

**RELIGIOUS COPING, RELIGIOSITY, DEPRESSIVE AND  
ANXIETY SYMPTOMS AMONG MALAYSIAN MEDICAL  
STUDENTS**

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## ABSTRACT

Medical students are vulnerable to depression and anxiety due to the nature of their academic life. Religious coping is often used as a coping mechanism in this population. This study aimed to determine the prevalence of depressive and anxiety symptoms among medical students as well as to determine the correlation between religious coping, religiosity and socio-demographic factors with anxiety and depression. A cross sectional design was used for this study and samples were collected via convenient sampling. Religiosity and religious coping were measured using the Malay version of the Duke Religious Index (DUREL-M) and the Malay version of the Brief Religious Coping Scale (Brief RCOPE). Depression and anxiety were measured using the Malay version Hospital and Anxiety Depression Scale (HADS-M). All scales used were validated for the Malaysian population. A total of 622 patients participated in this study. A majority of them were female, single and from the Muslim and Buddhist religion. They scored moderately on the organized (mean: 3.51) and non-organized religious (mean: 3.85) subscales of the DUREL, but had high intrinsic religiosity (mean: 12.18). The prevalence of anxiety and depressive symptoms were 4.7 % and 17.4 % respectively. Islam, negative religious coping and the presence of depressive symptoms were significantly associated with anxiety symptoms. Only the presence of anxiety symptoms was significantly associated with depressive symptoms. The prevalence of depressive and anxiety symptoms among Malaysian students were lower than previous local and international data. They had high intrinsic religiosity however negative religious coping was associated with increased anxiety symptoms. Focus needs to be directed towards reducing negative religious coping as it has adverse impact on the mental health of Malaysian medical students.

**Keywords :** Coping , Mental health , Anxiety, Depression, Medical students.

## Abstrak

Pelajar perubatan sering kali terdedah kepada kemurungan dan keresahan kerana perjalanan akademik mereka yang sukar. Agama sering digunakan sebagai mekanisme dalam populasi ini. Kajian ini bertujuan untuk menentukan kelaziman simptom kemurungan dan keresahan di kalangan pelajar perubatan serta untuk menentukan korelasi antara agama, religiositi dan faktor sosio-demografi dengan keresahan dan kemurungan. Cara kajian keratan rentas digunakan untuk kajian ini dan sampel dikumpulkan melalui 'convinient sampling'. Religiositi dan keagamaan diukur dengan menggunakan versi Melayu Indeks Agama Duke (DUREL-M) dan versi Bahasa Melayu Skal Keagamaan Ringkas (Brief RCOPE). Kemurungan dan kecemasan diukur menggunakan Skala Depresi Hospital dan Kecemasan Versi Melayu (HADS-M). Semua skala yang digunakan telah disahkan untuk penduduk Malaysia. Sejumlah 622 pelajar mengambil bahagian dalam kajian ini. Majoriti merupakan pelajar perempuan, tunggal dan dari agama Islam dan Buddha. Keputusan menunjukkan yang pelajar perubatan mempunyai markah yang sederhana dalam skala keagamaan teratur (ORA) (min: 3.51) dan keagamaan yang tidak teratur (NORA) (min: 3.85), tetapi mempunyai religiositi intrinsik yang tinggi (maksudnya: 12.18). Peratusan keresahan dan gejala kemurungan adalah 4.7% dan 17.4% masing-masing. Agama Islam, 'negative religious coping' dan simptom kemurungan dikaitkan dengan keresahan. Walaubagaimanapun, hanya kehadiran simptom keresahan dikaitkan dengan kemurungan. Peratusan simptom kemurungan dan keresahan di kalangan pelajar Malaysia lebih rendah dibandingkan dengan data lokal dan global. Mereka mempunyai keagamaan intrinsik yang tinggi namun menghadapi cabaran dengan cara keagamaan yang negatif (negative religious coping), membawa kepada peningkatan keresahan. Fokus perlu diarahkan untuk mengurangkan 'negative religious coping' untuk meningkatkan kesihatan mental dalam kalangan mereka.

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## LIST OF ABBREVIATIONS

<b>BriefRCOPE-M</b>	Brief Religious Coping Scale Malay Version
<b>DUREL-M</b>	The Duke University Religiosity Scale Malay Version
<b>IR</b>	Intrinsic Religiosity
<b>GLM</b>	General Linear Model
<b>HADS-M</b>	Hospital Anxiety and Depressive Scale Malay Version
<b>NCOPE</b>	Negative Coping
<b>NORA</b>	Non-organized Religious Activity
<b>ORA</b>	Organized Religious Activity
<b>PCOPE</b>	Positive Coping

## **CHAPTER 1**

### **INTRODUCTION**

Mental illness is Achilles heel of the generation today. Globally it has a high burden of disease associated with high rates of morbidity, absenteeism and presenteeism at work. International data has placed anxiety disorders as the sixth highest cause of disability worldwide (Baxter, Vos, Scott, Ferrari, & Whiteford, 2014). This trend is worrying as increased disability translates to higher morbidity and decreased quality of life. Subsequently, disability leads to increased cost to the government as unemployment rates increase and people are unable to contribute the nation's Gross Domestic Product (GDP). A recent report mentioned that the yearly economic cost of anxiety disorders to Malaysians was approximately 80 million USD, and this value was projected to increase further (Manaf, Aljunid, & Rahman, 2009). Depressive disorders are also on the rise in Malaysia. The most recent National Morbidity Health Survey in 2015 concluded that the lifetime prevalence of mental illness among Malaysians is 29.2 %. Another study reported that the prevalence of depression in Malaysia was between 4 to 46 % (Mukhtar & Oei, 2011). These figures are alarming as it translates to higher fiscal burden and does not bode well in the long term for our economic growth.

Depression and anxiety are common and often overlooked among medical students. Recent studies concluded that the global prevalence of depression or depressive symptoms among medical students ranged from 27% to 34.6% (Moutinho et al., 2017; Puthran, Zhang, Tam, & Ho, 2016; Rotenstein et al., 2016), which are staggeringly high figures. Anxiety symptoms, while not as widely studied as depression, were shown to be as prevalent with figures between 35% and 37% (Ediz, Ozcakil, & Bilgel, 2017;

Moutinho et al., 2017). The impact of untreated mental illness on these students' performance during their most formative years in medical school cannot be overstated. Given that the South East Asian region is the proverbial melting pot for many religions and cultures (Yudohusodo, 2009), it is interesting to ascertain the role of religiosity and religious coping in this particular group.

Mental illness among medical students are hardly scarce however may be difficult to detect. These may be for a myriad of reasons but have the same ultimate end : poor performance and eventual drop out from medical school. One of the reasons depressive and anxiety symptoms are difficult to detect may be because stress from medical school life is sometimes indistinguishable from depressive symptomatology. Medical students thus attribute these symptoms due to stress and do not think it is actually indicative of a more serious psychopathology(Rosenthal & Okie, 2005). The academic curriculum also contributes to the emotional burden carried by medical students. Medical life is known to be draining and academically challenging, thus contributing a significant amount of distress to medical students. Some students are perturbed by the frequent encounter with morbid illnesses, death and macabre physical conditions of their patients. These encounters could also add to their distress, and contribute to their eventual meltdown(Givens & Tjia, 2002).

The time frame whereby students are either depressed or anxious may vary, but there is some evidence that it usually occurs during the clinical years, whereby medical students are exposed to so-called real life hospital scenarios and are often inundated with ward rounds, rotations and junior residency duties(Ngasa et al., 2017; Quince, Wood, Parker, & Benson, 2012). At times, sleep deprivation has also been blamed for making medical students more vulnerable to depression and anxiety(Rosenthal & Okie, 2005). Clinical years are often tough and unforgiving, leading students to burn out and

become ambivalent about their aim of joining medical school in the first place. This doubt, coupled with chronic stress from their academic life, often is a recipe for depression and anxiety among medical students.

There are several factors that prevent medical students from seeking help. Stigma in receiving treatment further makes it more challenging for medical students, as they often feel guilty to seek help. Guilt, coupled with paucity of time and means to seek help often means that the mental health of medical students are often suppressed and not looked into. There is also an underlying belief that seeking help from a mental health professional will decrease their job opportunities once they graduate. This belief has been further bolstered by the fact that some medical employers do enquire about the mental health status of prospective doctors. Thus, it is understandable that medical students face several barriers to seeking help (Rosenthal & Okie, 2005). Efforts need to be directed towards decreasing stigma to enable medical students to seek help.

It is clearly pivotal to stem the root cause of depression and anxiety among medical students, as they are future clinicians and healers of society. In the case where the current high prevalence of depression and anxiety is left unchecked, this will lead to future doctors who are mentally unstable and not capable of carrying out their duties. One study done abroad showed that depression among medical professionals were worryingly high at a total prevalence of 31 % (Tyssen & Vaglum, 2002). This trend is clearly alarming as untreated depression often leads to physician suicide (Scherhammer & Colditz, 2004). Besides suicide, there are several other ramifications for future physicians in the form of increased depression, anxiety, emotional burnout and abuse of illicit substances and drugs (Brooks, Gerada, & Chalder, 2011). These adverse effects clearly will have negative effects on society. Thus, prophylactic steps must be taken beginning from the medical students in colleges and universities.

Religion and mental health have been generally viewed as allies, with positive religious coping providing much needed solace in times of distress (Ano & Vasconcelles, 2005; Hackney & Sanders, 2003). Religious coping, as described by Pargament, refers to seeking religion as a means of strength in difficult times and includes reading holy scriptures, seeking counsel from religious leaders and decreasing distress or unpleasant thoughts using religious means (Pargament, Tarakeshwar, Ellison, & Wulff, 2001). It can be further divided into two constructs, which is positive and negative religious coping. Coping generally has been defined as behavioural methods to deal with the individual's stressors, losses and obstacles. Coping is a multidimensional construct as it encompasses behavioural, cognitive, and religious as well as emotional methods. The binary notion of religious coping has been shown to have impact on mental health, with positive coping generally associated with less distress and better outcomes, and the opposite seen with negative coping (Pargament, Koenig, & Perez, 2000). However, there are some exceptions to this association. In particular, the concept of religious strain has been introduced to explain the phenomena whereby trauma and religious adversity can lead to a strenuous relationship with God and as a result lead to a decline in coping and mental health as a whole (Exline, Yali, & Sanderson, 2000; Harris, Leak, Dubke, & Voecks, 2015). Positive religious coping may also not be necessarily beneficial as one study showed that reliance on positive coping lead to unrealistic expectations and eventually be corrosive to an individual's overall health (Phelps et al., 2009). Negative coping has also been shown to have positive outcomes in some instances as an individual's struggles with God may translate to religious endurance in the long run. Thus, the concept of religious coping does have its grey areas, and a binary conceptualization may not be the most accurate to view this method of coping.

Initial efforts in studying religious coping have not been without its struggles. Before the Religious Coping (RCOPE) was designed, earlier scales to measure religious coping were fundamentally flawed. For example, these early scales focused on methods of coping without delving into the content of that particular method. Secondly, earlier scales, for example the Ways of Coping scale and the COPE inventory, combined non-specific methods of general coping with only a few religious coping. As a result, these early scales were unable to sieve out the actual strength of religious coping (Pargament, Feuille, & Burdzy, 2011). With these shortcomings in mind, Pargament and colleagues developed the RCOPE scales in 1997. The RCOPE was different in that it included the varied nuances of religious coping and viewed religious coping as a multi-dimensional construct, under the tenets of positive and religious coping.

The association of religiosity with mental health has fascinated researches in their efforts to find a modifiable factor in preventing mental illness. This is so as religion is an important fabric of people's lives. One study quoted that majority of people either have a routine praying habit, perceive organized religion as important and look at faith as a important driving force in their lives (Tix & Frazier, 1998). The landmark review by Koenig and colleagues summarized that a majority of studies favoured a positive relationship between religion and mental health (H. G. Koenig, McCullough, & Larson, 2001). More recent studies however have had varied results. A study among an Iranian cohort of medical students found that religiosity negatively predicted depression and anxiety (Vasegh & Mohammadi, 2007). Similarly, another study involving Muslim medical students in Iran showed that religiosity was a protective factor against depression (Heidari, Pahlavanzadeh, Ghadam, Dehghan, & Ider, 2016). However, another study among Jewish medical students found that there was no significant association between religiosity and depression or anxiety (Lupo & Strous, 2011). Thus,



there is a need for more studies in this area to further define the relationship between religion and mental health.

Malaysia is a country consisting of a pluralistic society, with Islam as the national religion. However, religions such as Christianity, Hinduism, Buddhism, Taoism and other religions are practiced freely. Importantly, prior studies on the subject of religiosity and mental health focused on populations with a monotheistic majority society (Hackney & Sanders, 2003). No prior study has been done to study the relationship between religious coping, depression and anxiety among medical students in Malaysia, even though religion is an important part of the social fabric in this region (Hefner, 2010).

The rationale of this study was to investigate the relationship between religiosity, religious coping, depressive and anxiety symptoms among Malaysian medical students in University Malaya. This study was undertaken as the medical students are a vulnerable population with high rates of anxiety and depression, proven by other previous studies. However prior studies examining mental health status of University Malaya students did not exist, further reinforcing the need for such a study. Furthermore, research pertaining to religious coping, religiosity and their correlation with mental health of medical students has never been undertaken in the South East Asian region prior to this. This was also the first study to be undertaken in University Malaya assessing depressive and anxiety symptoms among medical students. Data from this study can also be used as part of the national data regarding depression and anxiety among medical students in Malaysia.

The objectives of the study were to determine the prevalence of depressive and anxiety symptoms among the UM medical student population and to identify the socio-demographic correlates of depression and anxiety in this population. The study also

aimed to examine the correlation and association between religiosity, religious coping, depressive and anxiety symptoms among medical students . This study has several research questions, as listed below :

- a) What are the prevalence of depressive and anxiety symptoms among medical students?
- b) What are the socio-demographic correlates of depressive and anxiety symptoms among medical students ?
- c) Is there an association between religious coping, depressive and anxiety symptoms among medical students ?
- d) Is there an association between religiosity, depressive and anxiety symptoms among medical students ?

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Depression and anxiety amongst medical students**

Depression is a global health problem with increasing morbidity. The World Health Organization estimates that 350 million people are affected by depression and is the leading cause of disability worldwide in terms of total years lost due to disability (Olfiffe, Ogrodniczuk, Bottorff, Johnson, & Hoyak, 2012). The prevalence of Major Depressive Disorder continues to rise in part due to the stigma and negativity attached to this disorder. Studies have shown that perceived stigma was significantly correlated with greater severity of depression (Pyne et al., 2004; Yen et al., 2005). The medical student population is thus at great risk as they constitute a vulnerable population who are exposed to continuous stigma, leading them to not disclose their illness and seek help (Schwenk, Davis, & Wimsatt, 2010). Furthermore, medical students were reportedly afraid that being open about their depression would lead them to being ostracised or deprived from certain opportunities in medical school (Givens & Tjia, 2002). These form barriers to seeking help for their depression, leading to increased morbidity among this population. It is commonly known that medical students are a vulnerable group to develop depression due to their intense and demanding training. A recent meta-analysis concluded that the lifetime prevalence of depression among medical students were 28 %, with being female, first year of study and medical students of Middle Eastern descent being more disposed to being depressed (Puthran et al., 2016). An American meta-analysis conducted recently concluded that the prevalence of depressed medical students were higher than the general population, at 27.2% (Rotenstein et al., 2016). In another older study, the prevalence of depression

among medical students in one study was 12.8 % with female students showing a higher percentage (16.1%) compared to male students (8.1%)(M. Dahlin, Joneborg, & Runeson, 2005). A fairly recent Indian study showed shockingly high rates of depressive symptoms among their medical students, with 51.3 % of their respondents having depressive symptomatology(Iqbal, Gupta, & Venkatarao, 2015). In Malaysia, the prevalence of depression studied in a local university was 35.9 %. This was associated with the female gender, the Malay race, poor interpersonal relationship and pressure prior to exams(Sherina & Kaneson, 2003). Other Malaysian data showed that the prevalence of depression among medical students was between 22% to 35% (Saravanan & Wilks, 2014; M. S. B. Yusoff, Rahim, & Yaacob, 2011).

There are many factors that act as predictors for depression among medical students. One large study in South Korea identified the following risk factors in developing depression among medical students : female gender, lower class years, living alone at a lodging house or a rented room, and financial difficulty in paying college fees. The lifetime prevalence of depression in this population was 10.3%(M. S. Roh, H. J. Jeon, H. H. Kim, S. K. Han, & B. J. Hahm, 2010). In a study done among Malaysian university students, depression was strongly correlated with older students and those born in rural areas. High stress scores were found among older students, females, Malays and families with either low or high incomes(Shamsuddin et al., 2013a). Other risk factors include higher academic load, lack of sleep, exposure to patient's suffering, student bullying and debts(E. A. Guthrie et al., 1995; Stewart, Lam, Betson, Wong, & Wong, 1999). A fairly recent Malaysian study showed that there were no association between gender and depression however there was a correlation between the female gender and anxiety symptoms(Saravanan & Wilks, 2014). Thus it is imperative to identify the correlates for depression among medical students as it will contribute a better understanding of this population.

Anxiety among medical students is common (Michie & Sandhu, 1994). Anxiety is an important illness to detect as it was shown to contribute to poor academic results, drop out, substance abuse and even suicide (Midtgaard, Ekeberg, Vaglum, & Tyssen, 2008; Tyssen, Vaglum, Grønvold, & Ekeberg, 2001). A significant cause of this anxiety was shown to be caused by long hours of studying, high workload and financial pressures while pursuing their medical studies (Adams, 2004; Hope & Henderson, 2014).

There are several studies concerning the prevalence of anxiety symptoms among medical students globally. A Brazilian study showed that prevalence of anxiety and depressive symptoms were 37.2% and 34.6 % respectively (Moutinho et al., 2017). A prevalence study done among female medical students in Iran found that the prevalence of anxiety and depression was 34.9% and 14.7% respectively. Among the predictors of anxiety in this population were depression, packed academic courses and emotional failure in the preceding six months prior to study inclusion (Ibrahim, Dania, Lamis, Ahd, & Asali, 2013). A large multicentre study among medical students in Brazil found that the prevalence of state-anxiety and trait-anxiety was 81.7% and 85.6% respectively. The factors associated with depression and anxiety in this population were the female sex, tuition fees and school location (Mayer et al., 2016). Middle Eastern data showed that 28.7 % of their medical students had anxiety symptoms whereas 28.6 % of them were depressed (Ahmed, Banu, Al-Fageer, & Al-Suwaidi, 2009). A Malaysian study done in 2013 found that the prevalence of anxiety symptoms was very high at 54.5 % (M. S. B. Yusoff, Rahim, & Yaacob, 2010). Similarly, another Malaysian study done in 2013 from four public universities in Malaysia reported that the rates of anxiety symptoms among medical students was 63% (Shamsuddin et al., 2013b).

Year one medical students were under more stress and perceived burden compared to clinical year students, perhaps due to the stress of the curriculum and adjusting to the new educational setting (E. Guthrie et al., 1998; Radcliffe & Lester, 2003). Another study in Pakistan reported similar findings whereby year one and two students had higher or comparable anxiety and depressive symptoms compared to their final year counterparts. The prevalence of anxiety and depression among this population was high at 43.89% (Jadoon, Yaqoob, Raza, Shehzad, & Zeshan, 2010). Other studies also reported that more students were more depressed at the end of their first year compared to at the end of their studies (Vitaliano, Maiuro, Russo, & Mitchell, 1989). This is not surprising as first year medical students are a vulnerable group of students as they are exposed to new learning environments and having to face the stress of being away from family. Though there is some evidence that there is more stress in the later years of medical education (Helmers, Danoff, Steinert, Leyton, & Young, 1997), in one study, half of the cohort who were first years reported neurotic symptoms at the beginning of the academic year, with one third of them reporting the presence of persistent symptoms 6 months later (Miller & Surtees, 1991). This goes to show that medical students, particularly, those in their first year of studies, are particularly vulnerable to neurotic and depressive symptoms.

Thus, it is evident that depression and anxiety are major problems among medical student, which can potentially affect their productivity as future doctors. It is important to identify the correlates and associations of depression and anxiety symptoms among Malaysian medical students, as it will enable us to identify potential risk factors so that early intervention can be done.

## 2.2 Religiosity among medical students

Religiosity is an interesting construct to study. Broadly speaking, religiosity can be measured in terms of personal devotion, spiritual practices and private beliefs pertaining to religion. Since religiosity is personal matter of faith, it has been difficult to accurately measure it empirically. However the importance of religiosity and mental health cannot be overstated as it has been shown that religiosity is a protective factor against suicide (Snider & McPhedran, 2014). However, one pertinent question remains: What are the mechanisms by which religiosity facilitates improved well-being of mental health? Some have proposed that belief in God and spirituality in general corresponded with the personal character traits of patients such as hope, grit, endurance and optimism, which facilitated positive outcomes in mental health. Other authors concluded that religiosity may have a placebo effect in patients by boosting their expectations of their treatment (Rosmarin et al., 2013). Independent of the mechanism, it is safe to state that religiosity has positive impact on mental health and is an important construct to study (Behere, Das, Yadav, & Behere, 2013).

A meta-analysis done recently found that religiosity had a mild protective role against depression (Smith, McCullough, & Poll, 2003). However, some studies have reported a negative association between religion and mental health, citing the negative effects of 'religious strain' on mental health (Exline et al., 2000). In the undergraduate population, some studies have been done, however most of these studies have been done from either the Muslim (Vasegh & Mohammadi, 2007) or Christian perspective (Jansen, Motley, & Hovey, 2010). Studies focusing exclusively on the medical student population are scarce. A study among an Iranian cohort of medical students found that religiosity negatively predicted depression and anxiety (Vasegh & Mohammadi, 2007). Similarly, another study involving Muslim medical students in Iran showed that

religiosity was a protective factor against depression(Heidari et al., 2016). However, another study among Jewish medical students found that there were no significant association between religiosity and depression or anxiety(Lupo & Strous, 2011). Another recent meta analysis analysing 74 articles in detail concluded that about two thirds of studies showed that increased religiosity was associated with decreased anxiety and depression among the studied population(AbdAleati, Zaharim, & Mydin, 2016).Thus, there seems to be differing data on the relationship between religiosity, depression and anxiety. Furthermore, no such study has been conducted in a Malaysian setting.

While fairly much has been said about the association between depression and religiosity, there is also some literature regarding religiosity and anxiety disorders. One meta-analysis conducted showed that a total of 7 out of 10 studies showed that religious factors was associated with lesser symptoms in the domains of generalized anxiety disorder, panic and phobic disorder. The same meta-analysis also showed that in 10 % of the studies, religiosity was associated with worsening symptoms in panic disorder(Khalaf, Hebborn, Dal, & Naja, 2015). Thus, they established that increased religiosity does not necessarily correlate with better anxiety. However a majority of the studies showed that people who were religious were able to decrease their anxiety levels, improved coping and also predicted prolonged remission(Bowen, Baetz, & D'arcy, 2006; Kendler et al., 2003; Razali, Aminah, & Khan, 2002).

In spite of data supporting the positive role of religiosity in anxiety, there have also been conflicting reports. One study showed that increased religiosity among Christian adolescents was associated with increased anxiety(Peterman, Labelle, & Steinberg, 2014). Older studies have also added heterogeneity in the field of religiosity and mental health by showing that there was no relationship between mental health outcomes with



religiosity indices. It is nonetheless surprising that there is data to suggest that increased anxiety is correlated with more involvement in religious activity(Harris, Schoneman, & Carrera, 2002). A possible reason for this could be that religion is a heterogeneous construct and its multi-dimensionality made it a struggle to measure in studies. Thus measuring true religiosity became the Holy Grail for researches who were interested in this field. Another possible reason is that religiosity takes a toll on the personal life of its believers as they are often forced to upkeep a resilient façade in public, often translating to inner anxiety and depression.

### **2.3 Religious coping among medical students**

Religious coping is an important means by which people cope with the stresses of their daily lives(Ano & Vasconcelles, 2005). Coping has been defined as the ‘ search of significance in the times of stress’(Pargament, 2001) and has been seen as vital to the coping mechanism of many people. Traditionally, people have coped religiously in the face of adversity by turning to God, seeking help from community based religious leaders, and turning to religious scriptures. These methods are helpful for those in acute stress and also for those who have chronic difficulties in life. In Malaysia, this form of coping is even more apparent as Malaysia is a country which consists of a multi-religious society, with Islam as it official religion(Chandia & Choong, 2014). Religious coping can be divided into positive and negative religious coping(Pargament et al., 2000). The noted scholar Kenneth Pargament defined religious coping as endeavours to handle the challenges and obstacles in life in ways connected to the sacred. ‘Sacred’ in this context was an inclusive term, included the classical view of the Almighty and divinity but also other perspectives related to spirituality(Pargament & Mahoney, 2005).

This was an important step in the realm of religious psychology as the study of religion was often strictly confined to rigid societal norms and under umbrella of major world religions such as Christianity, Islam, Hinduism and Buddhism. As a result of this exclusivity, people who were spiritual but did not subscribe to any particular mainstream religion were often missed in studies.

As mentioned earlier, religious coping can be divided into positive and negative religious coping. Positive coping refers to dependence on the divine for help in the need and leads to a secure and trusting relationship with God. Negative coping refers to an individual's belief that problems or stress are a result of incurring the wrath of God, and is often characterized by insecurities in faith, doubt in God's benevolence and eventually a strained relationship with God. Positive coping is often viewed as the more adaptive compared to negative coping. However this is not always true as negative coping has also been shown to be correlated with spiritual growth and maturity(Phelps et al., 2009).

In a Malaysian study, it was found that negative religious coping was associated with higher scores on the depression, anxiety, and stress scale (DASS)(M. S. Nurasikin et al., 2013). Thus far, most studies in religious coping have focused on the Christian population, particular in Western countries. Surprisingly, there are few studies assessing religious coping among the medical student population. There was one notable study on the Muslim Pakistani medical student population that showed that religious coping was not significantly associated with depression and anxiety(Khan & Watson, 2006). An Iranian study done among 355 medical students concluded that positive religious coping with improved self care behaviour, which led to improved mental health(Nia et al., 2017).With the backdrop of mixed association results, more studies are needed to ascertain whether religious coping is associated with better mental health outcomes

among medical students. In Malaysia, no such study has been conducted in the undergraduate medical student population.

University of Malaya

## **CHAPTER 3**

### **METHODOLOGY**

#### **3.1 Study Setting**

This study was conducted in University Malaya Medical Faculty, which is located in Kuala Lumpur. University Malaya is the nation's premier university, and their Faculty of Medicine is the oldest in the country. University Malaya currently has only one intake of students, which number about 140 students annually into their undergraduate MBBS programme. Selection is done via a strict pre-admission interview and examination process, and only those who pass these tests are granted admission into the programme. The student population typically consists of a multi-ethnic background, including Malays, Indians, Chinese and other minority groups. Foreign students also make up the medical student population. However for the purpose of this study, only Malaysian medical students were involved.

#### **3.2 Study Design and Sampling method**

This was a cross sectional study done among undergraduate medical students at the University of Malaya from Year 1 to Year 5. University of Malaya, being located at the heart of Kuala Lumpur and receiving students countrywide, consists of students from various different cultural and religious backgrounds. Non-probabilistic convenience sampling method was employed and students who consented to the study were given questionnaires to answer. Those who agreed to join the study were screened according to the following inclusion and exclusion criteria. Out of 697 medical students, 622

students who fulfilled the inclusion criteria and did not meet the exclusion criteria participated in the study.

### **3.2.1 Inclusion criteria**

- Malaysian medical students currently pursuing studies in their medical MBBS degree at the University of Malaya.
- Aged 19 and above.
- Students must be in their first-degree programs.

### **3.2.2 Exclusion criteria**

- Illicit substance usage.
- Refusal to participate in study.

Socio-demographic information was collected via pre-designed questionnaires made for the study. Religiosity was measured using the Duke Religious Index Malay Version (DUREL-M) while religious coping was measured using the Malay Version of the Brief Religious Coping Scale (Brief RCOPE-M). Depressive and anxiety symptoms were measured using the Malay Version of the Hospital Anxiety and Depressive Scale (HADS-M). All scales were validated for use in the Malaysian population. The Medical Ethical Committee of University Malaya Medical Centre approved the study.

### **3.3 Study duration**

Samples were collected within a time frame of 3 months, that is from 1<sup>st</sup> October –20<sup>th</sup> December 2017.

### **3.4 Sample Size Calculation**

The following formulae was used for sample size calculation in a cross sectional study (Charan & Biswas, 2013) :

$$n = t^2 \times p(1-p) / m$$

$$=1.96^2 \times 0.359(1-0.359)/0.05^2$$

$$=3.841 \times 0.359 \times 0.641 / 0.0025$$

$$= 353.55$$

$$\approx \mathbf{354 \text{ students}}$$

n = required sample size

t = confidence level at 95% (standard value of 1.96)

p = estimated prevalence of depression ( value obtained from the literature review )

m = margin of error at 5% (standard value of 0.05)

However, in this study, a total of 622 students participated, far exceeding the required number of samples required.

### **3.5 Study Procedure**

Sampling was done in a convenient sampling manner. The researcher met medical students from each year at their respective lecture halls. After explaining to them the objective of the study, a copy of the informed consent and patient information sheet were handed out to the participants. After giving them adequate time to read and understand the informed consent, they signed it and proceeded to complete the questionnaires given. The researcher collected back all the filled questionnaires at the end of the session. In this way, responses were obtained from consenting medical students from Year 1 up to Year 5. The researcher emphasized to them that participation in the study was completely voluntary.

### 3.6 Study Instruments

For the purpose of this study, 4 scales were used, namely: the socio-demographic questionnaire, DUREL-M, HADS-M and Brief RCOPE-M.

**3.6.1 Socio-demographic questionnaire (Appendix C)** The researcher developed a concise socio-demographic questionnaire which consisted of demographic data such as age, sex, year of study and hand-phone number as well as items which were found in an earlier study to be correlated with depression and anxiety among medical students in Malaysia (Shamsuddin et al., 2013a).

**3.6.2 DUREL (Appendix E)** This scale was used to measure religiosity in the study population. It was conceptualized from the 10-item Intrinsic Religiosity Scale and is a brief measure of religiosity consisting of five items that measures three dimensions or subscales of religiosity: Organized Religious Activity (ORA), Non-Organized Religious Activity (NORA) and Intrinsic Religiosity (IR) (H. Koenig, Parkerson Jr, & Meador, 1997). ORA refer to communal religious activities such as attending public places of worship and religious activities. NORA refers to religious activities conducted in a personal matter, such as private scripture reading, and personal prayer time. IR assesses the degree of personal religious commitment and motivation. The DUREL was translated to the Malay language as the DUREL-M (Duke Religious Index Malay Version) and has been validated in the Malaysian population (M. Nurasikin, Aini, Aida Syarinaz, & Ng, 2010). It scores between a range of 5-27. The translated version had a good internal reliability of 0.8 (M. Nurasikin et al., 2010). Scoring of the DUREL-M must be done cautiously as each subscale measures a different dimension of religiosity. Thus simply adding the scores into one summated religiosity score may lead to inaccurate interpretation of the specific sub-scores (H. G. Koenig & Büssing, 2010).

**3.6.3 HADS (Appendix D)** The HADS was used to screen for anxiety and depressive symptoms in the study population. It was originally developed by Sigmund and Snaith in 1983 to measure anxiety and depression in the general medical population (Zigmond & Snaith, 1983), however it has been used among the general population including the medical student population (Quince et al., 2012). This scale consists of 14 items and has been validated in the local setting as the Hospital Anxiety and Depression Scale Malay Version (HADS-M). A lower cut-off score of 8 or 9 was found to be appropriate for the Malaysian population as it had a sensitivity of 93.2% and specificity of 90.8%. Choosing the more conventional cut-off point of 11 would have missed out a significant proportion of Malaysians with anxiety and depressive symptoms (Yahya & Othman, 2015). In this study, the cut-off of 8 was chosen for the HADS-M.

**3.6.4 Brief RCOPE (Appendix F)** This scale is a brief tool to assess religious coping, which consists of 14 items. It was developed by Pargament to assess the role of religion in coping with challenges and stresses in life and was modified from the RCOPE scale, also by Pargament. The spirit of the RCOPE scale intended to measure religious coping as a multi-dimensional and reflected the essence of religious functions. For example, the items chosen in the scale were intended to reflect religious coping via cognitive, emotion and interpersonal relationship with others (Pargament et al., 2011). The scale also takes into consideration that religious coping is dichotomous and consists of positive and negative coping methods. Positive coping methods refer to harnessing a positive relationship with God as a means of coping and involves praying, meditating and reflecting on God to help in times of distress. Negative coping methods occur when one blames God for their mishaps and believes the trauma or challenges being faced is punishment from God (Pargament et al., 2011). This scale was translated into the Malay language with a Cronbach Alpha of 0.87 for positive coping (P COPE) and 0.88 for



negative coping (N COPE) (N. Yusoff, Low, & Yip, 2009). It consists of seven positive coping items and seven negative coping items.

### **3.7 Data Analyses**

The data in this study were analysed using the Statistical Package for Social Science version 25. Descriptive statistics were carried out to summarize the characteristics of the participants. Mean and standard deviations were used to report continuous typed variables whereas categorical typed variables were presented by frequency followed by percentage. Religious typed variables were further correlated with anxiety and depression through spearman rank correlation analysis. Bivariate analysis was used to investigate the risk factors (socio demographic, psychiatric factors and religious typed factors) associated with the increment of anxiety and depression. Factors with p value less than 0.05 were subjected to multivariable analyses.

### **3.8 Ethical considerations**

Medical students are a vulnerable population in the faculty. Given the teacher-student relationship between senior doctors, lecturers and medical students, the researchers were aware that the study framework needed to be ethical from the outset. As such approval was obtained prior to commencement from the Medical Ethics Committee of University Malaya Medical Centre (UMMC). Written informed consent was obtained from all the participants prior to them taking part in the study. Confidentiality of the participants were ensured as no names were taken, instead the medical students who participated were identified via unique serial numbers. Medical students who had scored moderate and above on the depression and anxiety scale were contacted and offered help by way of a face-to-face interview and intervention was carried out accordingly.

## CHAPTER 4

### RESULTS

#### 4.1 Socio-demographic data

The first table, table 4.1 illustrates the socio-demographic data of the study population. A total of 622 out of 697 medical students took part in this study, giving the participation rate of 89 %. Year 1 and Year 5 medical students made up the most of the participants (23.6% and 24 % respectively), while there were similar representations between Years 2-4. There were more female (64.8%) than male (35.2%) students and most of them were not married (81.5%). In terms of religion, Islam and Buddhism were the dominant religions, with the percentage of 46.1% and 29.9%, respectively. Almost all of them (98.9%) were full-time students and the majority came from middle to high-income families (69.8%). As for student accommodation, 96.3% of students stayed in hostel, either alone (38.9%) or with roommates (57.4%). With regards to university related payments, government or private scholarships/loans covered more than half of the students' fees. 4.7 % of the students had anxiety symptoms while 17.4% of them exhibited depressive symptoms with 15.9 % having symptoms of both disorders (Table 4.1).

**TABLE 4.1** Socio demographic and psychiatric status of medical students (n=622)

<b>Socio-demographic</b>	<b>Mean (SD)</b>	<b>n (%)</b>
Age	21.18 (1.53)	
Gender		
Male		219 (35.2)
Female		403 (64.8)
Year of study		
1		147 (23.6)
2		102 (16.4)
3		114 (18.3)
4		110 (17.7)
5		149 (24.0)
Family income (RM)		
Low (<2300)		132 (21.2)
Middle (2300-5599)		245 (34.9)
High (>5600)		245 (34.9)
Religion†		
Islam		287 (46.1)
Christianity		59 (9.5)
Hinduism		53 (8.5)
Buddhism		186 (29.9)
Taoism		20 (3.2)
Others		17 (2.7)
Relationship status†		
Single		507 (81.5)
In a relationship		112 (18.0)
Married		3 (0.5)
Pre-University qualification†		
Matriculation		408 (65.6)
STPM		7 (1.1)
A Levels		36 (5.8)
Others		171 (27.5)
Family history of depression		
Yes		44 (7.1)
No		578 (92.9)
Concurrent Jobs while Studying		
Yes		7 (1.1)
No		615 (98.9)
Living Arrangements †		
Hostel (Alone)		242 (38.9)
Hostel (Roommate)		357 (57.4)
Living with Family		15 (2.4)
Living in private outside campus (alone)		1 (0.2)
Living in private outside campus (Roommate)		7 (1.1)

Source of Finance for Studies†	
Own	177 (28.5)
Government Scholarship/Loan	406 (65.3)
Private Scholarship/Loan	39 (6.3)
<b>Student status</b>	
Negative	386 (62.0)
Anxiety	29 (4.7)
Depression	108 (17.4)
Anxiety and Depression	99 (15.9)

† some variables were further dummy coded to minimize uneven data distribution in univariate and multivariate analysis:

Religion = Islam vs. non-Islam.

Relationship status = Single vs. non-single.

Pre-University qualification = Matriculation vs. non-Matriculation.

Living arrangements = Hostel vs. not staying in hostel; Staying alone vs. not staying alone.

Source of Finance for studies = Self vs. scholarship.

Year 5 students were more anxious compared to Year 1 students (21.5% vs. 12.2%) while the trend was reversed for depressive symptoms, with Year 1 student showing more depressive symptoms compared to their final year counterparts (4.1% vs. 2.7%). Year 3 medical students had the highest rates of mixed anxiety and depressive symptoms. Generally, anxiety and depressive symptoms increased with year of study however reached a plateau during the last two senior years (Year 4 and 5) (Table 4.1.1). It is also interesting to note that mixed symptoms were higher among Year 1-3 medical students, however lower compared to anxiety symptoms alone between Year 4 and 5 medical students.

Regarding severity of depressive and anxiety symptoms, majority of students who were anxious or depressed were in the mild category (19.5 % and 21.9% respectively). Only a minor percentage of students had severe symptoms, out of which 3.2% had

severe anxiety symptoms while only 0.3 % had severe depressive symptoms (Table 4.1.2).

When stratified according to gender, males had more anxiety symptoms compared to their female counterparts (41.6 % vs.. 38.7 %). However in terms of depressive symptoms, both male and female students were almost similar at about 30 % each. Male students also had higher percentage of severe anxiety symptomatology compared to their female counterparts (4.1% vs. 2.7 %). However in terms of depressive symptoms, female outweighed male students (0.5 % vs. none). In summary, male students were more anxious than female students and had more severe symptomatology, where else the rates of depression between both genders were similar.

**TABLE 4.1.1** Anxiety, Depressive and mixed symptoms of medical students (n=622)

<b>Year of Study</b>	<b>Anxiety symptoms (%)</b>	<b>Depressive symptoms (%)</b>	<b>Anxiety and Depressive symptoms (%)</b>
1	12.2	4.1	12.9
2	12.7	5.9	13.7
3	15.8	6.1	20.2
4.	24.5	5.5	16.4
5.	21.5	2.7	16.8

**TABLE 4.1.2** Severity of depressive and anxiety symptoms (n=622).

Symptom	Anxiety symptoms n (%)	Depressive symptoms n (%)
Negative (< 8)	375 (60.3)	433 (69.6)
Mild (8-10)	121 (19.5)	136 (21.9)
Moderate (11-14)	106 (17.0)	51 (8.2)
Severe (15-21)	20 (3.2)	2 (0.3)

**Table 4.1.3** Severity of depressive and anxiety symptoms stratified by gender (n=622).

Gender	Severity	HADS-Anxiety n (%)	HADS-Depression n (%)
Male (n = 219)	Negative	128 (58.4)	152 (69.4)
	Mild	46 (21.1)	44 (20.1)
	Moderate	36 (16.4)	23 (10.5)
	Severe	9 (4.1)	-
Female (n = 403)	Negative	247 (61.3)	281 (69.7)
	Mild	75 (18.6)	92 (22.9)
	Moderate	70 (17.4)	28 (6.9)
	Severe	11 (2.7)	2 (0.5)

#### 4.2 Religiosity, religious coping and its correlation with depressive and anxiety symptoms

On average, the medical students who participated in this study were fairly religious. They attended religious related activities a few times annually, with a mean ORA score of 3.51 (maximum score of 6). Besides that, they spent at least two times per week in

non-organized religious activities such as reading holy scriptures or personal prayer as shown by the mean NORA score of approximately 4.00 (maximum score of 6). Additionally, the IR scores among the students were relatively high (12.18 out of a maximum score of 15.00). The total mean DUREL-M score was 19.54 out of a possible maximum score of 27. The medical students showed more positive compared to negative religious coping, as evidenced by a mean score of 19.81 vs. 10.16 respectively (Table 4.2). This meant that the medical students who participated in the study relied more on positive coping, characterized by the positive relationship and appraisal of their spiritual connection with God, rather than rely on negative coping, which is characterized by frustration and spiritual draught in the face of obstacles. However, rather interestingly, Spearman ranked correlation analysis revealed only negative religious coping was significantly ( $p < 0.01$ ) correlated with both anxiety ( $\rho = 0.183$ ) and depressive symptoms ( $\rho = 0.118$ ) of the students. In terms of religiosity, only intrinsic religiosity (IR) was significantly correlated with depressive symptoms ( $\rho = -0.087$ ). However, the effect sizes of these associations were very small (Table 4.2). Positive coping was significantly correlated with all measures of religiosity, however

negative	coping	was	not.
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**TABLE 4.2** Spearman correlation analyses between religious-type scaled variables, anxiety and depression

	Mean (SD)	ORA (DUREL-M)	NORA (DUREL-M)	IR (DUREL-M)	P COPE	N COPE	HADS (anxiety)
ORA (DUREL-M)	3.51 (1.20)	1.000					
NORA (DUREL-M)	3.85 (1.93)	0.366**	1.000				
IR (DUREL-M)	12.18 (3.12)	0.381**	0.542**	1.000			
P COPE	19.81 (5.99)	0.272**	0.560**	0.650**	1.000		
N COPE	10.16 (3.57)	0.040	0.074	0.042	0.108**	1.000	
HADS-M (anxiety)	6.87 (3.95)	-0.016	0.064	-0.041	0.042	0.183**	1.000
HADS-M (depression)	6.00 (2.99)	-0.036	-0.011	-0.087*	-0.025	0.118**	0.720**

SD = standard deviation.

\*  $p < 0.05$

\*\*  $p < 0.01$

**DUREL-M** : Duke Religious Index Malay Version **ORA** : Organized Religious Activity **NORA** : Non-Organized Religious Activity **IR** :Intrinsic Religiosity **P COPE** : Positive coping **N COPE** : Negative coping **HADS-M** : Hospital Anxiety and Depression Scale Malay Version.



#### **4.3 Univariable and multivariable analysis for the correlates of anxiety symptoms**

Univariable General Linear Model (GLM) analysis was done to assess the correlates of anxiety symptoms. It revealed that current year of study, religion, staying alone, negative religious coping as well as depressive symptoms, were significantly ( $p < 0.05$ ) associated with anxiety. After adjusting for multivariable through GLM, only religion (Islam), negative religious coping and depressive symptoms remained significant. Among these three variables, depression had the highest estimate effect size (0.479), followed by negative religious coping (0.038). The effect size of Islam on anxiety was very small at 0.008. Other socio-demographic factors were not significantly associated with anxiety symptoms. The multivariable GLM showed that Islam, negative religious coping and depressive symptoms were associated with higher anxiety symptoms (Table 4.3).

**TABLE 4.3** General Linear Model (GLM) on factors associated with anxiety based on (n=622)

Factors/ Variables	Univariate-GLM			Multivariate-GLM		
	b <sup>1</sup> (95% CI)	p value	Partial eta <sup>2</sup>	b <sup>2</sup> (95% CI)	p value	Partial eta <sup>2</sup>
<b>Age‡</b>	0.315 (0.113-0.517)	<b>0.002</b>	<b>0.015</b>			
<b>Gender</b>		<b>0.255</b>	<b>0.002</b>			
Male	0.377 (-0.273-1.028)	0.255	0.002			
Female†						
<b>Year‡</b>		<b>0.038</b>	<b>0.016</b>		<b>0.320</b>	<b>0.008</b>
1	-1.246 [-2.143-(-0.349)]	0.007	0.012	-0.441 (-1.411-0.529)	0.372	0.001
2	-0.955 (-1.947-0.036)	0.059	0.006	0.130 (-0.866-1.127)	0.797	0.000
3	-0.434 (-1.393-0.526)	0.375	0.001	-0.142 (-1.015-0.731)	0.750	0.000
4	-0.089 (-1.058-0.881)	0.857	0.000	0.321 (-0.432-1.073)	0.650	0.001
5†						
<b>Family income</b>		<b>0.168</b>	<b>0.006</b>			
Low	-0.393 (-1.219-0.453)	0.369	0.001			
Middle	0.404 (-0.295-1.104)	0.257	0.002			
High†						
<b>Islam</b>		<b>0.030</b>	<b>0.008</b>		<b>0.031</b>	<b>0.008</b>
Yes	0.688 (0.067-1.310)	0.030	0.008	0.486 (0.045-0.927)	0.031	0.008
No†						
<b>Relationship</b>		<b>0.497</b>	<b>0.001</b>			
Single	-0.277 (-1.078-0.524)	0.497	0.001			
Non-single†						
<b>Family history Depression</b>		<b>0.348</b>	<b>0.001</b>			
Yes						
No†	0.580 (-0.632-1.793)	0.348	0.001			

<b>Pre U qualification</b>		<b>0.845</b>	<b>0.000</b>			
<b>Matriculation</b>	0.065 (-0.590-0.720)	0.845	0.000			
<b>Non-matric†</b>						
<b>Current jobs</b>		<b>0.917</b>	<b>0.000</b>			
<b>Yes</b>	-0.157 (-3.106-2.792)	0.917	0.000			
<b>No†</b>						
<b>Hostel</b>		<b>0.237</b>	<b>0.002</b>			
<b>Yes</b>	0.993 (-0.653-2.640)	0.237	0.002			
<b>No†</b>						
<b>Staying alone</b>		<b>0.005</b>	<b>0.013</b>		<b>0.202</b>	<b>0.003</b>
<b>Yes</b>	0.916 (0.283-1.550)	0.005	0.013	0.483 (-0.216-1.228)	0.202	0.003
<b>No†</b>						
<b>Academic financial source</b>		<b>0.769</b>	<b>0.000</b>			
<b>Own</b>	0.103 (-0.586-0.792)	0.769	0.000			
<b>Scholarship†</b>						
<b>ORA</b>	-0.009 (-0.268-0.250)	<b>0.947</b>	<b>0.000</b>			
<b>NORA</b>	0.147 (-0.015-0.308)	<b>0.075</b>	<b>0.005</b>			
<b>IR</b>	-0.041 (-0.140-0.059)	<b>0.425</b>	<b>0.001</b>			
<b>P COPE</b>	0.032 (-0.020-0.084)	<b>0.223</b>	<b>0.002</b>			
<b>N COPE</b>	0.235 (0.150-0.321)	<b>0.000</b>	<b>0.045</b>	0.156 (0.094-0.218)	<b>0.000</b>	<b>0.038</b>
<b>Depression</b>	1.380 (0.877-1.883)	<b>0.000</b>	<b>0.480</b>	0.889 (0.815-0.962)	<b>0.000</b>	<b>0.479</b>

† : Reference group.

‡ : Multicollinearity issue: Spearman correlation coefficient between “Age” and “Year” was 0.967 with p value significant at the 0.01 level (two-tailed). Therefore, only “Year” variable was involved in multivariate analysis. Variables with p value less than 0.05 were retained for multivariate analysis.

b<sup>1</sup>: crude regression coefficient; b<sup>2</sup>: adjusted regression coefficient; CI: Confidence interval; Partial eta squared: Estimated effect size.

Bolded p values and partial eta squared indicated comparison inter-variables whereas un-bolded values were comparison groups within the same variable using least square difference (LSD). **ORA** : Organized Religious Activity; **NORA** : Non-Organized Religious Activity; **IR** : Intrinsic Religiosity; **P COPE** : Positive coping; **N COPE** : Negative coping.

#### **4.4 Univariable analysis for the correlates of depressive symptoms**

As for depressive symptoms, univariable GLM revealed that only negative religious coping and anxiety symptoms were significantly correlated (Table 4.4). The univariable analysis showed that negative coping had an estimated effect size of 0.012 in relation to depressive symptoms. This showed that students with negative coping were correlated to higher depressive symptoms, though with a relatively small effect size of 0.012. Of these two factors, multivariable GLM showed that only anxiety symptoms were significantly associated with depression with an estimated effect size of 0.475. Rather surprisingly, religiosity and religious coping were not significantly associated with depressive symptoms among medical students ( Table 4.4 ).

**TABLE 4.4** General Linear Model on factors associated to depression based on (n=622)

Factors/ Variables	Univariate-GLM			Multivariate-GLM		
	b <sup>1</sup> (95% CI)	p value	Partial eta <sup>2</sup>	b <sup>2</sup> (95% CI)	p value	Partial eta <sup>2</sup>
<b>Age</b>	0.101 (-0.053-0.255)	<b>0.199</b>	<b>0.003</b>			
<b>Gender</b>		<b>0.198</b>	<b>0.003</b>			
Male	0.324 (-0.169-0.817)	0.198	0.003			
Female†						
<b>Year</b>		<b>0.743</b>	<b>0.003</b>			
1	-0.310 (-0.994-0.374)	0.373	0.001			
2	-0.469 (-1.225-0.287)	0.224	0.002			
3	-0.054 (-0.786-0.678)	0.884	0.000			
4	-0.167 (-0.907-0.572)	0.657	0.000			
5†						
<b>Family income</b>		<b>0.259</b>	<b>0.004</b>			
Low	0.343 (-0.291-0.977)	0.289	0.002			
Middle	0.429 (-0.102-0.959)	0.113	0.004			
High†						
<b>Islam</b>		<b>0.562</b>	<b>0.001</b>			
Yes	0.140 (-0.333-0.613)	0.562	0.001			
No†						
<b>Relationship</b>		<b>0.308</b>	<b>0.002</b>			
Single	0.315 (-0.291-0.922)	0.308	0.002			
Non-single†						

<b>Family history of depression</b>		<b>0.108</b>	<b>0.000</b>			
Yes	0.753 (-0.165-1.671)	0.108	0.000			
No†						
<b>Pre-U qualification</b>		<b>0.150</b>	<b>0.003</b>			
Matriculation	0.364 (-0.132-0.859)	0.150	0.003			
Non-matric†						
<b>Current jobs</b>		<b>0.312</b>	<b>0.002</b>			
Yes	1.151 (-1.082-3.384)	0.312	0.002			
No†						
<b>Hostel</b>		<b>0.231</b>	<b>0.002</b>			
Yes	-0.763 (-2.010-0.485)	0.231	0.002			
No†						
<b>Stay alone</b>		<b>0.368</b>	<b>0.001</b>			
Yes	0.222 (-0.261-0.705)	0.368	0.001			
No†						
<b>Study financial source</b>		<b>0.245</b>	<b>0.002</b>			
Own	0.309 (-0.213-0.831)	0.245	0.002			
Scholarship†						
<b>ORA</b>	-0.030 (-0.226-0.167)	<b>0.767</b>	<b>0.000</b>			
<b>NORA</b>	-0.010 (-0.133-0.112)	<b>0.870</b>	<b>0.000</b>			
<b>IR</b>	-0.074 (-0.149-0.002)	<b>0.055</b>	<b>0.006</b>			
<b>P COPE</b>	-0.014 (-0.053-0.026)	<b>0.491</b>	<b>0.001</b>			
<b>N COPE</b>	0.092 (0.027-0.158)	<b>0.006</b>	<b>0.012</b>	-0.33 (-0.082-0.016)	<b>0.186</b>	<b>0.003</b>
<b>Anxiety</b>	0.525 (-0.482-0.568)	<b>0.000</b>	<b>0.480</b>	0.531 (0.487-0.575)	<b>0.000</b>	<b>0.475</b>

† : Reference group.

Variables with p value less than 0.05 were retained for multivariate analysis.

b<sup>1</sup>: crude regression coefficient; b<sup>2</sup>: adjusted regression coefficient; CI: Confidence interval; Partial eta squared: Estimated effect size.

Bolded p values and partial eta squared indicated comparison inter-variables whereas un-bolded values were comparison groups within the same variable using least square difference (LSD). **ORA** : Organized Religious Activity; **NORA** : Non-Organized Religious Activity; **IR** : Intrinsic Religiosity; **P COPE** : Positive coping; **NCOPE**: Negative coping

## **CHAPTER 5**

### **DISCUSSION**

#### **5.1 Depression and anxiety among medical students**

Mental illness among medical students have often been swept under the carpet and under-recognized(Amarasuriya, Jorm, & Reavley, 2015), though the rates of these mental illness among this vulnerable population are by no means trivial. A recent meta-analysis of depression among medical students concluded that the global prevalence was around 28 %(Puthran et al., 2016). There are several factors that contribute to this under recognition of depression and anxiety among medical students. Principal among these factors is the prevailing stigma against medical students, which effectively prevents them from seeking help. Medical students are often viewed as future care givers and thus the notion that would-be doctors themselves are burdened by the bane of mental illness is often difficult to accept and trivialized by the public(Janoušková, Weissová, Formánek, Pasz, & Bankovská Motlová, 2017). Interestingly, medical student instructors have been found to perpetuate the stigma against medical students as the teachers themselves have highly stigmatizing attitudes(Winkler et al., 2015).Thus, medical students are truly vulnerable to mental illness particularly depression and anxiety. In addition, they are often subject to immense stress and may affect the students' academic and personal lives in various ways (Dyrbye, Thomas, & Shanafelt, 2005).

The prevalence of depressive and anxiety symptoms in our study was found to be approximately 17 % and 5 % respectively. These figures were markedly lower than



other Malaysian data that showed that the rate of depression was 35.9 % in one study (Sherina & Kaneson, 2003) and rates of anxiety were 63% in another (Shamsuddin et al., 2013b). Several factors explain these differences. Firstly, the screening questionnaires used were different in all studies. The study by Sherina M and colleague (Sherina & Kaneson, 2003) used the Beck Depressive Inventory, which was not validated for the Malaysian population. The research done by Shamsuddin et al (Shamsuddin et al., 2013b) used the Depression, Anxiety and Stress Scale 21 (DASS-21). Though the scale used was validated in the local language (Musa, Fadzil, & Zain, 2007), there have been suggestions that the DASS-18 would be more appropriate in the Asian setting (Oei, Sawang, Goh, & Mukhtar, 2013). Secondly, the sample size used in our study was significantly bigger than the ones used in previous Malaysian studies. Usage of different outcome measurement tools also contributed to the different results. Besides methodological reasons, the decrease in anxiety and depressive symptoms in our population indicate that medical students were using more positive coping methods to deal with anxiety and depression.

Studies done abroad summarized that the prevalence of depression and anxiety among medical students ranged between 1.4%-73.5% (Rotenstein et al., 2016) and 28%-85% (Ahmed et al., 2009; Mayer et al., 2016). Interestingly, the anxiety and depression prevalence data from this study was also lower than the global data. One possible reason is due to the paternalistic and hierarchical nature of medicine practiced in the Asian region (Claramita, Nugraheni, van Dalen, & van der Vleuten, 2013), mental illness is often perceived to be a sign of weakness, and thus students may have under-reported their symptoms. The medical students who participated could also have been more resilient and have better coping mechanisms compared to Western medical students, though this hypothesis needs more evidence in the form of well designed studies.

Majority of the students showed mild symptomatology, and only a minority of them were in the severe symptom bracket. This showed they had good chance of recovering as most of them were in the mild category. This results differs from another Malaysian study that showed that most medical students had moderate, followed by severe symptoms of anxiety and depression(Shamsuddin et al., 2013a). The results in the current study population provide fertile grounds for early intervention before medical students slip into more severe symptomatology. It is of note, though males were shown to be more anxious compared to their female counterparts, gender was not significantly associated with neither depressive nor anxiety symptoms in the multivariable analysis. The results in this study are similar to a study among Pakistani medical students whereby gender was also not associated with mental illness or suicidal ideation(Yousaf, Daud, & Shafique, 2016). However this finding differs from several other studies whereby females were more associated with being depressed and anxious compared to their male counterparts(M. E. Dahlin & Runeson, 2006; Rosenthal & Okie, 2005). Thus in the context of University Malaya medical students, gender does not associate with depressive or anxiety symptoms.

Descriptive statistics showed that male students were more anxious compared to their female counterparts. These results differ from many studies that showed that the female gender is more anxious and depressed compared to the male gender(Jadoon et al., 2010; Ngasa et al., 2017; M. S. Roh, H. J. Jeon, H. Kim, S. K. Han, & B. J. Hahm, 2010). Male students are often expected to 'man-up' and face their struggles with bravado, thus possibly leading to more anxiety symptoms among males in this study. Thus, it is imperative to alter set paradigms that females are more anxious as this study showed that in University Malaya at least, male medical students scored higher in anxiety symptoms. This is a worrying trend as male anxiety is often overlooked and thus leading to male students being paid less attention to compared to their female

counterparts. However, multivariate analysis showed that gender was not correlated with anxiety and depressive symptoms, alike a study done among British medical students(Quince et al., 2012). Thus after correcting for all the variables present in this study, gender was found not to be significantly associated with anxiety and depressive symptoms in the population studied.

The only socio-demographic factor found to be associated with anxiety was the Islamic religion. However, the effect size was very small ( $\eta^2$ : 0.008). This could be explained by the presence of social stigma which is especially strong within the Muslim community (Ciftci, Jones, & Corrigan, 2013), which could have led to increased anxiety symptoms in this population. Surprisingly year of study was not significantly correlated with either depression or anxiety among medical students. This finding is in contrast to other studies done globally which showed that increasing year of study was associated with more anxiety and depression (Iqbal et al., 2015; Ngasa et al., 2017). An explanation for this could be that the new medical education syllabus implemented in University of Malaya since 2015 (University Malaya Medical Programme) integrates the clinical component since Year 1 itself, blurring the clear demarcation between clinical and non-clinical year students.

Our data, however, showed that depressive and anxiety symptoms, as measured by the HADS, increased by year of study but seemed to reached a stable level at the final 2 years of their medical student life. This could be as medical students were often inexperienced and very young when they join the programme(Heinen, Bullinger, & Kocalevent, 2017), however learn the necessary skills required to survive medical school in later years, reflected in plateauing scores of depressive and anxiety symptoms in their more senior years.

## 5.2 Religiosity, depression and anxiety among medical students

Religion has a complex and somewhat conflicting relationship with mental health. Religion has been operationalized as a search for significance rooted in the sacred (Pargament, 1997). While some authors have suggested that religion has beneficial effects on mental health (Ellison, Burdette, & Hill, 2009), other studies have found an inconsistent relationship (Shreve-Neiger & Edelstein, 2004). Part of the complexity concerning religiosity has been adequately measuring this construct in the context of research due to various different perspective and interpretation by the people. The term 'religiosity' has also become slightly outmoded as people seem to connect more to the term 'spirituality', which is often seen as a more inclusive construct. Hence, due to the perceived negativity often attached to religious people, research findings might be skewed as lesser people may want to consider themselves religious (Baumsteiger & Chenneville, 2015).

Despite these limitations to the construct of religiosity, several researchers have found that people who were religious generally did better in life and were able to endure more hardships compared to those who were not or less religious (Kasen, Wickramaratne, Gameroff, & Weissman, 2012). Thus, it is interesting thus to note that our study did not find a markedly significant association between religiosity, anxiety and depressive symptoms among the medical student population. The only construct of religiosity that was significantly associated with depressive symptoms was IR, however with a very small effect size. This showed that medical students who had strong personal conviction of God fared better in terms of lower depressive scores. This finding is similar to an Israeli study done among medical students (Lupo & Strous, 2011), which showed that religiosity was not correlated with reduced anxiety and depression. However our results differ from other religiosity studies done among

Muslim and Christian majority medical students (Heidari et al., 2016; Jansen et al., 2010; Vasegh & Mohammadi, 2007), whereby religiosity was shown to be significantly associated with anxiety and depression among medical students.

Malaysian medical students showed moderate organized (ORA) and non-organized religious activity (NORA) but scored fairly high on intrinsic religiosity (IR=12.18). The intrinsic religiosity score in our study was higher than a previous study done among Brazilian medical students (mean IR score: 9.63) (Lucchetti, de Oliveira, Koenig, Leite, & Lucchetti, 2013). Intrinsic religiosity refers to the one's own religious commitment and endeavours, in contrast to extrinsic religiosity, which refers to practising religion for the sake of creating an external image of piety for the world to see and for personal gains. Intrinsic religion thus relates to efforts to centre one's life around and finding true meaning via religious beliefs (Allport & Ross, 1967). Thus our results showed that Malaysian medical students were intrinsically religious in that their IR scores were high. Our results also showed that positive coping was correlated with all measures of religiosity. This indicates that students who were religious also had more positive religious coping. Positive religious coping is associated with improved general well being, positivity and generally better capability to handle the stressors of daily living (Pargament et al., 2001).

There are several possible explanations for the results seen in our population. Our study population was a heterogeneous sample, consisting of students from various race and cultures. Given the pluralistic nature of the study population, the concept and interpretation of religiosity may be variable and they may subscribe more to the concept of spirituality. Furthermore, religion is a multidimensional construct and religiosity as measured by scales may not be completely reflective of the strength and nature of one's relationship with God. Thus, scales alone may not be an adequate measure of religiosity

in its true sense. In conclusion, our study further bolstered present evidence that religiosity does not necessarily correlate with better or worse depressive and anxiety scores among medical students(H. G. Koenig, 2001; Lupo & Strous, 2011)

### **5.3 Religious coping, depression and anxiety among medical students**

Religious coping is an important coping tool for individuals. This rings true especially in Asian populations, whereby religion plays a vital role in society and gives a sense of peace and fulfilment in their lives(Chaudhry, 2008). Religious coping can be generally divided into positive and negative coping mechanisms. Positive coping reflects a beneficial and fruitful relationship with God, leading to adaptive coping mechanisms and generally better outcomes. Negative coping refers to strife and a tense relationship with God, often leading to negative, less adaptive outcomes. However these relationships are not linear, as shown by studies which have proven that negative coping does not necessarily correlate with poorer outcomes and positive coping does not necessarily correlate with better outcomes. Thus, even negative religious coping or struggles can lead to eventual growth and maturity through the mechanism of coping(Phelps et al., 2009).

In this study, the medical students used more positive coping compared to negative religious coping ( mean score : 5.99 vs. 3.57 ). In the multivariable analysis, negative religious coping was associated with increased anxiety but not depressive symptoms, similar to another study conducted among Malaysian psychiatric patients (M. S. Nurasikin et al., 2013) and Somalia college students (Areba, Duckett, Robertson, & Savik, 2018). Surprisingly, though positive religious coping was correlated with all measures of religiosity, it did not significantly associate with anxiety and depression. This finding differed from other studies with a mostly mono-religious background that demonstrated that positive religious coping decreased symptoms of mental health (Abu-

Raiya & Pargament, 2015). Our study showed that negative religious coping was maladaptive in that it was significantly associated with increased anxiety symptoms among medical students. It might be postulated that for medical students from a multi-religious background, in contrast to those from a mono-religious background, positive religious coping was not associated with decreased anxiety and depressive symptoms as they may employ other means of coping. These results are contradictory to one other study (Nia et al., 2017), and indicate that in the Malaysian medical student population, more focus should be given to negative religious coping as it led to more depressive and anxiety symptoms.

Thus, in the Malaysian context, positive religious coping may not translate to lesser anxiety or depressive symptoms. However, this does not conclusively mean that positive religious coping has no association with depression and anxiety, as other mediating factors were not considered, such as stress and hopelessness.

## **CHAPTER 6**

### **Conclusion**

In conclusion, the prevalence of depressive and anxiety symptoms among medical students in a local university in Malaysia were lower than previous local and international studies done, at approximately 17% and 5 % respectively. The majority of them had mild symptoms, while only a small percentage of them were in the 'severe' bracket. The medical students studied also employed more positive religious coping compared to negative coping, however only negative religious coping was significantly associated with anxiety symptoms. The medical students studied also showed fairly high intrinsic religiosity, in comparison to organized and non-organized religiosity. Our study concluded that negative religious coping was significantly associated with increased anxiety symptoms among medical students. In the overall multivariable analysis, negative religious coping was not associated with depressive symptoms among the medical students. Negative religious coping is a stronger factor that correlates with mental health among medical students.

### **6.1 Recommendations**

This study has added to the body of evidence that religious coping is indeed vital in ensuring positive mental health among medical students. Since negative religious coping was shown to be detrimental to the students' mental health, efforts must be directed towards getting the medical students to have more adaptive religious coping mechanisms. The percentages of medical students with depressive and anxiety symptoms are worrying, as left unchecked; they could easily slide into developing more



severe symptomatology. More senior medical students were more anxious and depressed compared to the junior students, and thus more attention need to paid to this group of students. As medical students are poised to be future doctors and healers, it is imperative that preventative intervention be done to create future generation of doctors with good mental health. Specifically, prospective medical students should be offered mental health screening prior to entering the course in the interest of early detection and prevention of mental illness. As mental illness is on the rise in Malaysia, it is prudent to make psychiatric screening more widely available, not only for prospective medical students, but also for those who are already in the programme.

Future studies targeting anxiety and depression among medical students could focus on mediating factors such as stress and other socio-demographic factors to further understand the relationship between depression and anxiety. Larger studies involving multiple centres across Malaysia would also increase the generalizability of the results.

## **6.2 Limitations**

Our study is not devoid of limitations. Firstly the cross-sectional nature of this study rendered it unable to assess causality of the factors, and can at best study their correlation. Secondly, this study was done in a single public university and did not take into account other institutions. Including other public universities and private studies would have enhanced generalizability of the results from this study. Since both anxiety and depression were strongly correlated with each other ( $\eta^2$ : 0.479 and  $\eta^2$ : 0.475 respectively), future studies should analyse potential mediating factors between these two illnesses and the role of religious coping and religiosity in this context. As mentioned earlier, including possible mediating factors such as hopelessness, distress and stress could have strengthened the association between the variables studied in this dissertation. Next, due to constraints in resources and time, face-to-face interview with

a diagnostic tool could not be used to make a diagnosis of Major Depressive Disorder or an Anxiety Disorder.

### **6.3 Strengths**

To the author's knowledge, this is the first study done in the South East Asian region to assess the association between religious coping, religiosity with depression and anxiety amongst medical students. Our study found negative religious coping significantly associated with increased depressive and anxiety symptoms. Malaysian students had high intrinsic religiosity however negative religious coping led to increased anxiety and depressive symptoms. Religiosity was not shown to be necessarily protective against depression and anxiety in our study population. Thus attention needs to be refocused towards reducing negative religious coping as it is maladaptive and leads to deterioration in mental health. Consenting medical students should be asked specifically about their religious coping in order to incorporate it into a holistic plan to safeguard them and to subsequently intervene in those who are at high risk to develop mental health issues, particularly depression and anxiety.

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