-------------------------|-----------|
|                                                  |               | Normal                    | Mild     | Moderate | Severe   | Extremely<br>severe |              |                         |           |
| <b>Ethnicity</b>                                 |               |                           |          |          |          |                     |              |                         |           |
| Malay                                            | 465           | 395 (84.9)                | 28 (6.0) | 25 (5.4) | 15 (3.2) | 2 (0.4)             | <b>0.000</b> | -                       | 0.999     |
| Bumiputera Sabah                                 | 15            | 14 (93.3)                 | 1 (6.7)  | 0 (0.0)  | 0 (0.0)  | 0 (0.0)             |              | -                       | 0.999     |
| Chinese                                          | 8             | 5 (62.5)                  | 1 (12.5) | 0 (0.0)  | 2 (25.0) | 0 (0.0)             |              | -                       | 0.999     |
| Indian                                           | 3             | 2 (66.7)                  | 0 (0.0)  | 0 (0.0)  | 0 (0.0)  | 1 (33.3)            |              | -                       | 0.999     |
| Bumiputera Sarawak                               | 3             | 1 (33.3)                  | 1 (33.3) | 0 (0.0)  | 0 (0.0)  | 1 (33.3)            |              | -                       | 1.000     |
| Other                                            | 2             | 2 (100.0)                 | 0 (0.0)  | 0 (0.0)  | 0 (0.0)  | 0 (0.0)             |              | -                       | Ref       |
| <b>Religion</b>                                  |               |                           |          |          |          |                     |              |                         |           |
| Islam                                            | 482           | 409 (84.9)                | 30 (6.2) | 25 (5.2) | 15 (3.1) | 3 (0.6)             | <b>0.000</b> | 0.490 (0.056-4.288)     | 0.519     |
| Buddhism                                         | 6             | 4 (66.7)                  | 1 (16.7) | 0 (0.0)  | 1 (16.7) | 0 (0.0)             |              | 1.000 (0.048-20.829)    | 1.000     |
| Christian                                        | 6             | 5 (83.3)                  | 0 (0.0)  | 0 (0.0)  | 1 (16.7) | 0 (0.0)             |              | -                       | Ref       |
| Hindu                                            | 3             | 2 (66.7)                  | 0 (0.0)  | 0 (0.0)  | 0 (0.0)  | 1 (33.3)            |              | 2.500 (0.100-62.605)    | 0.577     |
| <b>No. of household members</b>                  |               |                           |          |          |          |                     |              |                         |           |
| 1-2                                              | 62            | 54 (87.1)                 | 2 (3.2)  | 2 (3.2)  | 3 (4.8)  | 1 (1.6)             | <b>0.035</b> | -                       | Ref       |
| 3-5                                              | 288           | 220 (82.1)                | 14 (5.2) | 17 (6.3) | 14 (5.2) | 3 (1.1)             |              | 1.356 (0.543-3.338)     | 0.077     |
| >6                                               | 167           | 146 (87.4)                | 15 (9.0) | 6 (3.6)  | 0 (0.0)  | 0 (0.0)             |              | 0.348 (0.108-1.123)     |           |
| <b>Monthly income (individual)</b>               |               |                           |          |          |          |                     |              |                         |           |
| RM 4, 360 and below per month (B40) <sup>1</sup> | 214           | 182 (85.0)                | 14 (6.5) | 7 (3.3)  | 9 (4.2)  | 2 (0.9)             | 0.522        | 0.505 (0.157-1.627)     | 0.252     |
| Between RM4, 361 - RM 9, 619 (M40) <sup>2</sup>  | 187           | 157 (84.0)                | 12(6.4)  | 10(5.3)  | 6(3.2)   | 2(1.1)              |              | 0.586 (0.182-1.889)     | 0.371     |
| RM 9, 620 and above (T20) <sup>3</sup>           | 26            | 22 (84.6)                 | 0 (0.0)  | 4 (15.4) | 0 (0.0)  | 0 (0.0)             |              | -                       | Ref       |
| No income                                        | 70            | 59 (84.3)                 | 5 (7.1)  | 4 (5.7)  | 2 (2.9)  | 0 (0.0)             |              | 0.516 (0.133-1.998)     | 0.338     |

Results were analyzed using chi-square and logistic regression and are marked as \*, \*\*, respectively. The significance *P*-value is less than 0.05. Nagelkerke R<sup>2</sup> was used. The “-” represents no odds ratio (OR).

**Table 4.5: Association of DASS scores for stress with sociodemographic factors (cont.).**

| Variables                                                    | All<br>N= 497 | DASS score (Stress) n (%) |          |          |          |                     | <i>P</i><br><i>value</i> * | <i>Adjusted OR</i><br>(95% CI) | <i>P value</i> ** |
|--------------------------------------------------------------|---------------|---------------------------|----------|----------|----------|---------------------|----------------------------|--------------------------------|-------------------|
|                                                              |               | Normal                    | Mild     | Moderate | Severe   | Extremely<br>severe |                            |                                |                   |
| <b>Any chronic illness?</b>                                  |               |                           |          |          |          |                     |                            |                                |                   |
| Yes                                                          | 42            | 35 (83.3)                 | 2 (4.8)  | 2 (4.8)  | 2 (4.8)  | 1 (2.4)             | 0.767                      | -                              | Ref               |
| No                                                           | 455           | 385 (84.6)                | 29 (6.4) | 23 (5.1) | 15 (3.3) | 3 (0.7)             |                            | 0.733 (0.273-1.967)            | 0.537             |
| <b>Diagnosed with mental health-related illness?</b>         |               |                           |          |          |          |                     |                            |                                |                   |
| Yes                                                          | 11            | 10 (90.9)                 | 1 (9.1)  | 0 (0.0)  | 0 (0.0)  | 0 (0.0)             | 0.871                      | -                              | 0.999             |
| No                                                           | 486           | 410 (84.4)                | 30 (6.2) | 25 (5.1) | 17 (3.5) | 4 (0.8)             |                            | -                              | Ref               |
| <b>Received treatment for mental health-related illness?</b> |               |                           |          |          |          |                     |                            |                                |                   |
| Yes                                                          | 5             | 4 (80.0)                  | 1 (20.0) | 0 (0.0)  | 0 (0.0)  | 0 (0.0)             | 0.733                      | -                              | 0.999             |
| No                                                           | 492           | 416 (84.6)                | 30 (6.1) | 25 (5.1) | 17 (3.5) | 4 (0.8)             |                            | -                              | Ref               |

Results were analyzed using chi-square and logistic regression and are marked as \*, \*\*, respectively. The significance *P*-value is less than 0.05. Nagelkerke R<sup>2</sup> was used. The “-“represents no odds ratio (OR).

## CHAPTER 5

### DISCUSSION

Mental illness is currently a major global health problem that affects 4.2 million of the Malaysian population (Hassan *et al.*, 2018). It can be divided into depression, anxiety, and stress (Hassan *et al.*, 2018). The present study was designed to determine the impact of COVID-19 on mental health among the general population in Malaysia. The general population in this study is defined as Malaysian citizens who were at their current residence during the MCO. Several studies conducted during the lockdown suggested that mental health issues have arisen since the beginning of the COVID-19 pandemic (Al-Dhaheeri *et al.*, 2021; Lai *et al.*, 2020; Wong *et al.*, 2020; Brook *et al.*, 2020; Pierce *et al.*, 2020). The present findings revealed that 15.4% to 35.2% of the participants experience mild to extremely severe mental illness (Table 4.2). It is worth highlighting that a higher prevalence of anxiety symptoms was observed among the participants compared to depression and stress symptoms (Table 4.2).

This finding implies that the Malaysian population became increasingly vulnerable to anxiety disorder as the pandemic continued. The results obtained from this study are consistent with a previous study by Ni *et al.* (2020). They have revealed that among the 1577 study participants from China, 23.8% and 19.2% of them were diagnosed with anxiety and depression, respectively. Quarantine, loss of employment,

and fear of financial status were among the major factors contributing to the global increase in anxiety (Skoda *et al.*, 2020). Anxiety can be characterized as a condition that presents troubled thoughts and behavioural changes due to overreaction to threatening situations (Kamaludin *et al.*, 2020). It is the most common psychological problem and is highly associated with the global burden of illness (Bandelow *et al.*, 2017). Anxiety also is the leading risk factor for suicide as it accounts for 70% of all suicide attempts (Nepon *et al.*, 2010).

The present finding also revealed that 30.6% of the participants experienced depressive symptoms during the MCO implementation (Table 4.2). These findings align with a meta-analysis study by Wang *et al.* (2020 b). They have reported that 30% of the total respondents (288 830 respondents) from 19 countries experienced depression during the COVID-19 pandemic. The highest prevalence of depression was observed in Hou, China (71.5%). It is reported that depression is the most prevalent mental health disorder and a major cause of morbidity in many countries, including the United States and Canada (Kader Maideen *et al.*, 2014; Kessler & Bromet, 2013). Depression commonly occurs among the adult population and is a severe disorder related to decreased quality of life (Ustün *et al.*, 2004). Despite the fact that anxiety and depression are linked, there are some differences have been identified. It is reported that anxiety is believed to cause more adverse effects on a person's physical health, causing shortness of breath, chest pain, and dizziness (Adwas *et al.*, 2019) compared to depression.

From the present study, stress is the least prevalent mental health observed among the participants, with 15.4% of the individuals observed to experience mild to extremely severe stress during the COVID-19 pandemic. A similar finding was reported by Wong *et al.* (2021), whereby the study participants perceived the lowest prevalence for stress (30.6%) compared with depression (59.2%) and anxiety (55.1%). Even though individuals are less likely to be stressed, it is still regarded as one of the most crucial risk factors contributing to mental illness (Seedat *et al.*, 2009). Feeling fatigued, anxiety and depression are the symptoms of stress that have been shown to impair social interaction. Thus, depression and stress are closely related (Hammen, 2005).

The Depression Anxiety Stress Scale (DASS-21), developed by Lovibond and Lovibond in 1995, is the most well-known survey instrument to assess mental health, including depression, anxiety, and stress. Thus, it was used in this study to validate items' with internal consistency and reliability of a Cronbach's alpha of 0.74-0.93 (Sinclair *et al.*, 2012). It is a well-established instrument for measuring depression, anxiety, and stress symptoms in clinical and non-clinical adult populations (Nordin *et al.*, 2017; Sinclair *et al.*, 2012). However, since DASS-21 was developed in Australia and applied to different socio-cultural contexts and populations, some evidence has shown that DASS-21 may not be valid when applied to different contexts. Hence, careful consideration when applying DASS-21 to the study is essentially crucial (Le *et al.*, 2017). Alternatively, instruments such as Generalized Anxiety Disorder-7 (GAD-7) and Patient Health Questionnaire-8 (PHQ-8) can also be used with different objectives and tested variables. PHQ-8 is an assessment used to investigate the

presence and severity of depressive disorder. In contrast, the GAD-7 is a seven-item scale that assesses generalised anxiety symptoms (Peters *et al.*, 2021).

The present study assessed the association of sociodemographic factors with mental health among the Malaysian population during the COVID-19 pandemic. The sociodemographic factors observed in this study include gender, age, marital status, level of education, living area, residential state, type of housing, type of job, ethnicity, religion, no of household members, and monthly income. A logistic regression analysis revealed a significantly higher risk of depression, anxiety, and stress symptoms among female participants compared to males. These results are consistent with the previous finding by Salari *et al.* (2020) and Wong *et al.* (2020). They have reported that the female population appears to have more psychological symptoms due to the COVID-19 pandemic than males. Studies have shown that women are more prone to stress and anxiety disorders in the aftermath of stressful events, whereas males exhibit greater resilience (McLean *et al.*, 2011). Fluctuating oestrogen levels have been demonstrated to cause a negative impact on stress and anxiety among females (Maeng & Milad, 2015). Hence, it is critical to explore gender-specific tactics to tackle mental health during health emergencies.

In this study, individuals aged 26-35-year-old reported having nearly twice the likelihood of developing mental health symptoms such as depression than those aged 36-45 years old. However, anxiety and stress showed no association with the age of the participants. In a study by Lee *et al.* (2020), it was found that the loneliness faced during this COVID-19 pandemic due to quarantine has been a major cause of mental health issues for young adults. Leaning on substances such as alcohol and drugs like

marijuana/cannabis, heroin, and cocaine has become a coping mechanism with loneliness for some individuals since being confined indoors due to an ongoing pandemic (Jemberie *et al.*, 2020). Due to this, a study by Merlo *et al.* (2021) reported a recent increase in the amount and frequency of alcohol use among young adults (18-35 years old) during the pandemic. Besides that, the pandemic also resulted in a major disruption in interpersonal development, career management, and education of young adults. Hence, the risk of psychological problems is significantly increased (Lee *et al.*, 2020).

Likewise, married and single individuals showed the likelihood of depression and stress symptoms than widowed individuals. The present finding contradicts a previous study conducted by Kader Maideen *et al.* (2014) among 1556 study participants in Selangor, Malaysia. The results from this study revealed a higher prevalence of psychological problems among divorcees (42.9%) than separated (33.3%), widowed (11.5%), or single adults (14%) (Kader Maideen *et al.*, 2014). Toxic households, including the addicted or abusive parent or spouse, significantly influence mental health in married couples and single individuals. Spending extra time at home could be exceedingly stressful if the individual has already been living in a toxic home situation. The Women's Aid Organisation and Talian Kasih reported a 57% increase in engagements following the government's MCO, with domestic violence identified as one of the causes (Shanmugam *et al.*, 2020). Besides, anxiety, domestic violence, and stress were found to be major factors contributing to depression (Kader Maideen *et al.*, 2014).

Living with many family members during the pandemic has been reported as a crucial factor associated with poor mental health, such as depression and stress (Table 4.3). Previous research by Li *et al.* (2020) found that women with more than two children had 14.2% more depression, 25.2% more anxiety, and 31.6% more acute stress symptoms than women with one or no children. The finding is highly associated with the peacefulness experienced at home during the COVID-19 pandemic. During this pandemic, parents and children spent most of their time together at home, which led to inevitable conflicts and anger resulting in disruption of emotions among the family members. Unstable financial status to support a large family, arguments among family members, and failure of children to meet parent's requirements during the pandemic were observed as the major factors that impeded the harmony within families and the mental health of family members (Wu *et al.*, 2020).

During the pandemic, staying at home was a solution to decrease the spread of the outbreak. However, it also means an increase in the number of people in the house, resulting in overcrowding and mental health problems. Previous research has also shown that the type of housing that the individual lives in during COVID-19 quarantine can strongly impact mental health. A study by Akbari *et al.* (2021) reported that living in private houses is better for mental health than low-rise and high-rise housing residents. This correlates with the current study that was carried out, which showed increased depression and anxiety among individuals living in townhouses. Thus, mental health is tied to the ambient variables in a house rather than space and the activities that a house may afford. It has been shown that healthy mental health is associated with adequate air quality, greenery, and nature.

## **CHAPTER 6**

### **CONCLUSION AND FUTURE RECOMMENDATIONS**

#### **6.1 Conclusion**

In conclusion, the present study indicates that 17.1%, 19.5%, and 9.2% of the participants experience moderate to extremely severe depressive, anxiety, and stress symptoms, respectively. It indicates that anxiety was the most prevalent mental health factor among the respondents during the COVID-19 pandemic. According to sociodemographic variables, young adults, individuals living in larger households, and females were more susceptible to mental health problems such as depression, anxiety, and stress. These findings highlight the importance of monitoring the mental health disorders in the general population during the COVID-19 pandemic and then offering targeted therapies for the variables that showed the most significance and association with mental health problems.

#### **6.2 Future recommendations**

Although the Malaysian MCO impacted people from all backgrounds, this study was limited to the general population among Malaysian citizens. Several instances of migrant workers and daily wage labourers mass migration from across the country to their hometowns were reported during the lockdown. These people suffered greatly due to a loss of employment and permanent housing in the cities where they worked. Staying away from their family and serving the country at such a critical moment may have negatively influenced health care professionals' mental health as

well. However, due to imposed constraints, researchers could not collect data from these communities and sectors. Thus, similar studies can be conducted to better understand the occurrence and impact of lockdown on migratory workers, medical professionals, and individuals living in shelter houses. Researchers can also include other mental health indicators besides depression, anxiety, and stress, such as eating disorders, insomnia, and bipolar affective disorder.



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## APPENDICES

**Table 1: A close-ended question using the Depression, Anxiety, and Stress Scale (DASS-21) was used in this study (sections A, B, and C).**

**Section A: Demographics of Respondents**

| Code | Variables                                                       | Response Options                                                                                                                                                                                                                                      | Not Applicable |
|------|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| DR1  | State                                                           | Johor<br>Kedah<br>Kelantan<br>Melaka<br>Negeri Sembilan<br>Pahang<br>Perak<br>Perlis<br>Pulau Pinang<br>Sabah<br>Sarawak<br>Selangor<br>Terengganu<br>Wilayah Persekutuan Kuala Lumpur<br>Wilayah Persekutuan Labuan<br>Wilayah Persekutuan Putrajaya |                |
| DR2  | State the district when you are undergoing PKP                  |                                                                                                                                                                                                                                                       |                |
| DR3  | State the postcode number of your residence when undergoing PKP |                                                                                                                                                                                                                                                       |                |
| DR4  | You live in the area                                            | Urban<br>Rural                                                                                                                                                                                                                                        |                |
| DR5  | Specify your type of residence                                  | Apartment<br>Condominium<br>Town House<br>Group/Cluster Houses<br>Twin house<br>Flat<br>Detached House (Luxury Bungalow)<br>Detached House (Traditional)<br>Terrace house<br>Others                                                                   |                |
| DR6  | Gender                                                          | Male<br>Female                                                                                                                                                                                                                                        |                |
| DR7  | State your age                                                  |                                                                                                                                                                                                                                                       |                |
| DR8  | Ethnic group                                                    | Bumiputera<br>Chinese<br>Indian<br>Other                                                                                                                                                                                                              |                |

Section A: Cohort's demographics and socioeconomics information, including residence during MCO, age, sex, religion, marital status, ethnic background, education level, type of job, and monthly income.

Section B: Questions related to health, history of chronic illness, and mental illness.

Section C: Information related to the impacts of COVID-19 on their mental health.

**Table 1: A close-ended question using the Depression, Anxiety, and Stress Scale (DASS-21) was used in this study (sections A, B, and C) (cont.).**

**Section A: Demographics of Respondents**

| Code | Variables                         | Response Options                                                                                                                                                                                                                      | Not Applicable |
|------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| DR9  | Religion                          | Islam<br>Christian<br>Hindu<br>Buddist<br>Others                                                                                                                                                                                      |                |
| DR10 | Marital Status                    | Single<br>Married<br>Widow/Widower                                                                                                                                                                                                    |                |
| DR11 | State the number of households    |                                                                                                                                                                                                                                       |                |
| DR12 | Level of education                | Primary school<br>Lower secondary (PMR/SRP/PT3)<br>Upper secondary (SPM/STPM)<br>Diploma or equivalent<br>Bachelor's degree or equivalent<br>Master's degree or equivalent<br>Doctor of Philosophy<br>Never received formal education |                |
| DR13 | Type of job                       | Self-employed<br>Government/Statutory Bodies<br>Private/Government Linked Companies ("GLCs")<br>Retired<br>Students<br>Not working                                                                                                    |                |
|      | If working, state your occupation |                                                                                                                                                                                                                                       |                |
| DR14 | Monthly income (individuals)      | RM 4, 360 per month and below<br>Between RM4, 361 - RM 9, 619<br>RM 9, 620 and above<br>No income                                                                                                                                     |                |

Section A: Cohort's demographics and socioeconomics information, including residence during MCO, age, sex, religion, marital status, ethnic background, education level, type of job, and monthly income.

Section B: Questions related to health, history of chronic illness, and mental illness.

Section C: Information related to the impacts of COVID-19 on their mental health.

**Table 1: A close-ended question using the Depression, Anxiety, and Stress Scale (DASS-21) was used in this study (sections A, B, and C) (cont.).**

| <b>Section B: Information Health Related Respondents</b> |                                                                                                                                                                        |                                   |                |
|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------|
| Code                                                     | Variables                                                                                                                                                              | Response Choice                   | Not Applicable |
| HRR1                                                     | Do you have any chronic illness?                                                                                                                                       | Yes (please specify below)<br>No. |                |
| HRR2                                                     | If Yes, please state your chronic illness                                                                                                                              |                                   |                |
| HRR3                                                     | Have you been diagnosed with any health related Mental illness?                                                                                                        | Yes (please specify below)<br>No. |                |
| HRR4                                                     | If Yes, please state the name of the mental health illness and the period confirmed suffering from the disease                                                         |                                   |                |
| HRR5                                                     | Are you currently receiving any treatment for a related illness such mental health? (This question needs to be answered if the answer is on the above question is Yes) | Yes (please specify below)<br>No. |                |
| HRR6                                                     | If Yes, please specify the type of treatment.                                                                                                                          |                                   |                |

Section A: Cohort's demographics and socioeconomics information, including residence during MCO, age, sex, religion, marital status, ethnic background, education level, type of job, and monthly income.

Section B: Questions related to health, history of chronic illness, and mental illness.

Section C: Information related to the impacts of COVID-19 on their mental health.

**Table 1: A close-ended question using the Depression, Anxiety, and Stress Scale (DASS-21) was used in this study (sections A, B, and C) (cont.).**

**Section C: Implications of The Movement Control Order (MCO) Against Mental Health**

| Code                                | Variables                                                                                                               | Likert Scale    |      |          |            | Not<br>Applicable |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------------|------|----------|------------|-------------------|
|                                     |                                                                                                                         | 0               | 1    | 2        | 3          |                   |
|                                     |                                                                                                                         | Never<br>at All | Rare | Frequent | Very Often |                   |
| Impact of COVID-19 on Mental Health |                                                                                                                         |                 |      |          |            |                   |
| DASS1                               | I find it hard to calm down.                                                                                            |                 |      |          |            |                   |
| DASS2                               | I realized my mouth felt dry.                                                                                           |                 |      |          |            |                   |
| DASS3                               | I can't seem to experience any positive feelings at all.                                                                |                 |      |          |            |                   |
| DASS4                               | I have difficulty breathing (for example, breathing too fast, shortness of breath despite not doing physical activity). |                 |      |          |            |                   |
| DASS5                               | I don't feel motivated to start a situation.                                                                            |                 |      |          |            |                   |
| DASS6                               | I tend to overreact to a situation.                                                                                     |                 |      |          |            |                   |
| DASS7                               | I used to tremble (e.g., hands).                                                                                        |                 |      |          |            |                   |
| DASS8                               | I feel too nervous                                                                                                      |                 |      |          |            |                   |
| DASS9                               | I was worried there would be a situation where I panicked and behaved irrationally.                                     |                 |      |          |            |                   |
| DASS10                              | I feel I don't have anything that I hoped for.                                                                          |                 |      |          |            |                   |
| DASS11                              | I find I am easily restless.                                                                                            |                 |      |          |            |                   |
| DASS12                              | I find it hard to relax.                                                                                                |                 |      |          |            |                   |
| DASS13                              | I feel gloomy and sad.                                                                                                  |                 |      |          |            |                   |

Section A: Cohort's demographics and socioeconomics information, including residence during MCO, age, sex, religion, marital status, ethnic background, education level, type of job, and monthly income.

Section B: Questions related to health, history of chronic illness, and mental illness.

Section C: Information related to the impacts of COVID-19 on their mental health.

**Table 1: A close-ended question using the Depression, Anxiety, and Stress Scale (DASS-21) was used in this study (sections A, B, and C) (cont.).**

| Section C: Implications of The Movement Control Order (MCO) Against Mental Health                                                                                                                         |                                                                                                                  |                                     |      |          |            |                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------|------|----------|------------|----------------|
| Code                                                                                                                                                                                                      | Variables                                                                                                        | Likert Scale                        |      |          |            | Not Applicable |
|                                                                                                                                                                                                           |                                                                                                                  | 0                                   | 1    | 2        | 3          |                |
|                                                                                                                                                                                                           |                                                                                                                  | Never at All                        | Rare | Frequent | Very Often |                |
|                                                                                                                                                                                                           |                                                                                                                  | Impact of COVID-19 on Mental Health |      |          |            |                |
| DASS14                                                                                                                                                                                                    | I can't accept anything that stops me from continuing what I'm doing                                             |                                     |      |          |            |                |
| DASS15                                                                                                                                                                                                    | I almost panicked                                                                                                |                                     |      |          |            |                |
| DASS16                                                                                                                                                                                                    | I'm not excited at all                                                                                           |                                     |      |          |            |                |
| DASS17                                                                                                                                                                                                    | I feel worthless                                                                                                 |                                     |      |          |            |                |
| DASS18                                                                                                                                                                                                    | I am easily offended                                                                                             |                                     |      |          |            |                |
| DASS19                                                                                                                                                                                                    | Even though I didn't do any physical activity, I was aware of the throbbing in my heart (e.g., faster heartbeat) |                                     |      |          |            |                |
| DASS20                                                                                                                                                                                                    | I'm scared for no reason                                                                                         |                                     |      |          |            |                |
| DASS21                                                                                                                                                                                                    | I don't think this life is meaningful anymore                                                                    |                                     |      |          |            |                |
| Section A: Cohort's demographics and socioeconomics information, including residence during MCO, age, sex, religion, marital status, ethnic background, education level, type of job, and monthly income. |                                                                                                                  |                                     |      |          |            |                |
| Section B: Questions related to health, history of chronic illness, and mental illness.                                                                                                                   |                                                                                                                  |                                     |      |          |            |                |
| Section C: Information related to the impacts of COVID-19 on their mental health.                                                                                                                         |                                                                                                                  |                                     |      |          |            |                |

**Table 2: The 21-items of DASS-21 that represent the depression, anxiety, and stress symptoms.**

| No  | Question                                                                                                                | N | S | O | AA | D | A | S |
|-----|-------------------------------------------------------------------------------------------------------------------------|---|---|---|----|---|---|---|
| 1.  | I find it hard to calm down.                                                                                            | 0 | 1 | 2 | 3  |   |   |   |
| 2.  | I realized my mouth felt dry.                                                                                           | 0 | 1 | 2 | 3  |   |   |   |
| 3.  | I can't seem to experience any positive feelings at all.                                                                | 0 | 1 | 2 | 3  |   |   |   |
| 4.  | I have difficulty breathing (for example, breathing too fast, shortness of breath despite not doing physical activity). | 0 | 1 | 2 | 3  |   |   |   |
| 5.  | I don't feel motivated to start a situation.                                                                            | 0 | 1 | 2 | 3  |   |   |   |
| 6.  | I tend to overreact to a situation.                                                                                     | 0 | 1 | 2 | 3  |   |   |   |
| 7.  | I used to tremble (e.g., hands).                                                                                        | 0 | 1 | 2 | 3  |   |   |   |
| 8.  | I feel too nervous.                                                                                                     | 0 | 1 | 2 | 3  |   |   |   |
| 9.  | I was worried there would be a situation where I panicked and behaved stupidly.                                         | 0 | 1 | 2 | 3  |   |   |   |
| 10. | I don't think I had what I expected (despair).                                                                          | 0 | 1 | 2 | 3  |   |   |   |
| 11. | I find I am easily restless.                                                                                            | 0 | 1 | 2 | 3  |   |   |   |
| 12. | I find it hard to relax.                                                                                                | 0 | 1 | 2 | 3  |   |   |   |
| 13. | I feel gloomy and sad.                                                                                                  | 0 | 1 | 2 | 3  |   |   |   |
| 14. | I can't accept anything that stops me from continuing what I'm doing.                                                   | 0 | 1 | 2 | 3  |   |   |   |
| 15. | I almost panicked.                                                                                                      | 0 | 1 | 2 | 3  |   |   |   |
| 16. | I'm not excited at all.                                                                                                 | 0 | 1 | 2 | 3  |   |   |   |
| 17. | I feel worthless.                                                                                                       | 0 | 1 | 2 | 3  |   |   |   |
| 18. | I am easily offended.                                                                                                   | 0 | 1 | 2 | 3  |   |   |   |
| 19. | Even though I didn't do any physical activity, I was aware of the throbbing of my heart (e.g., faster heartbeat).       | 0 | 1 | 2 | 3  |   |   |   |
| 20. | I'm scared for no reason.                                                                                               | 0 | 1 | 2 | 3  |   |   |   |
| 21. | I don't think this life is meaningful anymore.                                                                          | 0 | 1 | 2 | 3  |   |   |   |

TOTAL

Question that related to the mental health symptoms. The total score for the respective questions was calculated to represent depression, anxiety, and stress scores.