MENTAL HEALTH DISORDERS AMONG ROHINGYA REFUGEES IN MALAYSIA

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MENTAL HEALTH DISORDERS AMONG ROHINGYA REFUGEES IN MALAYSIA

ABSTRACT

Mental health disorders among refugees has been recognized as a major public health issue. However, to date, there is limited evidence on the prevalence of Mental health disorders among Rohingya refugees residing in transit countries such as Malaysia. This study aimed to examine the prevalence and associated factors of Major Depressive Disorder (MDD), generalized anxiety disorder (GAD) and post-traumatic stress disorder (PTSD) among Rohingya refugees in Malaysia. Adult Rohingya refugees residing in Selangor (n = 220) were randomly selected to participate in this cross-sectional study that was conducted from June to November 2019. Perceived social support, religious orientation, and food security was assessed using the Multidimensional Scale of Perceived Social Support (MSPSS), Religious Orientation Scale-Revised (ROS-R) and the Radimer/Cornell food insecurity instrument. Mini-International Neuropsychiatric Interview (MINI) was used to examine MDD, GAD, and PTSD. The prevalence of GAD, PTSD, and MDD was reported at 92 (41.8%), 84 (38.2%) and 71 (32.3%). Several factors were significantly associated with MDD following multivariate analysis namely being female (AOR = 2.54; 95% CI 1.21, 5.34), living in Malaysia for less than 1 year (AOR = 6.95; 95% CI 1.89, 25.57), having been physically injured (AOR = 3.25; 95% CI 1.52, 6.96), perceived low/moderate social support (AOR = 2.17; 95% CI 1.13, 4.19) and food insecurity (AOR = 2.77; 95% CI 1.19, 6.47). Exposure to violence (AOR = 38.46; 95% CI 16.27, 90.91) and food insecurity (AOR = 3.74; 95% CI 1.41, 9.91) were significantly associated with PTSD. The findings of this study provide new evidence relating to the burden and risk factors of Mental health disorders among Rohingya refugees residing in Malaysia, addressing these risk factors could improve mental health among this population.

Keywords: Rohingya, MDD, PTSD, GAD

MENTAL HEALTH DISORDERS AMONG ROHINGYA REFUGEES IN MALAYSIA

ABSTRAK

Gangguan kesihatan mental di kalangan pelarian telah diakui sebagai masalah kesihatan awam yang utama. Namun, setakat ini, terdapat bukti yang terhad mengenai 'prevalence' gangguan kesihatan mental di kalangan pelarian Rohingya yang tinggal di negara transit seperti Malaysia. Kajian ini bertujuan untuk mengkaji 'prevalence' dan faktor-faktor yang berkaitan dengan 'Major Depressive Disorder' (MDD), 'Generalized Anxiety Disorder' (GAD) dan 'Post Traumatic Stress Disorder' (PTSD) di kalangan pelarian Rohingya di Malaysia. Pelarian Rohingya dewasa yang tinggal di Selangor (n = 220) dipilih secara rawak untuk menyertai dalam kajian keratan rentas ini yang dijalankan dari Jun hingga November 2019. Sokongan sosial, orientasi keagamaan, dan keselamatan makanan telah dinilai menggunakan Skala Multidimensi Sosial yang Dirasakan Sokongan (MSPSS), Skala 'Multidimensional Scale of Perceived Social Support (MSPSS)', 'Religious Orientation Scale-Revised (ROS-R)' dan 'Radimer/Cornell food'. 'Mini-International Neuropsychiatric Interview (MINI)' digunakan untuk memeriksa MDD, GAD, dan PTSD. 'Prevalence' GAD, PTSD, dan MDD dilaporkan pada 92 (41.8%), 84 (38.2%) dan 71 (32.3%). Beberapa faktor dikaitkan secara 'significant' dengan MDD berikutan analisis multivariat iaitu jantina wanita (AOR = 2.54; 95% CI 1.21, 5.34), tinggal di Malaysia kurang dari 1 tahun (AOR = 6.95; 95% CI 1.89, 25.57), kecederaan fizikal (AOR = 3.25; 95% CI 1.52, 6.96), perasaan sokongan sosial rendah / sederhana (AOR = 2.17; 95% CI 1.13, 4.19) dan keslamatan makanan yang tidak mencukupi (AOR = 2.77; 95% CI 1.19, 6.47). Pendedahan kepada keganasan (AOR = 38.46; 95% CI 16.27, 90.91) dan keslamatan makanan yang tidak mencukupi (AOR = 3.74; 95% CI 1.41, 9.91) dikaitkan dengan PTSD. Penemuan kajian ini memberikan bukti baru berkaitan dengan beban dan faktor risiko gangguan kesihatan mental di kalangan pelarian Rohingya yang tinggal di Malaysia. Menangani faktor risiko ini dapat meningkatkan kesihatan mental di kalangan penduduk ini.

Kata kunci: Pelarian Rohingya, MDD, PTSD, GAD

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LIST OF SYMBOLS AND ABBREVIATIONS

MDD   :   Major Depressive disorder

PTSD   :   Post-traumatic stress disorder

UNHCR   :   United Nations High Commissioner for Refugees

SEM   :   Social-Ecological Model

SPSS   :   Statistical Package for the Social Sciences

CI   :   Confidence interval

OR   :   Odds ratio

NGO   :   Non-Governmental Organizations

RSM   :   Rohingya Society of Malaysia

GAD   :   Generalized Anxiety Disorder

MSPSS   :   Multidimensional Scale of Perceived Social Support

ROS-R   :   Religious Orientation Scale-Revised

MINI   :   Mini- International Neuropsychiatric Interview

AOR   :   Adjusted Odds ratio

DSM   :   Diagnostic Statistic Manual

CDC   :   Centre of Disease Control

UMREC   :   University of Malaya Research Ethical Committee

UMMC   :   University Malaya Medical Centre

VIF   :   Variance inflation factor

UK   :   United Kingdom

USA   :   United States of America

CNS   :   Central Nervous System

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CHAPTER 1: INTRODUCTION

This research aims to first determine the prevalence of MDD, GAD and PTSD among Rohingya refugees in Malaysia. Second, this study examines the associated namely demographic characteristics, perceived social support, religious orientation and food security associated with MDD, GAD, and PTSD. This chapter outlines the background of the study, the problem statement, the rationale, the research questions and the objectives of this study and the outline of this thesis.

1.1 Background of study

Refugees worldwide are commonly affected by mental health disorders namely MDD, PTSD, and GAD. Such mental health disorders require early diagnosis and interventions to improve the recovery rates and prognosis of these mental health disorders. Rohingya are individuals that initially originated from Myanmar, however, in 1982 these individuals were denied citizenship in Myanmar, thus denying them basic human rights (Tay et al., 2018). As a result, the Rohingya were stateless people, which currently accounts for the majority of refugees worldwide (UNHCR, 2018). Many of these Rohingya refugees seek asylum in countries such as Lebanon, Pakistan, Bangladesh, Iran, Pakistan, Uganda, Turkey, and Malaysia (UNHCR, 2018). Since Malaysia is not a signatory to the 1951 Refugee Convention, it does not provide for asylum systems or laws to manage and regulate the status of refugees (Letchamanan, 2013).

With the rising number of Rohingya refugees in Malaysia over the past few decades, exposure of these individuals to harsh living conditions and lack of healthcare support, it is almost certain that many of them would be suffering from mental health disorders (Tay et al., 2018). However, to date, there are limited studies conducted

among Rohingya refugees in Malaysia that have reported on the prevalence and associated factors (risk/protective) of mental health disorders (Tay et al., 2018).

1.1.1 Refugee and Asylum seeker

A refugee is as "a person who is outside his/her country of nationality or habitual residence; has fear of persecution because of his/her race, religion, nationality, membership in a particular social group or political opinion; and is unable or unwilling to avail himself/herself of the protection of that country, or to return there, for fear of persecution" (Lustig et al., 2004). As a result, these refugees leave their original countries involuntarily, in fear of persecution and the constant dangers at home prevent their return.

According to the United Nations High Commissioner for Refugees (UNHCR), there are almost 22 million refugees located throughout the world. Most of these refugees have not been resettled to safety. A large majority (86%) of refugees globally reside in developing nations and may remain stuck in a limbo state in a post-conflict country (UNHCR, 2016).

A person who has left their original country and seeks protection in a foreign state is a person registered as an asylum seeker (Honkanen, 2016). Seeking asylum is considered a basic human right (Honkanen, 2016). Hence, those who are not registered as refugees are asylum seekers. Individuals who are granted asylum will obtain the status of a refugee (Honkanen, 2016). Those who are asylum seekers are usually awaiting formal processes and reside in the asylum seeker reception center. Respective asylum systems will decide whether those seeking asylum should be granted any protection internationally and they fulfill refugee status. Both Rohingya refugees and asylum seekers are within the scope of this literature review as they represent the same person in different stages of flight.

1.1.2 Rohingya refugees in Malaysia

To date, around 70,000 Rohingya refugees are registered with UNHCR Malaysia, while about 30,000 to 40,000 more remain unregistered. The Rohingya came in waves with the highest numbers of arrivals in the period 1990 to 1994, 2000 to 2004 and 2012 to 2015. In the period from 2012 to 2015, many arrived by boat in Thailand after undertaking dangerous journeys across the Andaman Sea before being smuggled or trafficked into Malaysia (Tazreiter, Pickering, & Powell, 2017; UNHCR, 2017). Rohingya live throughout Peninsular Malaysia, all being considered 'illegal' or 'prohibited' immigrants under the Immigration Act and therefore are at risk of arrest (Wake, 2016; Wake & Cheung, 2016). The Rohingya in Malaysia live in overcrowded housing with a lack of access to educational opportunities, employment, and healthcare (Verghis, 2013). Some Rohingya have lived for decades in Malaysia and have established livelihoods and/or receive remittances from relatives resettled in Australia, Canada, Denmark or Sweden (Huennekes, 2018), but many continue to live in precarious economic situations (Azis, 2014). Those who have been detained in immigration detention centers are at risk of indefinite confinement, malnutrition, physical and mental abuse and assault, exploitation, and extortion (International Rescue Committee, 2012).

1.1.3 Mental health disorders disorder among refugees

Vulnerable populations such as Asylum seekers and refugees are predisposed to develop mental health disorders (Honkanen, 2016). As a consequence, these mental health disorders may impact as far as second or third-generation refugees (Honkanen, 2016). The risk factors for refugee mental health disorders mainly arise from traumatic experiences such as violence, torture, separation from family and disorganization in

their original countries (Honkanen, 2016). The mental health challenges of refugees can be classified into three stages based on the status of their journey. (Honkanen, 2016). These phases are premigration, migration, and resettlement, each presenting unique challenges (Lustig et al., 2004). During the pre-migration stage, they are exposed to violence, struggle through war, conflicts of family members and disappearances or deaths of loved ones (Henley & Robinson, 2011). Refugees families also encounter threats during the pre-migration stage (Henley & Robinson, 2011).

The migration stage involves sudden evacuation which results in dangers that pose through geographical challenges (such as crossing deserts, mountains, rivers), encountering wild animals and lack of basic amenities (Geltman et al., 2005). This stage would result in a long stay in refugee camps or transit centers in the first asylum countries. Here they may be exposed to further stressors such as poor basic access to food, water, security and education (Grabska, 2006). Others who escape by sea, further face hazards such as starvation, dehydration and may also be witnesses to the death of fellow travelers (Henley & Robinson, 2011).

These pre-migration and migration experiences would result in a wide range of adversities. For example, refugees could be fearful of authorities and may result in insolation (Henley & Robinson, 2011). Refugees could also endure injuries due to conflicts or escape. Only about less than 1% of refugees worldwide are given the chance for resettlement in a country (Henley & Robinson, 2011). These lucky few confront additional challenges (Henley & Robinson, 2011).

Research internationally concludes that the environment during the post-migration stage may have as much impact on the mental health of the pre-migration and migration stage (Porter & Haslam, 2005). During resettlement, refugees must try to adapt to a new environment with sociocultural diversities (Bates et al., 2005). Other

stressors in the post-migration stage also include cultural bereavement and acculturation stress (Crowley, 2009). Additionally, many refugees also suffer separation from their family, friends and experience stress upon reuniting with lost ones (Cécile Rousseau, Rufagari, Bagilishya, & Measham, 2004). Several studies have reported that the commonest mental health disorder suffered by refugees worldwide was MDD, PTSD, and GAD (Turrini et al., 2017).

1.2   Problem Statement

The problem statement based on the Rohingya refugees residing in Malaysia is discussed in the following paragraphs.

1.2.1   An increasing number of Rohingya refugees

In the year 2018, there are about 158620 refugees in Malaysia, an increase of 4% compared to the year 2017 (UNHCR, 2018). Of which 87% are persecuted ethnic groups from Myanmar (UNHCR, 2018). The Myanmar refugees and asylum seekers comprise of Rohingya 73900 (an increase of 62% from the year 2013) Chins, Shins, Myanmar Muslims and Arakanese and Rakhine. The majority (66%) of these refugees are males and 26% are below 18 years of age (UNHCR, 2018). Selangor state and the Federal Territory of Kuala Lumpur have the largest number of refugees and asylum seekers compared to other states in Malaysia (Letchamanan, 2013).

1.2.2   Under recognition of mental health disorders among the Rohingya refugees

There are limited published prevalence data about mental disorders among Rohingya groups aside from Bangladesh (Tay et al., 2018). There are also no systematic studies around mental health problems of Rohingya in other countries,

apart from a brief report that identified major stress factors for Rohingya refugee men in the United States (Jeremiah, Magan, Oyewuwo-Gassikia, & Ibrahim, 2017). Furthermore, the majority of the studies looking into the prevalence of mental health disorders and factors (risk/protective) among Rohingya refugees in Malaysia were unpublished reports conducted by non-governmental organizations (NGO) (Tay et al., 2018). To date in Malaysia, there are only three studies that have examined mental health disorders among refugee populations, two of which were conducted among adolescent refugees (Gosnell, 2017; Low, Tan, Kok, Nainee, & Viapude, 2018) and one among the adult refugees (Shaw, Pillai, & Ward, 2018). However, all the above studies did not specifically report on the prevalence or association factors of mental health disorders among the Rohingya refugees. A lack of studies could reflect a sense of ignorance towards mental health disorders among this population (Tay et al., 2018). It is only fair that since the Rohingya refugees make up the majority of refugees in Malaysia, more studies are needed to address this gap in the literature.

1.2.3   Challenges and stress faced by Rohingya refugees

Refugees often experience trauma and mental distress, both before leaving their country of origin and when seeking shelter in a country of the first asylum such as in Malaysia. Experiencing or witnessing traumatic events such as death threats and torture, exposure to war, financial insecurity and political persecution have been associated with higher rates of mental distress (Buscher & Heller, 2010). Displacement-related stressors such as social isolation, poverty, unemployment, a lack of social support, discrimination and a loss of meaningful activity play a major role in causing mental health concerns (Buscher & Heller, 2010). Due to these challenges and stressors, effort must be made to report on the prevalence of mental health disorders among these refugees. By identifying the protective and risk factors of mental health

disorders among these populations, targeted intervention can be delivered to reduce the burden of mental health disorders among the Rohingya refugees by private, governmental and NGO.

1.2.4 Unmet mental health needs of Rohingya refugees

This population could be unaware of the underlying mental health problems that they are facing due to poor mental health literacy (Henley & Robinson, 2011). Limited accessibility to health care is common among refugees in Malaysia due to several reasons such as are lack of finance, ongoing security threats of arrest, detention and deportation, lack of recognition of their refugee status and language barriers (Buscher & Heller, 2010). Many a time all these unmet needs would result in poor help-seeking behaviors for mental health disorders, resulting in the worsening of underlying mental health disorders and even high-risk behaviors such as suicide (Buscher & Heller, 2010).

1.2.5 Implications of untreated mental health disorders among Rohingya refugees

Individuals with mental health disorders such as MDD, GAD, and PTSD would not only have negative health consequences but also these disorders will lead to significant financial and social constraints (Angold et al., 1998; Bodden, Dirksen, & Bögels, 2008). There could be a possibility to develop other forms of mental health disorders due to an underlying existing mental health disorders. For example, MDD increases the risk for other mental disorders (Angold & Costello, 1993). Individuals suffering from mental health disorders may also have an associated increased risk of high-risk behaviors such as suicide and substance abuse (Brent, Poling, & Goldstein, 2011; Ge et al., 2009; Yaacob, Juhari, Talib, & Uba, 2009). The stigma of mental health

disorders, which would interfere with help-seeking, compliance with treatment, and social isolation (Corrigan, 2004; Sirey et al., 2001). Finally, this would likely disrupt the functional, emotional, mental and social development, therefore resulting in an impairment of interpersonal relationship with family, peers, and maybe even increase the incidence of violence, legal issues, substance abuse, recurrence of mental health disorders, impaired health, conduct disorders and suicide (Angold & Costello, 2001; Brent et al., 2011; National Institute of Mental Health, 2014; Thapar, Collishaw, Pine, & Thapar, 2012; Yaacob et al., 2009). In summary mental health disorders among refugees have many negative consequences at an individual level, interpersonal level, community, and societal level.

1.3 Study Rationale

1.3.1 Evidence-informed policies and programs

To date in Malaysia, there are a limited number of studies relating to mental health disorders among Rohingya refugees. The reason for this is simply because of first, difficulties in obtaining funding for refugee-related research, as existing research funding is prioritized for health issues concerning citizens. Second, limited access to information systems and databases containing data on the health of the migrant and refugee population (Chuah, Tan, Yeo, & Legido-Quigley, 2019). Nevertheless, such studies involving refugees are important as they highlight the prevalence of mental health disorders which would reflect the burden of disease among this vulnerable population, which otherwise would never surface. Besides, a study such as this one would also provide some understanding regarding the sociodemographic profile and factors (risk and protective) for mental health disorders. As Malaysia is a transit country for these refugees, most of them face difficulties in accessing basic universal healthcare. Current programs that look into the health and welfare of these refugees

are mainly conducted by UNHCR, Malaysia as well as some NGO's (Chuah et al., 2019). Therefore, generating more evidence-informed policies for this underprivileged population, more studies such as this one would be crucial.

1.3.2   Screening for MDD, GAD, and PTSD

With the harsh living condition, there is no doubt that the Rohingya refugees in Malaysia may be suffering from mental health disorders. Unfortunately, many of them do not seek help due to various reasons such as lack of awareness of mental health disorders and cost associated with healthcare (Chuah et al., 2019). This study not only bridges the gaps in the literature with regards to mental health disorders among Rohingya refugees in Malaysia, but it also serves as a platform to detect participants suffering from MDD, GAD, and PTSD. Additionally, this research study would also provide help to those detected with mental health disorders in the form of counseling, referral to a psychologist in UNHCR, Malaysia and referrals to hospitals. Participants in this study would benefit from these additional services that otherwise would be difficult for them to access.

1.4   Research hypothesis, questions, and objectives

1.4.1   Research hypotheses and questions

Research question 1: What is the prevalence of Major MDD disorder, GAD and PTSD among Rohingya refugees in Malaysia?

Research question 2: Is there an association between Perceived Social Support, Religious orientation, and food insecurity and Major MDD disorder among Rohingya refugees in Malaysia?

Null Hypotheses: Perceived Social Support, Religious orientation, and food insecurity are not associated with MDD.

Research question 3: Is there an association between Perceived Social Support, Religious orientation, and food insecurity and GAD among Rohingya refugees in Malaysia?

Null Hypotheses: Perceived Social Support, Religious orientation, and food insecurity are not associated with GAD.

Research question 4: Is there an association between Perceived Social Support, Religious orientation, and food insecurity and PTSD among Rohingya refugees in Malaysia?

Null Hypotheses: Perceived Social Support, Religious orientation and food insecurity are not associated with PTSD.

1.4.2   General Objectives

This study aims to examine the prevalence of PTSD, MDD, and GAD, and factors associated with these mental health disordersamong adult Rohingya refugees in Malaysia.

1.4.3   Specific Objectives

a) To determine the prevalence of MDD, PTSD and GAD disorders among Rohingya refugees.

b) To determine the association of Perceived Social Support, Religious orientation and Food security with MDD among Rohingya refugees.

c) To determine the association of Perceived Social Support, Religious orientation and Food security with GAD among Rohingya refugees.

d) To determine the association of Perceived Social Support, Religious orientation and Food security with PTSD among Rohingya refugees.

1.5   Study outline

This thesis consists of six chapters. Chapter 1 provides an introduction to the thesis. Chapter 2 presents a review of the literature which was conducted in this study. Chapter 3 presents the methodology of this study. Chapter 4 is a presentation of the results of data analysis. Chapter 5 is a discussion on the prevalence of MDD, GAD and PTSD and justifications for the results obtained from the direction of the association of the independent variables with MDD, GAD, and PTSD. Finally, Chapter 6 presents the conclusions and recommendations generated from this thesis. Directions for future studies are also suggested in this section.

CHAPTER 2: LITERATURE REVIEW

2.1   Introduction

This chapter present is a review of literature that aims to summaries the literature on the following (a) Statistics of refugees worldwide which are discussed in Section 2.2 (b) prevalence of MDD, PTSD, GAD among Refugees (including Rohingya refugees) which is discussed in Section 2.3 and (c) determinants of MDD, PTSD, and GAD among refugees (including Rohingya refugees) which is discussed in Section 2.4. The theoretical and conceptual framework used in this study was described in this chapter as well in Sections 2.6 and 2.7.

2.2   Statistics of Refugees

2.2.1   Global refugee statistics

As of 2018, about 68.5 million people have been forced from home (UNHCR, 2018). Of which 25.4 million are refugees, over half of whom are under the age of 18. Only 102800 refugees have been resettled (UNHCR, 2018). There are 10 million stateless people who have been denied nationality and access to basic rights. The majority of refugees worldwide (57%) come from Syria, Afghanistan, and South Sudan (UNHCR, 2018). The top refugee-hosting countries are Iran, Lebanon, Pakistan, Uganda, and Turkey are top refugee-hosting countries (UNHCR, 2018).

2.2.2   Malaysian refugee statistics

According to UNCHR as of June 2018, there are 158620 refugees and asylum seekers in Malaysia (UNHCR, 2018). Majority of these refugees are from Myanmar (Burma) (137380) followed by Pakistan (5790), Yemenis (2860), Somalis (2810), Syrians (2760), Sri Lankans (1900), Afghan (1660), Iraqis (1480) and Palestinians

(780) (UNHCR, 2018). The Myanmar refugees and asylum seekers comprise of 73900 Rohingya, 30530 Chins, 9840 Myanmar Muslims, 4010 Rakhine and Arakanese (UNHCR, 2018). Around 66% of these refugees and asylum seekers in Malaysia are males and 26% (42017) are individuals ages below 18 years (UNHCR, 2018). Selangor (617000) and Kuala Lumpur (29900) states have the largest number of total refugees and asylum seekers compared to other states in Malaysia (UNHCR, 2018). More concerning is the increasing number of Rohingya refugees in Malaysia when compared to the year 2013 which reported only 28120 registered Rohingya refugees to currently 70,000 (Letchamanan, 2013).

2.3 Prevalence of mental health disorders among refugees

An umbrella of a recent review published in 2017 identified 13 reviews that reported data on the prevalence of common mental disorders among both adult and children refugee and asylum seekers population (Turrini et al., 2017). They found that MDD and GAD were at least as frequent as PTSD, accounting for up to 40% of asylum seekers and refugees (Turrini et al., 2017). The estimated prevalence of mental health disorders among refugees is as the following; GAD was reported between 4 to 40%, 5 to 44% for MDD and 9 to 36% for PTSD (Turrini et al., 2017). In Malaysia, limited studies have reported on the mental health disorders among adult refugees, one study by Shaw et al. (2018) reported that 98.8% of adult refugees in Malaysia suffer from PTSD, MDD, and GAD (Shaw et al., 2018). The data on the prevalence of PTSD, MDD, and GAD among Rohingya refugees are far limited and the majority were focused on Rohingya refugees in Bangladesh. Riley et al. (2017) reported a prevalence of MDD at 89%, PTSD at 36% and GAD at 14% among adult Rohingya refugees in Bangladesh.

2.4   Determinants of mental health disorders among refugees

The Social-Ecological Model (SEM) was used to classify the determinants of mental health disorders among refugees into the following levels namely individual level of influences, interpersonal relationship level influence, and community level influence (Bronfenbrenner, 1994). Individual-level influences such as gender (being female) and older age have been identified by studies as a significant risk factor for MDD and PTSD among adult Rohingya refugees (Riley et al., 2017). Studies have also reported that poor educational levels, unemployment, unmarried, exposure to violence and physical injuries all being significant risk factors for developing mental health disorders such as MDD, GAD, and PTSD among refugees (Kirmayer et al., 2011; Tay et al., 2018). Interpersonal relationship level influences such as environmental stressors have been identified as significant risk factors for both MDD and PTSD among the Rohingya refugees such as food insecurity being homelessness, freedom of movement, concern about safety and separation from a family member (Riley et al., 2017). Community-level influences such as duration of displacement also have been reported as a significant risk factor for mental health disorders among refugees (Bronfenbrenner, 1994). A longer duration of displacement is reported to increase the risk of mental health disorders among refugees (Gosnell, 2017). Finally, societal level influences such as poor social support and poor religious orientation have been identified as significant risk factors for developing mental health disorders such as MDD, GAD, and PTSD among refugees (Kirmayer et al., 2011; Tay et al., 2018).

2.5   Gap in literature

The majority of studies on mental health disorders among refugees are conducted in high-income countries and non-conflict countries while limited research is done in post-conflict areas (first transit areas) such as Malaysia & Thailand (Gosnell, 2017;

Turrini et al., 2017). There is inadequate assessment of mental health disorders especially MDD, PTSD and GAD among adult Rohingya refugee populations in Malaysia (Tay et al., 2018). Up-to-date information on the rate and characteristics of mental health disorders such as MDD, GAD, and PTSD based on the latest Diagnostic Statistic Manual (DSM) 5 criteria among refugees in Malaysia is needed (Honkanen, 2016; Kirmayer et al., 2011). There is a need to examine factors that contribute to MDD, PTSD, and GAD among Rohingya refugees in Malaysia. The majority of factors have been examined among refugees in western countries (Fazel, Reed, Panter-Brick, & Stein, 2012). As Malaysia is not a resettlement country these refugees are under constant conflict and they require periodic mental health assessment (Fazel et al., 2012). Overall the above gaps need to be addressed to provide some light on careful clinical and policy consideration of Rohingya refugee/asylum seekers in the Malaysian context.

2.6   Theoretical framework

The SEM, analyzes the development of an individual's in the context of the relationships that make up their environment (Paquette & Ryan, 2001). It is also known as the "Bio Ecological Systems Theory," which focuses on the biology of an individual which is the major element influencing development (Paquette & Ryan, 2001). The factors associated are their immediate family, community environment and social landscape which play a role in their development (Paquette & Ryan, 2001). Changes or conflict in any one layer will affect the other layers (Paquette & Ryan, 2001). Therefore, this model studies the interaction of the biological and social factors of a person's environment.

The SEM has undergone many modifications in the past. The Urie Bronfenbrenner's Ecological Systems Theory, is the most frequently used model (Bronfenbrenner, 1994). There are five factors within this model namely, microsystem, mesosystem, ecosystem, macrosystem, and chronosystem. The SEM has evolved to become a useful model in identifying risk factors of individuals in the field of medicine. The Chronosystems involve the biological and personal factors that predispose individuals to behave in a certain manner as individual-level influences (Paquette & Ryan, 2001). Microsystems are characterized by interaction in interpersonal relationship-level which would cause high-risk behaviors due to informal relationships (Paquette & Ryan, 2001). The mesosystem layer focuses on the networks within the individual microsystem such as those within the community (Paquette & Ryan, 2001). Ecosystems emphasize on communal-level interactions that have a higher risk in terms of an individual's community and social relationships (Paquette & Ryan, 2001). Macrosystems being the outermost layer in the context of an individual's environment and also includes other influences such as religious, social, financial and political norms which normally would result in conflicts among people (Paquette & Ryan, 2001).

According to the Centre of Disease Control (CDC) 2012, social-ecological approach, the simplified version of these systems has been applied, where they have classified by on individual-level influences, interpersonal relationship-level influences, community-level influences and societal-level influences (Figure 2.1). Several determinants for MDD, GAD, and PTSD among refugees have been identified at each level.

Individual-level influences include gender, age, poor educational levels, unemployment, unmarried and exposure to violence physical injuries (Turrini et al., 2017). Interpersonal relationship-level influences are those factors that make the environment where the relationships between individuals and others occur (Turrini et al., 2017). Examples include environmental stressors such as food insecurity being homelessness, freedom of movement, concern about safety and separation from family members. Communal-level influences are defined as those factors affecting individuals such as the school or the workplace and duration of displacement (Turrini et al., 2017). Societal-level influences are focused on the cultural influences on individuals. This is based on one's religion or traditional beliefs (Turrini et al., 2017). Examples include perceived social support and religious orientation. A person is responsible for establishing and upholding behavioral changes that are required to improve health and eliminate risk. However, a person's actions are influenced by their social environment as described in the SEM. Hence, the most practical method which results in inappropriate behaviors is usually an amalgam of all factors at each level. The SEM is used to develop the conceptual framework of this study. This model has been recommended for use when examining factors associated with mental health outcomes among the refugee population (Derrick Silove, Ventevogel, & Rees, 2017). In regards to these systems and influence, this SEM was initiated to identify the factors that place refugees at risk of mental health disorders.
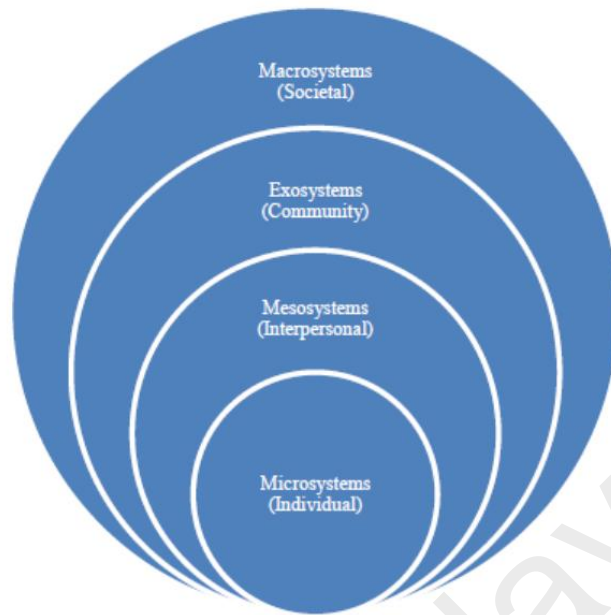
Figure 2.1: The Social-Ecological Model

Source: Centers for Disease Control and Prevention (CDC). (2012). *The Social-Ecological Model: A Framework for Prevention*. Retrieved November 15, 2018, from http://www.cdc.gov/violenceprevention/overview/social-ecologicalmodel.html

2.7   Conceptual framework

The SEM is used as a conceptual framework to examine the determinants for the development of mental health disorders (PTSD, MDD, and GAD) among Rohingya refugees in Malaysia as shown in Figure 2.2.

Individual:

- Gender
- Age
- Marital status
- Educational attainment
- Employment status
- Exposure to violence
- Physical injuries

Interpersonal:

- Food insecurity
- Homelessness
- Separation from Family member

Community:

- Time spent in Malaysia

Societal:

- Perceived social support
- Religious orientation

MDD
PTSD
GAD
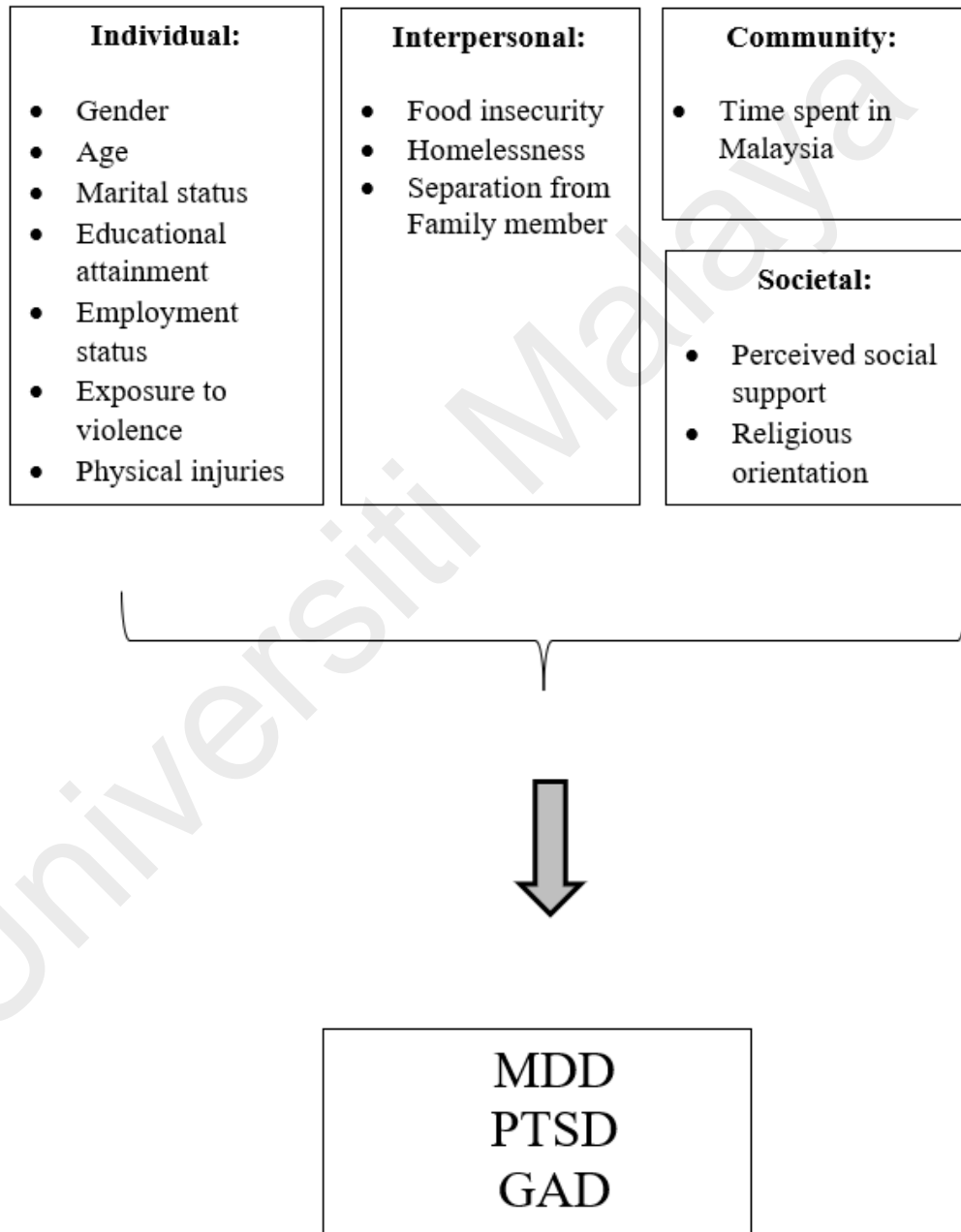
Figure 2.2: Conceptual framework

2.8 Summary of Chapter 2

This chapter has reported on the prevalence of MDD, GAD, and PTSD worldwide among refugees. It also identified several determinants (many of which were individual-level determinants based on the SEM) of MDD, GAD, and PTSD. Finally, findings from this chapter provided some direction in deciding on developing a conceptual framework for this project.

CHAPTER 3: METHODOLOGY

3.1 Introduction

The specific research method used for the collection and analysis of data to fulfill the objectives, along with the flow of the study, are described in this chapter. Sections 3.2 explain the design. The processes of ethical clearance and application are described in Section 3.3. These are followed by Sections 3.4 and 3.5, which explain the study setting and study population. Sampling methods are described in Section 3.6. These are followed by Section 3.7, which describes the required sample size and sample size calculation. Section 3.8 describes the study variables. Section 3.9 describes the study instrument and the measurement scale. Methods of data collection and statistical software used are described in Sections 3.10 and 3.11. Data management and analysis are described in Sections 3.12 and 3.13.

3.2 Study design

The cross-sectional study design was selected to answer the objectives of this study because it is practical in obtaining baseline data (British Medical Journal, 2011).

3.3 Ethics and Permission

The ethical code of this study is in line with the Declaration of Helsinki 1974 and Nuremberg code 1949 (Tikveel, 1949; World Medical Association, 1974). This study had applied for ethical approval from the University of Malaya Research Ethical Committee (UMREC) on 31st May 2019 and ethical approval was obtained on 25th June 2019 (UMREC reference number: UM. TNC2/UMREC – 581). The ethical approval for this study is valid from June 2019 to June 2022. Ethical concerns/issues are discussed in further details as in the following paragraphs:

3.3.1   Preserving participants confidentiality

No personal identifiers were used during the process of collection of data, analysis of data and reporting results. All participants were assigned to a serial code that is unique to each participant. Each serial code corresponded to a particular participant. The serial code was documented on each questionnaire and interview-based diagnostic instrument sheet. All the processes of data coding (serial number coding), transfer of data into respective software's and data analysis were performed on computers in the Department of Psychological Medicine, Medical Faculty, University Malaya Medical Centre (UMMC). All these computers and files within it have security lock functions that can only be accessed by Principal investigators. With the above measures, we would be able to ensure that the participant's confidentiality will be maintained.

3.3.2   Safety and security of participants/researchers

To ensure the safety of participants, all study instruments were administered to participants at their residence by the researcher. This avoided any possibility of harm to participants as they were able to answer the questionnaires and interview at the convenience of their residence without having to go out. To ensure the safety of researchers, all researchers involved during the process of data collection were accompanied by a representative from the RSM during each session of data collection. Also, the researchers had with them their identification card (Malaysian Identification card), UMMC Department identification card and an official letter from UMMC which would indicate the purpose of the study. With these measures in place, any possible safety or security threats to both participants and researches were minimized.

3.3.3   Referral pathway

Participants who were found to have either MDD, PTSD or GAD following the MINI International Neuropsychiatric Interview were managed in the following ways. Participants diagnosed to have mild MDD, PTSD or GAD were given counseling by the researcher. In cases of moderate MDD, PTSD or GAD, they were referred to the clinical psychologist UNHCR, Malaysia for further management. Those participants with severe MDD, PTSD or GAD who are unable to afford the financial cost of treatment were referred to UNHCR, Malaysia for further assistance/support; while those who can afford the financial cost of treatment, these participants were referred to the nearest Government based Psychiatry Clinic by the researcher (A referral letter was provided). All the above mention methods will only take effect provided the participants give consent for it. Figure 3.1 shows the referral pathway for participants to diagnose with mental health disorders. In the event participants disclose other symptoms or issues unrelated to this study but may require necessary attention, these cases would be taken note of and highlighted to UNHCR for further assistance.
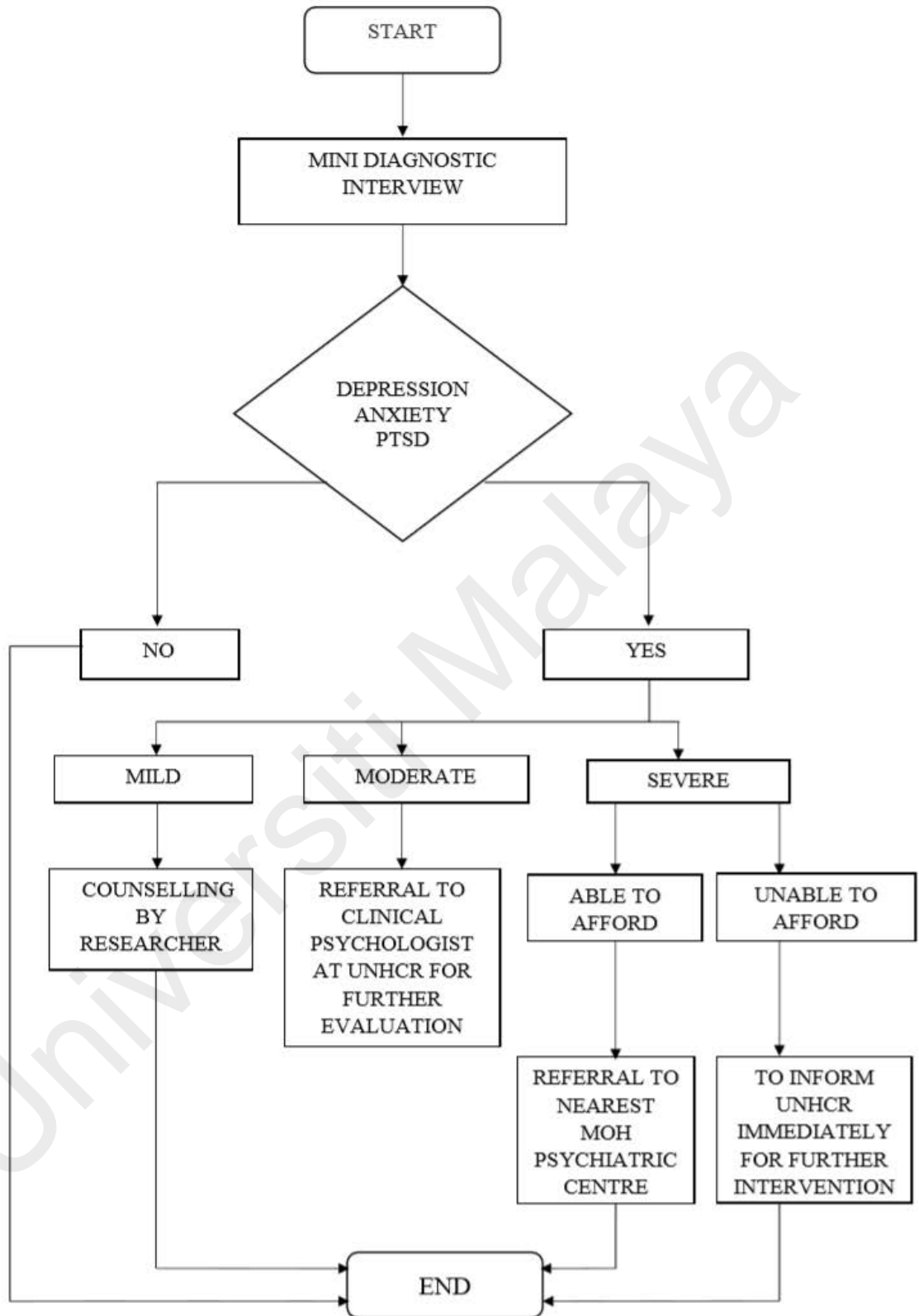
Figure 3.1: Referral pathway for participants diagnose with mental health disorders

Note. MOH, Ministry of Health, Malaysia; UNHCR, United Nations High Commissioner for Refugees, Malaysia.

3.4   Setting

Data were collected from Rohingya refugees residing in Selangor as shown in Figure 3.2. There is an estimated 66030 UNHCR Persons of concern in Selangor which includes Rohingya refugees (UNHCR, 2018).

Figure 3.2: Location of data collection

3.5   Study Population

The study population includes adult Rohingya refugees (ages 18 years and above) who provide consent to participate in this study. Exclusion criteria include not Rohingya refugees.

3.6 Sampling method

A random sample of all Rohingya refugees residing in Selangor was performed. The list/registry (with address and contact number) of Rohingya refugees residing in Selangor was obtained from the RSM. Random selection was performed using an Excel RAND function. A list of 11000 randomly generated numbers was obtained from the Excel RAND formula, then the random values generated were ordered from lowest to highest and the first 220 subjects in the sorted list were selected. Following which the researcher called the contact numbers of the selected 220 subjects in the registry (with help from RSM office secretary Mr. Muhamad Rayas Bin MD Ali) to set an appointment to meet subjects at their residence to further explain the study and obtain written consent.

3.7 Sample size calculation

Sample size was calculated based on the respective objectives as shown in Table 3.1 and the largest sample size finally selected was based on the sample size calculation for the objective to determine the association of gender and MDD among adult refugee population which reported that females are more likely to have MDD compared to male with an adjusted OR of 2.4, a p-value of <0.05 and 95% CI of 1.75, 3.36 (Feyera, Mihretie, Bedaso, Gedle, & Kumera, 2015).

G* power software version 3 was used for sample size calculation for this phase (Erdfelder, Faul, Lang, & Buchner, 2009). The following parameters in G* power software was used: (a) Tail (s) two, (b) Odds ratio (adjusted) set at 2.4 based on study by Feyera et al (2015) (Feyera et al., 2015), (c) Pr (Y=1|X=1)H0, the probability of outcome (MDD) among participants without exposure (male gender) 0.26 based on study by Feyera et al (2015) (Feyera et al., 2015), (d) alpha set at 0.05, (e) power set

at 80%, (f) R^2 other exposure variable set as zero as Adjusted OR was used indicating that effects from all other covariates have been adjusted/accounted for, (g) Binomial distribution selected as exposure variable which is gender is a binomial variable and (f) X parm, the proportion of those with outcome (MDD) who have the exposure (female) = 0.65 (Feyera et al., 2015). The sample size required after a 5% inflation rate was 220 (Feyera et al., 2015). Figure 3.3 shows the sample size calculation using the G* power software.

To further validate the sample size estimation, using parameters from Feyera et al (2015) (Feyera et al., 2015), Open Epi sample size software version 3.01 (Dean, Sullivan, & Soe, 2013) was used with the following values: (a) alpha set at 0.05, (b) Power set at 80%, (c) Ratio of Unexposed/Exposed =0.85, (d) Percentage of unexposed with outcome =26%, (e) Percentage of exposed with outcome =42% and (f) Odds ratio (adjusted) = 2.4. The sample size required after a 5% inflation rate was 220 (Feyera et al., 2015). Figure 3.4 shows the sample size calculation using Open Epi. The actual sample size obtained was 220.

Table 3.1. Estimation of sample size based on objectives

Author (Year)	Objectives	α	Power	A	B	C	Required sample size	After 5% Inflation
Riley et al. 2017	Determine the prevalence of GAD	0.05	0.8				185*	194
Riley et al. 2017	Determine prevalence of MDD	0.05	0.8				151*	158
Feyera et al. 2015	Determine the association of factors (Gender) with MDD	0.05	0.8	35	2.4	0.85	206* 209[a]	216 220

Note. All the above studies are based on adult refugees; A, Percentage of unexposed with the outcome; B, Adjusted Odds ratio; C, ratio of unexposed to exposed in the sample; * sample size calculation using Open Epi; [a] sample size calculation using G-power software.
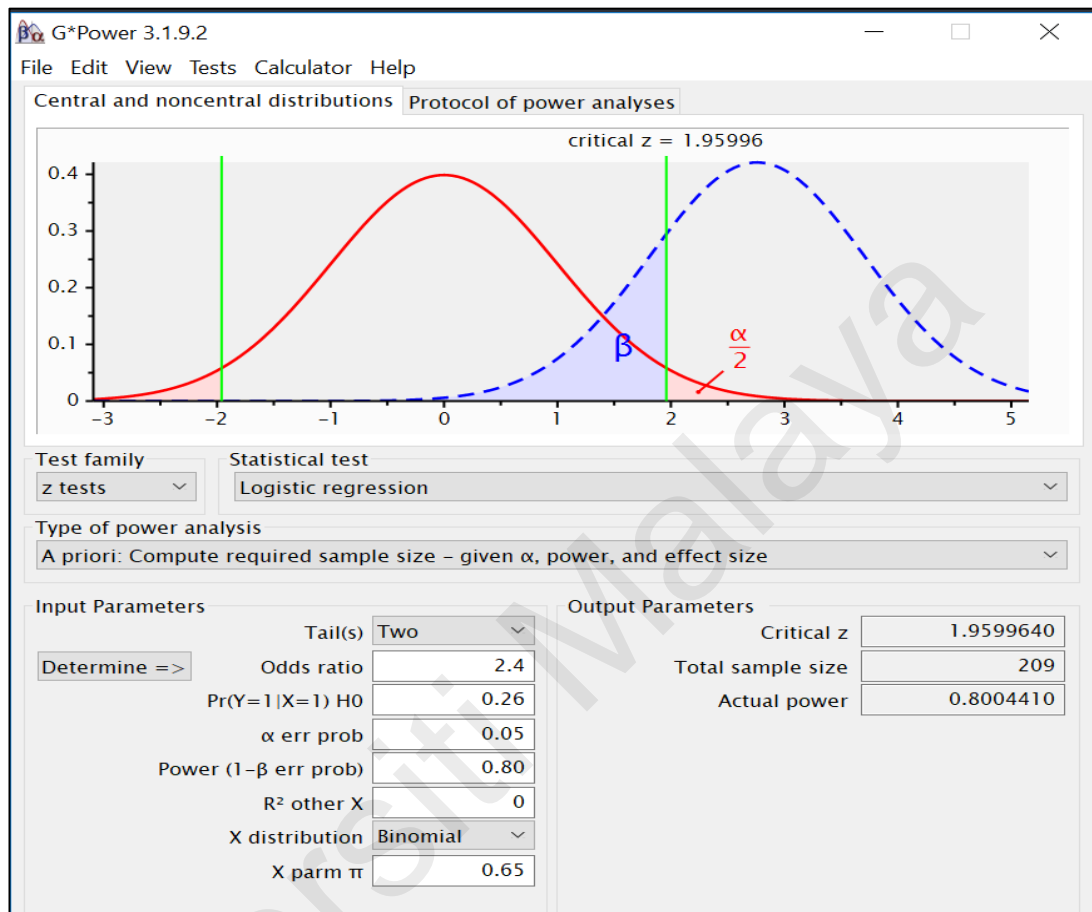
Figure 3.3: Sample size output G power software

Sample Size:X-Sectional, Cohort, & Randomized Clinical Trials			
Two-sided significance level(1-alpha):			95
Power(1-beta, % chance of detecting):			80
Ratio of sample size, Unexposed/Exposed:			0.85
Percent of Unexposed with Outcome:			26
Percent of Exposed with Outcome:			46
Odds Ratio:			2.4
Risk/Prevalence Ratio:			1.8
Risk/Prevalence difference:			20
	Kelsey	**Fleiss**	**Fleiss with CC**
Sample Size - Exposed	102	100	111
Sample Size-Nonexposed	87	85	95
Total sample size:	189	185	206

Figure 3.4: Sample size output Open Epi software

3.8 Study variable

The independent variables collected were gender, age, marital status, educational attainment, employment status, marital status, time spent in Malaysia (Time since displacement), food insecurity, homelessness, separation from family members, exposure to violence, physical injuries, perceived social support and religious orientation. The dependent variables collected were MDD, PTSD and GAD symptoms. The independent and dependent variables for the respective objectives in this study are stated in Table 3.2. The operational definition and scales of independent and dependent variables are shown in Table 3.3 and Table 3.4.

Table 3.2. Independent and dependent variables

Objective (s)	Independent variables	Dependent variables
To determine the prevalence of MDD among refugee	MDD symptoms	-
To determine the prevalence of PTSD among refugee	PTSD symptoms	-
To determine the prevalence of GAD among refugee	GAD symptoms	-
To determine the factors (risk/protective) of MDD among refugee	Factors	MDD symptoms
To determine the factors (risk/protective) of PTSD among refugee	Factors	PTSD symptoms
To determine the factors (risk/protective) of GAD among refugee	Factors	GAD symptoms

Note. Factors denote gender, age, marital status, educational attainment, employment status, marital status, time spent in Malaysia (Time since displacement), food insecurity, homelessness, separation from a family member, exposure to violence, physical injuries, perceived social support and religious orientation.

Table 3.3. Operational definitions and scales of measurement of the independent variables

Variable	Operational definition	Scale of measurement
Gender	As per identification card status (Zimbrean, 2014).	Male/Female
Age	Age as of last birthday (Petry, 2002).	18 to 35 years (young adult) 36 to 55 years (middle-aged) $\geq$ 56 years (older adult)
Marital status	Civil status of each individual with the marriage laws or customs of the country (Zimbrean, 2014).	Single/Married/ divorced
Educational attainment	Level of the highest completed qualification reported for a person in any field of study (C Rousseau, Drapeau, & Platt, 2000).	Less than secondary School/secondary school/college.
Employment status	Individual who has entered into or works under a contract of employment (Hodes, Jagdev, Chandra, & Cunniff, 2008).	Full-time employment /Part-time, Unemployed
Time spent in Malaysia	Duration since first arrived in Malaysia (Gosnell, 2017).	<12, 12 – 23, 24-36, >36 (Months)
Physical injuries	Non-accidental use of physical force by someone that may result in bodily injury, physical pain (Geltman et al., 2005).	Yes, No
Homelessness	Not being able to secure shelter (Riley et al., 2017).	Yes/No (No indicating homelessness)
Separation from Family member	Separated from a family member since arriving in Malaysia (Zimbrean, 2014).	Yes, No
Exposure to violence	Personal exposure to traumatic events such as physical police assault, brutal raids in the home, imprisonment with torture, witnessing assaults on their family member and shelling (Almqvist & Broberg, 1999).	Non-Exposed/Exposed

Variable	Operational definition	Scale of measurement
Food insecurity	Food insecurity which is characterized by the inability to access, maintain, consume quality food in sufficient quantity (Radimer, Olson, & Campbell, 1990)	Food secure: Negative answers (Not true) to all hunger and food insecurity items
Perceived social support	Perception of social support adequacy from family, friends and significant others	Low to moderate support (mean score of 1 to 5) High support (mean score of 5.1 to 7)
Religious orientation	Extrinsic -Personal	Mean score (range 3-15)
	Extrinsic- Social	Mean score (range 3-15)
	Intrinsic	Mean score (range 8-40)

'Table 3.3 continued'

47

Table 3.4. Operational definitions and scales of measurement of the dependent variables

Variable	Operational definition	Scale of measurement
PTSD symptoms	Symptoms of PTSD based on the DSM V criteria: stressor, intrusion symptoms, avoidance, negative alterations in cognitions and mood, alterations in arousal and reactivity, Symptoms last for more than 1 month, Symptoms create distress or functional impairment (American Psychiatric Association, 2013).	Based on MINI PTSD (Yes) PTSD (No)
MDD symptoms	Symptoms of MDD based on the DSM V criteria: Changes from previous functioning either depressed mood or loss of interest or pleasure within the past 1 week including today (Bienenfeld, 2016).	Based on MINI MDD (Yes) MDD (No)
GAD symptoms	Symptoms of MDD based on the DSM V criteria: Excessive GAD and worry, difficult to control the worry causing cause clinically significant distress or impairments and disturbance is not caused by the direct physiological effects of a substance (American Psychiatric Association., 1994).	Based on MINI GAD (Yes) GAD (No)

Note. < indicates less than MINI, MINI International neuropsychiatric interview for schizophrenia and psychotic disorders studies.

3.9   Study instrument

   This study utilizes instruments that are self-administered questionnaires and are

described in the following paragraphs. The study instruments used in this study are

available in both English and Bahasa Malaysia.

3.9.1   Perceived social support using the Multidimensional Scale of Perceived

Social Support (MSPSS)

The MSPSS is a 12 item self-administered measure of social support that assesses the

perception of social support adequacy from three different sources: Family, Friends

and Significant Others (Zimet, Dahlem, Zimet, & Farley, 1988). The items are scored

on a 7-point Likert scale (1 very strongly disagree, 7 very strongly agree). The

classification of perceived social support is based on the mean scale scores as the

following: (a) low to moderate social support (score of 1 to 5), (b) high social support

(score of 5.1 to 7) (Zimet et al., 1988). The MSPSS has been translated to Malay and

reported to have satisfactory psychometric properties for use among adults in Malaysia

(Ng, Amer Siddiq, Aida, Zainal, & Koh, 2010). Permission to use the MSPSS Malay

version was obtained from the authors via email on 17 Mei 2019. In this study, the

internal consistency Cronbach alpha was reported at 0.91 (n=220).

3.9.2   Religious Orientation Scale-Revised (ROS-R)

The ROS-R is a 14 item self-administered measure of religious orientations that asses

three important dimensions of religious orientations; Intrinsic, Socially orientated-

extrinsic and Personally orientated – extrinsic (Gorsuch & McPherson, 1989). All the

items in ROS-R were rated on 5-point Likert scales ranging from strongly disagree (1)

to strongly agree (5). Resulting in a range of 8-40 for the intrinsic orientation scale

and 3-15 for each extrinsic orientation scale. Higher scores indicate higher levels of a

specific religious orientation. The ROS-R has been translated to Malay and reported to have satisfactory psychometric properties for use among adults in Malaysia (Kamaluddin, Nasir, Wan Sulaiman, Khairudin, & Ahmad Zamani, 2017). Permission to use the ROS-R Malay version was obtained from the authors via email on 17 Mei 2019. In this study, the internal consistency Cronbach alpha was reported at 0.68 (n=220).

3.9.3   Radimer/Cornell Food Insecurity Instrument

The Radimer/Cornell food insecurity instrument is a 10 item self-administered measure of food security, household food insecurity, individual food insecurity and child hunger (Radimer et al., 1990). All the items in this instrument were rated on 3-point Likert scales ranging from 1 (not true), 2 (sometimes true) to 3 (often true). The response is then categorized into negative answers (response not true) and positive answers (response sometimes true or often true). Subsequently, for each measure of food security, the following classification was used: (a) Food Security is considered when negative answers are scored across all hunger and food insecurity items, (b) Household insecure is considered when positive answers are scored to one or more items (1-4) but not to adult or child level items, (c) Individual insecure is classified when positive answers are scored to one or more of items (5-8) but not to items (9-10) and (d) Child hunger is considered when Positive answer is scored to items (9-10) (Kendall, Olson, & Frongillo, 1996). Food security status is collapsed into two categories; household food security and household food insecurity, for analysis for this study. The Radimer/Cornell food insecurity instrument has been translated to Malay and reported to have satisfactory psychometric properties for use among the Malaysian population (Zalilah & Merlin, 2001). Permission to use the Radimer/Cornell food insecurity instrument (Malay version) was obtained from the

authors via email on 30 Mei 2019. In this study, the internal consistency Cronbach alpha was reported at 0.95 (n=220).

3.9.4 MINI International Neuropsychiatric Interview

The MINI International Neuropsychiatric Interview version 7.02 was designed as a brief structured interview for the major psychiatric disorders in DSM-5 and ICD-10 (Lecrubier et al., 1997). Validation and reliability studies have been done comparing the MINI. to the SCID-P for DSM-III-R and the CIDI (a structured interview developed by the World Health Organization) (Lecrubier et al., 1997). The results of these studies show that the MINI has similar reliability and validity properties, but can be administered in a much shorter period (mean 18.7 ± 11.6 minutes, median 15 minutes) than the above-referenced instruments. The ratting responses are either 'Yes' or 'No'. For this study, the MINI will be used to assess MDD, PTSD and GAD. There are 6, 7 and 4 questions in the MDD, PTSD and GAD modules.

3.10 Data collection

A period of two months from July to August 2019 was allocated for data collection, with strategic organization, planning and time management being major contributors that enabled the completion of data collection within this time frame. The process of data collection started as soon as ethical clearance is obtained. Data collection was performed by the researcher and explained in the following paragraphs.

First, the training of translators was conducted by the researcher, to inform the purpose of the study (participant's information sheet) and requirements to answer the questionnaire and obtain written consent from participants. Translators were engaged during the process of data collection. Translators were recruited from the RSM and they are well versed with both Rohingya, Malay, and the English language. The

translator was given training sessions, whereby during this session all the translators went through the items in the subject information sheet, consent forms and study instruments (questionnaires) that were used in this study so that they were familiar with the meaning of each item. In the event, certain terminologies in the questionnaire's subject information sheet and consent forms have no direct translation into the Rohingya language. However, the closest meaning of the words in the Rohingya language was obtained from the Glossary report (Appendix 4,5 and 6) by Tay et al., (2018) (Tay et al., 2018). The translators were only used in the event participants are unable to understand items in the subject information sheet, consent forms, and study instruments. Questionnaires were distributed to all participants who complied with the inclusion criteria during the designated dates for the questionnaire session (No proxy was allowed). A registry was opened to register the date, time, name, index number of the questionnaire and number of questionnaires distributed. The timing of collection and answering the questionnaires was based upon allocated time agreed upon participants so to ensure that the research process does not interfere with the daily duties of participants.

The background and objectives of the research were explained to the participants. Participants were also informed that there would be no use or release of personal identifiers in this study, thereby maintaining confidentiality throughout the research. After obtaining written consent, data collection began. Detailed instruction on how to answer the questionnaire was provided to all respondents. Participants filled in the questionnaire in their residence, which took approximately 30 minutes to complete. The investigator was present during each questionnaire session to ensure independent responding and also to address any inquiries from participants relating to the questionnaire. A collection box was provided during each questionnaire session, with

all completed questionnaires being immediately deposited into this box by the researcher. Also, during this phase, the researcher conducted the MINI International Neuropsychiatric Interview on participants that have completed the self-administered questionnaires.

During the first few weeks of July 2019 data collection was slow as the researcher was getting familiar with the locations of the subject's residence in Selangor. The progress of data collection gradually improved in August 2019, and the total number of samples collected by the end of August 2019 was 220. Thus, a total of 220 questionnaires were collected during the process of data collection.

3.11   Software tool

The software tool used in this study was SPSS version 24.0. Raw data were entered into SPSS software, following which data cleaning was performed. Also, descriptive analyses, tests for interactions and multicollinearity, and logistic regression analyses were performed using this software.

3.12   Data management

The SPSS 24.0 software was used for all the processes involved in data management, such as data entry, cleaning, normality testing, and data analysis, as presented in the following paragraphs.

During the process of data collection, the researcher reminded all participants to answer all questions and not to leave any unanswered questions. Also, the researcher checked all the questionnaire upon collection to detect any potential missing data and immediately ask the participants to fill up any missing values. All primary data were documented by hand on the questionnaires. Subsequently, a worksheet was created in

Statistical Package for the Social Sciences (SPSS) 24.0 and all raw data were imported into this worksheet. Information entered included participants' demographic details, perceived social support, religious orientation, food security and the mental health disorders namely MDD, GAD, PTSD status variable. To minimize errors and increase the accuracy of data entry, double data entry was performed. The first data entry was performed from 1st November 2019 to 15th November 2019, while the second data entry was performed from 16th November 2019 to 30th November 2019. The data were entered by the researcher at a rate of 16 cases per day, with one-hour intervals after each session of 4 cases being entered into SPSS. There were no mismatches identified. Following double data entry, data were merged and then checked for abnormal values (abnormal data points). There were no abnormal values during the codding of data.

The majority of the variables were measured on a categorical scale and are free of distribution, therefore, there was no need for testing for normality or outliers with exception to one variable on religious orientation which was measured on a continuous scale. The religious orientation variable was tested for normality visually using a histogram as shown in Figure 3.5 and also using the test of normality (Shapiro-Wilk and Kolmogorov-Smirnov) function in SPSS which reported p-values more than 0.05 indicating a normal distribution as shown in Table 3.5.
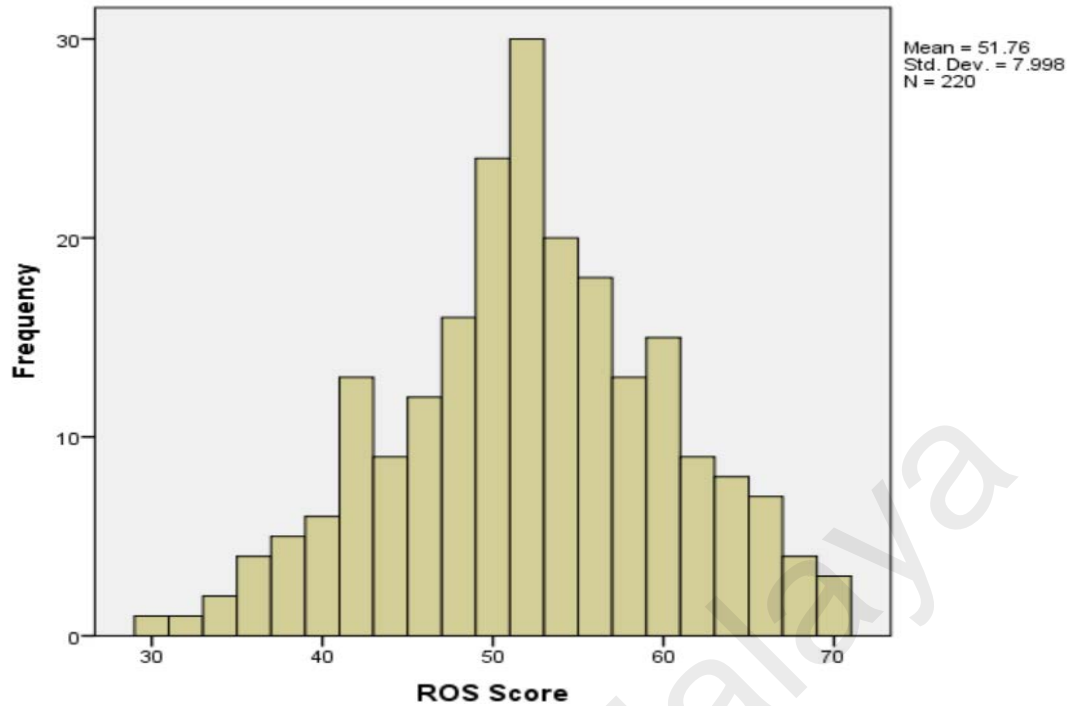
Figure 3.5: Histogram for religious orientation variable

Table 3.5: Test of Normality

| | Kolmogorov-Smirnov[a] | | | Shapiro-Wilk | | |
	Statistic	Df	Sig.	Statistic	df	Sig.
ROS-R	.051	220	.200	.993	220	.428

a. Lilliefors Significance Correction

3.13   Data analysis

The data analysis is discussed in the following sections: (a) Statistical analysis used based on each objective; (b) Assumptions of binary logistic regression analysis; (c) Test of interaction and (d) Description of the multivariate binary logistic regression the text below.

(a) **Statistical analysis used based on objectives**

This section included an analysis of 220 participants using the SPSS 24.0 software (International Business Machines (IBM) Corporation, 2016). Data analyses for the specific objectives are described in Table 3.5. Sociodemographic data were analyzed using descriptive statistics. Variables that were found to be significant at $p < 0.25$ in the univariate binary logistic analysis were entered into multivariate logistic regression (Bursac, Gauss, Williams, & Hosmer, 2008). The significance level was set at a p-value < 0.05.

Table 3.6: Statistical analysis based on study objectives

Objective	Statistical analysis	Summary measure
To determine the prevalence of MDD, PTSD and GAD disorders among Rohingya refugees.	Descriptive statistics	Frequency (%)
To determine the association of Perceived Social Support, Religious orientation and Food security with MDD among Rohingya refugees.	Multivariate binary logistic regression (Enter method)	Adjusted odds ratio 95% CI P-value
To determine the association of Perceived Social Support, Religious orientation and Food security with GAD among Rohingya refugees	Multivariate binary logistic regression (Enter method)	Adjusted odds ratio 95% CI P-value
To determine the association of Perceived Social Support, Religious orientation and Food security with PTSD among Rohingya refugees	Multivariate binary logistic regression (Enter method)	Adjusted odds ratio 95% CI P-value

Note. %, Percentages; CI, Confidence interval. For regression analysis, an overall total score of religious orientation was used by combining the extrinsic and intrinsic domains of the religious orientation scale.

(b) **Assumptions of binary logistic regression analysis**

Several assumptions needed to be fulfilled to justify the use of a binary logistic regression analysis model as follows: (a) there must be at least two cases for each category of dependent variable; (b) dependent variables are mutually exclusive and exhaustive; (c) the independent variables are independent of each other (test of multicollinearity), and (d) errors (residuals) are randomly distributed (Chinna & Yuen, 2014). Any violation of these assumptions would bias or mislead the regression model. Assumption (a) is met as the dependent variable in the objectives examining association in this study is MDD, GAD, and PTSD which is categorized into two levels, namely depressed or not depressed, Anxious or not anxious, having PTSD or no PTSD. Assumption (b) is met as the dependent variable in this study is either MDD or not depressed, Anxious or not anxious, having PTSD or no PTSD and both outcomes cannot occur simultaneously, meaning that the dependent variable is mutually exclusive and exhaustive.

Assumption (c) is tested by cross-tabulating all the independent variables that are significant from univariate analysis and the Cramer's V value is calculated. Cramer's V is the most popular of the chi-square-based measures of the nominal association because it gives good norming from 0 to 1 regardless of table size when row marginal equal column marginal (Goodman & Kruskal, 1954). The range of Cramer's V and its interpretation is as follows: < 0.10 (weak correlation), 0.1 to 0.3 (moderate correlation) and > 0.3 (strong correlation) (Goodman & Kruskal, 1954). Any two variables with a Cramer's V value of > 0.3 are considered to be strongly correlated, therefore one of them needs to be dropped from the multivariate analysis. The degree of correlation between all independent variables (significant in the univariate analysis at 0.25) was assessed in the data analysis section. For variables

measured on a continuous scale namely the ROS-R total score, multicollinearity was assessed using the variance inflation factor (VIF). VIF values are categorized as the following (a) VIF 1 indicates not correlated; (b) VIF between 1 and 5 indicates moderately correlated and (c) VIF greater than 5 indicates highly correlated (Theme Horse, 2015) Assumption (d) is not applicable as the dependent variable in this study is measured on a categorical scale.

(c) **Testing for interaction steps**

Testing for interaction between the independent variables was performed on variables significant at 0.25 in univariate analysis before including them in multivariate analysis. A significant value ($p < 0.05$) indicates that interaction is present.

(d) **Multivariate binary logistic regression steps**

Before performing multivariate logistic regression, univariate logistic regression was performed. The reference category was selected based on the criteria proposed by Garson (2006), who recommends that a category with many cases and with specificity should be selected as the reference category (Garson, 2006). The enter method was selected for the logistic regression as by selecting this method all independent variables are entered into the equation at the same time and this is an appropriate analysis when the researcher does not know which independent variables are predictors of the dependent variable (Ranganathan, Pramesh, & Aggarwal, 2017). Multivariate logistics calculation. All variables significant at $p < 0.25$ in univariate analysis are included in multivariate logistic regression analysis (Sperandei, 2014).

3.14 Gantt chart

The Gantt chart for this research is shown in Figure 3.6.

No	Activity	2019												2020				
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5
1	Porposal Preparation		▓	▓	▓													
2	Proposal Presentation and Approval					▓												
3	Ethical Processes					▓	▓											
4	Data collection							▓	▓									
5	Data Entry									▓	▓							
6	Data Analysis											▓	▓					
7	Report Writing													▓	▓	▓		
8	Final report presentation																▓	▓

Figure 3.6. Gantt chart

3.15 Summary of Chapter 3

A detailed account of this study's methodology is presented in this chapter. The cross-sectional study design was utilized. Data were collected from adult Rohingya refugees residing in Selangor between July to August 2019. The internal consistency of all the instruments was reported as good. Data analysis involved descriptive, univariate and multivariate logistic regression analysis.

CHAPTER 4: RESULTS

4.1   Introduction

The results of this study are described in this chapter. Section 4.2 describes the sample and variables in this study. All variables are described according to percentages, frequency and mean score. Section 4.3 presents the descriptive analysis of the demographic characteristics of participants, perceived social support, religious orientation, food security, the prevalence of MDD, GAD, and PTSD. This section gives us an understanding regarding the prevalence of mental health disorders among Rohingya refugees residing in Malaysia as well as their availability of social support and food. Further, it also sheds some light on Rohingya refugee's religious orientation. The results of the final analysis of logistic regression (univariate and multivariate) are presented in Section 4.4. This section aims to identify which variables (namely demographics, perceived social support, religious orientation, and food security) are significantly associated with MDD, GAD, and PTSD after controlling for confounders. A summary of the results of the analysis is presented in Section 4.5.

4.2   Sample and variable description

The variables collected were categorized as follows: Demographics (10 variables), perceived social support, religious orientation, food security, the prevalence of MDD, GAD, and PTSD. A response rate of 100% was reported in this study. Of these 220 respondents who completed the questionnaire, all provided usable questionnaires with no missing data. A total of 220 samples were collected for each variable.

4.3 Descriptive analysis

There were 116 (52.7%) male participants and 104 (47.3%) female participants. The mean age of participants was 33.5 years, with the majority of 151 (68.6%) being young adults between the ages of 18 to 35 years. The majority of participants were married 176 (80%) and had attained secondary school education 119 (54.1%). Most participants have been living in Malaysia for more than 3 years 187 (85.0%), however, the majority of them were part-time or unemployed 124 (56.4%). The majority of participants have been separated from their family members 160 (72.7%) and fortunately, the majority of participants have not been exposed to violence 125 (56.8%) and non-accidental physical injuries 157 (71.4%). The majority of participants reported high perceived social support 129 (58.6%). Food insecurity was reported by the majority of participants 156 (70.9%). The mean overall religious orientation score was reported at 51.8. The extrinsic (personal and social) and intrinsic mean religious orientation scores were reported at 13.6, 5.4 and 32.8. The prevalence of GAD, PTSD, and MDD was reported at 92 (41.8%), 84 (38.2%) and 71 (32.3%). Table 4.1 shows the characteristics of the participants.

Table 4.1: Characteristic of participants (N=220)

Characteristics		Frequency N (%)
Gender	Male	116 (52.7)
	Female	104 (47.3)
Age (Years)	18 to 35	151 (68.6)
	36 to 55	51 (23.2)
	≥56	18 (8.2)
Marital status	Single	39 (17.7)
	Married	176 (80.0)
	Divorced	5 (2.3)
Educational attainment	Less than secondary	87 (39.5)
	Secondary school	119 (54.1)
	College	14 (6.4)
Employment status	Full time employment	96 (43.6)
	Part-time/Unemployed	124 (56.4)
Time spent in Malaysia (Months)	<12	14 (6.4)
	12 to 23	9 (4.1)
	24 to 36	10 (4.5)
	>36	187 (85.0)
Homelessness	Yes	1 (0.5)
	No	219 (99.5)
Separation from a family member	Yes	160 (72.7)
	No	60 (27.3)
Exposure to violence	Non-Exposed	125 (56.8)
	Exposed	95 (43.2)
Physical injuries (non-accidental)	Yes	63 (28.6)
	No	157 (71.4)
Perceived social support	Low/Moderate	91 (41.4)
	High	129 (58.6)
Religious orientation* Mean (SD)	Overall[a]	51.8 (8.0)
	Intrinsic[b]	32.8 (4.4)
	Extrinsic -Personal[c]	13.6 (2.5)
	Extrinsic -Social[c]	5.4 (3.6)
Food security	Food secure	64 (29.1)
	Food insecure	156 (70.9)
MDD	Normal	149 (67.7)
	Having MDD	71 (32.3)
GAD	Normal	128 (58.2)
	Having GAD	92 (41.8)
PTSD	Normal	136 (61.8)
	Having PTSD	84 (38.2)

Note. * For religious orientation higher mean score indicates higher religious orientation; [a] Score range 14-70; [b] Score range 8-40; [c] Score range 3-15.

4.4 Logistic regression

4.4.1 Association of demographic variables, Perceived social support, Religious orientation and Food security with MDD

In total 8 variables were significant at 0.25 in the univariate analysis. Testing for multicollinearity among these 8 variables revealed that there were four variables in two pairs that had evidence of multicollinearity (Cramer's V value of > 0.3) as follows: (a) exposure to violence and physical injury (b) gender and employment as shown in Table 4.2. The variable removed was exposure to violence and employment. The balance 6 variable were tested for interaction and there was no significant interaction present between these 6 variables and the outcome variable as the p-value was > 0.05 as shown in Table 4.3. Finally, a total of 6 variables were entered into multivariate analysis. Out of the 6 variables entered into the multivariate analysis level, 5 were significantly associated with MDD, including being female (AOR = 2.54; 95% CI 1.21, 5.34), living in Malaysia for less than 1 year (AOR = 6.95; 95% CI 1.89, 25.57), having been physically injured (AOR = 3.25; 95% CI 1.52, 6.96), perceived low/moderate social support (AOR = 2.17; 95% CI 1.13, 4.19) and food insecurity (AOR = 2.77; 95% CI 1.19, 6.47). Table 4.4 shows the results of both univariate and multivariate logistic regression for the association of perceived social support, religious orientation and food security variables that are significant (p < 0.05) with MDD symptoms in multivariate analysis while adjusting for demographic variables. The Hosmer-Lemeshow test p-value was 0.798 (not significant), meeting the assumption of logistic regression.

Table 4.2: Test of Multicollinearity (a)

	Gender	Time in Malaysia	Physically injured	Social Support	Food Security	Exposure to Violence	Employment	Education
Gender		0.144	0.298	0.056	0.135	0.090	0.631	0.270
Time in Malaysia	0.144		0.030	0.116	0.069	0.182	0.177	0.103
Physically injured	0.298	0.030		0.162	0.295	0.463	0.132	0.126
Social Support	0.056	0.116	0.162		0.192	0.043	0.013	0.154
Food Security	0.135	0.069	0.295	0.192		0.195	0.120	0.123
Exposure to violence	0.090	0.182	0.463	0.043	0.195		0.010	0.036
Employment	0.631	0.177	0.132	0.013	0.120	0.010		0.169
Education	0.270	0.103	0.126	0.154	0.123	0.036	0.169	

Note. Cramer's V values of more than 0.3 indicate evidence of multicollinearity among variables

Table 4.3: Test for Interaction (a)

Variables in the Equation						
	B	S.E.	Wald	df	Sig.	Exp(B)
Step 1ᵃ Education attainment * Food Security * Gender * Living in Malaysia * Perceived social support * Physically injured			.000	3	1.000	
Education attainment (1) by Food Security (1) by Gender (1) by Living in Malaysia (3) by Perceived social support (1) by Physically injured (1)	21.987	40192.969	.000	1	1.000	3539790464.000
Education attainment (2) by Food Security (1) by Gender (1) by Living in Malaysia (2) by Perceived social support (1) by Physically injured (1)	21.987	40192.969	.000	1	1.000	3539790464.000
Education attainment (2) by Food Security (1) by Gender (1) by Living in Malaysia (3) by Perceived social support (1) by Physically injured (1)	21.987	40192.969	.000	1	1.000	3539790464.000
Constant	-.784	.146	28.731	1	.000	.456

Note. ᵃVariable(s) entered on step 1: Education attainment * Food Security* Gender * Living in Malaysia * Perceived social support * Physically injured.

Table 4.4: Factors associated with MDD

Variable	Univariate logistic regression		Multivariate logistic regression	
	Crude OR (95% CI)	p-value	Adjusted OR (95%CI)	p-value
Gender				
Male	1		1	
Female	1.58 (0.89,2.78)	0.117*	2.54 (1.21, 5.34)	0.014**
Age (years)				
18 to 35	1			
36 to 55	0.92 (0.47, 1.83)	0.819		
≥ 56	0.78 (0.26, 2,30)	0.649		
Marital status				
Single	1			
Married	0.75 (0.36, 1.55)	0.437		
Divorced	288^ (0.00, 0.00)	0.999		
Education				
Less than secondary	1		1	
Secondary school	0.68 (0.38, 1.23)	0.200*	0.89 (0.45, 1.75)	0.726
College	0.45 (0.12, 1.72)	0.241*	0.68 (0.15, 3.23)	0.631
Employment status				
Full-time employment	1			
Part time/Unemployment	1.41 (0.79, 2.50)	0.248*		
Time spent in Malaysia (Months)				
<12	6.67 (2.00, 22.21)	0.002*	6.95 (1.89, 25.57)	0.004**
12 to 23	3.33 (0.86, 12.90)	0.081*	3.66 (0.81, 16.54)	0.092
24 to 36	2.67 (0.74, 9.60)	0.133*	2.77 (0.61, 12.54)	0.185
>36	1		1	
Homelessness				
Yes	0.00 (0.00, 0.00)	1.000		
No	1			
Separation from a family member				
Yes	1.16 (0.61, 2.20)	0.659		
No	1			
Exposure to violence				
Non-Exposed	1			
Exposed	1.44 (0.82, 2.55)	0.207*		
Physical injuries				
Yes	2.83 (1.54, 5.22)	0.001*	3.25 (1.52, 6.96)	0.002**
No	1		1	
Perceived social support				
Low/Moderate	2.71 (1.51, 4.84)	0.001*	2.17 (1.13, 4.19)	0.021**
High	1		1	
Religious orientation (Overall)	0.99 (0.96, 1.03)	0.653		
Food security				
Food secure	1		1	
Food insecure	3.47 (1.64, 7.32)	0.001*	2.77 (1.19, 6.47)	0.019**

Note. OR, Odds ratio; CI, Confidence interval; The variable employment status and exposure to violence were excluded from multivariate analysis due to interactions; *Variables significant at 0.25 from the univariate analysis are entered into multivariate analysis. **Significant set at p-value < 0.05 after multivariate analysis, 1 indicates a reference group. The above analysis was adjusted for demographic variables. Hosmer-Lemeshow goodness-of-fit test chi-square = 3.836 (df = 7), p = 0.798. (Using enter method); ^2884776505.

4.4.2 Association of demographic variables, Perceived social support, Religious orientation and Food security with GAD

In total 4 variables were significant at 0.25 in the univariate analysis. Testing for multicollinearity among these 4 variables revealed that there was no evidence of multicollinearity (Cramer's V value of > 0.3) as shown in Table 4.5. The four variables were tested for interaction and there was no significant interaction present between these 4 variables and the outcome variable as the p-value was > 0.05 as shown in Table 4.6. Finally, a total of 4 variables were entered into multivariate analysis. Out of the 4 variables entered into the multivariate analysis level, none were significantly associated with GAD. Table 4.7 shows the results of both univariate and multivariate logistic regression for the association of perceived social support, religious orientation and food security variables with GAD symptoms in multivariate analysis while adjusting for demographic variables. The Hosmer-Lemeshow test p-value was 0.912 (not significant), meeting the assumption of logistic regression.

Table 4.5: Test of Multicollinearity (b)

	Marital status	Time in Malaysia	Physically injured	Education
Marital status		0.153	0.172	0.149
Time in Malaysia	0.153		0.030	0.103
Physically injured	0.172	0.030		0.126
Education	0.149	0.103	0.126	

Note. Cramer's V values of more than 0.3 indicate evidence of multicollinearity among variables

Table 4.6: Test for Interaction (b)

		B	S.E.	Wald	df	Sig.	Exp(B)
	Variables in the Equation						
Step 1[a]	Education attainment * Living in Malaysia * Marital status * Physically injured			.061	6	1.000	
	Education attainment (1) by Living in Malaysia (1) by Marital status (2) by Physically injured (1)	-20.852	40192.970	.000	1	1.000	.000
	Education attainment (1) by Living in Malaysia (3) by Marital status (2) by Physically injured (1)	-20.852	40192.970	.000	1	1.000	.000
	Education attainment (2) by Living in Malaysia (1) by Marital status (1) by Physically injured (1)	.351	1.421	.061	1	.805	1.420
	Education attainment (2) by Living in Malaysia (2) by Marital status (1) by Physically injured (1)	21.554	40192.969	.000	1	1.000	2294708584.000
	Education attainment (2) by Living in Malaysia (2) by Marital status (2) by Physically injured (1)	21.554	40192.969	.000	1	1.000	2294708584.000
	Education attainment (2) by Living in Malaysia (3) by Marital status (2) by Physically injured (1)	21.554	40192.969	.000	1	1.000	2294708584.000
	Constant	-.351	.139	6.362	1	.012	.704

a. Variable(s) entered on step 1: Education attainment * Living in Malaysia * Marital status * Physically injured.

Table 4.7: Factors associated with GAD

Variable	Univariate logistic regression		Multivariate logistic regression	
	Crude OR (95% CI)	p-value	Adjusted OR (95%CI)	p-value
Gender				
Male	1			
Female	1.21 (0.71, 2.06)	0.492		
Age (years)				
18 to 35	1			
36 to 55	1.39 (0.73, 2.63)	0.317		
≥ 56	1.56 (0.59, 4.16)	0.374		
Marital status				
Single	1		1	
Married	0.88 (0.43, 1.76)	0.709	0.99 (0.47, 2.09)	0.975
Divorced	5.18 (0.53, 50.65)	0.158*	4.21 (0.41, 43.16)	0.226
Education				
Less than secondary	1		1	
Secondary school	0.97 (0.55, 1.70)	0.906	0.97 (0.54, 1.75)	0.911
College	0.35 (0.09, 1.35)	0.128*	0.31 (0.08, 1.24)	0.097
Employment status				
Full-time employment	1			
Part time/Unemployment	1.09 (0.64, 1.87)	0.752		
Time spent in Malaysia (Months)				
<12	2.04 (0.68, 6.11)	0.205*	2.14 (0.70, 6.56)	0.185
12 to 23	1.91 (0.50, 7.34)	0.347	1.67 (0.42, 6.73)	0.468
24 to 36	1.53 (0.43, 5.46)	0.515	1.47 (0.38, 5.67)	0.580
>36	1		1	
Homelessness				
Yes	1	1.000		
No	0.00 (0.00, 0.00)			
Separation from a family member				
Yes	0.92 (0.50, 1.67)	0.780		
No	1			
Exposure to violence				
Non-Exposed	1			
Exposed	1.02 (0.60, 1.75)	0.940		
Physical injuries				
Yes	1.67 (0.93, 3.01)	0.089*	1.75 (0.94, 3.25)	0.077
No	1		1	
Perceived social support				
Low/Moderate	1.00 (0.58, 1.72)	0.988		
High	1			
Religious orientation (Overall)	0.98 (0.95, 1.02)	0.268		
Food security				
Food secure	1			
Food insecure	1.29 (0.71, 2.34)	0.406		

Note. OR, Odds ratio; CI, Confidence interval; *Variables significant at 0.25 from the univariate analysis are entered into multivariate analysis. **Significant set at p-value < 0.05 after multivariate analysis, 1 indicates reference group. The above analysis was adjusted for demographic variables. Hosmer-Lemeshow goodness-of-fit test chi-square = 2.080 (df = 6), p = 0.912. (Using enter method)

4.4.3 Association of demographic variables, Perceived social support, Religious orientation and Food security with PTSD

In total 7 variables were significant at 0.25 in the univariate analysis. Testing for multicollinearity among these 7 variables revealed that there were four variables in two pair that had evidence of multicollinearity (Cramer's V value of > 0.3) as follows: (a) gender and separation from a family member and (b) exposure to violence and physical injury as shown in Table 4.8. The variable removed was separation from a family member and physical injury. The balance 5 variable were tested for interaction and there was no significant interaction present between these 5 variables and the outcome variable as the p-value was > 0.05 as shown in Table 4.9. Finally, a total of 5 variables were entered into multivariate analysis. Out of the 5 variables entered into the multivariate analysis level, 2 were significantly associated with PTSD, including exposure to violence (AOR = 38.46; 95% CI 16.27, 90.91) and food insecurity (AOR = 3.74; 95% CI 1.41, 9.91). Table 4.10 shows the results of both univariate and multivariate logistic regression for the association of perceived social support, religious orientation and food security variables that are significant (p < 0.05) with PTSD symptoms in multivariate analysis while adjusting for demographic variables. The Hosmer-Lemeshow test p-value was 0.302 (not significant), meeting the assumption of logistic regression.

Table 4.8: Test of Multicollinearity (c)

	Gender	Age (years)	Separation from family members	Exposure to violence	Physical injuries	Food security
Gender		0.125	0.401	0.090	0.298	0.135
Age (years)	0.125		0.246	0.106	0.129	0.090
Separation from family members	0.401	0.246		0.122	0.298	0.033
Exposure to violence	0.090	0.106	0.122		0.463	0.195
Physical injuries	0.298	0.129	0.298	0.463		0.295
Food security	0.135	0.090	0.033	0.195	0.295	

Note. Cramer's V values of more than 0.3 indicate evidence of multicollinearity among variables.

Table 4.9: Test for Interaction (c)

	Variables in the Equation						
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Age* Violence Exposure * Food Security * Gender * ROS-R Score			4.550	2	.103	
	Age (1) by Violence Exposure (1) by Food Security (1) by Gender (1) by ROS-R Score	-.015	.008	3.682	1	.055	.985
	Age (2) by Violence Exposure (1) by Food Security (1) by Gender (1) by ROS-R Score	-.021	.020	1.064	1	.302	.980
	Constant	-.339	.152	4.983	1	.026	.713

a. Variable(s) entered on step 1: Age * Violence Exposure * Food Security * Gender * ROS-R Score.

Table 4.10: Factors associated with PTSD

Variable	Univariate logistic regression		Multivariate logistic regression	
	Crude OR (95% CI)	p-value	Adjusted OR (95%CI)	p-value
Gender				
Male	1		1	
Female	0.59 (0.34, 1.03)	0.063*	0.60 (0.27, 1.35)	0.217
Age (years)				
18 to 35	1		1	
36 to 55	1.18 (0.62, 2.25)	0.609	1.16 (0.45, 2.96)	0.762
≥ 56	0.31 (0.09, 1.12)	0.075*	0.36 (0.07, 1.95)	0.237
Marital status				
Single	1			
Married	1.26 (0.61, 2.62)	0.537		
Divorced	3.00 (0.45, 20.24)	0.259		
Education				
Less than secondary	1			
Secondary school	0.96 (0.54, 1.70)	0.889		
College	1.64 (0.53, 5.08)	0.395		
Employment status				
Full-time employment	1			
Part time/Unemployed	0.97 (0.56, 1.68)	0.923		
Time spent in Malaysia (Months)				
<12	0.85 (0.27, 2.63)	0.776		
12 to 23	0.44 (0.09, 2.16)	0.309		
24 to 36	0.65 (0.16, 2.61)	0.548		
>36	1			
Homelessness				
Yes	1	1.000		
No	0.00 (0.00, 0.00)			
Separation from a family member				
Yes	1.82 (0.96, 3.47)	0.068*		
No	1			
Exposure to violence				
Non-Exposed	1		1	
Exposed	34.39 (15.75, 75.10)	0.000*	38.46 (16.27, 90.91)	0.000**
Physical injuries				
Yes	21.54 (9.86, 47.07)	0.000*		
No	1			
Perceived social support				
Low/Moderate	0.94 (0.54, 1.64)	0.834		
High	1			
Religious orientation (Overall)	1.03 (0.99, 1.06)	0.154*	1.05 (0.99, 1.10)	0.069
Food security				
Food secure	1		1	
Food insecure	3.71 (1.84, 7.50)	0.000*	3.74 (1.41, 9.91)	0.008**

Note. OR, Odds ratio; CI, Confidence interval; The variable separation from a family member and physical injuries were excluded from multivariate analysis due to interactions; *Variables significant at 0.25 from the univariate analysis are entered into multivariate analysis. **Significant set at p-value < 0.05 after multivariate analysis, 1 indicates a reference group. The above analysis was adjusted for demographic variables. Hosmer-Lemeshow goodness-of-fit test chi-square = 9.503 (df = 8), p = 0.302. (Using enter method)

4.5   Summary of Chapter 4

This chapter presents the results of this study. Variables were collected from 220 adult Rohingya refugees residing in Selangor. A total of 220 samples were collected per variable for this study, which examined the prevalence of MDD, GAD, PTSD, and its associated factors. The prevalence of GAD, PTSD, and MDD was reported at 92 (41.8%), 84 (38.2%) and 71 (32.3%). Section 4.4 dealt with the association between Perceived social support, religious orientation, food security, and mental health disorders(namely MDD, GAD and PTSD). Following multivariate analysis, only 5 variables were significantly associated with MDD symptoms namely being female, living in Malaysia for less than 1 year, having been physically injured, perceived low to moderate social support and food insecurity. Two variables namely exposure to violence and food insecurity were significantly associated with PTSD. No variable was found to be significantly associated with GAD following multivariate analysis.

CHAPTER 5: DISCUSSION

5.1 Introduction

Mental health is an important determinant in addressing the overall health of the Refugees population. This study was designed to determine the prevalence and associated factors of MDD, GAD and post-traumatic stress disorder (PTSD) among Rohingya refugees in Malaysia. The findings of this study are discussed in this chapter, which begins with a discussion of the results of the demographic characteristic, Perceived social support, religious orientation, and food security among the Rohingya population in Sections 5.2 to 5.5. Results regarding the prevalence of MDD, GAD, and PTSD are discussed in Section 5.6. Section 5.7 to 5.9 provides a discussion of the direction of the association between perceived social support, religious orientation, and food security with MDD, GAD, and PTSD. The strengths and limitations of this study are discussed in Section 5.10. Finally, Section 5.11 summarizes the findings in this study.

5.2 Demographic characteristics of participants

The majority of participants in this study were males. Female participants accounted for about 47.3%. The reason for this unequal participation rate could be explained by several mechanisms. Gender inequality among Rohingya women could be a possible reason for the poor female participation rates in this study. Traditionally Rohingya women, face double restrictions; first from their government and military, and second from the men in their community (UNHCR, 2019). It is a norm among the Rohingya that men continue to lead and women obey silently (UNHCR, 2019). Other reasons that could explain a lack of female representativeness in this study could be, shy and introvert nature of the Rohingya women and the need for the women to take care of household chores. Alternatively, a lack of household randomization during the process of sampling could have also resulted in this finding. Despite the majority of refugees have been in Malaysia for more than 3 years and had secondary school education in their country of origin, the

majority (56.4%) were unemployed or employed on a part-time basis. Several mechanisms mediate this finding. As Malaysia is not a state party to the 1951 Convention Relating to the Status of Refugees and its' 1967 Protocol; Malaysia functions as a transit point for refugees and therefore many of them are considered illegal immigrants that do not possess legal documentation and possess no forms of employment entitlement (Edwards, 2011). The lack of legalization would reduce the employment chances among these populations (Rashvinjeet, 2019). Those employed on an informal basis would frequently get exploited some paid poor wedges and other work for long hours (violation of Labor law) (Rashvinjeet, 2019). Language barrier also is a factor that restricts employment chances. This is an important finding as poor employment among this population would mean a lack of financial income to sustain basic living requirement and this would result in negative health-related outcomes. Also, it suggests that variation in education systems across countries could contribute to unemployment.

A concerning finding in this study is that more than one-third of participants were separated from family members and have been exposed to violence. It does not come as a surprise as refugees are prone to such unfortunate events due to their underlying circumstances. But what is worrying is that these factors have been reported by previous studies as significant predictors of poor mental health outcomes among the refugee population (Momartin, Silove, Manicavasagar, & Steel, 2004; Savic, Chur-Hansen, Mahmood, & Moore, 2013).

A more reassuring finding is that the majority of refugees are not homeless and are married. It could be possible that as the majority of participants have been living in Malaysia for more than 3 years, they would have been able to secure accommodation as well as settled down. Being married provides some buffer against the development of mental disorders, however other challenges such as expanding family would, in turn,

bring new challenges to an already stricken population. For example, having to provide food, shelter, education, healthcare, and security to children.

5.3 Prevalence of MDD, GAD, and PTSD

Overall one-third of participants in this study were reported to have MDD (32.3%), GAD (41.8%) and PTSD (38.2%). Several mechanisms can mediate this finding. The majority of refugees in this study have been residing in Malaysia for more than 3 years. Although evidence suggests that a longer duration of displacement is a risk factor for mental health disordersamong refugees (Carlson & Rosser-Hogan, 1993; Marshall, Schell, Elliott, Berthold, & Chun, 2005; Vaage et al., 2010). It could be possible that participants in this study would have assimilated to the local community culture and social practices during this period, therefore enabling them to find jobs, accommodation, and social support. The active role played by the RSM and UNHCR Malaysia in providing aids and support could also help alleviate some distress faced by these populations. This is evident as the majority of participants in this study perceive moderate to a high degree of social support. Furthermore, a high degree of religious orientation, lack of exposure to violence and physical injuries would act as a buffer against mental health disorder, which could also result in a low prevalence of MDD, GAD, and stress. The detail discussion of MDD, GAD, and PTSD is presented in the following paragraphs.

5.3.1 MDD

The prevalence of MDD in this study was 32.3%, which was similar to the prevalence of MDD reported among refugees in the United States of America (USA), Italy and Iraq, where the prevalence of MDD was reported at 32%, 31%, 34% and 35% (Bogic et al., 2012; Craig, Sossou, Schnak, & Essex, 2008; Gorst-Unsworth & Goldenberg, 1998; Hollifield et al., 2006). However, this study reported a much lower prevalence of MDD compared to studies among refugees in Malaysia, Australia, USA and Israel which reported a prevalence of MDD at 98%, 88%, 86% and 79% (Coffey, Kaplan, Sampson,

& Tucci, 2010; Cwikel, Chudakov, Paikin, Agmon, & Belmaker, 2004; Keller et al., 2003; Shaw et al., 2018).

Variation in the prevalence of MDD among refugees can be explained in several ways. Among the studies that reported similar prevalence of MDD among refugees as this study, there were several similarities noted namely the use of same instruments to screen for MDD (MINI) (Bogic et al., 2012), all participants were post-war conflict refugees and majority of participants has been displaced for long duration of periods (more than 3 years) (Bogic et al., 2012; Craig et al., 2008; Gorst-Unsworth & Goldenberg, 1998; Hollifield et al., 2006).

Among studies reporting a higher prevalence of MDD among refugees compared to this study, several mechanisms can explain this variation. The first majority of refugees in these studies were on detention at the time the study was conducted. Hostile conditions in detention areas could surely increase the risk of MDD as evident in these studies (Coffey et al., 2010; Cwikel et al., 2004; Keller et al., 2003). Unlike this study, all the participants were not in detention at the time the study was conducted. Second, variation in sample characteristics and study instruments could have also contributed to a difference in the prevalence of MDD. For example, one study had predominantly female participants (Keller et al., 2003), and as evidence suggests that the risk of MDD tends to be higher in females (Hill & Lynch, 1983). The use of self- report screening instruments should be considered presumptive, as it may be affected by social desirability bias which could in turn artificially inflated the prevalence rates of mental health disorders (Mugisha, Muyinda, Wandiembe, & Kinyanda, 2015).

To date, there is limited evidence on the prevalence of MDD among Rohingya refugees both Internationally and in Malaysia (Tay et al., 2018). More recently the prevalence of MDD among Rohingya refugees in Malaysia and Bangladesh was reported at 76% and

89%, which is much higher than this study (Low et al., 2018; Riley et al., 2017). Among the possible explanation for this finding are; the use of different tools to screen for MDD, variation in age of participants, whereby the study conducted in Malaysia only involved adolescent Rohingya refugees, unlike this study which included only adult participants. Unlike Bangladesh, Malaysia is a middle-income country this could justify a lower prevalence of MDD among refugees in this study compared to that conducted in Bangladesh.

5.3.2 GAD

The prevalence of GAD in this study was 41.8%, which was similar to the prevalence of GAD reported among refugees in Jordon, USA, and India, where the prevalence of MDD was reported at 42%, 41% and 40% (CDC, UNHCR, & Nation, 2007; Craig et al., 2008; PHR, 1997). Furthermore, an average pool prevalence of GAD among refugees was reported at 40% by a systematic review (Lindert, Ehrenstein, Priebe, Mielck, & Brähler, 2009). Reasons for this similar finding could be mediated by the fact that the majority of these studies were conducted in middle-income countries such as India and Jordan; involved refugees that have been displaced for a long duration of time. A much higher prevalence of GAD was reported among refugees in Cambodia, the USA, and Mexico which reported a prevalence of GAD at 88%, 77% and 57% (Carlson & Rosser-Hogan, 1994; Keller et al., 2003; Sabin, Cardozo, Nackerud, Kaiser, & Varese, 2003). The variation in the prevalence of GAD is due to the following reasons. Unlike other studies, the majority of refugees in this study had no exposure to violence, being tortured or injured. Therefore levels of psychological distress (such as GAD and PTSD) would surely be much lower when compared to refuges that are exposed to constant violence, tortures and physical injuries as seen in studies conducted in the USA, Mexico, and Cambodia (Quosh, Eloul, & Ajlani, 2013). A lack of specificity with regards to the type of GAD assessed could also result in a variety of findings. For example, this study

reported on Generalized GAD Disorder (GAD), while other studies in Cambodia and the USA reported a much higher prevalence of GAD reported on unspecified GAD. Finally, variation in the instrument used to asses' GAD could result in this finding.

The findings of GAD are higher in this study when compared to a study conducted in Bangladesh among Rohingya refugees, which reported a prevalence of GAD at 14% (Riley et al., 2017). Variation in this finding could be explained by the following; in this study an interview-based instrument (MINI) was used to screen for GAD, unlike this study, the study in Bangladesh utilized a self-administered questionnaire. The use of a self-administered questionnaire could result in social desirability bias which would result in a low prevalence of GAD. Larger sample size in this study (n=220) compared to that conducted in Bangladesh (n=140) could have resulted in a higher prevalence of GAD.

5.3.3   PTSD

The prevalence of PTSD in this study was 38.2%, which was similar to the prevalence of PTSD reported among refugees in a systematic review which reported an average pool prevalence of PTSD at 36% (Lindert et al., 2009). Studies in Bangladesh, USA, Africa, and Algeria have all reported similar prevalence of PTSD among the refugee population, whereby the prevalence of PTSD was reported at 36%, 38.9%, 37.8% and 37.4 (De Jong et al., 2001; Hollifield et al., 2006; Onyut et al., 2009; Riley et al., 2017). Studies in the UK and Australia reported a much higher prevalence of PTSD, at 76% and 70% (Coffey et al., 2010; Robjant, Robbins, & Senior, 2009). While studies involving refugees in Gaza, Thailand, Ethiopia, and Uganda all reported a much lower prevalence of PTSD at 20%, 15%, 15.8% and 11.8% (De Jong et al., 2001; El Sarraj, Punamäki, Salmi, & Summerfield, 1996; Mollica, 1993; Mugisha et al., 2015).

The similarity in findings across studies could be due to a similar type of refugee population which is being assessed as is the case of this study and that in Bangladesh

which both focused on Rohingya refugees. The variation in prevalence rates across studies may be attributed to the following reasons (a) degree and duration of exposure to violence and trauma, whereby a higher degree and more recent exposure to violence or trauma (active conflict) would result in higher prevalence of PTSD; (b) variation in instruments to asses for PTSD, the use of self-reported instruments often results in presumptive prevalence rates; (c) variation in number of traumatic events, lower number of traumatic events would allow for spontaneous remission of PTSD resulting in lower prevalence of PTSD; and (d) impact of public health interventions for PTSD if any would also affect prevalence rates. (Mugisha et al., 2015).

5.4   Perceived social support among Rohingya refugees

The majority of participants (58.6%) in this study reported high perceived social support. This finding infers that the Rohingya population have experience of being valued, respected, cared about, and loved by others who are present in their life (Roohafza et al., 2014). Also, it reflects the presence of sources of social support from family, friends, community, NGO's and UNHCR Malaysia among this population group (Chuah et al., 2019; Yasin & Dzulkifli, 2010). This is an important finding as adequate social support would prevent the occurrence of mental health problems (Roohafza et al., 2014). In contrast, many other studies have reported lower rates of perceived social support among the refugee population, such as that among Syrian refugees in Turkey (Çankaya, Alan Dikmen, & Dereli Yılmaz, 2018); Sudanese refugees in Israel (Nakash, Nagar, Shoshani, & Lurie, 2017) and refugees in Sweden (Johnson, Rostila, Svensson, & Engström, 2017).

Variations in this finding could be a result of variation in instruments used to asses' perceived social support, whereby in this study the MSPSS was used while the study conducted among refugees in Sweden used a different tool (Johnson et al.,2017).

Among the studies that used the same tool (MSPSS) as this study to examine perceived social support, some studies reported on the mean score (continuous) (Çankaya et al., 2018; Johnson et al., 2017; Nakash et al., 2017), unlike this study which had categorized perceived social support into low/moderate and high groups. Therefore, this disparity makes a comparison of results across studies difficult. Furthermore, this study reported on perceived social support across both genders, while studies conducted in Turkey only involved females and in Israel only involved males (Çankaya et al.,2018). Variation in genders of participants can create a dilution effect whereby studies involving only males would generally tend to report a higher degree of perceived social support (Soman, Bhat, Latha, & Praharaj, 2016). In this study majority of refugees have been residing in Malaysia for more than 3 years. A long duration of stay would have enabled them to establish a larger social network and engage with organizations (governmental and non-governmental), which would promote a higher degree of perceived social support (Chuah et al., 2019; Sterle, Vervoort, & Verhofstadt, 2018). The majority of participants in this study were less than 36 years of age, and studies have reported higher perceived social support among young individuals ages 35 years and below compared to older individuals (Çankaya et al., 2018). A majority of participants in this study were married, this could be another reason for high perceived social support as evidence has reported higher perceived social among married individuals (Qadir, Khalid, Haqqani, Zill-E-Huma, & Medhin, 2013).

Nevertheless, still, a concerning finding of more than one-third of participants in this study demonstrated low to moderate levels of perceived social support. Traditionally one would expect refugees to have low perceived social support due to reasons such as lower educational status, unemployment, lack of social security, lower economic status, loneliness, not belonging to a nuclear family, and having no higher living standards (Çankaya et al., 2018).

5.5   Religious orientation among Rohingya refugees

Participants in this study demonstrated high levels of overall religious orientation, especially for the intrinsic religious orientation. This finding suggests that the Rohingya refuges generally do believe in the existence and nature of God, religious prescriptions about morality, communal and personal spirituality. More specifically these population groups are living their religion as they experience an internalization of their adopted beliefs. Religion, for them, is not a means, but an end (Allport & Ross, 1967). Low levels of extrinsic social religious orientation reflect that participants in this study do not use religion to achieve non-religious goals namely personal agendas (such as attaining security, social status, and solace) (Allport & Ross, 1967). These findings are important because it points towards a high degree of religious maturity among participants in this study, which is important in developing strong subjective well-being even when faced adversities, improve life satisfaction, physical health, and social connectedness (Ardelt & Koenig, 2007). These are important factors in alleviating social losses, physical and mental suffering that can ensure sustaining a displaced population through their journey (Buber-Ennser, Goujon, Kohlenberger, & Rengs, 2018). Similar findings have been reported among Syria, Iraq and Afghanistan refugees residing in Austria whereby 80% report moderate to high levels of religious orientation (Buber-Ennser et al., 2016). However, to date, there is a paucity of studies reporting on religious orientation among the Rohingya refugee population. Several mechanisms could mediate the findings of high levels of intrinsic religious orientation among participants in this study. First, studies have suggested that lower levels of educations are associated with higher religious orientations, this could justify findings from this study as the majority of participants had education levels till secondary schools (Johnson, 1997). Second, the official religion in Malaysia is Islam, therefore negative, discriminatory and hostile attitudes toward refugees especially Muslims refugees would be minimized when compared to other Western nations; and this

could further enhance the positive religious orientation of the Rohingya refugees (Buber-Ennser et al., 2016).

5.6   Food security among Rohingya refugees

The results of this study indicate a high prevalence (71%) of food insecurity among the Rohingya population residing in Selangor. This finding suggests that this population appears to have a lack of food availability, food access, food utilization and food stability (Lawlis, Islam, & Upton, 2018). It also reflects a poor household-level economic and social condition which results in limited or uncertain access to adequate food (Health reports, 1974). This is an important finding as food insecurity will result in nutritional deficiencies, malnutrition, poor health outcomes (chronic health conditions) and poor quality of life (Cole & Tembo G, 2011; Kushel, Gupta, Gee, & Haas, 2006). Similar findings have been reported among refugees worldwide. In South Africa, 77% of refugees of varying cultures reported food insecurity (Maharaj, Tomita, Thela, Mhlongo, & Burns, 2017). A high percentage of food insecurity has also been reported among Afghan refugees (74%) in Switzerland (Khakpour et al., 2017); Syria, Somalia and Iraq refugees (93%) in Norway (Henjum, Morseth, Arnold, Mauno, & Terragni, 2019). In the United States, 85%, 72%, and 53% of Liberian, Somali and African refugees were food insecure (Dharod, Croom, Sady, & Morrell, 2011; Craig Hadley & Sellen, 2006; Craig Hadley, Zodhiates, & Sellen, 2007). Studies from Australia and the United Kingdom (UK) have also shown that food insecurity among refugees is widespread, whereby in the UK, 100% of refugee families indicated food insecurity (Sellen, Tedstone, & Frize, 2002), and in a sample of newly arrived refugees in Australia, 71% reported having previously run out of food (Gallegos, Ellies, & Wright, 2008). Several reasons could explain the findings of food insecurity among the Rohingya population in this study. The first majority of participants in this study were unemployed/part-time employed. A poor

employment rate would directly result in financial constraints which would restrict expenditure and access for food (Napier, Oldewage-Theron, & Makhaye, 2018). Second, the majority of participants in this study were males and it has been reported that males tended to display higher levels of food insecurity compared to females due to differences in cooking skills among men and women (Henjum et al., 2019). Other mechanisms that could explain food insecurity among the refugee population include lack of knowledge about new foods, difficulties with shopping; cooking information, language challenges, and problems complying with various religious food rules (Craig Hadley et al., 2007).

5.7 Factors associated with MDD among Rohingya refugees

Several variables were found to be significantly associated with MDD among refugees following multivariate analysis. This study report that being female increases the odds of MDD among the Rohingya refugees. Similar results have been reported in studies involving Rohingya refugees in Bangladesh (Riley et al., 2017), Syrian refugees in Iraq (Mahmood, Ibrahim, Goessmann, Ismail, & Neuner, 2019), Afghan/Somali refugees in the Netherlands (Gerritsen et al., 2006), and Bosnian refugees in Sweden (Blight, Ekblad, Persson, & Ekberg, 2006). MDD has always been more common among females for various reasons, such as those attributed to genetics, higher GAD disorder, biological changes associated with puberty, cognitive predisposition (negative perception), and sociocultural factors (Adeniyi, Okafor, & Adeniyi, 2011; Birmaher et al., 1996; Yaacob et al., 2009). Furthermore, there are several theories to explain this gender difference, including the gender intensification hypothesis which indicates that MDD symptoms are more associated with feminine roles or stereotypes (Hill & Lynch, 1983). However, in contrast, several studies have reported that gender did not predict mental health among the refugee population (Schweitzer, Brough, Vromans, & Asic-Kobe, 2011). Variation in findings could be a result of methodological differences across studies.

This study also found that refugees that have been physically injured had an increase odd of MDD. This finding infers that refugees who experience non-accidental physical injuries or trauma could develop MDD symptoms. This is an important finding as refugees are a group of the population that will be constantly at risk of being physically injured especially during the pre-migration, migration and resettlement phases, compared to the general population. This finding is consistent with previous studies done involving Syrian refugees in Iraq (Mahmood et al., 2019), Afghan/Somali refugees in the Netherlands (Gerritsen et al., 2006), refuges refugees in Croatia (Letica-Crepulja, Salcioglu, Frančišković, & Basoglu, 2011), Vietnamese refugees in Australia (Steel, Silove, Phan, & Bauman, 2002) and refugees (unspecified) in the UK, Germany, Italy, and Uganda (Bogic et al., 2012; Roberts, Ocaka, Browne, Oyok, & Sondorp, 2008). Several mechanisms can explain this finding. Physical trauma may result in a wide range of physical and psychological impairment, and disability which could increase the risk of MDD (Steel et al., 2009). A reduction in health-related quality of life following physical injury increases the risk of MDD (Sluys, Häggmark, & Iselius, 2005). The denial or lack of access to healthcare among refugees who require medical attention following physical injuries also further increases the risk of MDD. However, in contrast to this study, a study conducted among Rohingya refugees in Bangladesh reported no significant association between trauma due to physical injuries and MDD (Riley et al., 2017). Among the reasons for this variation could be explained by several methodological difference such as variation in tools used to asses physical injuries, analysis used (this study used logistic regression and the one in Bangladesh utilized a linear regression), variation in number of variables controlled for (result in confounding bias) and variation in sample size.

In this study, MDD was also found to be significantly associated with those who have been living in Malaysia for less than 1 year. This translates to the possibility of the newly arrived Rohingya refugees in Malaysia to have an increased chance of developing MDD. This is an important finding as any refugees arriving in a new country would be facing many challenges and obstacles which may be more amplified especially during the early periods. Previous research points to the potential mental health vulnerability (such as MDD) of newly arrived refugees such as those Sudanese, Iran, Afghan, Indian and Burmese refugees in Australia (Momartin et al., 2006; Schweitzer et al., 2011; R. Schweitzer, Melville, Steel, & Lacherez, 2006; Silove, Steel, McGorry, & Mohan, 1998). The reason for the increased chances of MDD among newly arrived refugees could be explained by several mechanisms. Newly arrived refugees must learn to navigate an entirely new community, language, and cultural system, while simultaneously coping with the loss of homeland, family, and way of life, difficulties with employment, and difficulty accessing health and social services (Murray, Davidson, & Schweitzer, 2010; Schweitzer et al., 2011). Lacking necessities, restricted movement, and continued concern for safety may also be more profound during the early stages (Riley et al., 2017). Furthermore, as Malaysia is a transit country, not a resettlement country the constant feeling of uncertainty will be constantly present. All of these factors may result in adjustment issues that could increase the chances of MDD among newly arrived refugees. However, in contrast, studies have reported poor mental health outcomes with longer duration of displacement or resettlement among Cambodian, Vietnamese, African and Sudanese refugees (Carlson & Rosser-Hogan, 1993; Marshall et al., 2005; Perera et al., 2013; Schweitzer et al., 2006; Vaage et al., 2010). This variation could be due to differences in type (nationality) of refugee population being studied, whereby in this study the Rohingya refugees were the focus and in other studies, none included Rohingya refugees. Variation in cultural practices and believes among various refugee population

could also mediate this difference in assimilation or adaptation to a new setting, culture and its environment.

This study also found that refugees with low to moderate perceived social support had an increase odd of MDD. This finding infers that levels of perceived social support do affect the chances of developing MDD symptoms. This is an extremely important finding as refugees unlike the general population are deprived of social support due to their underlying circumstances. These findings have been replicated by previous studies among Sudanese refugees in Australia (Schweitzer et al., 2006), Syrian refugees in Germany and Turkey (Oppedal, Özer, & Şirin, 2018; Sierau, Schneider, Nesterko, & Glaesmer, 2019). Several reasons can justify this finding. As human beings, social support be it from immediate or extended families, friends, and social groups are important elements in ensuring good mental health. Poor social support among refugees would deprive them of emotional (e.g. sense of belonging, appreciation, being loved) informational, tangible (e.g. physical assistance includes financial) and intangible (e.g. personal advice) forms of support. This would create a sense of isolation in exile that would increase the chances of MDD among refugees (Schweitzer et al., 2006). Refugees with poor or moderate social support will lack guidance and reliable alliance (advice) which are important factors for problem-solving in stressful periods of life (Sierau et al., 2019). Based on the stress-mobilizing hypothesis, stress encourages individuals to seek social support, but in the case of refugees when the social support is poor this would result in a worsening of stress and predisposes them to develop MDD (Singh & A., 2015).

In this study, MDD was also found to be significantly associated with food insecurity. This finding suggests that lack of access and inability to maintain food availability increases the odds of refugees developing MDD. It is not a surprise that refugees constantly have issues of food insecurity as this is closely related to their poor

employment status, lack of social support and overall being an underprivileged population. Similar findings have been replicated by previous studies conducted among refugees in South Africa, Sri Lanka, UAE, and Canada (Hamid & Musa, 2010; Maharaj et al., 2017; Siriwardhana et al., 2013). Food insecurity increases the odds of MDD through several mechanisms either directly or indirectly. Food insecurity causes food deprivation which can result in nutritional deficiencies such as vitamin B12 and iron that increases the risk of developing MDD (Sathyanarayana Rao, Asha, Ramesh, & Jagannatha Rao, 2008). Refugees suffering from food insecurity are more likely to eat cheaper food which could be lacking in nutritional value (Ghattas, Sassine, Seyfert, Nord, & Sahyoun, 2015). Some individuals within a household facing food insecurity will limit their intake of food to provide more food to other household members once again resulting in nutritional deficiencies (Kicinski & Kicinski, 2012). Individuals who fail to secure food for themselves or their families would further experience psychological distress which would predispose them to develop MDD (Pinstrup-Andersen, 2009). Food insecurity leads to hunger which increases the risk of MDD (Campbell, 1991).

5.8   Factors associated with GAD among Rohingya refugees

Several variables were in descriptive terms only associated with GAD namely being divorced, being in Malaysia for less than a year and being physically injured. Similar findings were reported in studies involving refugees in Germany whereby both marital status and duration of displacement were not significantly associated with GAD (Georgiadou, Zbidat, Schmitt, & Erim, 2018). In contrast to this study previous studies have reported a significant association between (a) being divorce and GAD among the refugee population in Germany and UK (Bogic et al., 2012; Bogic, Njoku, & Priebe, 2015); (b) being physically injured and GAD among the refugee population in United States (Willard, Rabin, & Lawless, 2014).

Several methodological variations could explain the variation in findings reported in this study compared to others that report significant associations. First, the sample size used in this study was relatively smaller compared to studies conducted in Germany and the UK. Second, this study specifically focused on Rohingya refugees only, variation in sociocultural perspectives among refugees of various cultures could have also played a role in this finding. Third, in this study, the numbers that represented participants who were divorced, being in Malaysia for less than a year and being physically injured were relatively small when compared to other studies. Fourth, it could be possible that those participants who were divorced, been in Malaysia for less than a year and had been physically injured did not suffer from GAD at the time of assessment. Fifth, this study examines GAD, while others may have reported on a specific anxiety disorder.

5.9   Factors associated with PTSD among Rohingya refugees

Several variables were found to be significantly associated with PTSD among refugees following multivariate analysis. This study report that a history of exposure to violence significantly increases the odds of MDD among Rohingya refugees. Refugees are frequently exposed to traumatic/violence experience which can occur anytime during the process of pre-migration, migration, and post-migration. Violence among this vulnerable population may be a result of torture, rape, murder, genocide, political violence, and war experience. This is an important finding as exposure to violence in this already vulnerable population would further predispose them to develop PTSD. Similar results have been reported in studies involving Syrian refugees in Iraq, Afghan/Somali refugees in the Netherlands, Vietnamese and Bosnian refugees in Australia (Gerritsen et al., 2006; Mahmood et al., 2019; Momartin et al., 2004; Steel et al., 2002), refugees (unspecified) in the UK, Germany, Italy, Uganda, and Croatia (Bogic et al., 2012; Letica-Crepulja et al., 2011; Roberts et al., 2008).

Essentially PTSD commonly occurs following exposure to a violent terrifying event either by personally experiencing it or witnessing it. Reason for this is because violence disrupts five broad systems: (i) personal safety; (ii) interpersonal attachments; (iii) sense of justice; (iv) identity or role; and (v) existential-meaning and that violence can manifest in various psychosocial responses within these domains (Silove, 1999). Studies also suggest that exposure to violence results in hemispheric lateralization in which there is a relative failure of left hemispheric function, therefore, resulting in PTSD (van der, 1997). Evidence has suggested certain functional etiologies of PTSD that occur as a result of exposure to trauma/violence. For example exposure to violence cause the following (a) hyperadrenergic activity in the Central Nervous System (CNS), (b) Stimulation of the serotonergic (5-HT) receptors (5-HT signaling) in the CNS, (c) Increase in Corticotrophin-releasing factor in the cerebrospinal fluid and (d) Signaling of the dynorphin/κ opioid receptor in the brain, which all may increase the risk of PTSD (Bailey, Cordell, Sobin, & Neumeister, 2013). In this study majority of the population were separated from a family member during the process of migration, this experience may have also contributed to a violent experience that increases the odds of PTSD.

This study also found that refugees with food insecurity had increased odds of having PTSD. This infers that individuals with difficulty accessing, consuming and maintaining a constant supply of adequate food are predisposed to develop PTSD. This is an important finding as in this study the majority of refugees suffer from food insecurity, a finding that might be common to many refugees worldwide. Similar findings have been reported by studies conducted among refugees in Uganda, the general population in Ethiopia and Africa (Hadley et al., 2008; Mugisha et al., 2015; Schaal, Jacob, Dusingizemungu, & Elbert, 2010). Several mechanisms mediate these findings. Food insecurity results in high-stress levels that predispose individuals to develop PTSD. High-stress levels are generated through the following ways; (a) in-sufficient quantity, quality, or diversity of

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available foods (b) feelings of deprivation, anxiety, or restricted choice about the amount or type of available foods and (c) having to engage in procurement strategies such as begging, dependence on charity, stealing, or exchanging sex to obtain food (Whittle et al., 2019). Food insecurity also causes hunger and energy depletion which affects emotion, cognition, behaviors and linked to the recollection of violence and trauma that results in increased chances of PTSD (Whittle et al., 2019). Repeated prolonged exposure to food insecurity has been conceptualized as a traumatic experience that could elevate the risk of developing symptoms of PTSD in response (Whittle et al., 2019). The violence that occurs as a result of engagement in procurement strategies to obtain food may also lead to PTSD.

5.10   Strengths and limitation

There are several strengths to this study. To date, this is the first study examining factors (perceived social support, religious orientation, and food insecurity) associated with mental health outcomes (MDD, GAD, PTSD) among Rohingya refugees in Malaysia. Mental health outcomes namely MDD, GAD, PTSD in this study was assessed using MINI which is based on DSM V criteria, performed through face to face interviews undertaken by trained clinicians and therefore more likely to provide more realistic prevalence rates in the region as compared to using self-administered screening tools which may produce speculative results (Mugisha et al., 2015). The MSPSS, ROS-R, and Radimer/Cornell Food Insecurity Instrument reported having acceptable to good levels of Cronbach alpha values (0.91, 0.68 and 0.95) therefore reducing the possibility of measurement errors. To improve the precision of this study, the sample size calculation was based on the smallest effect size with a fairly narrow 95% CI. Confounding bias was controlled by including variables that have been reported to be significant predictors of MDD, GAD, and PTSD among the refugee population as independent variables in this study; and the use of multivariate analysis to control for confounding effect. The use of

random sampling methods avoids selection bias and increase the generalization of the finding of this study. The findings from this study can, therefore, be generalized to adult Rohingya refugees residing in Selangor. A 100% response rate addresses the issue of attrition bias and non-response bias in this study.

There are several limitations to this study. A self-reported questionnaire could lead to information bias as a result of social desirability bias, especially regarding questions about perceived social support, religious orientation, and food insecurity. Participants may be more inclined to answer certain questions in a socially desirable manner. The researchers tried to minimize this by ensuring that participants had no personal identifiers written on the questionnaire so that confidentiality was maintained. Most participants in this study were residing in Selangor and therefore generalizing the findings to refugees residing in other states in Malaysia must be done with caution. As Selangor is the state with the highest number of Rohingya refugees in Malaysia makes perfect sense to initiate such as study in Selangor as a start. As this study used a cross-sectional design, the researchers are unable to establish temporal relationships (Wei, McGrath, Hayden, & Kutcher, 2015).

5.11 Summary of Chapter 5

As expected, a majority of participants were separated from a family member during the process of migration, face food insecurity, and unemployment. About one-third of refugees have low to moderate social support but the majority have high religious orientations. The prevalence of GAD appears to be the highest followed by PTSD and MDD among participants in this study. Several variables were finally found to be significantly associated with MDD and PTSD following adjustment for potential confounders. Findings from this study replicate some other studies but the pressing issue here is the lack of studies involving Rohingya refugees. This deficiency makes comparison across studies difficult as the study population differs in its basic nature.

CHAPTER 6: CONCLUSION AND RECOMMENDATION

6.1   Introduction

This study examined the prevalence of MDD, GAD, PTSD and its association with several demographic factors, perceived social support, religious orientation and food insecurity among Rohingya refugees in Malaysia. The conclusions and recommendations from this thesis are presented in Sections 6.2 and 6.3. The contributions of this study and suggestions for future research directions are presented in Sections 6.4 and 6.5, followed by a summary of this chapter in Section 6.6.

6.2   Conclusion

The main empirical findings of this study are now summarised. To date, this is the first study to report on the prevalence of MDD, PTSD and GAD disorders among Rohingya refugees residing in Malaysia. The prevalence of GAD, PTSD, and MDD was reported at 92 (41.8%), 84 (38.2%) and 71 (32.3%) respectively. This study finding also highlights certain important demographic characteristics of Rohingya refugees residing in Selangor. For example, the majority of refugees have been living in Malaysia for more than 3 years, were unemployed or employed on a part-time basis only, were married, had attained secondary level education, have a place to stay, perceive low to moderate social support and have food insecurity. This study also identified several variables that were significantly associated with a mental health disorder. Female, living in Malaysia for less than 1 year, been physically injured, perceived low/moderate social support and food insecurity significantly increased odds of MDD among refugees. While the odds of PTSD were significantly increased among those who were exposed to violence and food insecurity.

6.3   Recommendations

There are several recommendations generated from this study which are categorized into program and policy-based recommendations which are discussed in the following paragraphs.

6.3.1   Program based recommendations

An important point to note here is that several stakeholders namely UNHCR Malaysia, Ministry of Health Malaysia (MOH), Private healthcare sector, Ministry of Finance (MOF), Academia and NGO's have to be actively involved and engaged in these programs collectively otherwise it would not be able to achieve its objectives (Chuah et al., 2019). This study strongly suggests that there is an important need for developing and implementing several program-based recommendations for the Rohingya refugees in Malaysia. These programs should adopt both a centralized and outreached based approach. A centralized approach would be to invite refugees to attend these programs within the respective facilities (e.g. Health clinics, Hospitals). While an outreach-based approach would mean to deliver these programs to the setting of a refugee's population. The latter approach would surely benefit refugees as it would eliminate structural and attitudinal barriers for these refugees to access these programs.

(a) **Mental health screening programs**

Mental health screening programs among Rohingya refugees should be an integral component in addressing mental health disorders's among refugees in Malaysia. The objectives would be to primarily detect those refugees suffering from mental health disorders's and subsequently provide basic mental health interventions or referrals to Psychiatric health facilities within the country. Mental health screening programs among refugees are needed in Malaysia because, first, this study has highlighted, about one-third of Rohingya refugees in Malaysia suffer from PTSD, GAD, and MDD. The

actual prevalence may be much higher as this study only sample 220 Rohingya refugees. Second, the early timely intervention of mental health disorders's is recommended so that the prognosis and outcomes would be much favorable. Third, untreated mental health disorders's among the refugee population would not only affect these refugees directly but would also increase the burden of disease in Malaysia and harm the Malaysian community as a whole. Finally, with the rising numbers of Rohingya refugees in Malaysia and the long resettlement process the mental health of this population group should not be neglected.

(b) **Mental health education programs**

The mental health education program should be given to refugees in Malaysia. Such a program should aim to improve refugees' understanding and awareness of mental health disorders, the common risk and protective factors of mental health disorders's and the need to seek help and source of help for mental health disorders's. For example, from this study, Rohingya refugees should be educated about what is MDD, PTSD and GAD, its prevalence among refugees in Malaysia and finally the risk factors of first developing MDD such as being Female, living in Malaysia for less than 1 year, been physically injured, perceived low/moderate social support and having food insecurity; second, developing PTSD such as exposure to violence and food insecurity. To add value to these mental health educations programs, these programs could be delivered in the native Rohingya language by the help of trained translators and it is important to ensure that the teaching mode is kept simple so that it could be understood by an individual with a background of primary or secondary level education. Such programs would increase awareness of mental health disorders, improve help-seeking and health service utilization among refugees in Malaysia.

(c) **Mental health capacity building programs for health clinics.**

Mental health capacity building program that targets staff working in health clinics especially NGO's based health clinic should be initiated. These programs should aim to; (a) improve the staff's ability to provide basic mental health first aid (MHFA) and psychosocial support to those refugees suffering from mental health disorders's; (b) sensitize staff regarding the common mental health disorders, risk and protective factors of mental health disorders among refugees. These measures would benefit the refugees as they would be able to receive some form of MHFA and psychological support at a primary care level that would alleviate their symptoms before actually getting specialized help. Additionally, the health clinic staff would function as important gatekeepers that would be able to promote timely referrals/intervention for those refugees suffering from mental health disorders. The reason for targeting health clinics especially NGO's health clinics is because these clinics are easy to reach as most facilities are located in vicinities close to refugee communities. Furthermore, in these clinics, the protection and financial barriers of accessing healthcare services are mitigated, as documents are not required at the point of care and the cost of treatment is free or minimal (Chuah et al., 2019).

(d) **Programs to promote more refugees-based research in Malaysia**

There needs to be more research like this one in Malaysia involving refugees (Chuah et al., 2019). The objective of this program would be to increase the interests of researches to conduct studies relating to mental health disorders among the refugee population and to develop alternative funding sources. Research such as this is important for several reasons. First, there is a severe paucity of data on the prevalence of mental health disorders and factors associated with Rohingya refugees in Malaysia. Second data on the prevalence of mental health disorders among Rohingya refugees would create an opportunity for an evidence-based policy that would benefit this underprivileged population in Malaysia. Third, to enhance discussion among studies relating to Rohingya

refugees in Malaysia, more studies are needed as this would ensure the comparability of findings across studies reporting on the same population group. As evident in this study, the majority of the discussion points were discussed about other studies conducted among non-Rohingya refugees either in Malaysia or Internationally. Ultimately replication of research such as this one would quantify the burden of mental health disorders's among Rohingya refugees in Malaysia which would further highlight this issue to Policymakers.

6.3.2 Policy-based recommendations

Several policy-based recommendations have been generated from this study. These policies recommendations are discussed based on the following context what are the policy recommendations, the reasons for this recommendation, objectives of the policy and how will these policy recommendations help refugees in Malaysia.

(a) Policy on the basic right to employment

Policy looking into basic rights to employment for refugees in Malaysia should be developed as soon as possible. The justification for having such a policy is due to the following reasons: First, this study reports that the majority of Rohingya refugees have difficulty in securing full-time employment despite being in Malaysia for several years. Second, this study also highlights the majority of refugees have food insecurity which could be directly a result of financial constraints they face due to unemployment. Third, to date in Malaysia, no policy has spelled out basic rights to employment for the refugee population and therefore refugees in Malaysia do not have the rights to legally work in Malaysia (Dick, 2019). Policies on basic rights to employment for refugees should focus on ensuring all refugees have the right to know about the work, participate in the work and refuse unsafe work. Additionally, they should also be governed by the Labor laws. The existence of Policies on basic rights to employment for refugees would benefit them in several ways. Refugees would get more opportunities to be employed on a full-time

basis. They would be able to generate a constant flow of income that would reduce financial constraints. A higher degree of financial freedom would reduce food insecurity and increase health-seeking behaviors. Also, refugees would not be exploited by employers.

(b) **Policy for Universal Health Coverage for refugees**

Policies on Universal health coverage (UHC) should be extended to include the refugee population in Malaysia. The justification for this simply because, first the UHC currently only applies to Malaysian citizens (Chuah et al., 2019). Second, this study has reported almost a third of participants to suffer from MDD, PTSD, and GAD which warrants mental health interventions. Third, several factors were identified in this study as risk factors that would increase the odds of MDD, PTSD, and GAD that should be addressed. Fourth, many refugees in Malaysia are unable to afford the financial cost related healthcare service in Malaysia, despite efforts such as providing a 50% discount for all refugees recognized by UNHCR who seek help from public healthcare facilities (Chuah et al., 2019). The main objective of the UHC policy for refugees in Malaysia would be to ensure access to affordable quality healthcare services. This can be achieved thru several mechanisms as the following; development of a Government-funded health insurance for refugees, guarantee undocumented refugees protection from arrest and detention at health care facilities and ensure that patients' confidential data, including their documentation status, are not shared with third-party stakeholders, such as the Immigration authorities (Dick, 2019). These measures would surely encourage refugees to seek help early on, thus resulting in return improvement of mental health outcomes among the refugee population and reduce the costs of using secondary health care later on.

6.4   Contribution of the study

First, this study provided baseline data on the prevalence of MDD, PTSD and GAD disorders among Rohingya refugees in Malaysia which is currently lacking. Second, this study identified factors (risk/protective) associated with these mental health disorders among this population. Such data on prevalence and risk/protective factors of mental health disorders among this vulnerable population would certainly help various stakeholders to generate more efforts in tackling the issue of mental health disorders among Rohingya refugees in Malaysia. Third, this study also detected those refugees suffering from either MDD, PTSD or GAD and provided them with counseling, referrals to either governmental or NGO healthcare facilities/service for further assessment and management as described in the following paragraphs. Participants of this study underwent diagnostic assessments for MDD, GAD, and PTSD as a part of the study. This created an opportunity for the Rohingya refugees to have a free assessment for common mental health disorders namely MDD, PTSD, and GAD, which otherwise would most probably not be detected due to constraints faced by these refugees. Participants diagnosed with mild MDD, PTSD or GAD were given counseling by a mental health professional as a part of the study. The counseling provided may be able to offer some relief and reassurance among those suffering. Free referrals to Government based Psychiatric clinics were given to those participants suffering from moderate to severe MDD, GAD or PTSD. The referral letter provided would enable participants to directly get access to highly specialized governmental based mental health care instead of having to consult a primary healthcare doctor first.

Finally, the findings generated from this study will be disseminated to the community, RSM and UNHCR Malaysia. Also, there is an aim to publish findings of this study into relevant journals. By disseminating findings of this study through these channels, the researchers hope that relevant recommendations to existing and future programs and

policies aimed at addressing the issues mental health disorders among Rohingya refugees in Malaysia can be made. The possible risk involved in the dissemination of study findings is addressed by ensuring confidentially/anonymity of participants and protecting data ownership. All data will be owned by the University of Malaya. The benefits of this study are available to all participants via the participation information sheet which is available both in English and Malay language. A translator was present during the process of distribution of the subject information sheet to help participants who are not clear with the meaning of the subject information sheet.

6.5   Future research direction

This research project can be extended in several areas in the future.

a) More studies such as this one should be conducted involving Rohingya refugees residing in other states in Malaysia. This would improve generalization and comparability of findings across studies.

b) Future studies should include several factors such as income level, UNHCR Malaysia registration status and occupation type which were not included in this study. This is because these factors could be predictors of mental health disorders among refugees.

c) Longitudinal research examining the association of perceived social support, religious orientation, food insecurity and demographic characteristics with mental health outcomes among the Rohingya refugee population in Malaysia needs to establish temporal causality.

d) It would be relevant for future studies to determine the association of perceived social support, religious orientation, food insecurity and demographic characteristics with varying severity levels of MDD, GAD, and PTSD among refugees in Malaysia.

e) Determining if there is a significant difference between the prevalence of MDD, GAD, and PTSD among the refugee population in Malaysia could be another direction for future research.

f) Other mental health disorders's (such as schizophrenia, bipolar disorder, etc.) among Rohingya refugee's population should also be examined aside from common mental health disorders such as MDD, GAD, and PTSD.

g) Further studies should also examine the predictors of perceived social support, religious orientation and food insecurity among the Rohingya refugee population in Malaysia.

6.6   Summary of Chapter 6

Several recommendations are made in this chapter, based on the findings obtained from the assessment of prevalence and factors associated with mental health disorders among Rohingya refugees in Malaysia. These recommendations include the following; (a) developing mental health screening program for refugees which enable early detection and intervention of mental health disorders; (b) Initiating mental health education programs for refugees that would improve awareness of mental health disorders; (c) Increasing mental health capacity of health clinics which would enable refugees to receive early MHFA and psychological support; (d) Generate more research relating to mental health disorders among refugees in Malaysia as this would then be used for developing evidence-informed Policies; (e) Develop policies on basic right to employment for refugees which would improve employment and reduce financial constraints and (f) To extend UHC policy to include refugees in Malaysia, this would ensure access to affordable quality healthcare service, therefore, reduce the prevalence of mental health disorders among refugees. Although future research is required to replicate these study findings, the implementation of these recommendations should not be delayed.

Finally, this chapter describes the contribution of this study to the field of mental health research among refugees and the potential benefits gained by participants of this study. Several suggestions are made for future research in the field of mental health research among refugees.

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