ASSOCIATION OF MENTAL HEALTH LITERACY AND DEPRESSION SYMPTOMS AMONG YOUNG ADOLESCENTS IN SELANGOR

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FACULTY OF MEDICINE
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ASSOCIATION OF MENTAL HEALTH LITERACY AND DEPRESSION SYMPTOMS AMONG YOUNG ADOLESCENTS IN SELANGOR

Abstract

Mental health literacy (MHL) relating to depression (depression literacy) is a multifaceted concept comprising of knowledge of depression, help seeking and stigma components, that plays an important role in depression outcomes. The aim of this study was to examine the association of depression literacy components namely knowledge of depression, help seeking, stigmatising attitudes and adequacy of depression literacy with depression symptoms among adolescent in Malaysia. This study reports on the common tools used to examine depression literacy, validation of the MHL and Stigma questionnaire and Centre for Epidemiological Studies Depression scale (CES-D) Malay version questionnaire, findings of the depression literacy components and the association of depression literacy components with depression symptoms among adolescents. To answer the objectives of this study, a systematic review, a validation study and one cross sectional study was performed. The systematic review of studies reporting on tools used to examine depression literacy and findings of depression literacy components was carried out. One validation of tools and a cross sectional study were then conducted among secondary school-going adolescent ages between 12 to 14 years in National Secondary Schools from June to December 2017. The validation study involved 65 adolescents from two schools in the Federal Territory of Kuala Lumpur with aim to validate the MHL and stigma questionnaire and the CES-D Malay version questionnaire. The cross-sectional study involved 1707 adolescents from 46 schools in Selangor and was for the purpose of examining the association of depression literacy components with depression symptoms using the validated MHL and stigma questionnaire and the CES-D

Malay version questionnaire. The systematic review identified vignette-based methodology as the most commonly (85%) used tools to assess depression literacy. Recognition of depression, symptoms of depression, intention to seek help, source of help and personal stigma were the most commonly reported components of depression literacy. Cronbach's alpha across all constructs in the MHL and stigma questionnaire ranged from 0.518 to 0.764 indicating acceptable levels of internal consistency. Cohen's kappa values for majority (59%) of items in the MHL and stigma questionnaire indicated moderate level of agreement (0.41 and above). The CES-D Malay version questionnaire reported no floor and ceiling effect, good internal consistency (Cronbach alpha 0.88) and excellent test re-test reliability analysis (ICC = 0.93; 95% CI 0.851, 0.961). Prevalence of depression symptoms among adolescents was 20.3%. Only a minority of participants were able to correctly recognize depression 60 (3.5%) and were classified as having adequate depression literacy 51 (3.0%). There was no significant association between inadequate literacy and depression. Multivariate analysis further showed keeping a person busy as a helpful first aid action (AOR = 1.75; 95% CI 1.19, 2.59), regard getting out in the sunlight as harmful (AOR = 1.96; 95% CI 1.12, 3.45), would not tell anyone if having a problem (AOR = 3.80; 95% CI 2.55, 5.67), perceive dangerousness towards people with depression (AOR = 1.83; 95% CI 1.13, 2.95), not endorsing family as a source of help (AOR = 2.19, 95% CI 1.02, 4.69), being worried what others might think if help is sought (AOR = 1.67; 95% CI 1.02, 2.75), feeling that nothing can help (AOR=1.66 ; 95% CI 1.01, 2.70) and difficult to get an appointment (AOR=1.85 ; 95% CI 1.07, 3.19), were significantly associated with depression. Several recommendations were made such as integrating the concept of depression literacy into school based mental health services and early screening of depression among adolescents.

Keywords: adolescent, mental health literacy, depression

Abstrak

Literasi kesihatan mental berkaitan dengan kemurungan (literasi kemurungan) merupakan konsep pelbagai yang merangkumi ilmu kemurungan, pencarian bantuan dan komponen stigma yang memainkan peranan penting di dalam gejala kemurungan. Tujuan kajian ini adalah untuk mengkaji perhubungan komponen literasi kemurungan khususnya pengetahuan kemurungan, pencarian bantuan, sikap stigma dan kecukupan literasi kemurungan dengan simptom kemurungan dikalangan remaja Malaysia. Kajian ini melaporkan instrumen yang biasa digunakan untuk mengkaji literasi kemurungan, validasi instrumen "MHL and stigma" dan instrumen Centre for Epidemiological Studies Depression (CES-D) versi Melayu, dapatan komponen literasi kemurungan dan perhubungan diantara komponen literasi kemurungan dengan simptom kemurungan di kalangan remaja. Untuk menjawab objektif penyelidikan ini, kajian sistematik, kajian validasi dan kajian rintis telah dijalankan. Kajian sistematik yang melaporkan berkenaan instrumen yang digunakan untuk mengkaji literasi kemurungan dan dapatan komponen literasi kemurungan telah dijalankan. Satu kajian validasi instrumen dan kajian rintis telah dijalankan di kalangan remaja umur 12 hingga 14 tahun di Sekolah Menengah Kebangsaan dari Jun hingga Disember 2017. Kajian validasi melibatkan 65 pelajar daripada dua buah sekolah di Wilayah Persekutuan Kuala Lumpur telah dijalankan untuk mengesahkan instrumen "MHL and stigma" dan instrumen CES-D versi Melayu. Seramai 1707 remaja daripada 46 sekolah di Selangor terlibat di dalam kajian rintis dengan tujuan untuk menyiasat perhubungan komponen literasi kemurungan dengan simptom kemurungan menggunakan instrumen "MHL and stigma" dan instrumen Centre for Epidemiological Studies Depression (CES-D) versi Melayu yang telah disahkan. Kajian sistematik mendapati metodologi berdasarkan vignette merupakan instrumen yang paling biasa (85%) diguna untuk menilai literasi kemurungan. Julat Alpha Cronbach merentasi semua konstrak instrumen "MHL and stigma" berada diantara

v

0.518 hingga 0.764, menunjukkan tahap ketekalan dalaman yang boleh diterima. Nilai Cohen Kappa untuk majoriti (59%) daripada item di dalam instrumen "MHL and stigma" menunjukkan tahap skala persetujuan yang sederhana (0.41 dan ke atas). Instrumen CES-D versi Melayu melaporkan tiada kesan "floor and ceiling", ketekalan dalaman yang sangat baik (Alpha Cronbach 0.88) dan analisis ujian reliabiliti yang sangat memuaskan (ICC = 0.93; 95% CI 0.851, 0.961). Simptom kemurungan di kalangan remaja adalah 20.3%. Hanya sebilangan minoriti peserta dapat secara tepat mengenal kemurungan 60 (3.5%) dan dikelaskan sebagai mempunyai literasi kemurungan yang mencukupi 51 (3%). Tiada kaitan significant diantara literasi kemurungan yang tidak mencukupi dan kemurungan. Analisis multivariat menunjukkan membiarkan seseorang sibuk sebagai langkah pertolongan kecemasan yang baik (AOR = 1.75; 95% CI 1.19, 2.59), mengandai pendedahan kepada pancaran cahaya matahari sebagai berbahaya (AOR = 1.96; 95% CI 1.12, 3.45), tidak memberitahu sesiapa jika ada masalah (AOR = 3.80; 95% CI 2.55, 5.67), tanggapan bahaya terhadap orang yang mengalami kemurungan (AOR = 1.83; 95% CI 1.13, 2.95), tidak mengakui keluarga sebagai sumber sokongan (AOR = 2.19, 95% CI 1.02, 4.69) dan bimbang apakah tanggapan orang lain jika minta bantuan (AOR = 1.67; 95% CI 1.02, 2.75), merasakan tiada apa yang boleh membantu (AOR=1.66 ; 95% CI 1.01, 2.70) dan sukar untuk mendapat temujanji (AOR=1.85 ; 95% CI 1.07, 3.19), adalah terkait secara signifikan dengan kemurungan. Beberapa rekomendasi dibuat seperti mengintegrasikan konsep literasi kemurungan ke dalam perkhidmatan kesihatan mental berasaskan sekolah dan saringan awal kemurungan.

Kata kunci: remaja, literasi kesihatan mental, kemurungan

Acknowledgements

Table of Contents

List of Figures

List of Tables

List of Symbols and Abbreviations

ADAP	:	Adolescent Depression Awareness Programme
ADHD	:	Attention Deficit Hyperactivity Disorder
ADKQ	:	Adolescent Depression Knowledge Questionnaire
BDI	:	Beck Depression Inventory
CES-D	:	Centre for Epidemiological Studies Depression scale
CDI	:	Children's Depression Inventory
CITC	:	Corrected Item-Total Correlation
CI	:	Confidence Interval
DASS	:	Depression, Anxiety and Stress Scale
DSM	:	Diagnostic and Statistical Manual of Mental Disorders
D-Lit	:	Depression Literacy scale
FINQ	:	Friend in Need Questionnaire
GP	:	General Practitioners
HIV	:	Human Immunodeficiency Virus
IHME	:	Institute for Health Metrics and Evaluation
I-CVI	:	Item-Content Validity Index
ICC	:	Intraclass Correlation Coefficient
ICC_A	:	Intraclass Correlation Coefficient for agreement
MCAR	:	Missing Completely at Random
MDD	:	Major depressive disorder
MHL	:	Mental Health Literacy
MHLS	:	Mental Health Literacy scale
MHD	:	Mental Health Disorder
MOH	:	Ministry of Health

MOE	:	Ministry of Education
NOS	:	Newcastle Ottawa Scale
NHMS	:	National Health Morbidity Survey
OR	:	Odds ratio
PHQA	:	Patient Health Questionnaire Assessment
QATSQ	:	Quality Assessment Tool for Quantitative Studies
RCT	:	Randomized Controlled Trial
SEA	:	South-East Asia
SEM	:	Social Ecological Model
SPSS	:	Statistical Package for the Social Sciences
WHO	:	World Health Organization

List of Appendices

CHAPTER 1: INTRODUCTION

The focus of this thesis is to first validate the mental health literacy (MHL) and stigma questionnaire among adolescents, which is used to assess MHL relating to depression (depression literacy), and the Centre for Epidemiological Studies Depression scale (CES-D) Malay version questionnaire, which is used to screen for depression. Second, this thesis examines the various components of depression literacy, such as knowledge of depression, help seeking and stigmatising attitudes, and the association of each component of depression literacy with depression symptoms among adolescents. The adequacy of depression literacy and its relationship with depression symptoms were also examined in this thesis. This chapter outlines the concept of MHL, the problem statement, the rationale, the research questions and objectives of this study. The flow and structure of this thesis are summarized in this chapter.

1.1 Background of study

Adolescents worldwide are affected by depression. Health-care providers are constantly emphasizing prevention, early diagnosis, interventions, recovery and prognosis in regard to depression. The reason for this is that depression is a disorder that affects and impairs mental, physical, social and emotional functional capabilities of individuals (Brent, Poling, & Goldstein, 2011). Furthermore, depression during adolescence impairs various developmental processes and also increases the possibility of depression in adulthood (Birmaher et al., 1996).

Depression literacy is derived from the concept of MHL defined previously by scholars from Australia and Canada (Jorm et al., 1997; Kutcher, Bagnell, & Wei, 2015; Kutcher, Wei, & Coniglio, 2016). Depression literacy is characterized by three main components: the knowledge of depression component, which focuses on the recognition of depression,

causes, symptoms, risk factors, first aid, prevention and intervention; the help-seeking component, which focuses on help-seeking intentions, attitudes and behaviours; and the stigma component, which includes stigmatising attitudes. In this study, the components of depression literacy are conceptualized as the following: (a) knowledge of depression, which includes recognition of depression, first aid, prevention and intervention; (b) help-seeking attitudes and intentions; and (c) stigmatising attitudes, which include personal stigma, perceived stigma and social distance. In addition, the adequacy of depression literacy was also assessed.

Depression literacy is an important concept that is able to improve prevention rates, early diagnosis, intervention and prognosis in regard to depression among adolescents in several ways. Adequate depression literacy enables adolescents to quickly and correctly recognize depression within themselves or among their peers based on certain signs, symptoms and risk factors (Coles et al., 2016; Wright, Jorm, Harris, & McGorry, 2007). Early recognition of depression creates a sense of urgency in terms of the need to seek appropriate help (Burns & Rapee, 2006). Adolescents with adequate depression literacy will tend not to present their symptoms in a normalizing style, but rather in a psychologizing style, thereby improving rates of early diagnosis of depression (Kessler, Lloyd, Lewis, & Gray, 1999). Finally, acceptance and adherence to treatment will improve because of increased mental health knowledge about depression, and less stigmatising attitudes towards mental health disorders (MHDs) and their treatment (Reavley & Jorm, 2011; Yap, Reavley, Mackinnon, & Jorm, 2013).

Therefore a comprehensive assessment of all the components of depression literacy is preferred as it is insufficient to draw conclusions on the adequacy of depression literacy by merely examining a single component of depression literacy (Lam, 2014). It is also relevant to investigate the association of depression literacy with depression symptoms among Malaysian adolescents as there is a lack of studies looking into this.

Furthermore, it is important that instruments used to examine depression literacy are valid and reliable as these instruments will reflect the levels of depression literacy among adolescents, which will in turn affect mental health outcomes (Wei, McGrath, Hayden, & Kutcher, 2015). Depression literacy has been examined using various tools among the general population; however, there is a need to establish whether these tools are compatible to be used among adolescents and whether these instruments have the ability to simultaneously assess all the various components of depression literacy (Wei et al., 2015; Wei, McGrath, Hayden, & Kutcher, 2016).

1.1.1 Adolescence

Adolescence is a developmental stage that all humans undergo and is greatly influenced by social, environmental and cultural factors. The traditional definition of adolescents is individuals aged between 10 and 19 and they make up a quarter of the global population (World Health Organization [WHO], 2005). The World Health Organization (WHO) has classified adolescents into two categories: namely, early adolescents, i.e. those aged between 10 and 14, and late adolescents, i.e. those aged between 15 and 19 (Sawyer et al., 2012). There are about 5.5 million adolescents in Malaysia and more than half of them go to school (Institute for Public Health, 2017). In Malaysia, secondary school-going adolescents are individuals aged between 13 and 17 (Hays, 2015).

Individuals in adolescence begin to explore their identity and position in society, which makes this phase a critical transitional period from childhood into adulthood. This period is characterized by more biopsychosocial changes than other life stages, apart from infancy (Holmbeck, 2002). The three main developmental processes that occur during adolescence are physical, cognitive, and social and emotional developmental processes (Holmbeck, 2002). During adolescence, the most problematic and stressful years are around the ages of 12 or 13 (Sargin, 2009). Adolescents exhibit conflicting and contrary

characteristics during this period, referred to as a crisis stage due to its peculiarities. Adolescence is a period when some feelings, such as depression, anxiety, guilt, embarrassment, indecisiveness and desperation, are experienced intensively (Sargin, 2009). In order to develop appropriate lifelong self-management skills and healthy behaviours, acquiring adequate knowledge and proper attitudes during the adolescence stage is critical (Holmbeck, 2002). Adolescents will be able to relate and engage more positively with their families, surroundings and even themselves if they are able to adjust well to the developments that occur during the adolescence period (Steinberg & Morris, 2001). There are a few driving factors that influence the mental health outcomes of adolescents, such as social determinants of health, risk and protective factors, puberty, social role transition and health-related behaviours (Sawyer et al., 2012). The development of MHDs during the adolescence phase can have grave implications for physical, psychological, emotional, social and spiritual health (Peters et al., 2016).

1.1.2 Mental health disorders among adolescents

Mental health is a vital aspect of the life of every individual along with physical, spiritual and financial well-being. A sound mind is key in obtaining satisfaction in one's life (Swami et al., 2007). MHDs are emotional and behavioural conditions that are characterized by changes in thinking, mood or behaviour and can impair the functional ability of an individual and therefore should be diagnosed at an early stage. Adolescents commonly suffer from various types of MHD (Patel, Flisher, Hetrick, & McGorry, 2007). Reports have suggested that one in five adolescents are projected to be diagnosed with an MHD (Swartz et al., 2007). There is a wide spectrum of adolescent MHDs; however, the three most common MHDs among Malaysian adolescents are depression, anxiety and stress (Institute for Public Health, 2015; Knopf, Park, & Mulye, 2008).

Almost half of MHDs, such as depression, tend to occur before the age of 14, and the risk increases sixfold by the ages of 15 to 18 (Hankin, 2006; Kessler et al., 2005). MHDs have serious effects on adolescent health as they can affect general well-being, functioning and development in adolescence (Perry et al., 2014). Recognizing and treating these disorders early on will improve the outcomes (Patel et al., 2007). Unfortunately there are always barriers preventing adolescents from gaining access to early treatment, such as seeking treatment late due to poor knowledge about the illness and fear of stigmatization by peers or the community (Knopf et al., 2008). Furthermore, adolescents with undiagnosed and untreated MHDs will be in danger of getting involved in harmful risky activities such as violence, illicit substance use and unprotected sex (Kapphahn, Morreale, Rickert, & Walker, 2006).

1.1.3 Adolescent depression

As many as 2.3 million Malaysians are affected by mental illness during their lifetime, and unfortunately the detection and treatment of this health concern remains suboptimal (Mukhtar & Oei, 2011). The general public often treats depression as a part of adolescent development or even as a natural process during this stage, thereby failing to recognize it as an abnormality that requires urgent attention (Kok & Goh, 2011). Adolescent depression is a mental and emotional disorder presenting with persistent feelings of sadness and loss of interest. The diagnosis of depression is based on the Diagnostic and Statistical Manual of Mental Disorders (DSM) criteria, and depression increases the risk of suicide (First, 2013). There is a wide spectrum of depression symptoms among adolescents, such as mood disturbances, loss of interest, poor concentration, fatigue, poor sleep patterns, altered appetite or weight, agitation, a feeling of hopelessness, and suicidal ideation or acts (Moffatt, 2007). However, adolescents with depression generally present with fewer melancholic symptoms, such as low mood, loss of weight or feeling of extreme

guilt, than adults. Instead, adolescents suffering from depression tend to present with more violent and aggressive behaviours, be negative, irritable and feel misunderstood (Hankin, 2006). These symptoms are often regarded as punitive problems in school or inappropriate behaviours at home (Hankin, 2006). This variation in symptoms among adult and adolescent populations is because adolescents are exposed to varying psychosocial and developmental stressors, such as peer pressure, changing hormonal levels and developing bodies (Kaur et al., 2014).

Among the established risk factors for adolescent depression are parental depression, negative and stressful life events, namely social pressures, alcohol and drug abuse, and the demise of a loved one (Kaur et al., 2014). Evidence has shown that the probability of developing depression across both genders is equal before the onset of puberty; however, with advancing ages (15 and above), females tend to have a twofold increased risk of developing depression compared to males (Turner, 2014).

1.1.4 Health literacy

Levels of education and literacy concerning health that individuals acquire over time will determine the state of the general health and well-being of a population (Berkman, Sheridan, Donahue, Halpern, & Crotty, 2011). Health literacy was originally confined to health-care settings, which aimed to increase the ability of individuals to comprehend and make effective decisions in utilizing medical-related information, which in turn would improve patients' understanding of treatments and adherence to medications or therapies (Kutcher, Wei, & Coniglio, 2016). However, this definition was subsequently expanded by the WHO to include "the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand, and use information in ways which promote and maintain good health" (Kanj & Mitic, 2009).

A more recent understanding of health literacy consists of several components, including the following: (a) the capabilities required by individuals to acquire or preserve health and recognize diseases; (b) awareness of when, how and where to obtain information related to health and health-care services; (c) knowledge of how to adequately use given treatments or therapies; (d) understanding the concept of social capital related to health, which improves the awareness of individuals regarding their privileges concerning health and health care; and (e) finally being empowered as an agent that promotes health improvement (Kanj & Mitic, 2009; WHO, 2013).

The concept of health literacy introduced by WHO was futher revised by the European Health Literacy Survey (HLS-EU) to consists of three conceptual models, which integrates health relevant domains namely health care, disease prevention, health promotion and four information processing stages (acess, understand, appraise, apply) related to health relevant decision making and task. In combination, these areas and stages create a 12 cell matrix measuring health literacy (namely competencies related to accessing, understanding, appraising and applying health information in the domains of healthcare, disease prevention and health promotion, respectively), which were operationalize by 47 items (Sørensen et al., 2012). In this broad and comprehensive definition of health literacy, there is no restriction to specific aspects of health literacy, such as the use of health information with respect to specific health-related topics (e.g., diabetes literacy, mental health literacy) or contexts or domains (e.g., health literacy in healthcare, functional health literacy). Health literacy is depicted as a skill that changes and develops through the life course. Hence, acquiring health literacy at a young age may be a base for health-related quality of life as well as a promising approach to disease prevention and health promotion (Sørensen et al., 2012).

Much emphasis on health literacy has been placed by organizations such as the WHO and many developed nations such as Australia, the United States and Canada, simply because evidence has shown the impact health literacy has on improving the health-related outcomes of a population (Rootman & Gordon-El-Bihbety, 2008; United States department of Health and Human Services, 2010). The National Health Morbidity Survey (NHMS) 2015, in Malaysia, reported that only 6.6% of Malaysians were classified as having adequate health literacy (Institute for Public Health, 2015).

1.1.5 Mental health literacy

With the rising prevalence of MHDs globally and the escalating financial cost related to these disorders both at an individual and community level, the field of MHL has become the focus of public health research (Kessler et al., 2005). MHL is an essential element within the domain of health literacy and recently has been receiving much focus on a global platform for interventions aimed at improving mental health (Kutcher et al., 2015). The concept of MHL should always be understood and applied in the context of health literacy. The initial understanding of MHL has developed from a relatively circumscribed and overtly narrow definition (Kusan, 2014), in which MHL was originally defined as "knowledge and beliefs about mental disorders that aid their recognition, management or prevention" (Jorm et al., 1997). Due to the underlying complexity in understanding the necessities required to improve mental health outcomes, the concept of MHL underwent expansion to include the following elements: "(a) knowledge of how to prevent mental disorders, (b) recognition of when a disorder is developing, (c) knowledge of help-seeking options and treatments available, (d) knowledge of effective self-help strategies for milder problems, and (e) first-aid skills to support others who are developing a mental disorder or are in a mental health crisis" (Jorm, 2012). The above-mentioned

definition of MHL by Jorm et al. (1997) is a reflection of the knowledge content based on the DSM criteria (Kusan, 2014).

Based on the former understanding of MHL and the present definition of health literacy, the current concept of MHL has evolved to include the following components: first "understanding mental disorders, their treatment, how to optimize and maintain good mental health" (mental health knowledge component); second "decreasing stigma related to mental disorders" (stigma component); and finally "enhancing help-seeking efficacy, which includes knowing when and where to seek help, what to expect when seeking help, and being empowered to receive the best available help for mental health problems or disorders" (help-seeking component) (Kutcher, Wei, Costa, et al., 2016; Kutcher, Wei, & Coniglio, 2016). This current definition of MHL by Kutcher et al. (2016) is an extension and refinement of previous constructs of MHL (Jorm, 2012; Jorm et al., 1997), which is consistent with global public health frameworks such as the Ottawa Charter of Health Promotion (WHO, 1986). Kutcher et al.'s (2016) definition of MHL is in line with the evolving concept of health literacy (Baker et al., 2007; Nutbeam, 2008), which integrates the stigma component that has been traditionally regarded in relation to MHL, and has now become a component under the conceptual umbrella of MHL (Jorm et al., 1997; Kutcher, Wei, & Coniglio, 2016). In addition, Kutcher et al.'s (2016) definition of MHL also expanded Jorm et al.'s (1997) concept of self-help strategies to a broader component of help-seeking efficacy (Jorm et al., 1997; Kutcher, Wei, & Coniglio, 2016).

In view of the existing evidence, it is clear that both help seeking and stigma, which were previously often explored in relation to MHL, are now considered to be components of MHL and are not to be treated as separate factors (Kutcher et al., 2015). The reasons for this are simply that, first, such a definition of MHL avoids circumspection, which would arise by solely conceptualizing MHL as a knowledge component (knowledge of

the contents of the DSM). This is because knowledge solely concerning an illness is a reflection of a predominant biomedical alignment of the mental health arena and does not account for health-oriented literacies such as salutogenic principles (Kusan, 2014). Second, MHL interventions should reflect the three core MHL components (knowledge, stigma and help seeking) and when applied should be ideally evaluated based on their ability to improve all three of these components of MHL (Kutcher, Wei, & Coniglio, 2016). Third, as the concept of MHL was initially derived from health literacy, MHL has to continuously evolve to be in line with health literacy in order to benefit individual and public mental health (Kutcher, Wei, & Coniglio, 2016). Finally, such a comprehensive concept of MHL would provide a platform for decision-making related to mental health, which could then be applied at multiple levels within a community to tackle important issues influencing mental health outcomes (Kutcher et al., 2015).

Therefore, the MHL framework consists of three interrelated components, i.e. mental health knowledge (knowledge of mental illness), attitudes (stigma) and help-seeking efficacy (help-seeking intention and attitudes), which should ideally be targeted together in MHL research and interventions, as these components are considered core MHL principles (Anjo, 2018; Kutcher, Wei, & Coniglio, 2016; Wei, Hayden, Kutcher, Zygmunt, & McGrath, 2013). Similarly studies have examined MHL by adopting the definition provided by both Jorm et al. (1997) and Kutcher et al. (2016), which includes the knowledge, help-seeking and stigma components (Lam, 2014; Sharma, Banerjee, & Garg, 2017; Wei et al., 2013, 2015, 2016). It is important that the constructs of MHL be updated with advancements in the concept of health literacy and they must not function as a separate entity from health literacy.

Literature has recently suggested that the concept of MHL be developed into a theory of MHL due to the various underlying components under the umbrella of MHL that have been proposed by various scholars (Spiker & Hammer, 2018). However, there is currently

still no consensus on a theory of MHL, therefore this study conceptualized MHL as relating to depression (depression literacy) based on the MHL definition proposed by both Jorm et al. (1997) and Kutcher et al. (2016) whereby depression literacy was comprised of three major components, namely knowledge of depression, help seeking and stigmatising attitudes. In addition, this study also looked into the adequacy of depression literacy among adolescents. Adolescents should be the primary target for whom MHL is assessed and delivered, preferably as a continuum effort and not merely an isolated measure delivered occasionally.

Allthought is it understood that the concept of MHL is derived from the concept of health literacy, a gross comparison between these two concepts reveals several similarity and difference. The similarity across these concepts include the assessment of the knowledge, attitude, practise components and overall assessment on the adequacy of literacy. While the difference include the lack of 12 cell matrix which asses health literacy in terms of competencies related to accessing, understanding, appraising and applying health information in the domains of healthcare, disease prevention and health promotion, respectively, in the concept of MHL

To date majority of studies on MHL have been examing the knowledge, attitude and practise components instead of the traditional matrix of health literacy. The are several reasons for this, first following the introduction of the concept of health literacy, several scholars (e.g Jorm and Kutcher) have derived the concept of MHL from the existing Health literacy concept. The MHL framework derived by these scholar predominantly focuses on the knowledge, attitude and practise principals of MHL. Second some scholar argue that using the health literay concept to examine MHL may be challenging as the current instruments traditional used to asses health literacy namely the European Health Literacy Survey Questionnaire (HLS-EU-Q47) may not be specific to mental health literacy. Third, to date among adolescents worldwide there is limited studies that have

reported on knowledge, attitude and practise components of MHL, therefore examining these components would provide some baseline findings which could then be expanded into the other matrixs of health literacy. Finally evidence have suggested that the use of vignette based methodology appears more superior in examining MHL as it provides a more stimulus to participants to response to items by actually putting themselves into the position of the vignette. Unfortunately majority of the instrument that measure health literacy do not adopt a vignette based methodology.

Within the Malaysian health-care system, much attention has been given to adolescent mental health because this issue is regarded as one of the national health concerns that need to be addressed urgently. However, there appears to be gaps in the number of home-based national measures focusing on adolescent MHL within the schools in Malaysia (Sutan, Nur Ezdiani, Muhammad Aklil, Diyana, & Raudah, 2018).

1.1.5.1 Knowledge of depression

Knowledge of depression is a vital component of depression literacy and in this study the aspects within the knowledge of depression component that were examined are the recognition of depression illness, first aid, intervention and preventive measures based on the knowledge component of the MHL framework (Jorm et al., 1997).

Recognition or correct identification of depression refers to the ability of individuals to recognize symptoms or signs of depression based on the DSM criteria and to differentiate depression illness from other disorders (Jorm, 2012; Jorm et al., 1997). The importance of correctly recognizing depression is that it would avoid delay in seeking professional help and avoid difficulty in communicating with health professionals (Essau, Olaya, Pasha, Pauli, & Bray, 2013). Individuals with poor knowledge in terms of recognizing depression, causes and risk factors would respond to the disorder based on their own judgment, especially in the context of the first attack. For example, an

individual believing that depression is caused by supernatural causes would seek traditional treatment instead of professional help, thereby causing delay in seeking professional help (Wirback, Möller, Larsson, Galanti, & Engström, 2014). Also, adolescents with poor ability to recognize depression may even resort to self-medicating with drugs and alcohol (Shellman, Mokel, & Wright, 2007).

Knowledge of first aid for MHDs refers to some form of basic support, relief or help provided to individuals suffering from MHDs or in a state of mental health crisis, until specialized treatment is initiated or until the crisis is resolved (Jorm, Morgan, & Wright, 2008). Usually it is family and friends who provide first aid because these individuals would be the first to detect or notice changes in the behaviour or functioning of adolescents with depression (Angermeyer, Matschinger, & Riedel-Heller, 2001; Jorm et al., 2005; Wright et al., 2005). However, currently there is no consensus or guidelines on the types of first-aid actions that are regarded as being most effective for MHDs. An assessment of the first-aid knowledge and skill in regard to depression among adolescents is important for several reasons. First, because first-aid actions would act as a buffer until more suitable expert help is provided or until the crisis is resolved (Jorm et al., 2008). Second, first-aid actions enable the assessment of risk of harm such as suicide, which is common among depressed adolescents, and thus could actually prevent or reduce any self-harm actions. Third, appropriate first-aid action could facilitate help from an appropriate source such as an adult and professional sources of help (Jorm et al., 2008). As adolescents frequently consider each other to be an ideal source of help when dealing with MHDs, they have to be well educated with adequate knowledge of first aid in order to improve their confidence about helping their mentally distressed peers. Finally, often the general public are uncertain about how to assist individuals suffering from depression (Jaladin, Yun, & Tharbe, 2016).

Knowledge about intervention comprises knowledge regarding lifestyle, and psychological, medical and information-seeking actions (Jorm, Griffiths, Mackinnon, & Christensen, 2005). Lifestyle factors include items related to non-professional help, medical factors (which includes matters pertaining to prescribed medication), psychological factors (items relating to specialized help and treatments) and information-seeking factors, including items related to methods for seeking information (Jorm et al., 2005; Loureiro, 2015). It is extremely important to examine knowledge about intervention because it would enable us to identify what the positive and negative beliefs of adolescents are regarding the various components of interventions (Jorm et al., 2005). It would also help in promoting and implementing evidence-based medical treatments for mental disorders; this is because the general public's belief system regarding treatment may or may not be consistent with evidence-based medicine (Jorm, Angermeyer, & Katschnig, 2000).

Knowledge about prevention refers to activities adolescents endorsed as being helpful in preventing depression (Jorm, 2012; Jorm et al., 1997). Often individuals tend to seek treatment when warning symptoms or signs are clearly apparent. It is important to examine knowledge of prevention for several reasons. Due to the prolonged disabling effects and undesirable consequences of depression, it is better if it can be prevented early on (Essau et al., 2013). Adequate knowledge about preventing depression would prevent delays in treatment seeking, resistance of treatment and may even prevent the occurrence of depression in the first place (Jaladin et al., 2016).

1.1.5.2 Help seeking

Help seeking has been defined in literature as a process that begins in response to a problem that cannot be solved or improved alone and involves the active pursuit of, and interaction with, a third party (Cornally & McCarthy, 2011). The WHO has defined adolescent help seeking as "any action or activity carried out by an adolescent who perceives herself/himself as needing personal, psychological, affective assistance or health or social services, with the purpose of meeting this need in a positive way" (Barker, 2007). Help seeking in response to mental illness revolves around the idea of reaching out and discussing the underlying problem with other individuals with the objective of getting help, such as receiving advice, information, treatment and even support in regard to dealing with the mental health issues or problems (Rickwood, Deane, Wilson, & Ciarrochi, 2005).

It is important to understand that help seeking is a broader process of help-seeking behaviour. Help-seeking behaviour for a health problem is defined by three attributes: namely, problem focus (involving problem recognition and definition), intentional action (decision to act) and interpersonal interaction (selection of source of help) (Barker, 2007). In other words, help seeking is conceptualized as a multi-step process that is initiated by the recognition of a problem by an individual, with the intention of seeking help from others, shortlisting the potential relevant source of help and barriers to help seeking, and finally the actual action of seeking help (Barker, 2007).

Help-seeking behaviours are dependent upon three categories, i.e. help-seeking attitudes, help-seeking intentions and actual help-seeking behaviours. Help-seeking attitudes are belief in, and willingness and inclination towards seeking help (Gulliver, Griffiths, Christensen, & Brewer, 2012). Intention to seek help is willingness to seek help for oneself or others, and actual help-seeking behaviours can be regarded as the actual

help-seeking action taken in response to an issue that one is unable to resolve by oneself (Cornally & McCarthy, 2011).

In the context of depression literacy, the help-seeking components that are examined in this study are intention to seek help (decision to act) and help-seeking attitudes towards obtaining assistance such as sources of help and barriers to help seeking based on the help-seeking measurement framework as shown in Figure 1.1 (Rickwood & Thomas, 2012), which is in line with the help-seeking component of MHL as defined by Kutcher et al. (2016), which emphasizes "knowing when and where to seek help" (Kutcher, Wei, Costa, et al., 2016; Kutcher, Wei, & Coniglio, 2016).
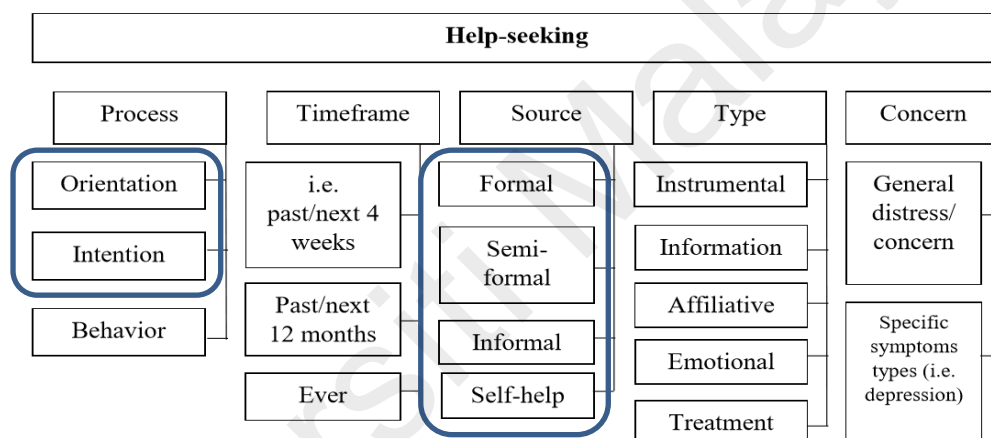
Figure 1.1: Help seeking measurement framework.
Source: Rickwood, D., & Thomas, K. (2012). Conceptual measurement framework for help-seeking for mental health problems. *Psychology Research and Behavior Management*, *5*, 173–183.

The reason for examining the help-seeking attitude and intention components is that, based on the theory of planned behaviour, the intention to act in a certain manner is dependent on attitudes towards help seeking, which are strong predictors of actual help-seeking behaviour (Armitage & Conner, 2001).

Generally, help may be requested from a third party such as informal sources of support, e.g. family members (parents, siblings, relatives) or peers (friends, classmates) or a formal help network, consisting of health professionals (physicians, psychologists and social workers) and community-based organizations (Houle, Chagnon, Lafortune,

Labelle, & Paquette, 2013). Barriers to help seeking can be broadly classified into structural and attitudinal barriers (Tapp et al., 2017). Monetary and accessibility issues related to the use of health services are examples of structural barriers, while poor understanding of the requirement for intervention, the perception that the problem will resolve itself, increased willingness to address the problem alone and finally stigma are examples of attitudinal barriers (Bruwer et al., 2011).

Alarmingly, the majority of adolescents (70%) with distressing problems refuse to seek help (Dubow, Lovko, & Kausch, 1990) and this figure increases to 77% among adolescents suffering from milder forms of MHD without a clinical diagnosis (Andrews, Issakidis, & Carter, 2001). Similarly, a lower help-seeking intention (37%) is reported with increasing severity of MHDs among adolescents (Bijl et al., 2003). There are several reasons why it is important to examine help seeking and include it as a component of depression literacy. The first is that the problem-focused attribute of help seeking is dependent on recognizing the disorder in the first place, as failing to do so would not result in any help-seeking behaviour. Second, help seeking is regarded as a coping strategy that helps maintain the psychological health of adolescents experiencing difficult events such as depression (Rickwood et al., 2005). Third, many adolescents with depression tend to seek professional help after long delays (Essau, 2005). Fourth, it is important that components of help seeking (help-seeking attitude and intention) be examined simultaneously; this is because an adolescent may intend to seek help, but many adolescents tend to seek help from inappropriate sources, which could have detrimental effects (Zachrisson, Rödje, & Mykletun, 2006). Finally, a better understanding of what the reasons are for not intending to seek help, preferred sources of help and barriers to help seeking among adolescents is important if we want to prevent, or provide appropriate intervention among adolescents with, depression. Urgency in regard to seeking help is very much also dependent on the correct recognition of the disorder and stigmatising attitudes (Burns & Rapee, 2006; Yap et al., 2013).

1.1.5.3 Stigma

Stigma has been defined as "a mark of shame, disgrace or disapproval which results in an individual being rejected, discriminated against, and excluded from participating in a number of different areas of society" (WHO, 2001). Often stigma is discussed as a single construct; however, more recently studies have reported that stigma is a multifaceted concept (Griffiths, Christensen, Jorm, Evans, & Groves, 2004; Peluso & Blay, 2009; Watson, Miller, & Lyons, 2005).

According to the individual cognitive model, the term "stigma" consists of three key components: namely, stereotypes, prejudice and discriminatory behaviour towards people with mental illness (Hinshaw & Stier, 2008). Stereotypes are mental labels and views towards others, such as being violent, unpredictable, ineffective and weak (Hamilton, Stroessner, & Driscoll, 1994). Prejudice refers to emotion-based negative attitudes such as anger and fear and predicts how one would behave towards a stigmatized individual, which might or might not result in discrimination (Weiner, Perry, Magnusson, & Werner, 1988). Discrimination is characterized by disparity or inequality displayed between individuals, such as social isolation (Brown & Bigler, 2005). Figure 1.2 shows the individual cognitive model of stigma.

Public Stigma	Self-Stigma
- **Stereotype:** Negative belief about a group e.g. dangerousness, incompetence, character weakness	- **Stereotype:** Negative belief about a self e.g. character weakness, incompetence
- **Prejudice:** Agreement with belief and/or negative emotional reaction e.g. anger, fear	- **Prejudice:** Agreement with belief and/or negative emotional reaction e.g. low self-esteem, low self-efficacy
- **Discrimination:** Behavior response to prejudice e.g. avoidance of work, housing opportunities	- **Discrimination:** Behavior response to prejudice e.g. fails to pursue work and housing

Figure 1.2: Individual cognitive model of stigma.

Source: Hinshaw, S. ., & Stier, A. (2008). Stigma as related to mental disorders. *Annual Review of Clinical Psychology*, *4*(1), 367–393.

Stigma is a complex multifaceted concept that involves both an attitudinal and a behavioural component (Hinshaw, 2005). The attitudinal component of stigma has been researched extensively as it is easier to measure (Walker, Coleman, Lee, Squire, & Friesen, 2008). Stigmatising attitudes towards mental illness have been conceptualized and measured in different ways, such as public stigma and self-stigma. Public stigma is divided into personal stigma and perceived stigma. Self-stigma and desire for social distance are examples of internalized public stigma that occurs when individuals internalize public stigmatising attitudes and suffer numerous negative consequences as a result (Jorm & Oh, 2009; Link, 1987). The commonly examined aspects of stigmatising attitudes towards MHDs are personal, perceived stigma and social distance (Yap, Reavley, & Jorm, 2013).

To date in Malaysia there are still misconceptions that surround mental health in our society, despite mental health problems being common in Malaysia. Some of the common stigma related to mental illness among Malaysian include; "Mental illness only happens to certain kind of people," "people with mental illness are violent and unpredictable", "Mental illness is caused by a personal weakness", "Mental illness is incurable and lifelong" and "Children do not experience mental health problems". Studies on mental health stigma in Malaysia are limited compared to other countries (Ibrahim et al., 2019).

In the context of depression literacy for this study, the stigmatising attitudes examined are conceptualized based on the individual cognitive models and involve the assessment of perceived stigma, personal stigma and social distance (Corrigan, Kerr, & Knudsen, 2005), which is in line with the stigma component of MHL defined by Kutcher et al. (2016), which includes public stigma (Kutcher, Wei, Costa, et al., 2016; Kutcher, Wei, & Coniglio, 2016).

Perceived depression stigma is defined as the extent to which an individual perceives public stereotypes and discrimination against a stigmatized group (Corrigan, 2004), or in other words, perceived depression stigma represents an individual's perception of what other people think and feel about depression. Personal depression stigma refers to an individual's personal thoughts and beliefs about depression. (Griffiths et al., 2006). Personal stigma is more complex because it can be applied to all, regardless of whether they know that they have a mental health problem (Eisenberg, Downs, Golberstein, & Zivin, 2009). Social distance is defined as one's desire to maintain distance from a stigmatized individual (Jorm & Griffiths, 2008).

Stigma is a common and widespread problem among adolescents; furthermore, adolescents with depression may be more prone to depression stigma, stigmatising responses and social distance than adults (Hinshaw, 2005; Martin, Pescosolido, Olafsdottir, & McLeod, 2007). It is imperative to understand stigma if we want to ensure

that adolescents suffering from MHDs are able to live a satisfactory quality of life. This is because stigma tends to develop during the early stages of life (Barney, Griffiths, Jorm, & Christensen, 2006), and stigmatising attitudes are reported to negatively affect help seeking, the utilization of mental health services, and adherence to and acceptance of treatments. Stigma also causes individuals to feel abnormal due to feelings of fear, embarrassment, shame or distrust, which will in turn lead to social distance and avoidance, and increase psychological distress among individuals suffering from mental disorders (Barney et al., 2006; Corrigan, 2004; Meredith et al., 2009; Moses, 2009; Schachter et al., 2008; Sirey et al., 2001). Stigmatising attitudes can initiate discriminatory actions towards individuals suffering from MHDs and even result in peer stigmatization, which is now a common issue among adolescents (Lasalvia et al., 2013; Walker et al., 2008). As many mental disorders tend to persist and reoccur over time, individuals may be susceptible to potential lifelong stigmatization, which originated from childhood or during adolescence (Kim-Cohen et al., 2003). Finally, as a result of stigmatization during adolescence, individuals are prone to poor academic performance, difficulty in securing jobs in the future and an overall increased risk of undesirable developmental outcomes (Woodward & Fergusson, 2000).

As depression literacy is characterized by attitudes that promote seeking appropriate help and reducing stigma, it is vital to address the stigmatising attitude component of depression literacy as stigmatising attitudes impair the progression of prevention, intervention, remission and recovery measures among those suffering from depression (Corrigan, 2007).

1.1.5.4 Adequacy of depression literacy

Having adequate depression literacy is generally defined as follows: (a) acquiring sufficient mental health knowledge regarding depression (its symptoms, protective/preventative factors and existing interventions); (b) having favourable attitudes towards oneself and others regarding help seeking for depression; and (c) having the ability to seek help for depression and actually seeking help if symptoms develop (Anjo, 2018). As MHL is a concept that consists of several components, levels of MHL should not only be reported by assessing a single component of MHL. Therefore, to ensure a proper measure of the adequacy of depression literacy, two components of depression literacy, namely recognition of depression (knowledge components of depression literacy) and intention to seek help, were combined to generate a composite variable (Lam, 2014). The reason for selecting these two components of depression literacy as a measure of the adequacy of depression literacy was based on the definition of MHL by Jorm et al. (1997).

Similarly, in examining whether depression literacy is adequate or inadequate, studies have defined adequate depression literacy as the correct recognition of depression with the intention to seek help (Lam, 2014). To date, only a few studies have reported on the adequacy of depression literacy among adolescents in line with the definition provided by Jorm at al. (1997). One such study conducted among adolescents in China reported that only 16.4% of adolescents had adequate depression literacy levels (Lam, 2014). Adequate depression literacy is important because studies have reported that by having adequate depression literacy, individuals will be more aware of how to recognize depression as a disorder, seek appropriate help, utilize necessary treatments, and halt or reduce the formation of stigmatising attitudes towards depression at macro and micro levels, thereby improving depression outcomes and the utilization of health services

(Corrigan & Watson, 2003; Henderson, Evans-Lacko, & Thornicroft, 2013; Rusch, Evans-Lacko, Henderson, Flach, & Thornicroft, 2011).

1.1.6 Malaysian school mental health service

In Malaysia, the school health service was introduced in 1975. It focuses primarily on a range of medical examinations, initiates prevention, investigates communicable diseases, administers routine vaccinations, and delivers health education to both primary and secondary school-going children (Buang, 2013). However, these medical examinations and health-promoting/education activities are firmly focused on physical health, with only a few of them looking into mental health (for example, screening of mental health and mental health education) (Lin, 2017a).

Currently in Malaysia there is a school mental health programme called the "Healthy Mind Programme" (*Program Minda Sihat*), which was introduced in 2014 (Ministry of Education [MOE] Malaysia, 2014). This programme is a joint effort by the Ministry of Health (MOH) and the Ministry of Education (MOE). The objectives of this programme are to create awareness among adolescents regarding the importance of mental health, to educate adolescents about stress reduction techniques, to screen for MHDs such as depression, anxiety and stress among adolescents aged 16, to educate teachers and counsellors on how to detect and provide intervention to adolescents suffering from MHDs such as depression, anxiety and stress, and finally to refer adolescents suffering from MHDs to relevant health-care professionals. The goal of this programme is to involve all secondary national schools. This programme operates across all national secondary schools in Malaysia whereby the school counsellors are the main individuals responsible for this program in each respective school. In Malaysia each school has a designated number of counsellors which depends on the number of students. This program was integrated into the present school curriculum by ensuring that all adolescents aged 16 are screened for depression, anxiety and stress. Those adolescents found to have

mild to moderate levels of depression, anxiety and stress are given basic interventions (by the school counsellors) which include anger management techniques, stress reduction techniques, relaxation techniques, positive thinking and problem-solving techniques. While those with severe levels of depression, anxiety and stress are referred to the nearest health clinic (via referral letter) for further assessment and management (MOE Malaysia, 2014). Alternatively, all students can get a consult with the school counsellor if they wish to.

1.2 Problem statement

1.2.1 Rising prevalence of adolescent depression and its health implications

The WHO has reported that depression will be the second largest contributor to disability globally by the year 2020, and the main cause of disease burden worldwide by 2030 (WHO, 2001,2008). Depression has been reported as one of the highly prevalent waxing and waning mental disorders among adolescents. It is estimated that about a quarter of adolescents worldwide suffer from at least a single episode of depression before the age of 18. More concerning is the fact that only a minority (20%) of these adolescents actually seek treatment, and among those who seek treatment, the majority (60%) do not comply with it (WHO, 2000). The prevalence of depression among adolescents is on the rise both internationally and in Malaysia.

On average, one in five Malaysian adolescents are depressed (Kaur et al., 2014; Latiffah, Tajik, Ibrahim, Abubakar, & Ali, 2016; Ramli et al., 2008). In Malaysia, studies have reported an increasing prevalence of depression symptoms among adolescents, from 24% in 2009 to 33% in 2015 (Latiffah et al., 2016). The actual prevalence of depression among adolescents may be much higher than has been reported by many studies, probably due to issues such as under-reporting or a lack of adolescents seeking help (Adlina et al.,

2007; Ghazali & Azhar, 2015). Despite significant improvements in the Malaysian health-care system, the screening and diagnosis of depression remain low (Zainab & Pereira, 2007). The reasons for this are the refusal of adolescents to disclose symptoms of depression, denial of the presence of depression symptoms, poor ability to recognize depression and difficulty in articulating symptoms of depression (Cook, Peterson, & Sheldon, 2009). The prevalence of adolescent depression, both internationally and in Malaysia, is discussed further in Chapter 2.

Depression during adolescence has many negative consequences. This disorder usually presents with a complicated disease course that will have a negative impact on both the health and resources of adolescents and their families, leading to significant financial and social constraints (Angold et al., 1998; Bodden, Dirksen, & Bögels, 2008). Depression also increases the risk of other mental disorders (Angold & Costello, 1993). Adolescent depression often persists in adulthood (Birmaher et al., 1996; Hofstra, Ende van der, & Verhulst, 2002). More concerning is the fact that early onset of depression lasts for longer and has more devastating health effects than the onset of depression during adulthood (Cook et al., 2009). There is an associated increased risk of high-risk behaviours among depressed adolescents, such as suicide and substance abuse (Brent et al., 2011; Ge et al., 2009; Yaacob, Juhari, Talib, & Uba, 2009). Adolescents suffering from depression may also suffer from the stigma of depression, which will interfere with help seeking and compliance with treatment, causing social isolation and peer stigmatization (Corrigan, 2004; Sirey et al., 2001). Finally, this disorder is likely to disrupt functional, emotional, mental and social development, thereby resulting in an impairment of interpersonal relationships with family and peers, and perhaps even an increase in the incidence of premarital pregnancy, poor educational achievement, violence, legal issues, substance abuse, recurrence of depression, 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, depression among adolescents has many negative consequences at an individual, interpersonal, community and societal level. The rising prevalence of adolescent depression is of grave concern as depression has many negative effects on adolescent physical, mental and emotional health.

1.2.2 Under-recognition of depression literacy among adolescents

The lack of serious study of depression literacy among Malaysian adolescents represents a troubling gap in knowledge, help seeking and stigmatising attitudes in the context of mental health matters in Malaysia (Marhani Midin, Zainal, Lee, & Nurashikin, 2018; Nik Murni Nik Mustafa, Ibrahim, & Hassan, 2015). This will result in restricted comprehension of MHL among adolescents residing in developing countries (Furnham & Hamid, 2014). There is an urgent need to narrow this gap in the literature primarily because findings generated from studies conducted among adolescents in Western developed countries cannot be generalized to adolescents in developing countries due to various cultural, social and economic differences (Rong et al., 2009). For example, the majority of developing nations suffer from insufficient mental health resources, which will affect the levels of depression literacy and the responses of adolescents in these regions (Ganasen, Parker, Hugo, Stein, & Emsley, 2008). Finally, once these gaps have been addressed, this will then translate into recommendations and suggestions for MHL-based interventions focused on improving MHL (Dias, Campos, Almeida, & Palha, 2018).

There are several reasons for the under-recognition of depression literacy among adolescents, especially Malaysian adolescents. The majority of the studies examining MHL, especially depression literacy, have been conducted in Australia and other Western countries (Bartlett, Travers, Cartwright, & Smith, 2006; Griffiths, Christensen, & Jorm,

2009; Jorm, Korten, Jacomb, et al., 1997; Jorm et al., 2005; Reavley & Jorm, 2011a, 2011b; Tieu, Konnert, & Wang, 2010; Wong, Xuesong, Poon, & Lam, 2012; Wong, Lam, & Poon, 2010). One of the reasons for this could be the concept of MHL, which was first introduced by Jorm et al. (1997) in Australia, and also the fact that many developed countries have recognized the crucial role that depression literacy has in addressing the issue of adolescent depression, thereby justifying the abundance of research on depression literacy in these countries (Rusch et al., 2011). Also, most of the studies examining depression literacy were conducted among the adult population (Bartlett et al., 2006; Griffiths et al., 2009; Jorm, Korten, Jacomb, et al., 1997; Jorm et al., 2005; Kutcher, Wei, & Coniglio, 2016; Reavley & Jorm, 2011a, 2011b; Tieu et al., 2010; Wong et al., 2012; Wong et al., 2010). For adolescents, especially those aged 10 to 19 (Sawyer et al., 2012), studies on depression literacy are limited and far fewer when compared to the adult population (Burns & Rapee, 2006; Leighton, 2010; Reavley & Jorm, 2011c; Wright et al., 2005). Generalizing the findings of adult populations to adolescent populations may not be appropriate. Finally, many studies report on either a single or a few components of depression literacy. Only reporting on a few components of depression literacy is insufficient to draw conclusions on depression literacy or its adequacy (Lam, 2014). Ideally depression literacy should be examined by assessing all the components simultaneously, as this would generate a well-rounded representation of the concept of depression literacy.

As evidence suggests that depression tends to occur as early as 14 years of age with increasing risk as age advances, it makes perfect sense to examine depression literacy among young adolescents aged between 11 and 14 in order to be able to prevent depression in the future (Bostic & Bagnell, 2012).

1.2.3 Lack of assessment of depression literacy among adolescents

International studies have reported that adequate MHL will improve mental health outcomes by increasing awareness of how to recognize MHDs, and seek appropriate help, treatment and reduced stigma against mental illness (Corrigan & Watson, 2003; Henderson et al., 2013; Rusch et al., 2011).

In Malaysia, the majority of the studies examining MHL related to depression were conducted among the adult population (Khan, Sulaiman, & Hassali, 2010; Loo & Furnham, 2013; Swami, Loo, & Furnham, 2010). There has only been one study conducted by the Institute for Health Behavioral Research, Malaysia in 2011 reporting on the knowledge component of depression literacy among Malaysian adolescents, in which the authors reported that 50% of school-going adolescents were able to correctly recognize depression but there is no report on subsequent depression literacy components: namely, first-aid knowledge, help seeking and stigma (Zawaha, Yogambikai, Siti Sa'adiah, Sulaiman, & Mohd Nasir, 2011). However, the findings from this study are to be generalized with caution due to certain limitations, such as a relatively small sample size (only one school involved) and the fact that the measurement tool used to examine MHL was not validated among Malaysian adolescents. Furthermore, currently there is lack of evidence in Malaysia with regard to the assessment of the adequacy of depression literacy and the association of depression literacy with depression among adolescents. This is of concern as we are unable to generalize the findings of international studies to our population due to various social and cultural diversities among populations.

Given the rising number of adolescents with MHDs in Malaysia, there is a pressing need to conduct a study looking into depression literacy among Malaysian adolescents in a more holistic manner, with the following aims: (a) to better examine adolescents' understanding of depression literacy; (b) to investigate the association between depression literacy and depression; and (c) to deliver suggestions for supplementing and

creating a more holistic comprehensive school-based mental health service for adolescents.

1.2.4   Need for a validated instrument to assess depression literacy

A recent systematic review reported on validated tools used to assess MHL literacy; however, two limitations were reported. First, there was no age restriction applied, therefore generalizing the findings of these validated tools among the adolescent population must be done with caution (Wei et al., 2015). Second, the majority of the validated tools were unable to examine all the components of depression literacy simultaneously (Wei et al., 2015). However, there are several instruments, such as the MHL and stigma questionnaire, that are able to examine all the components of depression literacy simultaneously and have been used extensively and validated among various international populations (Jorm et al., 2005; Loureiro, 2015). The MHL and stigma questionnaire has also been used in Malaysia to assess depression literacy among young adults; however, it still lacks validation among the Malaysian adolescent population (Jaladin et al., 2016). Without a validated tool, any findings reported are questionable, therefore there is an urgent need to validate the MHL and stigma questionnaire among Malaysian adolescents.

1.2.5   Need for recommendation for school mental health services

School mental health services such as mental health programmes are generally aimed at improving recognition of mental disorders, destigmatising help-seeking behaviour, facilitating access to services, and educating adolescents on the availability of sources of help and evidence-based effectiveness of various interventions (Rickwood, Wilson, & Deane, 2006). In order to ensure the above goals are achieved, it is important that school

mental services such as health promotion programmes include various components of MHL in their modules.

Despite the significant influence schools can have on students' perception and management of mental illness (Welsh, Parke, Widaman, & O'Neil, 2001), there seems to be limited efforts made with regard to the promotion of mental health, more specifically school-based mental health programmes in Malaysia (Nik Murni Nik Mustafa et al., 2015; Sutan et al., 2018). The existing school mental health programme, called the "Healthy Mind Programme" (*Program Minda Sihat*), has several limitations. First, the Healthy Mind Programme does not specifically targets on improving MHL relating to depression, lacks a standardized specific depression education component within it and does not incorporate all the depression literacy components in its programme structure (Lin, 2017a; Sutan et al., 2018). Second, this programme is not integrated into the education curriculum of schools (Lin, 2017a; Sutan et al., 2018). The reason for this could possibly be because of the lack of studies conducted in Malaysia examining depression literacy among adolescents. Furthermore, the progress and impact of the existing school-based mental health programme in Malaysia are not well established, probably due to human resource limitations (Ang, 2011), thereby highlighting the need for more studies looking into the MHL of adolescents such as this one with a view to further improving school mental health programmes.

Another component of school mental health services is mental health screening. It may be relevant to initiate screening for depression among younger secondary school-going adolescents so as to enable early detection and timely intervention of depression, for which more data on the prevalence of depression among young adolescents such as this study are required. Therefore, results from studies examining depression literacy among adolescents would be able to provide relevant recommendations to the existing school mental health services, thereby helping both the MOH and the MOE to guide public health

policymakers in developing and improving on the existing school-based mental health policies and programmes to better serve their purpose.

1.2.6 Need for research

A review of the various depression literacy components examined among adolescents is required in order to gather the existing evidence on adolescent depression literacy. There is also a need to identify tools used to examine depression literacy among adolescents in the literature, in order to enable the selection of the most appropriate and validated tool for examining depression literacy among adolescents. Validation of the tool selected to examine depression literacy among Malaysian adolescents is important in order to ensure that the tool is reliable and valid for use among Malaysian adolescents. Finally, the assessing knowledge, help-seeking and stigmatising attitude components of depression literacy and their association with depression symptoms among Malaysian adolescents are required before any recommendations to school mental health services and health policies can be made.

1.3   Study rationale

1.3.1 Evidence-informed policies and programmes

It is important that any policies and programmes be driven by systematic sound evidence. When evidence is inadequate, then policies or programmes made would not yield much benefit (Head, 2015). MHL is increasingly referenced as a benchmark for formulating policy relating to mental health, as evident in many countries, such as Australia, Scotland, Ireland and Canada (Chambers, Murphy, & Keeley, 2015). Evidence generated in the context of depression literacy studies has a major role in influencing policies regarding primary health-care services, school-based mental health services, family and peers. Primary health-care policies, whose main aim is focused on the

prevention of MHDs such as depression, generally have the objectives of increasing screening of depression among adolescents, improving service utilization, ensuring prompt referral to mental health professionals if indicated and increasing the awareness of depression among the community (Gladstone, Beardslee, & O'Connor, 2011). In order to achieve these objectives, the evidence generated from studies examining depression literacy is of great importance for several reasons.

First, to increase screening of depression and to improve service utilization at the primary health-care level, it is important for us to first identify whether adolescents are able to recognize symptoms and causes of depression in the first place, as early recognition of depression will prompt urgent professional help seeking. Second, it is of equal importance to identify the barriers to help seeking that adolescents perceive so as to allow administrators to develop evidence-based policies and measures that are designed to improve the knowledge of depression among adolescents and to address barriers to help seeking (Gladstone et al., 2011). One such initiative by the WHO is the development of youth-friendly health services, which makes health services more attractive to youths and thus improves service utilization, which is driven by evidence generated from MHL studies (McCann & Lubman, 2012).

Third, identifying the preferred source of help that adolescents would seek if they or their peers were suffering from an MHD would also improve professional help seeking. For example, if general practitioners (GPs) or primary health-care doctors are endorsed as preferred sources of help, then it is important that the health-care system develops policies to improve the competencies of the GPs or primary health-care doctors in dealing with MHDs among adolescents. This is crucial because primary health-care doctors and GPs tend to be regular family doctors of many families who come to seek treatment for various health problems frequently. Also, primary health-care doctors and GPs are often the front lines operating in various health-care systems across many countries including

Malaysia (Jorm, Wright, & Morgan, 2007). If non-professional help sources such as parents or teachers are endorsed as common sources of help then policies and programmes should be developed to educate parents and teachers about identifying emerging mental disorders and enhancing appropriate help seeking (Jorm, Wright, & Morgan, 2007), while if non-professionals such as peers are endorsed as sources of help then school mental health programmes should focus on educating adolescents so as to enable them to function both as providers and receivers of help. To achieve the role of a provider of help, adolescents need to be educated about the required competencies of a help provider role (Moffatt, 2007).

Fourth, evidence from depression literacy studies among adolescents would also be able to provide recommendations to school mental health services, including screening for depression and emphasis on educating adolescents regarding knowledge of depression, help seeking and stigmatising attitudes as part of the school education programme. These components are currently lacking in the school mental health programmes in Malaysia, probably due to a lack of evidence on depression literacy among Malaysian adolescents (Sutan et al., 2018). In the United States, the Adolescent Depression Awareness Programme (ADAP) emphasizes improvement of knowledge, help-seeking and reducing stigmatising attitudes among school-going adolescents (Swartz et al., 2007). In other words, developing and implementing policies or programmes addressing adolescent depression warrants evidence from studies examining depression literacy such as this one.

1.3.2 Screening for depression symptoms

It is worth noting that currently school-going adolescents in Malaysia are being screened for sumptoms of depression, anxiety and stress using the Depression, Anxiety and Stress Scale (DASS) screening tool, which is routinely done at the age of 16. Depression is a disorder that is known to occur among young adolescents (aged 11 to 14), with an increasing risk as age advances (15 to 18) (Hankin, 2006; Kessler et al., 2005). Therefore, there is a pressing need to screen for depression among young adolescents aged 11 to 14 as we are able to detect the disorder very early on, and reduce the risk of depression and its consequences among older adolescents. This study reports on the prevalence of depression symptoms among young adolescents, provides relevant intervention and probably recommends that the screening of depression symptoms among adolescents be routinely performed among young adolescents as well. In addition, this study also validates both the MHL and stigma questionnaire (which has not been validated among Malaysian adolescents) and the CES-D Malay version questionnaire (which awaits a test-retest reliability analysis) for use among Malaysian adolescents.

1.4 Research Questions, Hypotheses, and Objectives

1.4.1 Research questions and hypotheses

Question 1: What are adolescents understanding of MHL related to depression (depression literacy)?

Hypotheses 1: Adolescents have poor understanding of MHL related to depression (depression literacy).

Question 2: Is there an association between the components of depression literacy (namely knowledge of depression, intention to seek help, stigmatising attitudes) and depression symptoms among adolescents?

Hypotheses 2: Every component of depression literacy is associated with depression symptoms among adolescents.

Question 3: Is there an association between the components of depression literacy (namely sources of help and barriers to help seeking) and depression symptoms among adolescents intending to seek help?

Hypotheses 3: Every component of depression literacy is associated with depression symptoms among adolescents intending to seek help.

Question 4: Is there an association between adequacy of depression literacy and depression symptoms among adolescents?

Hypotheses 4: Adequacy of depression literacy is associated with depression symptoms among adolescents.

1.4.2 General objective

To examine MHL related to depression (depression literacy) and its association with depression symptoms among school-going adolescents in Selangor.

1.4.3 Specific objectives

a) To collate and analyse the extant evidence on depression literacy among adolescents.

b) To validate the MHL and stigma questionnaire.

c) To validate the CES-D Malay version questionnaire.

d) To determine the prevalence of depression symptoms among adolescents.

e) To determine the adequacy of depression literacy among adolescents.

f) To examine the knowledge of depression among adolescents:

- To determine the percentage of adolescents that are able to correctly identify depression symptoms.

- To determine the percentage of first-aid actions and interventions that adolescents believe to be helpful for those with depression symptoms.

- To determine the percentage of preventive activities that would be selected by adolescents to prevent depression symptoms.

g) To examine help seeking for depression symptoms among adolescents:

- To determine the percentage of adolescents that are willing to seek help for depression symptoms (intention to seek help).

- Among those adolescents willing to seek help, to determine the percentage of sources of help that are believed to be helpful and barriers to help seeking being endorsed (help-seeking attitude).

h) To examine stigmatising attitudes towards depression symptoms among adolescents:

- To determine the percentage of adolescents agreeing to stigmatising attitudes (perceived, personal stigma and social distance) towards those with depression symptoms.

i) To determine the association of depression literacy with adolescent depression symptoms:

- To examine the association between knowledge of depression, intention to seek help, stigmatising attitudes and depression symptoms.

- To examine the association between help seeking (sources of help and barriers to help seeking) and depression symptoms among adolescents intending to seek help.

- To examine the association between the adequacy of depression literacy and depression symptoms.

1.5   Study outline

Two areas were focused upon by this study. The aim of phase 1 was to validate the MHL and stigma questionnaire, and the CES-D Malay version questionnaire. The purpose of phase 2 was to examine the components of depression literacy, namely knowledge of depression, help seeking, stigmatising attitudes and the adequacy of depression literacy, and their association with depression symptoms. This study was organized and performed in five stages to achieve the objectives. The first stage is a review of the literature, the second stage data collection and the third stage is data analysis. Results are presented in stage four. Findings, conclusions and recommendations are discussed in the final stage.

1.5.1   Stage 1: Review of literature

The first part of the literature review involves a review of the prevalence of adolescent MHDs such as depression at global, international, regional and local level, along with identifying determinants of depression and common tools used to screen for adolescent depression. The second part is a systematic review aimed at identifying tools used to examine depression literacy among the adolescent population, and at identifying the components of depression literacy reported among adolescents, such as knowledge of depression, help seeking and stigmatising attitudes towards depression. The search and review of articles published between January 2006 and December 2016 was performed between April and May 2017, and analysis of the review was completed in December 2017 (the search period was subsequently updated to December 2018). Details of the systematic review are discussed in Chapter 2.

1.5.2 Stage 2: Collection of data

Data collection was divided into two phases and was conducted in different locations. Phase 1 was performed for the purpose of validating the MHL and stigma questionnaire and the CES-D Malay version questionnaire. Phase 2 was performed to answer objectives (c), (d), (e), (f), (g) and (h) in Section 1.4.3. Phase 1 was conducted between April and July 2017. Data were collected from two national secondary schools in the Federal Territory of Kuala Lumpur. Socio-demographic variables were collected and validation of the questionnaires was performed. Phase 2 was conducted between August and November 2017. Data were collected from 46 national secondary schools in Selangor state. The variables collected were socio-demographic characteristics (such as gender, age, ethnicity, feeling lonely, alcohol intake, smoking, substance abuse, being bullied, parental supervision, parental marital status, parental income, change of school and co-curricular involvement), knowledge of depression (namely recognition of depression, first-aid actions, prevention actions, intervention actions), help seeking for depression (willingness to seek help, preferred sources of help, barriers to help seeking), stigmatising attitudes (such as personal stigma, perceived stigma, social distance), adequacy of depression literacy and depression symptoms. Chapter 3 describes the details of the methods used in both phase 1 and phase 2 of this thesis. Chapter 4 presents the results of data collection.

1.5.3 Stage 3: Data analysis

Data analysis was divided based on the two study phases: the validation of the MHL and stigma questionnaire and the CES-D Malay version questionnaire (phase 1); and the association of depression literacy components (knowledge of depression, help seeking, stigmatising attitudes, adequacy of depression literacy) with depression symptoms among adolescents (phase 2). Each substudy involves the analysis of original primary data. The analysis for the validation study (phase 1) was performed between April and July 2017.

The analysis for the depression literacy study (phase 2) was performed between December 2017 and February 2018. Chapter 4 describes the results of the analysis. In order to be adequately prepared for the analysis, getting familiar with, and learning about, the different software was important. The Statistical Package for the Social Sciences (SPSS) 24.0 and Microsoft EXCEL were used in this study. A few workshops, such as questionnaire validation, an introduction to SPSS and regression model analysis, were attended in order to gain more knowledge about the analysis of data.

1.5.4   Stage 4: Synthesis of results

The results of this study were evaluated in stage 4. Analysis of the validation tool (phase 1) was performed between June 2017 and July 2017 and analysis of phase 2 of the study was performed between December 2017 and February 2018. In Chapter 4, a detailed discussion of the findings of the results is presented. Several manuscripts were prepared for publication during this stage.

1.5.5   Stage 5: Discussion

Upon completing the review and analysis of data, the results obtained were discussed with regard to the topic of the study. Relevant recommendations were made. The discussion of findings for the validation study, components of depression literacy and their association with depression symptoms are presented in Chapter 5. In Chapter 6, conclusions and recommendations are presented. Figure 1.3 depicts the study outline.
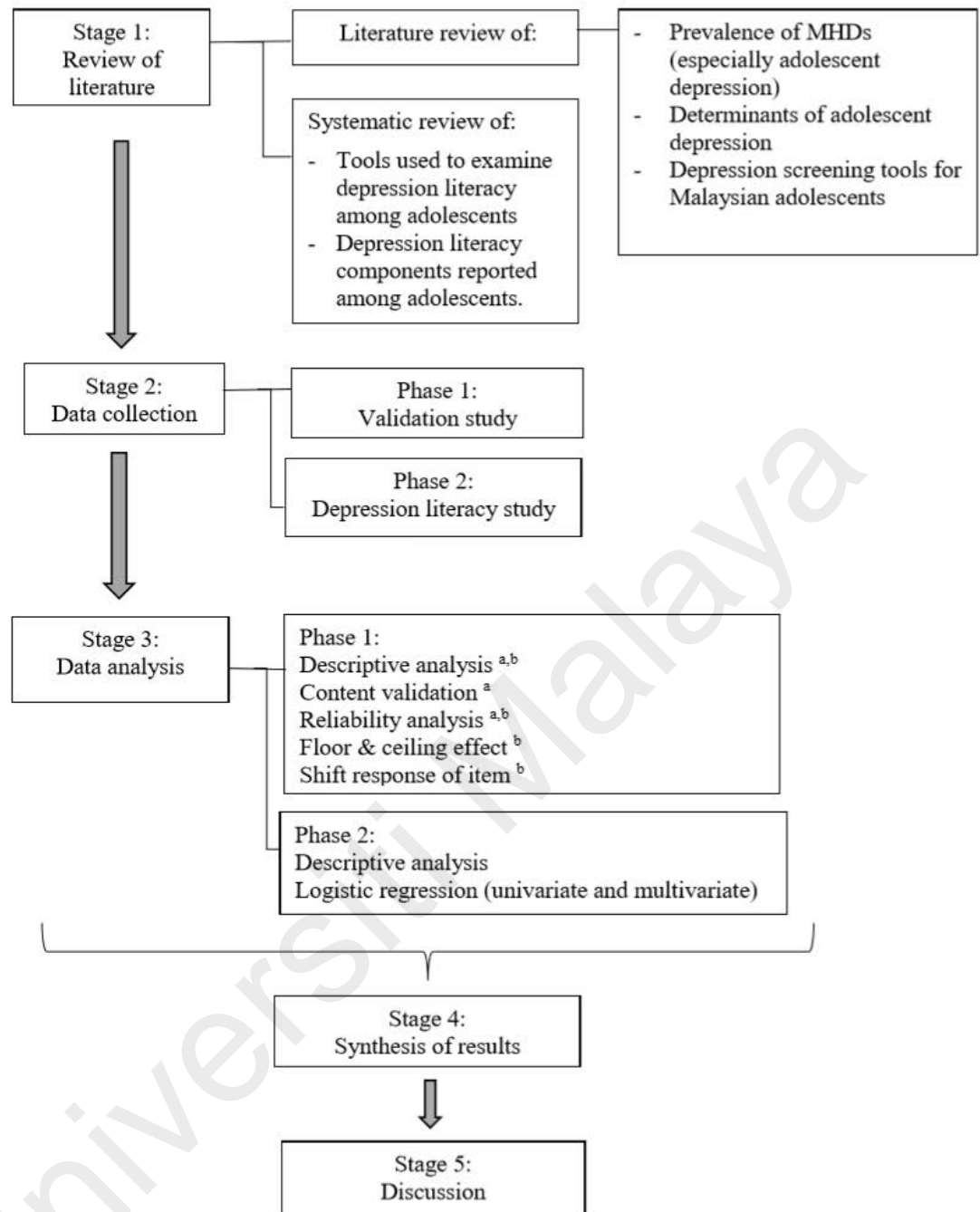
Figure 1.3: Outline of study.

[a] MHL and stigma questionnaire; [b] CES-D Malay version questionnaire

1.6   Structure of thesis

This thesis consists of six chapters. Chapter 1 provides an introduction to the thesis. A summary of the work done by the author and an outline of this thesis also form part of Chapter 1. This chapter presents the aims and objectives, an introduction to the concept of MHL relating to depression (depression literacy) and its various components, and the importance of this study in the area of adolescent mental health.

Chapter 2 presents a review of literature and a systematic review, which were conducted in this study. The review of literature focused on describing the prevalence of adolescent MHDs such as depression, and identifying determinants of depression and common tools for screening for depression among adolescents. The systematic review focused on identifying the tools commonly used for examining depression literacy among adolescents and components of depression literacy examined among adolescents. Each of the components of depression literacy is discussed in terms of the tools used to assess it, commonly reported components, aspects within a component that is examined and the findings of each component of depression literacy.

Chapter 3 presents the methodology of this study. This chapter includes the following: ethical application, ethical clearance and major works involved in producing this study, such as details on collection, management and analysis of data for use in the study. The results of the validation of the MHL and stigma questionnaire, and the CES-D Malay version questionnaire (phase 1), are presented in this chapter. The various problems and challenges encountered during the collection, management and processing of data, along with measures taken to overcome these problems, are discussed in this chapter.

Chapter 4 is a presentation of the results of data analysis. The results of descriptive and analytical analysis of the depression literacy components and their association with depression symptoms for participants from the 46 schools are presented (phase 2).

Chapter 5 is a discussion on the validation findings of the MHL and stigma questionnaire, and the CES-D Malay version questionnaire, the reasons and justifications for the results obtained from various components of depression literacy examined and the direction of the association of depression literacy components with depression symptoms. The strengths and limitations of this study also form a part of this chapter. Finally, Chapter 6 presents the conclusions and recommendations generated from this thesis. Directions for future studies are also suggested in this section.

1.7   Summary of Chapter 1

This chapter presents the study background of this thesis. It also describes the concept of depression literacy and its components, such as knowledge of depression, help seeking and stigmatising attitudes. This chapter also highlights the importance of having adequate depression literacy and its consequence for depression outcomes among adolescents. The objectives, outline and structure of this thesis are also described in this chapter.

CHAPTER 2: REVIEW OF LITERATURE

2.1   Introduction

This chapter is divided into two main parts. The first part is a review of literature that aims to summarize the literature on the prevalence of MHDs, especially depression, determinants of depression among adolescents and depression screening tools used among Malaysian adolescents, which is discussed in Section 2.2. The second part presents a systematic review that aims to identify tools used to assess depression literacy and various depression literacy components examined among adolescents worldwide, which is discussed in Section 2.3. The theoretical and conceptual framework used in this study is also described in this chapter, in Sections 2.4 and 2.5.

2.2   Review of literature

2.2.1   Background of review

Adolescere, which means "to grow up", is a Latin word from which the word "adolescence" originated (Adolescence, 2009). Adolescents' health is a rising concern worldwide. Annually around 1.4 million deaths occur among adolescents, of which 97% occur in low- and middle-income countries (Patton et al., 2012). According to the WHO, the main causes of death among adolescents are road accidents, human immunodeficiency virus (HIV), suicide, lower respiratory infections and interpersonal violence (WHO, 2014). Alarmingly, depression, road accidents, iron deficiency anaemia, HIV and suicide are the main causes of disability-adjusted life years lost in 10 to 19 year-olds (WHO, 2011, 2014). In 2016, according to an Institute for Health Metrics and Evaluation (IHME) report, depression was ranked as the fourth largest cause of health-related disability, an increase of about 33.9% from the year 2005 across all age groups in Malaysia, as shown in Figure 2.1 (IHME, 2016).
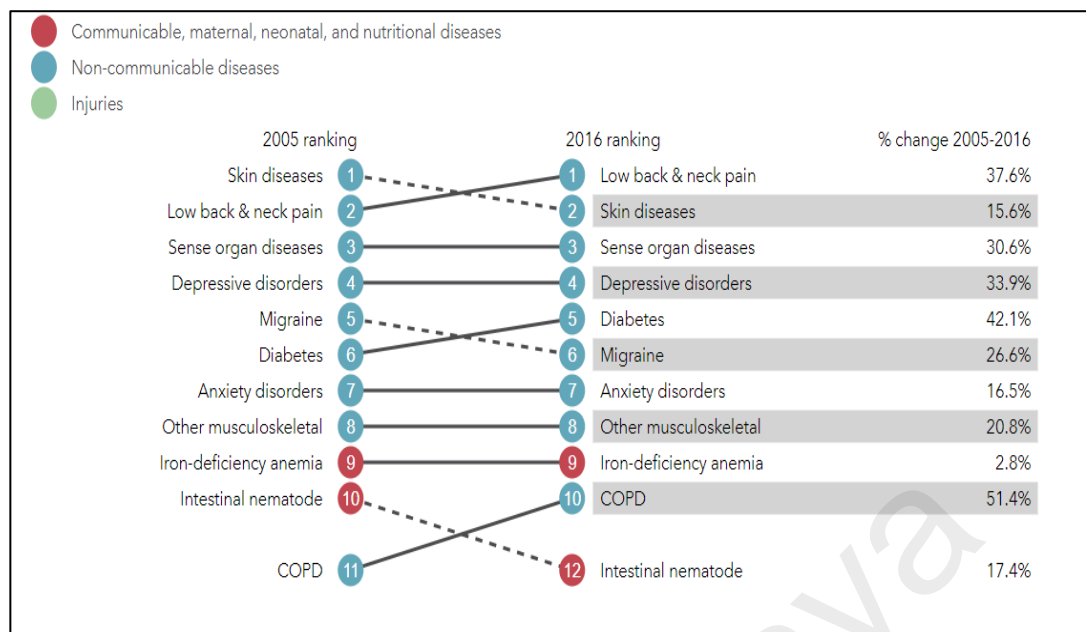
Figure 2.1: Top ten common cause of years lived with disability in 2016.

Source: IHME, Global Burden of Disease (GBD). 2016, Retrieved December 1, 2017, from http://www.healthdata.org/malaysia

2.2.2 Aims of review

This review specifically addresses adolescent depression and comprises three sections. The first section describes an overview of the prevalence of MHDs, especially depression, globally, regionally and locally among adolescents. The second section presents the determinants of depression among adolescents. The final section describes the list of depression screening tools used for Malaysian adolescents.

2.2.3 Searching for relevant literature

2.2.3.1 Inclusion criteria

Literature published between 1997 and 2017 on adolescents' health was identified, collected and reviewed, using a combination of PubMed and Google Scholar. Relevant articles were also retrieved through bibliographic searches. Articles had to meet the following criteria to be included in this review: (a) report on information related to adolescents; (b) written in English; (3) period of publication between 1997 and 2017; and

(d) report on the prevalence of common MHDs (including depression), associating factors of depression among adolescents and depression screening tools (used for Malaysian adolescents).

2.2.3.2 Searching of articles

Keywords, including (adolescent OR teenagers OR youth) AND ("mental health disorder" OR depression OR tools OR instruments), were entered during the process of collecting articles, following which articles were assessed to determine whether they had met the inclusion criteria.

2.2.3.3 Selection of articles

A total of 98 articles met the inclusion criteria and were included in this review as depicted in Figure 2.2.
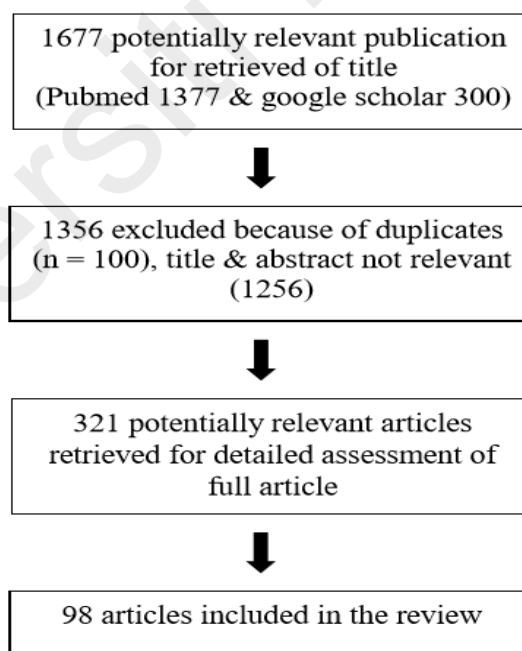
Figure 2.2: Articles included in the review.

2.2.4 Prevalence of adolescent MHDs

Data on the prevalence of MHDs among adolescents were provided by 31 articles that were published between 2000 and 2017. Data on prevalence were classified based on the following categories: (1) the overall percentages of the prevalence of MHDs worldwide; (2) the percentages of the prevalence of common MHDs; and (3) the percentages of the prevalence of adolescent depression worldwide.

2.2.4.1 Overall percentages of the prevalence of MHDs worldwide

The WHO has recently reported that worldwide almost 20% of adolescents suffer from disabling MHDs (WHO, 2017a). Globally MHDs are also predicted to increase by 15% among young people in the year 2020 (WHO, 2003). Among the high-income countries, the prevalence of MHDs is much higher in the North American, Australasian and western European regions. Among the low- and middle-income countries, the prevalence of MHDs is much higher in the East Asia region (Erskine et al., 2017).

In the United States, the lifetime prevalence of MHDs and severe MHDs among adolescents in the year 2010 was reported to be 46.3% and 21.4% (Merikangas et al., 2010). A survey conducted in England in the years 1999 and 2004 reports that one in ten individuals aged below 16 had an MHD, with a prevalence range of 7.1% to 19.4% (Green, McGinnity, Meltzer, Ford, & Goodman, 2005), while other European countries such as Germany report a much higher prevalence of MHDs among adolescents of 60% (Schmid, Goldbeck, Nuetzel, & Fegert, 2008). In 2015, about 14% of Australian adolescents were reported to be suffering from MHDs. More recently, a report released by the WHO in 2017 indicated that the United States and Germany report a much higher prevalence of MHDs among adolescents compared to adolescents in the United Kingdom and Australia (WHO, 2017a).

In Asia, the prevalence of MHDs was reported to be 10 to 20 % in the year 2010 (Srinath, Kandasamy, & Golhar, 2010). More specifically, the prevalence of MHDs among adolescents in Afghanistan was reported to be 22%, while it was 16% in China, 9% in Vietnam, 12% in India and 13% in Singapore (Srinath et al., 2010).

Among Malaysian adolescents, the prevalence of symptoms of MHDs follows a similar pattern to other countries in Asia. The majority of MHDs begin at 14 years of age (Institute for Public Health, 2015). A report released by the NHMS in 2015 revealed that the prevalence of symptoms of MHDs among Malaysian children and young adolescents aged 5 to 15 showed an increasing trend, escalating from 19.4% in 1996 to 24% in 2015 (Institute for Public Health, 2015). More alarming is the fact that symptoms of MHDs are commonly more frequent among adolescents aged 16 to 19 (34.7%), followed by those aged 5 to 15 (24%), and finally those aged 19 and above (29.2%) (Institute for Public Health, 2015). The NHMS 2015 report also indicates that many Malaysian youths are indeed not in a state of mental well-being. Table 2.1 shows the prevalence of symptoms of MHDs by age groups and years in Malaysia as reported by the NHMS in 2015 (Institute for Public Health, 2015).

Table 2.1: Prevalence of MHDs by age groups and years in Malaysia

Age (years)	1996	2011	2015
5 to 15	19.4%	20.0%	24.0%
16 to 19	N/A	N/A	34.7%
More than 19	10.7%	N/A	29.2%

Note. N/A, Data not available; Source NMHS, 2015

According to the NHMS 2015 report, Selangor state is ranked the fourth highest state in terms of the prevalence of children and adolescents with MHDs in Malaysia (Institute for Public Health, 2015). However, as Selangor state has the largest estimated population in Malaysia, at around 127,308, approximately 17,441 children and adolescents in

Selangor are suffering from MHDs, which is much higher than in other states in Malaysia. More recently, the NHMS 2017 report indicated that Selangor has the highest prevalence of depression symptoms among adolescents (22.6%) and the highest suicidal plan (9.5%), compared to other states in Malaysia (Institute for Public Health, 2017). This justifies the reason for conducting this study in Selangor (Institute for Public Health, 2015). The prevalence of MHDs among individuals aged 5 to 17 by states in Malaysia in 2015 is shown in Table 2.2 (Institute for Public Health, 2015).

Table 2.2: Prevalence of MHDs for ages 5 to 17 years by states in Malaysia, 2015

Sociodemographic characteristics	Count	Estimated population	Prevalence (%)	95% CI Lower	Upper
Malaysia	612	594256	12.1	11.0	13.4
State					
Johor	63	72045	14.0	10.3	18.9
Kedah	32	29210	8.2	5.6	11.9
Kelantan	44	35866	10.3	7.5	14.1
Melaka	36	12241	8.9	5.5	14.2
Negeri Sembilan	37	19991	11.7	7.5	18.0
Pahang	42	34277	13.2	8.6	19.8
Penang	32	24645	10.7	5.4	20.0
Perak	31	23268	5.7	3.2	9.8
Perlis	16	1932	4.9	3.0	8.1
Selangor	87	127308	13.7	10.8	17.2
Terengganu	39	24391	9.9	7.0	13.9
Sabah and Labuan*	79	83027	14.8	11.8	18.3
Sarawak	40	70048	16.0	11.6	21.8
Kuala Lumpur*	17	34099	13.6	8.3	21.5
Putrajaya*	17	1908	12.0	6.6	20.6

Note. CI, Confidence interval; *Federal Territory; Source NMHS, 2015

2.2.4.2 The percentages of the prevalence of common MHDs

The common MHDs that affect adolescents aged between 12 and 18 in the United States reported during the year 2017 included anxiety (32%), depression (13%), Attention deficit hyperactivity disorder (ADHD) (9%) and eating disorders (3%) (National Institute of Mental Health, 2017). In contrast, studies in Australia in 2015 reported that adolescents commonly suffered from ADHD (7.4%), anxiety disorders (6.9%), major depressive disorder (MDD) (2.8%) and conduct disorder (2.1%) (Lawrence, Johnson, Hafekost, Boterhoven De Haan, Sawyer, Ainley & Zubrick, 2015).

In Asia, the most common MHDs affecting adolescents are anxiety, depression and stress (Samy, Khalaf, & Low, 2015). The prevalence of depression is further discussed in Section 2.2.4.3. The prevalence of anxiety among adolescents in Indonesia (2015), Bangladesh (2014), Sri Lanka (2016) and Nepal (2015) was reported to be 5%, while adolescents in India (2007) and Thailand (2015) were reported to have a prevalence of anxiety of 8% and 9%, respectively. Myanmar (2016) reported the lowest prevalence of anxiety among adolescents at 4% (WHO, 2017b). The prevalence of stress ranged between 8.6% and 57.3% among Asian adolescents (Samy et al., 2015).

Similarly, in Malaysia, the most common MHDs affecting adolescents are anxiety (37%) and depression (20%) (Institute for Public Health, 2017). A higher prevalence of MHDs is reported among female adolescents than among males in Malaysia (Institute for Public Health, 2017). Erskine et al. (2017) report on the prevalence of various MHDs among children and adolescents worldwide in the year 2013, as shown in Table 2.3.

Table 2.3: Prevalence of MHDs by region and income for ages 5 to 17 years, 2013

	Prevalence (%)						
	CD	ADHD	ASDs	EDs	Depression	Anxiety	Mean across disorder
GLOBAL	5.03	5.47	16.05	4.41	6.16	3.21	6.72
High- income regions	35.59	36.47	5.47	28.14	35.54	18.27	26.41
Asia Pacific, High Income	N/A	3.46	0.43	N/A	1.40	N/A	0.88
Australasia	76.14	76.14	7.88	3.64	36.04	15.17	35.84
Europe, Western	16.56	17.41	2.95	3.37	40.12	17.14	16.26
Latin America, Southern	N/A	N/A	N/A	N/A	2.70	26.66	4.89
North America, High Income	72.69	72.83	10.89	70.85	48.95	24.96	50.20
Low-and-middle income regions	1.60	2.00	17.23	1.75	3.01	1.53	4.52
Asia, Central	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Asia, East	5.46	6.35	97.63	9.83	2.15	0.66	20.35
Asia, South	1.64	1.63	N/A	N/A	1.44	0.46	0.86
Asia, Southeast	0.0004	1.80	0.13	N/A	14.87	9.99	4.47
Caribbean	7.28	7.28	N/A	N/A	8.23	7.28	5.01
Europe, Central	N/A	N/A	N/A	2.02	N/A	0.39	0.40
Europe, Eastern	N/A	0.43	N/A	N/A	0.47	N/A	0.15
Latin America, Andean	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Latin America, Central	1.69	2.24	0.34	N/A	1.80	N/A	1.01
Latin America, Tropical	0.10	0.26	N/A	N/A	0.10	0.10	0.09
North Africa/Middle East	0.39	0.70	2.70	0.11	5.54	1.87	1.89
Oceania	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sub-Saharan Africa, Central	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sub-Saharan Africa, East	N/A	0.01	N/A	0.08	0.70	0.24	0.17
Sub-Saharan Africa, Southern	N/A	N/A	N/A	N/A	N/A	1.34	0.22
Sub-Saharan Africa, Western	0.04	N/A	N/A	N/A	0.13	0.02	0.03

Note. N/A, Data not available; CD, Conduct disorder; ADHD, Attention deficit hyperactivity disorder; ASDs, Autism spectrum disorders; EDs, Eating disorders.

2.2.4.3 The percentage of the prevalence of depression wordwide

Nearly 20 years ago it was estimated that only between 4 and 8 % of adolescents suffered from depressive disorders worldwide to be (Lewinsohn, Clarke, Seeley, & Rohde, 1997). However, 15 years on it is estimated that about 50% of the world's population of children and adolescents suffer from depression (Kessler & Bromet, 2013). Studies also report that 20% of adolescents will experience an episode of depressive symptoms by the age of 18 (Bostic & Bagnell, 2012). The global prevalence of adolescent depression in the year 2013 was reported to be 6.2%, with depression being ranked the second most common MHD among adolescents (Erskine et al., 2017). The prevalence of adolescent depression across the globe in 2013 was much higher in higher-income countries (36%) than in lower- and middle-income countries (3%) (Erskine et al., 2017). The regional prevalence of adolescent depression was reported to be much higher in the western European (40%) and North American (49%) regions than in the Asian (19%) and African/Middle East regions (6%), as shown in Table 2.3 (Erskine et al., 2017).

Many countries have reported a rising prevalence of adolescent depression. In the United States in 2014, 2.8 million adolescents suffered from major depressive episodes and this figure increased to 3.0 million in 2015 (Department of Health, 2013). The British Child and Adolescents Mental Health 2004 report indicated a prevalence of depression ranging from 7.1% to 19.4% (McCarthy, Bruno, & Fernandes, 2011). The prevalence of depression among adolescents in European countries ranged from 7 to 20 % in 2012, with the following percentages being reported: Hungary (7.1%), Austria (7.6%), Romania (7.6%), Estonia (7.9%), Ireland (8.5%), Spain (8.6%), Italy (9.2%), Slovenia (11.4%), Germany (12.9%), France (15.4%) and Israel (19.4%) (Balazs et al., 2012). The majority of recent studies conducted in other European countries also reported a prevalence of adolescent depression within the range of 7 to 20 %, such as in Sweden (2014) at 11.2% and Norway (2016) at 11%, with the exception of adolescents in Greece (2015), where a

much higher prevalence of depression of 25% was reported (Abebe, Frøyland, Bakken, & Von Soest, 2016; Magklara et al., 2015; Wirback et al., 2014).

In Africa, the prevalence of depression was reported to be 28% and 15% among Nigerian and Ugandan adolescents, respectively (Adeniyi, Okafor, & Adeniyi, 2011; Kinyanda, Kizza, Abbo, Ndyanabangi, & Levin, 2013).

In Asia, the prevalance of adolescent depression in the year 2013 was higher among the countries in the South-East Asia (SEA) region (15%) than in the East Asia (2%) and South Asia (1%) regions, as shown in Table 2.3 (Erskine et al., 2017). Within the SEA region, female adolescents (20–25 %) have a higher lifetime risk of depression than males (7–12%) (WHO, 2007). More specifically, the prevalence of depression symptoms among adolescents has been reported to be higher in countries such as India (2017), reported to be 58%, Hong Kong (2006), at 50%, Indonesia (2016), at 53%, and Thailand (2013), at 35%, when compared to Singapore (2004), at 2% (Mukhripah, 2016; Somrongthong, Wongchalee, & Orapin Laosee, 2013; Sun, Hui, & Watkins, 2006; Urmila, Usha, Mohammed, & Pavithran, 2017; Woo et al., 2004).

In Malaysia, the prevalence of adolescent depression symptoms increased from 10.2% in 2007 to 32% in 2017, a finding that is consistent with other Asian countries such as Indonesia and India (Adlina et al., 2007; Ibrahim et al., 2017). More recently, the NHMS 2017 report indicated that one in five Malaysian adolescents are depressed (Institute for Public Health, 2017). The prevalence of depression symptoms among adolescents in Selangor state was reported to be 22.6% in 2017, which is higher than other states in Malaysia (Institute for Public Health, 2017).

2.2.5 The determinants of depression among adolescents

There were 61 articles that reported on the determinants of depression (as shown in Appendix H). The social ecological model (SEM) was used to classify these determinants into the following levels: individual-level influence (40 articles), interpersonal relationship-level influence (17 articles) and community-level influence (8 articles).

2.2.5.1 Individual-level influences

Personal history and biological factors are examples of identified individual determinants that influence the risk of developing depression in an individual. Literature has reported that there is an association between gender and depression among adolescents. The majority of studies have shown that significantly more female than male adolescents suffer from depression (Abebe et al., 2016; Adlina et al., 2007; Allison, Roeger, Martin, & Keeves, 2001; Asal & Abdel-Fattah, 2007; Black, Roberts, & Li-Leng, 2012; Chopra, Punia, & Sangwan, 2017; Essau, Conradt, & Petermann, 2000; Ee & Zarinah, 2017; Eskin, Ertekin, Harlak, & Dereboy, 2008; Granrud, Steffenak, & Theander, 2017; Jha et al., 2017; Kaur et al., 2014; Maharaj et al., 2008; Tiwari & Ruhela, 2012; Yaacob et al., 2009).

Several studies have also documented associations between age and depression among adolescents. Most studies report that adolescent depression increases substantially with advancing age from 13 to 18 years (Adeniyi et al., 2011; Essau et al., 2000; McCarthy et al., 2011; Nagendra, Sanjay, Gouli, Kalappanavar, & VinodKumar, 2012; Vashisht et al., 2014), while some studies report that older adolescents (15–18) are less likely to be depressed than younger adolescents (Larson, Moneta, Richards, & Wilson, 2002; Maharaj et al., 2008). However, several studies did not report any significant association between age and depression (Ekundayo et al., 2007; Latiffah et al., 2016; Yaacob et al., 2009).

Several studies reported a significant association between race or ethnicity and depression (Jha et al., 2017; Kaur et al., 2014; Latiffah et al., 2016). Within the Malaysian context, adolescents of Indian and Chinese ethnicity are more at risk of depression (Kaur et al., 2014; Latiffah et al., 2016). This could be due to the difference in cultural practices, beliefs and socio-economic background, as reported by previous studies (Céspedes & Huey, 2008). However, some studies conducted internationally do not report any significant relationship between ethnicity and depression (Maharaj et al., 2008).

Substance abuse (smoking, alcohol and illicit drug intake) has also been reported by many studies to be associated with depression among adolescents. For example, adolescents with a history of smoking tabacoo were more likely to be depressed (Audrain-Mcgovern, Rodriguez, & Kassel, 2009; Kaur et al., 2014; Maharaj et al., 2008; Vogel, Hurford, Smith, & Cole, 2003; Windle & Windle, 2001). Similarly, the use of illicit drugs and alcohol increases the risk of depression (Brière, Rohde, Seeley, Klein, & Lewinsohn, 2014; Danielson et al., 2010; Dooley & Fitzgerald, 2013; Edwards, Heron, et al., 2014; Edwards, Joinson, et al., 2014; Fleming, Mason, Mazza, Abbott, & Catalano, 2008; Kaur et al., 2014; Maharaj et al., 2008; Sandal et al., 2017; Skogen et al., 2014).

Several studies have also reported a significant association between feeling lonely and depression among adolescents (Kaur et al., 2014; Tiwari & Ruhela, 2012; Wan Ismail et al., 2014; Witvliet, Brendgen, Van Lier, Koot, & Vitaro, 2010; Yaacob et al., 2009). Having a history of being bullied also increases the risk of depression among adolescents (Bhasin, Sharma, & Saini, 2010; Bowes, Joinson, Wolke, & Lewis, 2016; Kaur et al., 2014; Uba, Nor Yaacob, Juhari, & Abu Talib, 2010).

Academic stress that occurs as a result of low academic performance, poor study habits and a low education level has also been reported as being a significant risk factor for depression among adolescents. As academic stress increases, adolescents have a higher risk of depression (Chopra et al., 2017; Liu & Lu, 2012; Sandal et al., 2017).

2.2.5.2 Interpersonal relationship-level influences

Interactions and relationships with people such as family members and peers form the basis of interpersonal relationship-based influences. Several parental factors have been reported in literature as being important determinants of adolescent depression, including parental marital status, parental supervision and parental income. Studies have reported a significant association between parental marital status and depression among adolescents. Parental divorce contributed to an increased risk of depression among adolescents (Crawford, Cohen, Midlarsky, & Brook, 2001; Ge, Natsuaki, & Conger, 2006; Hadžikapetanović, Babić, & Bjelošević, 2017; Maharaj et al., 2008; Richardson & McCabe, 2001; StØrksen, RØysamb, Holmen, & Tambs, 2006).

Similarly, literature has also suggested that a lack of parental supervision increases the risk of depression during adolescence (Bacchini, Miranda, & Affuso, 2011; Fröjd, Kaltiala-Heino, & Rimpelä, 2007; Jacobson & Crockett, 2000; Jun & Choi, 2013; Kaur et al., 2014; Sagrestano, Paikoff, Holmbeck, & Fendrich, 2003; Wan Ismail et al., 2014). Low parental income, which could result in financial difficulty and more stressful life events, has been reported to increase the risk of depression among adolescents (Andrews & Wilding, 2004; Ee & Zarinah, 2017; Goodman, Slap, & Huang, 2003; Tracy, Zimmerman, Galea, McCauley, & Stoep, 2008).

2.2.5.3 Community-level influences

Risks of depression that are determined by the social environment and community-based factors that individuals interact with and engage in are examples of community-level influences. School climate plays an important role in depression among school-going adolescents. Studies have shown that changes in school climate that occur when there is a change of school results in an increased risk of depression among adolescents (Lester & Cross, 2015). This is because a when an individual changes to a new school,

"the quality and character of the new school life", including both social and physical aspects of the school, can have either a positive or negative effect on the emotional development of students (Lester & Cross, 2015).

Co-curricular activities have been reported to be associated with depression. Several studies report involvement in co-curricular activities as being a protective factor for adolescent depression (Driessens, 2015; Eccles, Barber, Stone, & Hunt, 2003; Peck, Roeser, Zarrett, & Eccles, 2008), while other studies report involvement in co-curricular activities as being a risk factor for depression (Barber, Eccles, & Stone, 2001; Boone & Leadbeater, 2006). Not all studies find a relationship between participation in co-curricular activities and depression (Denault & Poulin, 2009; Rose-Krasnor, Busseri, Willoughby, & Chalmers, 2006). This variation in finding in the literature regarding the relationship between co-curricular activities and depression is due to methodological variation among studies and differences in the conceptualization of curricular activities.

2.2.6 Depression screening tools among Malaysian adolescents

In total, 16 articles addressing depression screening tools among Malaysian adolescents were identified. Among the common tools used to screen for, or assess, depression symptoms among adolescents in Malaysia are the Children's Depression Inventory (CDI) (Adlina et al., 2007; Ee & Zarinah, 2017; Ghazali & Azhar, 2015; Uba et al., 2010; Yaacob et al., 2009), the DASS (Kaur et al., 2014; Latiffah et al., 2016; Uba et al., 2010; Yaacob et al., 2009), the CES-D (Ghazali, Elklit, Balang, & Chen, 2016; Ghazali, Elklit, Balang, Sultan, & Yoke, 2014), the Patient Health Questionnaire Assessment (PHQA) (Ibrahim et al., 2017) and the Beck Depression Inventory (BDI) (Norfazilah, Hafizah, Zubaidah, & Azmawati, 2015). The DASS instrument was found to be a weak tool as a measure of depression among Malaysian young adolescents (Hashim, Golok, & Ali, 2011). While both the BDI (Muhktar & Oei, 2010) and the CDI

(Tan et al., 2013) have been validated among Malaysian adolescents and found to have good psychometric properties, the use of these tools requires permission and needs to be purchased. Thus, there is a costing issue involved. The PHQA to date has no report on its validation among Malaysian adolescents (Bienenfeld, 2016; Guan, 2014). The CES-D questionnaire has been validated among Malaysian adolescents aged 13 and above and found to have satisfactory psychometric properties (Ghazali et al., 2016, 2014). Furthermore, the CES-D questionnaire is freely available. A summary of validated tools used to screen for depression symptoms among Malaysian adolescents is shown in Table 2.4.

Table 2.3: Validated depression screening tools for Malaysian adolescents

Author, Year	Tool	Permission	Require to purchase
(Adlina et al.,2007) (Yaacob et al., 2009) (Ghazali & Azhar, 2015) (Ee & Zarinah, 2017)	CDI	Required	Yes
(Yaacob et al., 2009) (Uba et al., 2010) (Kaur et al., 2014) (Latiffah et al., 2016)	DASS	Not required	No
(Ghazali et al., 2014) (Ghazali et al., 2016)	CES-D	Required	No
(Norfazilah et al.,2015)	BDI	Required	Yes

Note. CDI, Children's Depression Inventory; DASS, Depression, Anxiety and Stress Scale; CES-D, Centre for Epidemiological Studies Depression scale; BDI, Beck Depression Inventory.

2.3 Systematic review of depression literacy among adolescents

2.3.1 Background of systematic review

The rationale for conducting this review is first that the majority of previous researches have utilized the definition of MHL provided by Jorm et al. (1997) when examining MHL (Bartlett et al., 2006; Griffiths et al., 2009; Jorm, Korten, Jacomb, et al., 1997; Jorm et al., 2005; Reavley & Jorm, 2011a; Wong et al., 2010). However more recently some studies have adopted the definition of MHL provided by Kutcher et al. (2016) (Wei et al., 2013, 2015, 2016). Some researches strictly operationalize MHL as mental health knowledge (Chen et al., 2017; Coles et al., 2016) while others include help-seeking and stigma components (Lopez, Sanchez, Killian, & Eghaneyan, 2018; Sayarifard et al., 2015; Wei et al., 2013, 2015, 2016). Due to the variations in definitions of MHL, it is important to review existing evidence of MHL relating to depression to better understand which components of depression literacy are being examined, how they are being examined, their findings and whether these findings are comparable between studies (Spiker & Hammer, 2018). Also, there is a need to see whether research on MHL relating to depression draws conclusions on the adequacy of MHL. It would be difficult to draw any conclusions on the adequacy of MHL if only the mental health knowledge component was examined (Lam, 2014). Second, as each component of MHL has various subcomponents within it, it is important to examine which components are reported upon as often researchers do not report on all subcomponents within a component of MHL, leading to a lack of uniformity (Spiker & Hammer, 2018). Third, previous reviews related to MHL were not specifically focused on depression as an MHD (Furnham & Hamid, 2014), had limitations in terms of setting (Furnham & Hamid, 2014), used a relatively narrow definition of MHL (Furnham & Hamid, 2014), focused more on the adult population (Cabassa, 2009) and did not specifically look into tools for examining MHL

among the adolescent population (Wei et al., 2015). Finally, to be able to provide a recommendation for MHL intervention it is necessary for research on MHL to focus on all three components of MHL, namely knowledge, stigma and help seeking, as MHL interventions should be ideally evaluated based on their ability to improve knowledge, help-seeking and stigma components of MHL (Kutcher, Wei, & Coniglio, 2016).

To bridge this gap in literature, this review attempts to systematically review evidence on depression literacy among adolescents that utilizes definitions of MHL provided by both Jorm et al. (1997) and Kutcher et al. (2016). More specifically, the purpose of this review is to:

  i.   identify the tools used to examine depression literacy among adolescents;

 ii.   to identify the various components of depression literacy examined and summarize their findings;

To date, no reviews have looked at these issues specifically. This review will fill the gap in the literature by identifying the most common tool used to examine depression literacy among adolescents. Moreover, this review will reflect the most common component of depression literacy examined and adolescents' understanding of depression literacy by summarizing and discussing depression literacy findings.

2.3.2   Literature search and study selection

In May 2019, an Internet-based search of nine databases, namely PubMed, CINAHL, Medline, Psychology and Behavioral Sciences Collection, Web of Science, ERIC, Scopus, ScienceDirect and Cochrane Library, and one grey literature source, Google Scholar, was carried out for studies reporting findings relevant to depression literacy components as defined by Jorm et al. (1997) and Kutcher et al. (2016), such as knowledge of depression, which includes knowledge of the following: recognition of depression,

symptoms, causes, intervention, first aid and prevention, help seeking, which includes help-seeking attitudes and intention, and finally stigmatising attitudes (Jorm, 2000; Kutcher, Wei, McLuckie, & Bullock, 2013). In addition, we also included studies reporting on the adequacy of depression literacy.

A Boolean search was performed on each database using the following search terms: adolescence (concept 1), health literacy (concept 2) and depression (concept 3). The adolescence concept was expanded into the MeSH search terms: "Adolescence" OR "Minors" OR "Adolescent Psychology" OR "Adolescent Psychiatry" OR "Adolescent Health" OR keywords: Adolescen* OR "young adult" OR Teen* OR Pubescen* OR Juvenil* OR Young OR Youth OR Youths OR Youthful OR Minor*.

The health literacy concept was expanded to incorporate the MeSH search terms "Health Literacy" OR "Health Knowledge, Attitudes, Practice" OR "Health education" OR "Help-Seeking Behavior" OR "Attitude to health" OR "Social Stigma" OR keywords: "Mental Health Literacy" OR "Depression Literacy" OR Knowledge OR "Health knowledge" OR "Health education" OR "Depression knowledge" OR "health curriculum" OR "Mental health awareness" OR "Help seeking behaviour" OR "Help Seeking Behavior" OR "health seeking behaviour" OR "health seeking behavior" OR "seeking help" OR "help seeking" OR "Stigmatizing attitude" OR "Stigmatizing attitudes" OR stigma* Attitude* OR "Attitude to health" OR discriminate*.

The depression concept was expanded into the MeSH search terms: "Depression" OR "Depressive Disorder" OR "Depressive Disorder, Major" OR keywords: Depressi* OR "Depressive Disorder*" OR "Major depression" OR "Depressive symptom*" OR "Depressed mood" OR "Depressive state" OR "Depressive episode*" OR "Depressive Syndrome" OR "Unipolar depression" OR "Symptom* of depression".

The search strategies of existing systematic reviews on the topics of adolescence or MHL or depression literacy were used as a reference to identify additional MeSH terms and keywords (Wei et al., 2015, 2016). Similar search terms were used to search in Google Scholar, however only the first 300 articles were included (Haddaway, Collins, Coughlin, & Kirk, 2015).

The criteria for selected studies are those in the English language, those published as journal articles only and quantitative studies. The publication dates for selected studies are within the past 12 years, from 1 January 2006 to 31 December 2018. No limitation on setting was made; thus, this review included studies from all regions of the world. Participants' ages were limited to those aged 10–19, as this is the adolescent age range suggested by the WHO (Sawyer et al., 2012). Studies reporting findings relevant to MHL related to depression as operationalized by both Jorm et al. (1997) and Kutcher et al. (2016) were included. Studies with qualitative designs, studies not reporting on variables of interest and unpublished articles were excluded from this review.

The search of articles in PubMed is presented in Table 2.5. The full search of other databases is available in Appendix E. Search limitations were specific to the respective database. Mendelay software was used to perform the following functions: exporting all citations and abstracts, identification and removal of duplicate articles. Figure 2.3 shows the study selection flow.

Table 2.5: Systematic search of article

| Database	Search limitation	Search term/strategy			Total hits
		Mesh	**OR**	**Keywords**	
PubMed	Jan 2006 to Dec 2018 Ages 6 to 18 years English Search Field Title and Abstract	"Adolescence" OR "Minors" OR "Adolescent Psychology" OR "Adolescent Psychiatry" OR "Adolescent Health"	Adolescen* OR "young adult" OR Teen* OR Pubescen* OR Juvenil* OR Young OR Youth OR Youths OR Youthful OR Minor*		#1=2626446
		"Health Literacy" OR "Health Knowledge, Attitudes, Practice" OR "Health education" OR "Help-Seeking Behavior" OR "Attitude to health" OR "Social Stigma"	"MHL" OR "Depression Literacy" OR Knowledge OR "Health knowledge" OR "Health education" OR "Depression knowledge" OR "health curriculum" OR "Mental health awareness" OR "Help seeking behavior" OR "Help Seeking Behavior" OR "health seeking behavior" OR "health seeking behavior" OR "seeking help" OR "help seeking" OR "Stigmatizing attitude" OR "Stigmatizing attitudes" OR stigma* Attitude* OR "Attitude to health" OR discriminate*		#2=1220484
		"Depression"OR "Depressive Disorder" OR "Depressive Disorder, Major "	Depressi* OR "Depressive Disorder*" OR "Major depression" OR "Depressive symptom*" OR "Depressed mood" OR "Depressive state" OR "Depressive episode*" OR "Depressive Syndrome" OR" Unipolar depression" OR "Symptom* of depression"		#3= 403412
			#1 AND #2 AND #3		4179

Note. #, Concept.
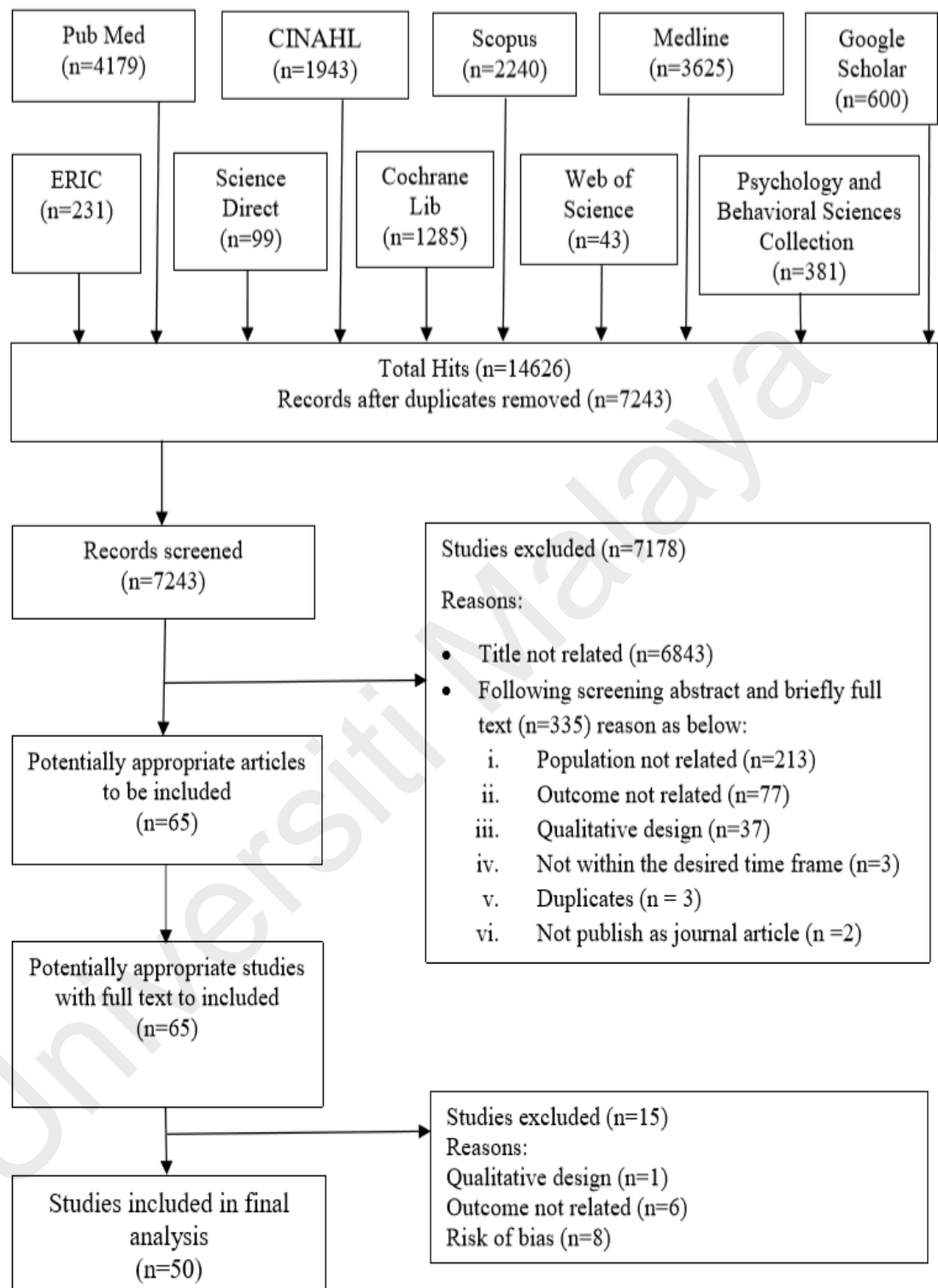
Figure 2.3: Flow chart of studies selection.

2.3.3 Data extraction and critical appraisal

A data extraction form was developed to help extract data based on the themes and key issues. The data extraction form also captured information on study eligibility and study characteristics (e.g. publication year, setting, study design, sample size and tools used). There were no restrictions based on the statistical methods used. For studies other than cross-sectional designs, only baseline results were extracted and included in this review.

The risk of bias was assessed using the following tools: (a) the Newcastle Ottawa Scale (NOS) for cross-sectional studies (Herzog et al., 2013; Stang, 2010). This tool includes three domains of bias: selection, comparability and outcome bias. The scoring of this scale applied in this review is as follows: fewer than or equal to 2 points and more than or equal to 7 points are indicative of poor and good quality, respectively (McPheeters et al., 2012; Wells, Shea, O'Connell, Peterson, & Welch, 2013). The response rate used in the selection bias domain of the NOS tool refers to the student or adolescent participation response rate (the percentage of students that participated in the study). A satisfactory response rate was considered to be 60% for paper-based surveys (Duncan, 2008).

(b) The Cochrane Collaboration tool was used to appraise the quality of randomized controlled trials as this tool is suggested for use in systematic reviews (Higgins et al., 2011). This tool examines the selection bias, performance bias, detection bias, attrition bias and reporting bias. A grade of either high, low or unclear is provided for each domain and a total cumulative score is generated. Studies are classified as having an overall low risk if a low risk is scored across all domains. An overall unclear risk of bias is considered if a low or unclear risk of bias is reported across all domains. And finally, studies with a high risk of bias for one or more key domains are classified as having an overall high risk (Higgins et al., 2011).

(c) The Quality Assessment Tool for Quantitative Studies (QATQS) was used to appraise the quality of non-randomized studies (Thomas, 2010) as this tool is recommended for use in systematic reviews (Deeks et al., 2003). This tool examines selection bias, confounding bias and withdrawal/dropout bias. A grade of either weak (3), moderate (2) or strong (1) was provided for each domain, following which a classification like the following was used: (a) strong studies have no weak ratings and at least four strong ratings; (b) moderate studies have fewer than four strong ratings and one weak rating; and (c) weak studies have two or more weak ratings (Thomas, 2010).

Two researchers were involved in the process of data extraction. The outcome was agreed by both researchers most of the time, and a third researcher was consulted in the event of any disagreement in order to come to a general consensus. The study characteristics and statistical methods used were descriptively analysed. This is a descriptive review, and results are displayed as percentages, means or commonly endorsed statements. SPSS version 24.0 software was used for data analysis. The variables for which the data were sought are based on the MHL framework of Jorm and Kutcher, and defined as follows: (a) knowledge of depression, which includes the recognition of depression, symptoms, causes, first aid, and intervention and preventive measures (Jorm et al., 1997); (b) help seeking, which includes help-seeking attitudes and help-seeking intentions (Gulliver et al., 2012); (c) stigma, which includes stigmatising attitudes (Hinshaw & Stier, 2008); (d) adequacy of depression literacy, which refers to depression literacy levels reported; and (e) depression was defined by the symptoms based on the DSM criteria (First, 2013).

2.3.4 Findings from the systematic review

Initially 14,626 articles were identified, and following the removal of duplicates, 7243 articles (titles and abstracts) were screened. A total of 65 articles were possibly relevant and were reviewed, of which 15 failed to meet the inclusion criteria. Figure 2.3 shows the final 50 articles that were included in this review.

2.3.4.1 Risk of assessment bias across studies

Eight articles were excluded from this review for the following reasons: (a) two cross-sectional studies were reported to be of poor quality based on the NOS tool (Leighton, 2009; Sameed et al., 2016); (b) two randomized controlled trial (RCT) study was found to have a high risk of bias based on the Cochrane tool (Hart et al., 2018; Jorm, Kitchener, Sawyer, Scales, & Cvetkovski, 2010); and (c) four non-randomized studies were classified as being of weak quality based on the QATQS tool (Fung et al., 2016; Ojio et al., 2015; Parikh et al., 2018; Schiller, Schulte-Körne, Eberle-Sejari, Maier, & Allgaier, 2014). Further description of the risk of assessment bias is presented in the following paragraphs.

(a) Newcastle Ottawa Scale quality assessment

Out of the 45 articles, two (Leighton, 2009; Sameed et al., 2016) were dropped from the review as both articles obtained overall scores of 2, indicating poor quality based on the NOS quality assessment. The set of 43 articles had quality ranging from fair (n=42) to good (n=1) based on the NOS quality assessment. The sampling method was described by the majority of studies (n=24) as non-random sampling. Only six studies reported on their sample size calculation. A satisfactory response rate was reported by 20 studies. Majority of the studies (n=23) reported using a validated tool in assessing knowledge, help seeking and stigmatising attitudes. The other studies had adopted tools previously

used in other settings but did not mention whether they had validated these tools among their population of interest. All of the studies assessed the outcome of depression literacy using a self-report questionnaire. Most of the statistical methods used were well described and justified. The results of the NOS quality assessment are shown in Table 2.6.

Table 2.6: Critical appraisal of cross-sectional studies using the NOS tool

Author	Selection			Ascertainment of the exposure	Outcome		Summary of quality rating
	Representativeness of the sample (sampling method)	Sample size	Response rate (%)		Assessment of the outcome	Statistical test	
Burns & Rapee, 2006	Non-random +	Not justified	+	Non-validated tool +	Self-report +	Not described	4
Kelly et al., 2006	Not described +	Not justified	76[a]	Non-validated tool +	Self-report +	Described +	3
Jorm et al., 2006	Non-random +	Not justified	38[a] Not described	Non-validated tool +	Self-report +	Described +	4
Kelly & Jorm, 2007	Non-random +	Not justified	Not described	Validated tool ++	Self-report +	Described +	5
Marcell & Halpern-Felsher, 2007	Non-random +	Not justified	77[a], 81[b] +	Non-validated tool +	Self-report +	Described +	5
Arbanas, 2008	Not described +	Not justified	+	Non-validated tool +	Self-report +	Described +	4
Leighton, 2009	Not described +	justified +	99[a]	Non-validated tool ++	Self-report +	Not described	2
Logsdon et al., 2009	Non-random +	Justified	44[a] Not described	Validated tool ++	Self-report +	Described +	6
Hernan et al., 2010	Not described +	Not justified	38[a]	Validated tool ++	Self-report +	Described +	4
Olsson & Kennedy, 2010	Non-random +	justified	87[a] +	Non-validated tool +	Self-report +	Described +	5
Boyd et al., 2011	Not described +	justified	Not described	Non-validated tool +	Self-report +	Described +	3
Marshall & Dunstan, 2011	Not described	justified +	54[a], 21[c]	Non-validated tool	Self-report +	Described +	4

Note. [a] Student/adolescent participation response rate; [b] Parental consent response rate; [c] School level response rate; + one score obtained; ++ two score obtained; Good quality (score of ≥ 7); Fair quality (score 3 to 6); Poor quality (score of ≤ 2). As the cross-sectional studies appraised using the NOS tool are all descriptive studies, the comparability bias domain was excluded during the process of appraisal.

'Table 2.6, continued'

Author	Selection			Ascertainment of the exposure	Outcome		Summary of quality rating
	Representativeness of the sample (sampling method)	Sample size	Response rate (%)		Assessment of the outcome	Statistical test	
McCarthy et al., 2011	Non-random +	Not justified	Not described	non-validated tool +	Self-report +	Described +	4
Swords et al., 2011	Random +	Not justified	99 [a], 53 [b] 49 [c] +	Validated tool ++	Self-report +	Described +	6
Calear et al., 2011	Non-random +	Not justified	Not described	Validated tool ++	Self-report +	Described +	5
Rose et al.,2011	Non-random +	Not justified	Not described	Validated tool ++	Self-report +	Described +	5
Driscoll et al.,2012	Not described +	Not justified	Not described	Validated tool ++	Self-report +	Described +	4
Williams, 2012	Non-random +	Not justified	31 [a],86 [c] +	Non-validated tool +	Self-report +	Described +	4
Sawyer et al.,2012	Random +	Not justified	64 [a] +	Validated tool ++	Self-report +	Described +	6
Essau et al.,2013	Random +	Not justified	100 [a],86 [b] +	Non-validated tool +	Self-report +	Described +	5
Melas et al.,2013	Non-random +	Not justified	77 [a] +	Non-validated tool ++	Self-report +	Described +	5
Hart et al.,2014	Non-random +	Not justified	96 [a]	Validated tool ++	Self-report +	Described +	6
Lee et al.,2014	Random +	Not justified +	Not described +	Validated tool +	Self-report +	Described +	5
Bradford & Rickwood,2014	Non-random	Justified	76 [a]	Non-validated tool	Self-report +	Described	6

Note. [a] Student/adolescent participation response rate; [b] Parental consent response rate; [c] School level response rate; + one score obtained; ++ two score obtained; Good quality (score of ≥ 7); Fair quality (score 3 to 6); Poor quality (score of ≤ 2). As the cross-sectional studies appraised using the NOS tool are all descriptive studies, the comparability bias domain was excluded during the process of appraisal.

Author	Selection				Outcome		Summary of quality rating
	Representativeness of the sample (sampling method)	Sample size	Response rate (%)	Ascertainment of the exposure	Assessment of the outcome	Statistical test	
Caporino et al.,2014	Non-random (+)	Not justified	Not described	Validated tool (++)	Self-report (+)	Described (+)	5
Dolphin & Hennessy, 2014	Non-random (+)	Not justified	Not described	Validated tool (++)	Self-report (+)	Described (+)	5
Yoshioka et al.,2014	Non-random (+)	justified (+)	44[c] (+)	Validated tool (++)	Self-report (+)	Described (+)	6
Lam, 2014	Non-random (+)	Not justified	100[a] (+)	Validated tool (+)	Self-report (+)	Described (+)	5
Bruno et al.,2015	Non-random (+)	justified (+)	98[a] (+)	Non-validated tool (+)	Self-report (+)	Described (+)	4
Jaber et al.,2015	Non-random (+)	justified (+)	36[a]	Non-validated tool (+)	Self-report (+)	Described (+)	4
Mason et al.,2015	Not described	Not justified	86[a],61[b] (+)	Non-validated tool (++)	Self-report (+)	Described (+)	5
Adeosun.,2016	Random (+)	justified (+)	93[a] (+)	Validated tool (++)	Self-report (+)	Described (+)	6
Coles et al.,2016	Non-random (+)	justified (+)	85[a]	Validated tool (++)	Self-report (+)	Described (+)	6
Dardas et al. 2016	Non-random (+)	Not justified	Not described	Validated tool (++)	Self-report (+)	Described (+)	5
Ogorchukwu et al., 2016	Random (+)	Justified (+)	Not described	Validated tool (++)	Self-report (+)	Described (+)	6
Sameed et al.,2016	Not described	justified (+)	46[a]	Non-validated tool (+)	Self-report (+)	Not described	2

'Table 2.6, continued'

Note. [a] Student/adolescent participation response rate; [b] Parental consent response rate; [c] School level response rate; + one score obtained; ++ two score obtained; Good quality (score of ≥ 7); Fair quality (score 3 to 6); Poor quality (score of ≤ 2). As the cross-sectional studies appraised using the NOS tool are all descriptive studies, the comparability bias domain was excluded during the process of appraisal.

'Table 2.6, continued'

Author	Selection			Ascertainment of the exposure	Outcome		Summary of quality rating
	Representativeness of the sample (sampling method)	Sample size	Response rate (%)		Assessment of the outcome	Statistical test	
Attygalle et al.,2017	+	+	+	++	+	+	7
Dardas et al.,2017	Random, +	Justified	67 [a]	Validated tool, ++	Self-report, +	Described, +	5
Lubman et al.,2017	Random, +	Not justified	Not described, +	Validated tool, +	Self-report, +	Described, +	5
Townsend et al.,2017	Non-random, +	Justified, +	77 [a]	Non-validated tool, ++	Self-report, +	Described, +	6
Sharma et al.,2017	Non-random, +	Not justified	Not described	Validated tool, +	Self-report, +	Described, +	4
Olivari & Guzmán-González et al.,2017	Non-random, +	justified, +	86 [a], +	Non-validated tool, ++	Self-report, +	Not described, +	6
Aluh eh et al.,2018	Non-random, +	Not justified	98 [a]	Validated tool, +	Self-report, +	Described, +	5
Ando et al.,2018	Random, +	justified	97 [a], +	Non-validated tool, ++	Self-report, +	Described, +	4
Dardas et al. 2018	Random, +	Not justified	Not described	Validated tool, ++	Self-report, +	Described, +	5

Note. [a] Student/adolescent participation response rate; [b] Parental consent response rate; [c] School level response rate; + one score obtained; ++ two score obtained; Good quality (score of ≥ 7); Fair quality (score 3 to 6); Poor quality (score of ≤ 2). As the cross-sectional studies appraised using the NOS tool are all descriptive studies, the comparability bias domain was excluded during the process of appraisal.

(b) **The Cochrane Collaboration tool**

The risk of assessment bias across all five randomized studies is shown in Table 2.7, with a low (Howard, Griffiths, McKetin, & Jennifer, 2018; Perry et al., 2014), unclear (Swartz et al., 2017) and high risk of bias (Hart et al., 2018; Jorm et al., 2010) being reported. One study classified as having an unclear risk of bias failed to report information on selection, performance and detection bias (Swartz et al., 2017), while the presence of performance bias in another two studies resulted in the classification of a high risk of bias (Hart et al., 2018; Jorm et al., 2010).

(c) **The QATQS tool**

Out of the eight non-randomized studies, four were reported to be of overall moderate quality as they obtained moderate to strong ratings in five domains and a weak score in the blinding information domain (Meredith et al., 2009; Ruble, Leon, Gilley-Hensley, Hess, & Swartz, 2013; Skre et al., 2013; Swartz et al., 2007). Four studies were classified as being of overall weak quality, scoring weakly in two or more domains, namely blinding information, data collection, withdrawals and dropouts (Fung et al., 2016; Ojio et al., 2015; Parikh et al., 2018; Schiller et al., 2014). Table 2.8 describes the risk of assessment bias for the eight non-randomized studies.

Table 2.7: Critical appraisal of RCT studies using the Cochrane risk-of-bias tool

Author	Selection Bias		Performance bias	Detection bias	Attrition bias	Reporting bias	Summary of overall accumulative risk
	Random sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	
Jorm et al.,2010	[a] Automated computer system used	[a] Conditions allocated by researcher not involved in data analysis	[c] Blinding was not performed on participants	[b] Unclear whether assessors had knowledge of treatment groups when assessing effects	[a] Analyses adjusted for data being missing at random	[a] All outcome measure effects were reported, along with effect sizes	High risk of bias
Perry et al.,2014	[a] Coin-toss approach used	[a] Conditions allocated by researcher not involved in data analysis	[a] Blinding was performed on researcher	[a] Assessor had no knowledge of treatment groups when assessing effects	[a] Analyses adjusted for data being missing at random	[a] All outcome measure effects were reported, along with effect sizes	Low risk of bias
Swartz et al.,2017	[a] Automated computer system used	[b] Unclear who performed randomisation	[b] Unclear if blinding was performed	[b] Unclear whether assessors had knowledge of treatment groups when assessing effects	[a] Analyses adjusted for data being missing at random	[a] All outcome measure effects were reported, along with effect sizes	Unclear risk of bias

Note. [a] Low risk of bias ratting; [b] Unclear risk of bias ratting; [c] High risk of bias ratting; Overall low risk of bias (across all domains low risk is scored); Overall unclear risk of bias (across all domains low or unclear risk of bias is scored); Overall high risk of bias (if one of more domains scored high risk of bias).

74

Author	Selection Bias		Performance bias	Detection bias	Attrition bias	Reporting bias	Summary of overall accumulative risk
	Random sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	
Hart et al.,2018	[a] Automated computer system used	[c] Allocation concealment was not performed	[c] Blinding was not performed on participants	[a] Assessor had no knowledge of treatment groups when assessing effects	[a] Analyses adjusted for data being missing at random	[a] All outcome measure effects were reported, along with effect sizes	High risk of bias
Howard et al.,2018	[a] Automated computer system used	[a] Conditions allocated by researcher not involved in data analysis	[a] Blinding was performed on participants and researcher	[a] Assessor had no knowledge of treatment groups when assessing effects	[a] Analyses adjusted for data being missing at random	[a] All outcome measure effects were reported, along with effect sizes	Low risk of bias

'Table 2.7, continued'

Note. [a] Low risk of bias ratting; [b] Unclear risk of bias ratting; [c] High risk of bias ratting; Overall low risk of bias (across all domains low risk is scored); Overall unclear risk of bias (across all domains low or unclear risk of bias is scored); Overall high risk of bias (if one of more domains scored high risk of bias).

Table 2.8 : Critical appraisal of non-randomised studies using the QATSQ tool

Author	Selection bias	Study design	Confounders	Blinding	Data collection methods	Withdrawals and dropouts	Summary
Swartz et al., 2007	[2] Participants are somewhat likely to be representative, response rate was not described	[2] Study is designated as a cohort study	[1] Confounders (age, ethnicity) were similar across pre and post-test groups	[2] Participants are not aware of the research question	[3] Tools were not shown to be valid or reliable	[1] There was a 82% follow-up rate from those that consented and completed the intervention	Moderate quality
Meredith et al., 2009	[2] Participants are somewhat likely to be representative with a response rate of 98%	[2] Study is designated as a cohort analytic study	[1] Confounders (gender, social economic factor, insurance) were similar across control and intervention groups	[3] Blinding not described	[1] Tools were shown to be valid and reliable	[1] There was a 88% follow-up rate from those that consented and completed the intervention	Moderate quality
Ruble et al.,2013	[2] Participants are somewhat likely to be representative with a response rate of 60%	[1] Study is designated as a non RCT	[1] Confounders (gender) were similar across control and intervention groups	[3] Blinding not described	[1] Tools were shown to be valid and reliable	[2] There was a 67% follow-up rate from those that consented and completed the intervention	Moderate quality
Skre et al.,2013	[2] Participants are somewhat likely to be representative, response rate of 73%	[1] Study is designated as a non RCT	[1] Confounders (gender, age and grade) were controlled for across control and intervention groups	[3] Blinding not described	[1] Tools were shown to be valid and reliable	[1] There was a 97% follow-up rate from those that consented and completed the intervention	Moderate quality

Note. [1] Strong ratting; [2] Moderate ratting; [3] Weak ratting; Strong quality (no weak ratings); Moderate quality (one weak rating); Weak quality (two or more weak ratings); response rate refers to student/adolescent participation response rate; Cohort analytic (two group pre and post, Cohort (one group pre and post); RCT, Randomized control trial.

Author	Selection bias	Study design	Confounders	Blinding	Data collection methods	Withdrawals and dropouts	Summary
Schiller et al., 2014	[2]Participants are likely to be representative, response rate of 64%	[2]Study is designated as a cohort study	[1]Confounders (gender) were controlled for across pre and post-test groups	[3]Blinding not described	[3]Tools were not shown to be valid or reliable	[3]Withdrawals and dropouts were not described	Weak quality
Ojio et al.,2015	[3]Participants are least likely to be representative, response rate of 86%	[2]Study is designated as a cohort study	[3]Control of confounder were not described	[3]Blinding not described	[3]Tools were not shown to be valid or reliable	[1]There was a 92% follow-up rate from those that consented and completed the intervention	Weak quality
Fung et al.,2016	[2]Participants are somewhat likely to be representative, response rate was not described	[2] Study is designated as a cohort analytic study	[1]Confounders (gender, age, education level) were similar across control and intervention groups	[3]Blinding not described	[1]Tools were shown to be valid and reliable	[3]Withdrawals and dropouts were not described	Weak quality
Parikh et al.,2018	[2]Participants are somewhat likely to be representative, response rate was not described	[2] Study is designated as a cohort analytic study	[3]Control of confounder were not described	[3]Blinding not described	[3]Tools were not shown to be valid or reliable	[3]Withdrawals and dropouts were not described	Weak quality

Note. [1] Strong ratting; [2] Moderate ratting; [3] Weak ratting; Strong quality (no weak ratings); Moderate quality (one weak rating); Weak quality (two or more weak ratings); response rate refers to student/adolescent participation response rate; Cohort analytic (two group pre and post); Cohort (one group pre and post); RCT, Randomized control trial.

2.3.4.2   Characteristics of study

Of the 50 articles included in this review, three were published in 2006 and 2007, one in 2008, two in 2009 and 2010, six in 2011, three in 2012, four in 2013, eight in 2014, three in 2015, four in 2016, seven in 2017 and four in 2018. Figure 2.4 shows the publication dates by study number.
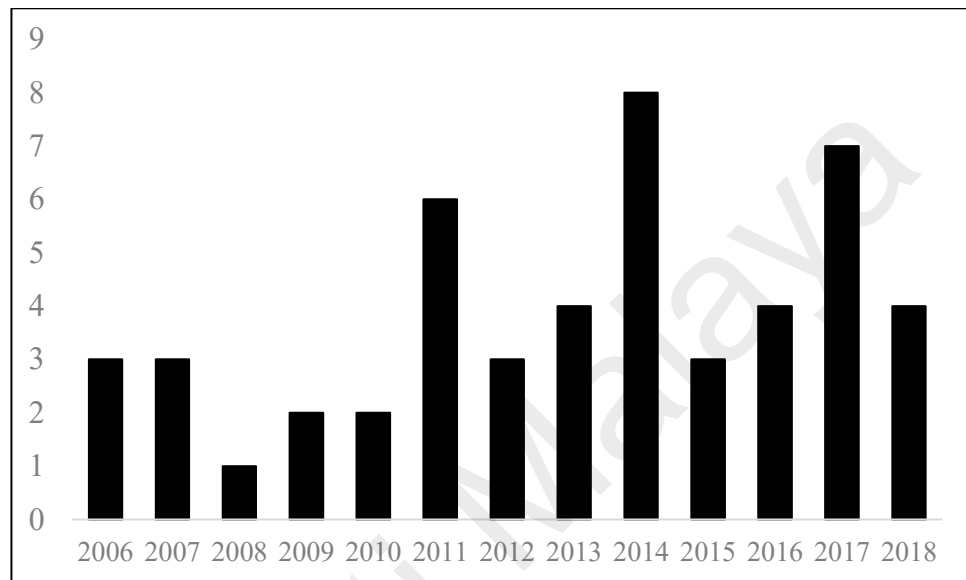
Figure 2.4: Publication years by study number.

Of the 50 articles included in this review, 43 were cross-sectional studies (Adeosun, 2016; Aluh, Anyachebelu, Anosike, & Anizoba, 2018; Ando et al., 2018; Arbanas, 2008; Attygalle, Perera, & Jayamanne, 2017; Boyd et al., 2011; Bradford & Rickwood, 2014; Bruno, McCarthy, & Kramer, 2015; Burns & Rapee, 2006; Calear, Griffiths, & Christensen, 2011; Caporino, Chen, & Karver, 2014; Coles et al., 2016; L. Dardas, Silva, Smoski, Noonan, & Simmons, 2017; Dardas, Silva, Noonan, & Simmons, 2016; Dardas et al., 2018; Dolphin & Hennessy, 2014; Essau, Olaya, Pasha, Pauli, & Bray, 2013; Hart et al., 2014; Hernan, Philpot, Edmonds, & Reddy, 2010; Jaber et al., 2015; Jorm et al., 2006; Kelly & Jorm, 2007; Kelly, Jorm, & Rodgers, 2006; Lam, 2014; Lee, Friesen, Walker, Colman, & Donlan, 2014; Logsdon, Usui, Pinto-Foltz, & Rakestraw, 2009; Lubman et al., 2017; Marcell & Halpern-Felsher, 2007; Marshall & Dunstan, 2011; Mason, Hart, Rossetto, & Jorm, 2015; McCarthy, Bruno, & Fernandes, 2011; Melas,

Tartani, Forsner, Edhborg, & Forsell, 2013; O'Driscoll, Heary, Hennessy, & McKeague, 2012; Ogorchukwu, Sekaran, Nair, & Ashok, 2016; Olivari & Guzmán-González, 2017; Olsson & Kennedy, 2010; Rose, Joe, & Lindsey, 2011; Sawyer et al., 2012; Sharma, Banerjee, & Garg, 2017; Swords, Hennessy, & Heary, 2011; Townsend et al., 2017; Williams, 2012; Yoshioka, Reavley, MacKinnon, & Jorm, 2014) three were RCT (Howard, Griffiths, McKetin, & Jennifer, 2018; Perry et al., 2014; Swartz et al., 2017) two were prospective cohort studies (Meredith et al., 2009; Swartz et al., 2007) and two non RCT (Ruble, Leon, Gilley-Hensley, Hess, & Swartz, 2013; Skre et al., 2013).

The majority of the studies included male and female adolescents as participants, except for two studies that only recruited female adolescents (Caporino et al., 2014; Logsdon et al., 2009) and one study that only recruited male adolescents (Bruno et al., 2015). All studies included primary data analysis. Only a few studies (n=5) had participants with mean ages within the early adolescent categories (10–14 years) (Olsson & Kennedy, 2010; Swords et al.,2011; Attygalle et al., 2017; Aluh et al., 2018; Ando et al.,2018). The majority of the studies recruited adolescents from schools (non-clinical samples) except five studies that sampled adolescents from primary health-care facilities (Meredith et al., 2009), community mental health centres (Rose et al., 2011), local community organizations (Ando et al., 2018; Jaber et al., 2015) and online pool registry (Lee et al., 2014). Adolescents in the perinatal period were recruited by one study (Logsdon et al., 2009) and two studies recruited depressed adolescents (Dardas et al., 2016; Meredith et al., 2009).

Among the articles reporting on components of depression literacy, 28 (56%) reported only on one component (Ando et al., 2018; Arbanas, 2008; Attygalle et al., 2017; Boyd et al., 2011; Bradford & Rickwood, 2014; Calear et al., 2011; Caporino et al., 2014; Dardas et al., 2017; Dardas et al., 2016; Dolphin & Hennessy, 2014; Essau et al., 2013;

Hart et al., 2014; Jaber et al., 2015; Jorm et al., 2006; Kelly et al., 2006; Lee et al., 2014; Logsdon et al., 2009; Marcell & Halpern-Felsher, 2007; Melas et al., 2013; Meredith et al., 2009; O'Driscoll et al., 2012; Olivari & Guzmán-González, 2017; Rose et al., 2011; Sawyer et al., 2012; Skre et al., 2013; Swords et al., 2011; Williams, 2012; Yoshioka et al., 2014) while 22 articles (44%) reported on more than one component (Adeosun, 2016; Aluh et al., 2018; Bruno et al., 2015; Burns & Rapee, 2006; Coles et al., 2016; Latefa Ali Dardas et al., 2018; Hernan et al., 2010; Howard et al., 2018; Kelly & Jorm, 2007; Lam, 2014; Lubman et al., 2017; Marshall & Dunstan, 2011; Mason et al., 2015; McCarthy et al., 2011; Ogorchukwu et al., 2016; Olsson & Kennedy, 2010; Perry et al., 2014; Ruble et al., 2013; Sharma et al., 2017; Swartz et al., 2017; Swartz et al., 2007; Townsend et al., 2017).

Among the articles that reported on a single component of depression literacy, knowledge of depression was reported by seven (25%) (Attygalle et al., 2017; Caporino et al., 2014; Essau et al., 2013; Jorm et al., 2006; Kelly et al., 2006; Melas et al., 2013; Skre et al., 2013), help seeking towards depression was reported by 12 article (43%) (Ando et al., 2018; Boyd et al., 2011; Bradford & Rickwood, 2014; Hart et al., 2014; Lee et al., 2014; Logsdon et al., 2009; Marcell & Halpern-Felsher, 2007; Meredith et al., 2009; Olivari & Guzmán-González, 2017; Sawyer et al., 2012; Swords et al., 2011; Williams, 2012) and stigmatising attitudes towards depression were reported by nine (32%) (Arbanas, 2008; Calear et al., 2011; Dardas et al., 2017; Dardas et al., 2016; Dolphin & Hennessy, 2014; Jaber et al., 2015; O'Driscoll et al., 2012; Rose et al., 2011; Yoshioka et al., 2014).

Among the articles reporting on more than one component of depression literacy, eleven of the articles (50%) reported on both knowledge and help-seeking (Adeosun, 2016; Aluh et al., 2018; Bruno et al., 2015; Burns & Rapee, 2006; Coles et al., 2016; Hernan et al., 2010; Lubman et al., 2017; Marshall & Dunstan, 2011; McCarthy et al.,

2011; Ogorchukwu et al., 2016; Olsson & Kennedy, 2010), three articles (14%) reported on knowledge and stigmatising attitudes (Dardas et al., 2018; Kelly & Jorm, 2007; Mason et al., 2015), one article reported on knowledge, help-seeking and stigmatising attitudes (Sharma et al., 2017), one on knowledge and adequacy of depression literacy (Swartz et al., 2007), one on help-seeking and stigmatising attitudes (Howard et al., 2018), one on knowledge, help-seeking and adequacy of depression literacy (Lam, 2014), one on adequacy of depression literacy and help-seeking (Ruble et al., 2013). Three articles (14%) reported on adequacy of depression literacy and stigmatising attitudes (Perry et al., 2014; Swartz et al., 2017; Townsend et al., 2017). The study characteristics and the various depression literacy components reported by all 50 studies are shown in Table 2.9. Figure 2.5 summarizes the number of studies based on depression literacy components.

Table 2.9: Study characteristics and components of depression literacy reported in the studies (N=50)

Author(s)	Study design	Setting	Sample size	Participant age range (mean age) in years	Tool used to measure outcome	Knowledge	Help-seeking	Stigmatising attitudes
Burns & Rapee, 2006	Cross sectional	Australia	202	15 to 17 (16.0)	FINQ	a,b	h,i	
Kelly et al., 2006	Cross sectional	Australia	1137	14 to 16 (N/A)	MHL Survey	e		
Jorm et al., 2006	Cross sectional	Australia	552	14 to 16 (15.5)	MHL Survey	g		
Kelly & Jorm 2007	Cross sectional	Australia	1123	12 to 17 (N/A)	MHL Survey, SDS	e		m
Marcell & Halpern-Felsher, 2007	Cross sectional	United States	210	13 to 19 (15.4)	Help-seeking questions		h,i	
Swartz et al., 2007*	Cohort	United States	3538	14 to 15 (N/A)	ADKQ	b		
Arbanas, 2008	Cross sectional	Croatia	325	17 to 19 (N/A)	Attitudes toward depression questionnaire			k
Meredith et al., 2009	Cohort	United States	368	13 to 17 (15.2)	Questions on barriers to help-seeking		j	
Logsdon et al., 2009	Cross sectional	United States	129	13 to 17 (14.4)	ATSPPHS		h	
Hernan et al., 2010	Cross sectional	Australia	74	14 to 16 (15.0)	MHL Survey, Doctor and OHP scale	a	i,j	
Olsson & Kennedy, 2010	Cross Sectional	United States	281	N/A (14.0)	MHL Survey	a	h,i	

Author(s)	Study design	Setting	Sample size	Participant age range (mean age) in years	Tool used to measure outcome	Outcome(s) Knowledge	Outcome(s) Help-seeking	Outcome(s) Stigmatising attitudes
Boyd et al., 2011	Cross sectional	Australia	201	11 to 18 (N/A)	Survey of help-seeking preferences and intentions		h,i,j	
Marshall & Dunstan, 2011	Cross sectional	Australia	122	12 to 18 (16.0)	Modified FINQ	a,b,g	h,i	
McCarthy et al.,2011	Cross sectional	United States	36	18 to 19 (N/A)	FINQ	a,b	h,i	
Rose et al., 2011	Cross sectional	United States	108	12 to 17 (N/A)	ATPH			l
Swords et al., 2011	Cross sectional	Ireland	393	12 to 16 (12.5)	Help-seeking questions		h,i	
Calear et al., 2011	Cross sectional	Australia	1375	12 to 17 (14.3)	DSS			k,l
O'Driscoll et al., 2012	Cross sectional	Ireland	385	15 to 16 (15.4)	SAQ, r-AQ, Paper and pencil projective figure placement test			k,m
Williams, 2012	Cross sectional	Jamaica	339	15 to 19 (17.2)	'Where do you go to for help' questionnaire		i	
Sawyer et al., 2012	Cross sectional	Australia	5362	12 to 14 (N/A)	Help-seeking vignette		i	
Essau et al., 2013	Cross sectional	Iran	1984	12 to 17 (14.5)	MHL Survey	a,c,e,f,g		
Melas et al., 2013	Cross sectional	Sweden	426	15 to 19 (16.0)	MHL Survey	a,g		

'Table 2.9, continued'

Author(s)	Study design	Setting	Sample size	Participant age range (mean age) in years	Tool used to measure outcome	Outcome(s)		
						Knowledge	Help-seeking	Stigmatising attitudes
Ruble et al., 2013*	Non-RCT	United States	710	14 to 15 (N/A)	ADKQ		h,i	
Skre et al.,2013	Non-RCT	Norway	1070	12 to 17 (14.1)	Symptom profile questions	a		
Bradford & Rickwood, 2014	Cross sectional	Australia	231	15 to 19 (16.3)	GHSQ		h,i	
Caporino et al., 2014	Cross sectional	United States	67	N/A (16.5)	Modified version of the beliefs about the causes of child problems questionnaire, AARP	c,g		
Dolphin & Hennessy, 2014	Cross sectional	Ireland	401	14 to 17 (15.9)	FAS			m
Hart et al.,2014	Cross sectional	United States	8216	14 to 15 (N/A)	ADKQ		i,j	
Perry et al., 2014*	RCT	Australia	380	13 to 16 (14.8)	D-Lit, DSS			k
Lam, 2014*	Cross sectional	China	1678	15 to 19 (N/A)	MHL and stigma Questionnaire	a,e	h,i,j	
Lee et al., 2014	Cross sectional	United States	701	10 to 18 (N/A)	Traditional help-seeking scale		i	
Yoshioka et al., 2014	Cross sectional	Japan	311	15 to 17 (16.1)	Personal Stigma Scale, Perceive Stigma Scale, SDS			k,l,m

'Table 2.9, continued'

Author(s)	Study design	Setting	Sample size	Participant age range (mean age) in years	Tool used to measure outcome	Outcome(s) Knowledge	Help-seeking	Stigmatising attitudes
Bruno et al., 2015	Cross sectional	United States	72	17 to 18 (17.5)	Modified FINQ	a,b	h,i	
Jaber et al., 2015	Cross sectional	United States	119	12 to 17 (15.4)	SSDS			n
Mason et al., 2015	Cross sectional	Australia	518	14 to 17 (15.9)	MHL Survey, MHFA, Personal stigma scale (youth version), SDS (for young person)	a,e		k,m
Coles et al., 2016	Cross sectional	United States	1104	14 to 19 (16.1)	Modified FINQ	a,b	h,i	
Adeosun, 2016	Cross sectional	Nigeria	280	N/A (15.1)	MHL Survey	a	i	
Dardas et al., 2016	Cross sectional	Jordan	88	15 to 17 (16)	DSS			k,l
Ogorchukwu et al., 2016	Cross sectional	India	916	15 to 19 (N/A)	MHL and stigma Questionnaire	a,f	i	
Attygalle et al., 2017	Cross sectional	Sri Lanka	1002	13 to 16 (14.0)	MHL and stigma Questionnaire	a,g		
Dardas et al., 2017	Cross sectional	Jordan	2349	12 to 17 (15.0)	DSS			k,l
Lubman et al., 2017	Cross sectional	Australia	2456	14 to 15 (14.9)	Vignette-based questions, GHSQ-V, BASH-B	a	h,i,j	
Townsend et al., 2017*	Cross sectional	United States	500	14 to 16 (N/A)	ADKQ, RIBS			m
Swartz et al., 2017*	RCT	United States	6676	14 to 15 (N/A)	ADKQ, RIBS			m

'Table 2.9, continued'

Author(s)	Study design	Setting	Sample size	Participant age range (mean age) in years	Tool used to measure outcome	Outcome(s) Knowledge	Help-seeking	Stigmatising attitudes
Sharma et al., 2017	Cross sectional	India	354	13 to 17 (N/A)	MHL and stigma Questionnaire	a,c,g	i,j	k,m
Olivari & Guzmán-González et al., 2017	Cross sectional	Chile	793	14 to 19 (17.0)	GHSQ-V		i	
Aluh et al., 2018	Cross sectional	Nigeria	285	12 to 18 (14.0)	FINQ	a,b	h,i	
Ando et al., 2018	Cross sectional	Japan	4478	10 (10.2)	Help-seeking vignette		h	
Dardas et al., 2018	Cross sectional	Jordan	2349	12 to 17 N/A	Depression Etiological Beliefs Scale, DSS	c		k,l
Howard et al., 2018	RCT	Australia	327	16 to 19 (16.0)	GHSQ, DSS, SDSS		h	k,n

'Table 2.9, continued'

Note. N/A, Not available; a, Recognition of disorder; b, Symptoms; c, Causes; e, First aid; f, Prevention; g, Intervention; h, Help-seeking intention; i, Attitudes to sources of help; j, Attitude to barriers to help-seeking; k, Personal stigma; l, Perceived stigma; m, Social distance; n, Self-stigma; * Studies reporting on overall depression literacy levels.

Mental health literacy (MHL); Friend in need Questionnaire (FINQ); Depression Literacy Scale (D-Lit); Adolescent depression knowledge questionnaire (ADKQ); General Help-Seeking Questionnaire (GHSQ); Attitudes Toward Seeking Professional Psychological Help Scale (ATSPPHS); Depression Stigma Scale (DSS); Self-Stigma of Depression Scale (SSDS); Friendship Activity Scale (FAS); Attitudes toward Psychological Help (ATPH); Shared Activity Questionnaire (SAQ); Social Distance Scale (SDS); General Help-Seeking Questionnaire-Vignette version (GHSQ-V); Barriers to Adolescents Seeking Help scale (BASH-B); Mental health first aid action questions (MHFA); Other health professional (OHP); Revised Attribution Questionnaire (r-AQ); Abbreviated Acceptability Rating Profile (AARP); Reported and Intended Behaviors Scale (RIBS).
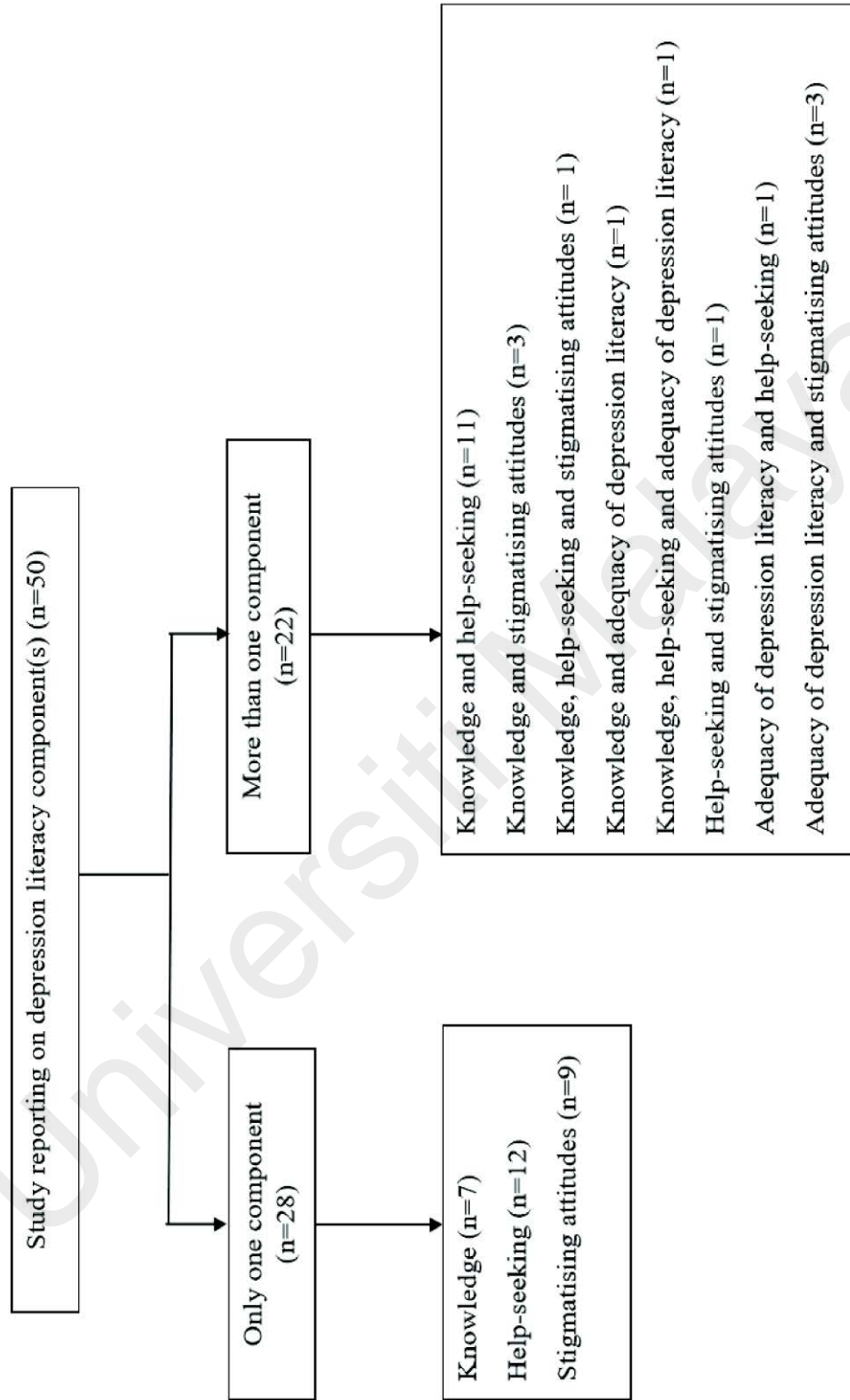
Figure 2.5: Number of studies based on depression literacy components

2.3.4.3 Tools used to measure depression literacy

Vignette-based methodology was the most commonly used method of assessing depression literacy, used in by 29 (58%) studies (Adeosun, 2016; Aluh et al., 2018; Ando et al., 2018; Attygalle et al., 2017; Bruno et al., 2015; Burns & Rapee, 2006; Coles et al., 2016; Dolphin & Hennessy, 2014; Essau et al., 2013; Hernan et al., 2010; Jorm et al., 2006; Kelly & Jorm, 2007; Kelly et al., 2006; Lam, 2014; Lee et al., 2014; Lubman et al., 2017; Marcell & Halpern-Felsher, 2007; Marshall & Dunstan, 2011; Mason et al., 2015; McCarthy et al., 2011; Melas et al., 2013; O'Driscoll et al., 2012; Ogorchukwu et al., 2016; Olivari & Guzmán-González, 2017; Olsson & Kennedy, 2010; Sawyer et al., 2012; Sharma et al., 2017; Swords et al., 2011; Yoshioka et al., 2014). The vignettes used varied across studies in terms of gender (the majority of studies (62%) used vignettes of a single gender) and the symptoms featured in the vignettes. The MHL Survey (Jorm et al., 1997), the Friend In Need questionnaire (FINQ; Burns & Rapee, 2006) and the MHL and stigma questionnaire (Reavley & Jorm, 2011a) were the most commonly used vignette-based tools for assessing depression literacy among adolescents. The remainder of the studies (n = 21, 42%) studies did not use a vignette-based methodology to examine depression literacy. The Adolescent Depression Knowledge Questionnaire (ADKQ), the General Help-seeking Questionnaire (GHSQ) and the Depression Stigma Scale (DSS) were the most commonly used non-vignette-based tools used to examine the knowledge, help-seeking and stigma components of depression literacy among adolescents.

The most commonly used tool for examining the knowledge component of depression literacy was the MHL Survey (used in 30% of studies). Intention to seek help and attitude to seeking help were frequently examined using the FINQ (21%) and MHL and stigma questionnaire (10%). Stigmatising attitudes were commonly examined using the DSS (26%). Table 2.10 shows the measures used to examine the various components of depression literacy.

Table 2.10: Measures of the knowledge, help-seeking and stigma components of depression literacy

Knowledge measures			Help-seeking measures			Stigma measures		
Measure	Developer/ Author	Number of studies using the tool (%)	Measure	Developer/ Author	Number of studies using the tool (%)	Measure	Developer/ Author	Number of studies using the tool (%)
MHL Survey*	Jorm et al., 1997	9 (30.0)	FINQ*	Burns & Rapee, 2006	6 (21.4)	DSS	Griffiths et al., 2008	6 (26.1)
FINQ*	Burns & Rapee, 2006	6 (20.0)	MHL and stigma Questionnaire*	Reavley & Jorm, 2011a	3 (10.7)	SDS*	Kelly & Jorm, 2007	2 (8.7)
MHL and stigma Questionnaire*	Reavley & Jorm, 2011a	4 (13.3)	MHL Survey*	Jorm et al., 1997	2 (7.1)	RIBS	Evans-Lacko et al., 2011	2 (8.7)
ADKQ	Hart et al., 2014	4 (13.3)	GHSQ	Wilson et al., 2005	2 (7.1)	SSDS	Barney et al., 2010	2 (8.7)
D-Lit	Griffiths et al., 2004	1 (3.3)	GHSQ-Vignette version*	Wilson et al., 2011	2 (7.1)	MHL and stigma Questionnaire*	Reavley & Jorm, 2011a	1 (4.3)
Vignette-based questions*	Lubman et al., 2017	1 (3.3)	ADKQ	Hart et al., 2014	2 (7.1)	FAS*	Siperstein, 1980	1 (4.3)
Depression Etiological Beliefs Scale	Samouilhan & Seabi, 2010	1 (3.3)	BASH-B	Kuhl et al., 1997	1 (3.6)	SAQ*	Morgan et al., 1996	1 (4.3)
Modified version of the beliefs about the causes of child problems questionnaire	Yeh & Hough, 1997	1 (3.3)	Help-seeking questions*	Marcell & Halpern-Felsher, 2007	1 (3.6)	Attitudes toward depression questionnaire	Corrigan et al., 2001	1 (4.3)

Note. *Measures that utilize a vignette-based methodology.

Knowledge measures | Help-seeking measures | Stigma measures

Measure	Developer/ Author	Number of studies using the tool (%)	Measure	Developer/ Author	Number of studies using the tool (%)	Measure	Developer/ Author	Number of studies using the tool (%)
Symptom profile questions	Skre et al., 2013	1 (3.3)	Help-seeking questions*	Swords et al., 2011	1 (3.6)	Personal stigma Scale (youth version) *	Yap et al., 2014	1 (4.3)
MHFA*	Hart et al., 2012	1 (3.3)	ATSPPHS	Fisher & Farina, 1995	1 (3.6)	Perceived stigma scale*	Griffiths et al., 2006	1 (4.3)
AARP	Tarnowski et al, 1992	1 (3.3)	Questions on barriers to help-seeking	Meredith et al., 2009	1 (3.6)	Personal stigma scale*	Griffiths et al., 2006	1 (4.3)
			Survey of help-seeking preferences and intentions	Boyd et al., 2011	1 (3.6)	SDS (adapted for young person)*	Jorm & Wright, 2008	1 (4.3)
			Help-seeking vignette*	Sawyer et al., 2012	1 (3.6)	r-AQ*	Corrigan et al., 2007	1 (4.3)
			Help-seeking vignette*	Ando et al., 2018	1 (3.6)	Paper and pencil projective figure placement test	Weiss, 1986	1 (4.3)
			Doctor and OHP scale *	Hernan et al., 2010	1 (3.6)	ATPH	Rose et al., 2011	1 (4.3)
			Traditional help-seeking scale*	Lee et al., 2014	1 (3.6)			
			'Where do you go for help' questionnaire	Williams, 2012	1 (3.6)			

'Table 2.10, continued' Note. *Measures that utilize a vignette-based methodology.

2.3.4.4 Depression literacy components identified

The most commonly reported component of depression literacy was help-seeking (27 studies), followed by knowledge of depression (24 studies), and stigmatising attitudes (17 studies). An overall level of depression literacy was only reported in 6 studies. The following paragraphs present the results relating to each component of depression literacy.

(a) Knowledge component of depression literacy

The most frequently reported aspect of knowledge of depression was recognition of depression, followed by knowledge of symptoms, intervention, first aid, causes and prevention. Recognition of depression (e.g. percentage correct recognition of depression) was reported in 18 studies, of which nearly half (n = 8, 44%) reported that the majority of participants were unable to recognise depression (Adeosun, 2016; Aluh et al., 2018; Coles et al., 2016; Lam, 2014; Melas et al., 2013; Ogorchukwu et al., 2016; Olsson & Kennedy, 2010; Skre et al., 2013). Seven studies (39%) reported that the majority of participants were able to recognise depression (Attygalle et al., 2017; Bruno et al., 2015; Hernan et al., 2010; Lubman et al., 2007; Mason et al., 2015; McCarthy et al., 2011; Sharma et al., 2017). The remaining three studies (17%) reported a mixed picture relating to the ability of participants to recognise depression, whereby these studies reported percentages of correct recognition of depression which both include values that are more than 50% as well as values less than 50% among their participants as the following. Burns & Rapee (2006) reported 68% and 34% of participants were able to recognise depression, Marshall & Dunstan (2011) reported 68% and 23% of adolescents were able to recognise depression and Essau et al.'s (2013) reported 49% and 53% of participants were able to recognise depression.

The majority of the studies that examined recognition of depression in both male and female adolescents reported that female adolescents were better at recognising depression (Aluh et al., 2018; Burns & Rapee, 2006; Coles et al., 2016; Essau et al., 2013; Hernan et al., 2010; Marshall & Dunstan, 2011; Melas et al., 2013; Ogorchukwu et al., 2016). The overwhelming majority of the studies (n = 17, 94%) used a vignette-based approach to examine recognition of depression, but one study did not (Skre et al., 2013). However only seven studies (41%) used both male and female vignettes (Bruno et al., 2015; Burns & Rapee, 2006; Coles et al., 2016; Essau et al., 2013; Hernan et al., 2010; Marshall & Dunstan, 2011; McCarthy et al., 2011), the majority of the other studies used vignettes of a single gender (n = 8, 47%) or did not specify the gender assigned to the vignettes (n = 2, 12%) (Lam, 2014; Sharma et al., 2017). The majority of studies that used both male and female vignettes to examine ability to recognise depression, reported that participants recognised depression when a female vignette was used (Bruno et al., 2015; Burns & Rapee, 2006; Marshall & Dunstan, 2011; McCarthy et al., 2011). The rate of recognition of depression was higher in studies that used vignettes featuring suicidal thoughts than in those that did not as reported across five studies (Bruno et al., 2015; Burns & Rapee, 2006; Marshall & Dunstan, 2011; Mason et al., 2015a; McCarthy et al., 2011). Suicidal thoughts, feelings of worthlessness, diminished interest in activities, weight loss and insomnia were symptoms of depression commonly endorsed by adolescents (Aluh et al., 2018; Bruno et al., 2015; Burns & Rapee, 2006; Coles et al., 2016; Marshall & Dunstan, 2011; McCarthy et al., 2011).

Adolescents regarded the following interventions for depression as helpful (a) people-based intervention by a counsellor and friend, (b) self-help strategies such as relaxation training, reducing/avoiding alcohol and drugs (Essau et al., 2013; Jorm et al., 2006) and (c) medication namely vitamins (Essau et al., 2013; Sharma et al., 2017). They considered positive social support, such as being listened to and support from a friend

without any adult engagement, helpful 'first aid' actions for depression (Essau et al., 2013; Kelly & Jorm, 2007; Kelly et al., 2006; Lam, 2014; Mason et al., 2015b). In addition distraction and basic minimal actions such as encourage the sufferer to be physically active and suggest seeking help were also endorsed as helpful 'first aid' for depression by the majority of adolescents in two studies (Essau et al., 2013; Lam, 2014). The common causes of depression reported were normal ups and downs of life, stress, the way in which the sufferer had been brought up (Essau et al., 2013; Sharma et al., 2017), cognition (Caporino et al., 2014) and lack of will (Dardas et al., 2018). Adolescents regarded physical activity, distractions, avoidance of the problem or stressful situations, spending time with family and friends on a regular basis and communicating regularly with family and friends as preventive of depression (Essau et al., 2013; Marshall & Dunstan, 2011; Ogorchukwu et al., 2016). Table 2.11 describes the ability of participants to recognise depression across studies and Table 2.12 summarises results relating to the knowledge component of depression literacy.

Table 2.4: Ability to recognise depression

Author(s)	Percentages of participants able to recognise depression		
	Total	Male	Female
Burns & Rapee, 2006	68[a],*	58	81
	34[b]	22	51
Hernan et al., 2010	73[a,b]	70	76
Olsson & Kennedy,2010	42[a]	N/A	N/A
McCarthy et al., 2011	N/A	75 [a],*	68 [a],*
	N/A	58 [b]	52 [b]
Marshall & Dunstan, 2011	68[a],*	51	80
	23[b]	12	30
Essau et al., 2013	N/A	49[b]	53[a]
Melas et al., 2013	43[b]	34	48
Skre et al.,2013[#]	35, 22	N/A	N/A
Lam, 2014	23[c]	N/A	N/A
Bruno et al., 2015	N/A	80[a],*	N/A
		53[b]	N/A
Mason et al., 2015	86[b],*	N/A	N/A
Adeosun, 2016	10[b]	N/A	N/A
Coles et al., 2016	40[a,b]	34	46
Ogorchukwu et al.,2016	29[a]	28	30
Attygalle et al., 2017	82[b]*	N/A	N/A
Lubman et al., 2017	60[a]	N/A	N/A
Sharma et al., 2017	84[c]	N/A	N/A
Aluh et al., 2018	5[b]	2.8	6.8

Note. All studies used a vignette-based methodology except for Skre et al.,2013. N/A information was not available; Total refers to all participants; [a] Female vignette used; [b] Male vignette used; [c] Gender of vignette used were not specified; *Vignette with suicidal thoughts; [#]Baseline data reported for intervention and control groups.

Table 2.5: Knowledge of depression reported in studies

Knowledge of depression	Studies
Recognition	
More than 50% of participants were able to recognise depression	Attygalle et al., 2017; Bruno et al., 2015; Hernan et al., 2010; McCarthy et al., 2011; Lubman et al., 2017; Mason et al., 2015; Sharma et al., 2017
Less than 50% of participants were able to recognise depression	Adeosun, 2016; Aluh et al., 2018; Coles et al., 2016; Lam, 2014; Melas et al., 2013; Ogorchukwu et al., 2016; Olsson & Kennedy, 2010; Skre et al., 2013
Mixed picture	Burns & Rapee, 2006; Essau et al., 2013; Marshall & Dunstan, 2011
Symptoms*	
Suicidal thoughts, feelings of worthlessness, diminished interest in activities, weight loss/decreased appetite and insomnia	Burns & Rapee, 2006
Suicidal thoughts, diminished interest in activities, feelings of worthlessness and weight loss/decreased appetite	McCarthy et al., 2011
Suicidal thoughts, feelings of worthlessness, weight loss/decreased appetite and diminished interest in activities	Bruno et al., 2015
Weight loss/ decreased appetite, insomnia and suicidal thoughts	Marshall & Dunstan, 2011
Insomnia (17%)	Aluh et al., 2018
Weight loss/decreased appetite, decreased interest/pleasure in activities, decline in grades and insomnia	Coles et al., 2016
43% of participants were able to identify 4 to 5 symptoms of depression	Swartz et al., 2007
Causes*	
Normal ups and downs of life, stress and the way in which the person was brought up	Essau et al., 2013
Cognition (42%)	Caporino et al., 2014
Stressful life events	Sharma et al., 2017
Stressful life events, social factors and lack will	Dardas et al., 2018
First aid*	
Listen to problems, talk to the sufferer firmly, suggest seeking help and encourage the sufferer to be physically active	Essau et al., 2013
Listen to problems, talk to the sufferer firmly, rally friends to cheer him or her up, suggest seeking help and encourage the sufferer to become more physically active	Lam, 2014

Knowledge of depression	Studies
First aid*	
Provide positive social support such as listening to and offering advice without any adult engagement	Kelly et al., 2007
Help the sufferer connect with an adult (44%)	Mason et al., 2015
Prevention*	
Regularly making time for relaxing activities, keeping physically active, having regular contact with family/friends, never drinking alcohol excessively, abstaining from use of marijuana, avoiding stressful situations and having a religious or spiritual belief	Essau et al., 2013
Listening to or understanding the problem, becoming physically active, love and affection, distraction from the problem	Ogorchukwu et al., 2016
Intervention*	
Counsellor, friend, getting out and about more, counselling, avoiding alcohol/drugs and relaxation training/stress management,	Jorm et al., 2006
Family doctor, counsellor, psychologist, close family/friend, becoming more physically active, getting relaxation training, receiving counseling, getting up early and going into sunlight, reading a self-help book, vitamins and reducing use of alcohol, cigarettes and drugs.	Essau et al., 2013
Talking to the sufferer	Attygalle et al., 2017
Talking to someone (42%)	Marshall & Dunstan, 2011
Meditation, increasing physical activity and vitamins	Sharma et al., 2017
Cognitive behavioral therapy (highest mean score of acceptability)	Caporino et al., 2014
Talking to the sufferer, getting more sleep, eating better and exercising	Melas et al., 2013

'Table 2.12, continued'

Note. *The following are the most-commonly rated items reported across studies by more than 50% of participants (relating to symptoms of depression; causes of depression; helpful 'first aid' actions for depression; prevention of depression; helpful interventions for depression) unless stated otherwise.

(b) **Help-seeking component of depression literacy**

The most frequently reported aspect of help-seeking was attitude to sources of help (n = 23), followed by intentions to seek help (n = 17) and attitude towards barriers to help-seeking (n = 7), as shown in Table 2.13. Broadly, two main groups of sources of help were assessed in these studies, informal and formal sources of help. The majority of the studies (n = 15) reported that adolescents preferred more informal sources of help such as family and friends (Aluh et al., 2018; Bruno et al., 2015; Coles et al., 2016; Hart et al., 2014; Lam, 2014; Lee et al., 2014; D. I. Lubman et al., 2017; Marshall & Dunstan, 2011; McCarthy et al., 2011; Ogorchukwu et al., 2016; Olivari & Guzmán-González, 2017; Ruble et al., 2013; Sawyer et al., 2012; Swords et al., 2011; Williams, 2012). The most commonly endorsed formal source of help were counsellors (Boyd et al., 2011; Bradford & Rickwood, 2014; Burns & Rapee, 2006; Hernan et al., 2010; Lubman et al., 2017; Marshall & Dunstan, 2011; Sharma et al., 2017). The majority of adolescents reported that they would seek help if they or a peer had depression (Aluh et al., 2018; Boyd et al., 2011; Bradford & Rickwood, 2014; Bruno et al., 2015; Burns & Rapee, 2006; Coles et al., 2016; Lam, 2014; Marcell & Halpern-Felsher, 2007; Marshall & Dunstan, 2011; McCarthy et al., 2011; Olsson & Kennedy, 2010). Two studies reported mean scores for intention to seek help for depression, however no cut-off scores were given. Therefore, making it difficult to conclude on intention to seek help for depression in these two studies (Howard et al., 2018; Logsdon et al., 2009; Swords et al., 2011). Adolescents perceived several attitudinal barriers to seeking help, for example feeling ashamed, shy or embarrassed, trying to address the problem by oneself, being worried about other people's negative attitude, refusing to admit there is a problem and treatment issues such as side effects of medicine (Hart et al., 2014; Hernan et al., 2010; Lam, 2014; Lubman et al., 2017; Meredith et al., 2009; Sharma et al., 2017).

Table 2.13: Seeking help for depression: intention, preferred sources and barriers

Author(s)	Percentage reporting intention to seek help[a]	Outcome(s) Help-seeking attitude*	
		Preferred source of help	Barriers to seeking help
Burns & Rapee, 2006	93%, 94%	Counsellor	
Marcell & Halpern-Felsher, 2007	88%	Partner (33%)	
Meredith et al., 2009			Worry about family perceptions (45%), other responsibilities at school (45%)
Hernan et al., 2010		Doctor, OHP (such as counsellor, youth worker, psychologist)	Worry that parents would get the bill, not having one's own Medicare card, not wanting to admit there is a problem, being ashamed to tell the doctor about one's problems, preferring to deal with problems on one's own
Olsson & Keneddy, 2010	70%	School counsellor, nurse, family doctor, psychiatrist	
Boyd et al., 2011	56%	School counsellor	Limited availability of professional services (34%)
Marshall & Dunstan, 2011	95%, 97%	Friends, family, counsellor	
McCarthy et al.,2011	58%,75%	Family (47%)	
Swords et al., 2011	100%	Family (38%)	
Williams, 2012		Friends (ranked as first choice of help)	
Sawyer et al., 2012		Friends, family	
Ruble et al., 2013	84%, 89%	Parent/Guardian (31%)	
Lam, 2014	68%	Both parents	Person might feel negatively about you (29%), too embarrassed/shy (29%)

| | Outcome(s) | | |
| | | Help-seeking attitude* | |
Author(s)	Percentage reporting intention to seek help[a]	Preferred source of help	Barriers to seeking help
Hart et al., 2014		Family	Treatment issues (46%)
Lee et al., 2014		Friends (highest mean score)	
Bradford & Rickwood, 2014	76%	Youth worker, private psychologist, school counsellor, other counsellor and health practitioner	
Bruno et al., 2015	86%, 96%	Friends (44%)	
Adeosun, 2016		General practitioners (44%)	
Coles et al., 2016	69%	Family (27%)	
Ogorchukwu et al., 2016		Mother (31%)	
Lubman et al., 2017	40%	Mother, father, school counsellor, another relative or family member, Mental health professional outside of school, phone help line, doctor, teacher, friend	Self-reliance (solve my problem myself, work out my own problems), Embarrassment (too embarrassed to talk to a counsellor, not wanting family to know)
Olivari & Guzmán-González et al., 2017		Father or mother (highest mean score)	
Sharma et al., 2017		Psychologist/counsellor (25-30%)	Ashamed or feel uncomfortable about asking for help (40-45%)
Aluh et al., 2018	95%	Family (32%)	
Ando et al., 2018	79%		

'Table 2.13, continued'

Note. [a] The percentage of adolescents who reported that they would seek help for themselves if they experienced depression or that they would seek help for the depressed person described in the vignette(s)/Others; *The following are the most-commonly rated items reported across studies by more than 50% of participants unless stated otherwise. Other health professional (OHP).

(c) **Stigmatising attitudes component of depression literacy**

The most frequently reported aspect of stigmatising attitudes was personal depression stigma (n = 11), followed by social distance (n = 8), perceived depression stigma (n = 6) and self-stigma (n = 2) as shown in Table 2.14. The majority of the studies reported mean scores for stigmatising attitudes, but various scales were used. Six studies used the same tool (the DSS) to examine personal and perceived stigma towards depression. One of these studies reported that adolescents have much higher levels of perceived stigma compared to personal stigma in terms of higher percentages of stigmatising attitudes towards depression (Dardas et al., 2016) while two other studies reported a higher mean perceived stigma score compared to personal stigma (Calear et al., 2011; Dardas et al., 2017). Studies also reported that the majority of adolescents have moderate to high personal stigma and perceived stigma toward depression (Dardas et al., 2016; Dardas et al., 2018; Rose et al., 2011). In contrast, adolescents reported high social acceptance of a peer with depression (Dolphin & Hennessy, 2014; Kelly & Jorm, 2007; Mason et al., 2015a; O'Driscoll et al., 2012; Swartz et al., 2017).

Studies exploring adolescents' endorsement of various stigmatising attitudes reported that the majority of adolescents agreed that people with depression could snap out of it if they wanted, can recover completely, would not tell anyone if they experienced depression and perceived people with depression as unpredictable (Dardas et al., 2017; Sharma et al., 2017; Yoshioka et al., 2014). Adolescents tended to agree with statements describing social acceptance of depression, such as socialising with someone with depression or developing a close friendship with such a person (Sharma et al., 2017; Yoshioka et al., 2014).

Table 2.6: Stigmatising attitude towards depression reported in studies

Author(s)	Outcome(s)			
	Personal Stigma	Perceived Stigma	Social Distance	Self-Stigma
Kelly & Jorm, 2007			12[a]	
Arbanas, 2008	(30-40)[b]			
Calear et al., 2011	15[c]	21[c]		
Rose et al., 2011		70%		
O'Driscoll et al., 2012	(3,4,2,3)[d]		52[e], 3[g]	
Dolphin & Hennessy, 2014			40[h]	
Yoshioka et al., 2014	A	B	D	
Jaber et al., 2014				54[i]
Perry et al., 2014	(11*,12+)[c]			
Mason et al., 2015	2[j], 3[k]		10[l]	
Dardas et al., 2016	75%	82%		
Dardas et al., 2017	18[c], E	19[c], E		
Sharma et al., 2017	C		D	
Townsend et al., 2017			5[m]	
Swartz et al., 2017			4%	
Howard et al., 2018	(13*,12+)[c]			(55*,56+)[i]
Dardas et al., 2018	88%	88%		

Notes.

% Percentage of adolescents having moderate to high stigmatising attitudes.

The following were the most-commonly endorsed items across all studies:

A, I would not tell anyone if I had depression (35%)

B, People with depression are unpredictable (44%)

C, People with depression can recover completely (more than 50%)

D, I would be willing to socialise with the person described in the vignette (more than 50%)

E, People with depression could snap out of it if they wanted (more than 50%)

[a] SDS (score range 4 to 24, higher scores indicate lower social acceptance); [b] Attitudes toward depression questionnaire scale (score range 5 to 75, higher scores indicate less personal stigma); [c] DSS personal and perceived stigma subscale (score range 0 to 36, higher scores are indicative of greater personal/perceived stigma); [d] r-AQ (score range 1 to 7, higher scores indicate stronger dangerousness stereotypes, stronger responsibility stereotypes, stronger prejudicial fear and stronger prejudicial anger); [e] SAQ (score range 24 to 72, higher scores indicate higher social acceptance); [g] Modified version of paper and pencil projective figure placement test (score range 1 to 7, higher scores indicate more physical social distance); [h] FAS (score range 13 to 52, higher scores indicate higher social acceptance); [i] SSDS (score range 16 to 80, higher scores are indicative of greater self-stigma); [j] Personal stigma scale - youth version (believe that the person is weak rather than sick) score range 1 to 5, higher scores are indicative of greater stigma; [k] Personal Stigma Scale - youth version (believe that the person is dangerous/unpredictable) score range 1 to 5, higher scores are indicative of greater stigma; [l] SDS adapted for young persons (score range 5 to 20, higher scores indicate lower social acceptance); [m] RIBS (score range 4 to 20, lower scores indicate lower stigma); * Intervention group (baseline results); + Control group (baseline results).

(d) **Adequacy of depression literacy**

Only a minority of participants were classified as being depression literate (Lam, 2014; Ruble et al., 2013; Swartz et al., 2017; Swartz et al., 2007; Townsend et al., 2017), as shown in Table 2.15. Majority of the studies assess how effective MHL-based intervention was in improving depression literacy among adolescents (Perry et al., 2014; Ruble et al., 2013; Swartz et al., 2017; Swartz et al., 2007).

Table 2.7: Depression literacy levels reported in studies

Author(s)	Depression literacy
Swartz et al., 2007[a]	20%
Ruble et al., 2013[a]	12%[*], 16%[+]
Perry et al., 2014[c]	11[*], 10[+]
Lam, 2014[b]	16.4%
Townsend et al., 2017[a]	21%
Swartz et al., 2017[a]	27%[*], 24%[+]

Note. [a] ADKQ; [b] MHL and stigma questionnaire; [c] D-lit scale (score range 0 to 16; higher scores indicate higher depression literacy). [*] Intervention group (baseline results); [+] Control group (baseline results).

2.3.5 Issues identified from the systematic review

2.3.5.1 Value of vignette-based methodology

Vignette-based methodology was the approach most commonly used to measure various components of depression literacy, especially the MHL questionnaire by Jorm et al. (1997) and the MHL and stigma questionnaire by Reavley and Jorm (2011a). The use of vignettes to examine MHL among adolescents in Australia is very common. This is probably due to the impact of Jorm's work on MHL, which originated in Australia and is of important value to studies looking into MHL (Jorm, 2000). This review highlights the key value of a vignette-based questionnaire along with its limitations.

One of the key values of utilizing a vignette-based methodology such as the MHL and stigma questionnaire is that it can assess multiple components of depression literacy simultaneously, especially in the recognition aspect of MHL. Vignettes also permit individuals to predict their plans of action if they suffer from symptoms similar to those presented by the vignettes. Such assessments are important in studies involving asymptomatic populations as they provide some directions on what measures these individuals might take if they experience these symptoms (Rickwood & Thomas, 2012). Finally, vignettes provide a more detailed stimulus to participants rather than just asking about MHDs (Yang, Link, & Phelan, 2008).

However, the drawbacks of using vignette-based methodology are that the vignettes may not reflect the complexity of real-life situations, and the variation in gender, age and symptomatology of the vignettes may affect participants responses (Bruno et al., 2015; Burns & Rapee, 2006; Marshall & Dunstan, 2011; McCarthy et al., 2011). This occurs because a vignette is usually delivered in a written or verbal manner, and symptoms and risk factors are clearly stated or mentioned, thereby enabling participants to identify problems in the vignette more easily. For example, one study reported that participants had poor ability to correctly recognize depression when presented with a short film

compared to a written vignette (Marshall & Dunstan, 2011). Studies also reported a poor ability of respondents to differentiate between healthy and ill categories when presented with symptomatic and asymptomatic vignettes (Pescosolido et al., 2008). There seem to be no standardized universal sets of vignettes used to examine depression literacy among adolescents. Several authors have developed their own vignettes, while most others have either replicated or modified the existing ones. This variation in number and type of symptoms described yields different responses towards depression across various studies, resulting in difficulty in comparing results across studies (Furnham & Hamid, 2014). Nevertheless, the majority of studies in this review utilize established vignettes.

Future studies examining depression literacy among adolescents should first determine what components of depression literacy they aim to examine. Some instruments are able to examine multiple components of depression literacy simultaneously, such as the MHL and stigma questionnaire and the Friend in Need Questionnaire (FINQ), while most others are only able to examine a single component. It is also important to note that not all instruments are able to provide an overall report on depression literacy levels or adequacy of depression. Instruments such as the ADKQ, Depression Literacy scale (D-Lit) and the Mental Health Literacy scale (MHLS) provide an overall score that can reflect depression literacy levels. Alternatively some researchers have utilized the MHL and stigma questionnaire and reported on the overall adequacy of depression literacy by combining the ability to recognize depression with intention to seek help (Lam, 2014).

Future studies that utilize a vignette-based methodology to examine depression literacy should practise the following recommendations. A well-established standardized vignette needs to be used. More specifically, vignette-based questionnaires should utilize both a male and female vignette. This is because using a single-gender vignette may produce a biased estimate as studies have reported that participants tend to be more

concerned and sympathetic towards a female vignette (Coles et al., 2016). Also, it is important that the use of a standardized set of symptoms to describe vignettes is practised as this enables comparison of findings across studies. The use of glaring symptoms such as suicidal thoughts must be performed with caution as such symptoms may enable participants to more correctly recognize depression, as reported among studies in this review (Bruno et al., 2015; Burns & Rapee, 2006; Marshall & Dunstan, 2011; Mason et al., 2015; McCarthy et al., 2011). It is also very important to match the vignette characteristics, such as gender and age, to those of the participants to avoid confounding bias as a result of the variation in vignette characteristics and participant characteristics (Coles et al., 2016; Dolphin & Hennessy, 2014; Marcell & Halpern-Felsher, 2007; O'Driscoll et al., 2012; Olsson & Kennedy, 2010). Finally, although not a focus of this review, it would be appropriate for future studies to examine the validity of the vignette-based instruments as a measure of MHL among the adolescent population (Wei et al., 2015).

2.3.5.2 Lack of uniformity in reporting of depression literacy

This review indicates that the knowledge and help-seeking components of depression literacy are the most commonly explored aspects of MHL relating to depression among adolescents, while there is a gap in the amount of research carried out on stigmatising attitudes towards depression among adolescents (Kaushik, Kostaki, & Kyriakopoulos, 2016). There are a few reasons that can explain this finding: the abundance of research on the knowledge and help-seeking components of depression literacy could be attributed to the initial understanding of MHL that was described by Jorm (2012), which places much emphasis on the knowledge and help-seeking aspects of depression literacy (Jorm, 2012). Stigmatising attitudes have always been considered in relation to MHL and not as a component of MHL, however, as recent evidence has suggested that stigma should be integrated as a component of depression literacy, which is in line with health literacy

(Kutcher et al., 2015). Finally, a possibility of an existing lack of agreement regarding the concept of MHL would potentially lead to confusion in the study arena of MHL, thereby resulting in unequal research into the various components of MHL in relation to depression (Spiker & Hammer, 2018).

Furthermore, this review also highlights that the majority of the MHL research relating to depression among adolescents has reported on only a single component of depression literacy. This is a concerning finding for several reasons. First, it indicates that studies on depression literacy among adolescents are not keeping up to date with the evolving nature of the MHL framework, which is line with health literacy and suggests that MHL is a concept comprising knowledge, help-seeking and stigma components that need to be assessed together (Kutcher, Wei, & Coniglio, 2016). A second limitation that arises when only a single component of depression literacy is examined is the inability to report on the adequacy of depression literacy or depression literacy levels. This is because the adequacy of depression literacy requires the assessment of more than one component (Lam, 2014). This is also reflected in this review, with only a minority of studies (n=6) actually examining depression literacy levels or reporting on the adequacy of depression literacy among adolescents.

Within each component of MHL related to depression there is also a lack of uniformity in subcomponents that is reported. More specifically, recognition of depression, symptoms of depression, attitudes towards help sources and personal stigma are more frequently reported within the knowledge, help-seeking and stigmatising attitude components of depression literacy. Also, disparate assessment of MHL relating to depression is seen from this review. For example, within the knowledge and stigma components, knowledge of depression symptoms and stigmatising attitudes towards depression were reported differently among studies, with some reporting on commonly endorsed statements and others on the percentage of correct responses and mean scores.

Overall, a lack of uniformity and disparate assessment of MHL relating to depression result in a difficulty in comparing results across studies, and reduce the ability to maximize the potential effect of MHL on mental health outcomes (Spiker & Hammer, 2018). A lack of uniform assessment of the various components and subcomponents within the concept of MHL would result in inadequate assessment of MHL, which could result in the development of inadequate MHL interventions.

Therefore, future studies should attempt to come to a consensus to develop a standardized theoretical MHL framework so as to ensure uniformity and consistency in the research of MHL. The habit of examining all the components of depression literacy, including the stigma component, must also be practised in the future.

2.3.5.3 Adolescent understanding of depression literacy

This review indicates that the majority of depression literacy studies were conducted among older school-going adolescents. There appears to be a limited number of studies reporting on depression literacy among younger adolescents (aged 11 to 14), especially among non-school-going adolescents. The findings of this review are further discussed based on each component of depression literacy to better appreciate the understanding adolescents have about depression literacy.

(a) Knowledge response of depression literacy

Overall, most studies used a measure of recognition of disorder and symptoms when reporting on the knowledge component of depression literacy. This review indicates that the majority of adolescents from developed nations are better equipped with the ability to correctly recognize depression than adolescents from developing nations such as Nigeria and India. Female adolescents are better able to recognize depression than male adolescents. Adolescents frequently regard suicidal thoughts, weight loss and decreased appetite as symptoms of depression. Finally, the majority of adolescents regard

supportive forms of first-aid actions and self-help intervention as being of helpful value towards depression.

The most commonly reported measure of knowledge of depression was percentage of recognition of depression, whereby most studies (n=8) reported that the majority of participants were unable to recognise depression (Adeosun, 2016; Aluh et al., 2018; Coles et al., 2016; Lam, 2014; Melas et al., 2013; Ogorchukwu et al., 2016; Olsson & Kennedy, 2010; Skre et al., 2013). The variation in the findings could be explained by the following reasons. First, there are variations in the symptoms used to describe the vignette in the questionnaire. For example, four studies had used a similar tool, the FINQ, to assess the knowledge of recognition of depression, for which there were two depression-related vignettes provided, one with suicidal thoughts and the other without. Across all these four studies, it is worth noting that the respondents were able to more correctly recognize the vignette with suicidal thoughts as being depressed than the one without suicidal thoughts (Bruno et al., 2015; Burns & Rapee, 2006; Marshall & Dunstan, 2011; McCarthy et al., 2011). Similar results were also reported with the use of the MHL and stigma questionnaire, which depicted a vignette with suicidal thoughts (Mason et al., 2015).

Second, the gender assigned to a vignette is also an important factor, as studies have reported a significant difference between the gender of characters in a vignette and the recognition of depression (Coles et al., 2016). A female in a vignette tends to be given more sympathy and taken more seriously by participants; furthermore, suicidal ideation is often presented with the female in a vignette but not in the male counterpart, thereby increasing the endorsement of depression among female vignettes. This finding is evident in four studies, with the females in vignettes being more correctly identified as depressed than their male counterparts (Bruno et al., 2015; Burns & Rapee, 2006; Marshall & Dunstan, 2011; McCarthy et al., 2011). This problem is addressed by matching the gender of the vignette to those of the participants and ensuring that both genders in the vignettes

have similar presentations of symptoms (Coles et al., 2016; Dolphin & Hennessy, 2014; Marcell & Halpern-Felsher, 2007; O'Driscoll et al., 2012; Olsson & Kennedy, 2010).

Third, the number and variations of response options provided are other factors affecting the rate of correct identification of the vignettes. In a closed-ended question, if the number of responses were increased, there would tend to be a lower rate of correct recognition of depression. One study provided five response options to the recognition of depression question, and the study reported a correct depression recognition rate of 83.6% (Sharma et al., 2017). The rate of correct recognition of depression was much lower in studies that provided more response options, such as that reported by studies conducted among adolescents in China and India (Lam, 2014; Ogorchukwu et al., 2016). However, the majority of the studies that assess knowledge of the recognition of the disorder use an open-ended question format (Burns & Rapee, 2006; Jorm et al., 2006; Kelly & Jorm, 2007; Kelly et al., 2006; Marcell & Halpern-Felsher, 2007). It is also worth noting that studies using open-ended questions with high non-response rates might tend to report higher levels of correct recognition of depression, possibly because the participants who do not respond to the open-ended questions could indicate that they did not know the answers and thus could actually lower the percentage of correct recognition (Essau et al., 2013). Fourth, the mode through which the vignette is presented to the participants also affects correct recognition rates. Higher correct recognition is noted with the presentation of written vignettes than with other methods, such as short films (Marshall & Dunstan, 2011). This is because a vignette that is usually delivered in a written or verbal form has symptoms and risk factors that are clearly stated or mentioned, thereby enabling participants to identify the problems presented in the vignette more easily than in film-based scenarios.

Fifth, the setting and time where the studies were conducted also influence the rate of correct recognition. Studies conducted in developing nations (Adeosun, 2016; Aluh et al.,

2018; Ogorchukwu et al., 2016) reported a much lower recognition rate of depression than those conducted in developed nations (Bruno et al., 2015; Hernan et al., 2010; Lubman et al., 2017; Mason et al., 2015; McCarthy et al., 2011; Recto & Champion, 2017). This finding arises because in developed nations, there are higher levels of awareness of depression among adolescents due to existing school depression education programmes, such as the Beyond Blue programme and the ADAP in Australia and the United States, thereby enabling adolescents in these regions to be able to correctly identify depression (McCarthy et al., 2011; Morgan & Jorm, 2007; Swartz et al., 2007).

Finally, cross-cultural differences could explain variations in the rate of the correct recognition of depression, whereby in some regions, emotional problems and stress are considered the literal translation of depression from the English language to the original native language (Adeosun, 2016; Aluh et al., 2018). Some native languages also have no popular lay term for depression, or even if there are such terms, they are relatively unfamiliar to the public (Amarasuriya, Jorm, & Reavley, 2015; De Silva, Ekanayake, & Hanwella, 2014). This explains the poor ability to recognize depression among adolescents in Nigeria and China, who may not be as well versed in the English language as adolescents from Australia or other European countries. Malaysia is a country with many cultural difference and practices, unfortunately to date in Malaysia there is limited evidence on ability to recognize depression among adolescents from various culture. Therefore, the mechanism on how cross-cultural differences in Malaysia would affect the rate of recognition of depression among adolescents is still not well studied.

Several similarities were reported among studies that found that the majority of participants were able to correctly recognize depression: namely, most of these studies were conducted in developed nations such as Australia and the United States, they utilized

female vignettes with suicidal thoughts and participants were older adolescents with mean ages ranging from 15 to 18.

In this review, seven studies reported that female adolescents are better able to correctly recognize depression than males (Burns & Rapee, 2006; Coles et al., 2016; Essau et al., 2013; Hernan et al., 2010; Marshall & Dunstan, 2011; Melas et al., 2013; Ogorchukwu et al., 2016). However, one study reported that males identify depression more correctly than females (McCarthy et al., 2011), while another study reported no significant gender difference (Aluh et al., 2018). The remaining ten studies reported on an overall rate of recognition without looking into any gender differences (Adeosun, 2016; Attygalle et al., 2017; Bruno et al., 2015; Lam, 2014; Lubman et al., 2017; Mason et al., 2015; Olsson & Kennedy, 2010; Recto & Champion, 2017; Sharma et al., 2017; Skre et al., 2013). Previously, studies have reported that females have a better recognition of depression than males in the young adult population (Cotton, Wright, Harris, Jorm, & McGorry, 2006; Jackson, Judd, Komiti, Fraser, & Murray, 2007; Jorm, Medway, & Christensen, 2000; Klineberg, Biddle, Donovan, & Gunnell, 2011; Wang et al., 2007; Wright & Jorm, 2009). The difference noted across genders with regard to recognition of depression could be explained by the following reasons. First, females are thought to be naturally more instinctive than males in terms of their emotional understanding (Burns & Rapee, 2006). Second, females tend to have a greater interest in, and knowledge of, inter- and intrapersonal processes than males (Berndt, 1998; Leadbeater, Blatt, & Quinlan, 1995). Third, females are simply more willing than males to use psychological and emotional labels (Burns & Rapee, 2006). Fourth, depression is more prevalent among female adolescents; thus, greater MHL could possibly come from greater personal experience of depression in both themselves and their peers (Lewinsohn, Rohde, Seeley, & Fischer, 1993). Finally, the cultural perception that males need to be strong and in

control and not require mental health services could deter males from correctly identifying depression (Hodgetts, 2001).

Much emphasis and importance have been placed on the ability to correctly recognize depression because it creates an urgency to seek appropriate help, facilitates treatment preferences and reduces stigmatising attitudes, which consequently reduces prolonged suffering, risk of suicide and developmental impairment of untreated depression (Burns & Rapee, 2006; Coles et al., 2016; Reavley & Jorm, 2011; Wright et al., 2007; Yap et al., 2013; Zuckerbrot & Jensen, 2006). Furthermore, participants who are able to identify depression correctly are more likely to be diagnosed correctly by doctors, as they tend to present their symptoms in a psychologizing style rather than in a normalizing style (Kessler et al., 1999).

Among the other components of knowledge of depression reported, only a few studies reported on percentages of correct responses (Swartz et al., 2007), and the majority of the other studies reported on the most common and least endorsed statements by participants (Aluh et al., 2018; Attygalle et al., 2017; Bruno et al., 2015; Burns & Rapee, 2006; Calear et al., 2011; Coles et al., 2016; Essau et al., 2013; Jorm et al., 2006; Kelly & Jorm, 2007; Kelly et al., 2006; Marshall & Dunstan, 2011; Mason et al., 2015; McCarthy et al., 2011; Ogorchukwu et al., 2016; Sharma et al., 2017).

Adolescents appear to be more familiar with symptoms of depression such as suicidal thoughts, weight loss and decreased appetite (Bruno et al., 2015; McCarthy et al., 2011). This finding is not surprising, as symptoms such as suicidal thoughts are considered obvious symptoms, thereby alerting participants (Burns & Rapee, 2006). This explains why participants are more inclined to correctly identify depression in vignettes presented with suicidal thoughts (Burns & Rapee, 2006). Other common symptoms mentioned that were not similar across studies were diminished interest in activities, fatigue and

insomnia. Diminished ability to think and depressed mood (sad/tearful) were least regarded as symptoms of depression (Burns & Rapee, 2006; McCarthy et al., 2011). This variation could be because some participants would perceive certain symptoms as "normal" responses to adversity, thereby not endorsing them in certain studies (Simonds & Thorpe, 2003). Two studies reported that adolescents commonly regard the normal ups and downs of life, stress and the way in which a person was raised as causes of depression (Essau et al., 2013; Sharma et al., 2017). The reason for this similarity is unclear, but it could be due to similar religious and socialization practices.

The majority of adolescents regard supportive forms of first action as being of helpful value in addressing depression (Kelly & Jorm, 2007; Kelly et al., 2006; Lam, 2014; Mason et al., 2015). This finding is reassuring and is possibly explained by the fact that supportive forms of first-aid actions such as listening to a person's problems are relatively simple and inexpensive (Nadia Badarudin, 2018). The concern, however, is that many adolescents consider supportive forms of first-aid action without any adult engagement, which could potentially delay the process of professional help seeking (Kelly & Jorm, 2007; Kelly et al., 2006; Lam, 2014; Mason et al., 2015). Self-help strategies and avoidance of high-risk activities are generally regarded by adolescents as having a helpful interventional value for depression (Essau et al., 2013; Jorm et al., 2006). Self-help strategies, such as reading a self-help book, getting up early and going out into the sunlight, are easy to carry out as they are neither expensive nor complicated.

(b) **Help-seeking responses towards depression**

Overall, most studies used a measure of help-seeking intentions and attitudes with regard to the help-seeking component of depression literacy. This review indicates first that the majority of adolescents intend to seek help if faced with an MHD such as depression (Aluh et al., 2018; Boyd et al., 2011; Bradford & Rickwood, 2014; Bruno et

al., 2015; Burns & Rapee, 2006; Coles et al., 2016; Lam, 2014; Marcell & Halpern-Felsher, 2007; Marshall & Dunstan, 2011; McCarthy et al., 2011; Olsson & Kennedy, 2010). Second, more concerning is the fact that informal sources of help are preferred to formal sources of help. Third, as regards barriers to help seeking for depression, adolescents perceive more attitude barriers than structural barriers.

The high rate of intentions to seek help reported by these studies could be due to two reasons. First, there is evidence suggesting that there is an association between the correct recognition of depression and help seeking (Burns & Rapee, 2006; Coles et al., 2016; Wright et al., 2007; Zuckerbrot & Jensen, 2006). Six studies reporting on more than 50% intention to seek help had percentages of correct recognition of depression ranging from 23% to 80%, which could possibly explain the reasons for the high intentions to seek help among participants across these studies (Bruno et al., 2015; Burns & Rapee, 2006; Coles et al., 2016; Marshall & Dunstan, 2011; McCarthy et al., 2011; Olsson & Kennedy, 2010). Second, many participants in these studies who are willing to seek help may do so but without actually correctly identifying the underlying disorder or misidentifying it as something else, thereby resulting in increased intention to seek help, although the source of help may be inappropriate (Adeosun, 2016). This phenomenon is evident in one study, where despite having a very low correct recognition of depression (4.8%), the majority of the participants (95%) did intend to seek help (Aluh et al., 2018). This issue can be addressed if studies examine the willingness to seek help among participants based on the respective response options selected or provided by the participants towards the recognition of the disorder in the described vignette, scenario or film.

The majority of adolescents prefer seeking help from informal sources, such as family and friends, rather than formal sources, such as doctors or mental health professionals. The reason for this preference is because first and foremost, adolescents are familiar with the individuals in the informal category; thus, they have more trust towards them (Burns

114

& Rapee, 2006; Wilson & Deane, 2001). Adolescents may also be afraid of breaching confidentiality among formal sources of help (Burns & Rapee, 2006; Wilson & Deane, 2001). Second, there is poor awareness among the public regarding the availability and roles of mental health professionals (Williams, Cheyne, & MacDonald, 2001). Third, there is inadequate access to, and availability of, mental health professionals in rural areas (Caldwell, Jorm, & Dear, 2004; Goldney, Taylor, & Bain, 2007). Fourth, there are stigma issues associated with seeking help from mental health professionals (Wisdom, Clarke, & Green, 2006). Fifth, many adolescents do not utilize mental health professionals' help because of their inability to correctly recognize the disorder in the first place as an MHD (Jorm et al., 2006). Finally, there is a belief that mental illness is due to supernatural forces and that the need for traditional or religious treatments supersedes the need for professional help (Adeosun, 2016). Studies conducted in India reported that participants commonly endorsed informal sources of help (Ogorchukwu et al., 2016). There were a few studies that reported higher endorsements of formal sources of help among adolescents, and the reason for this could be adolescents' increased awareness regarding professional formal help through the availability of school counsellors, existing school mental health programmes, and increasing awareness of depression and its treatment among the general public (Lubman et al., 2017; Olsson & Kennedy, 2010; Sharma et al., 2017). Adolescents may also be unwilling to seek informal help, such as from teachers, because of the fear that teachers' knowledge of their situation may affect their academic success (Loureiro, Rodrigues, Mendes, Pedreiro, & Sousa, 2013).

It is worth noting that studies reporting participants commonly endorsing both formal and informal help sources as helpful for MHDs have been predominantly conducted in developed nations such as Australia (Burns & Rapee, 2006; Marshall & Dunstan, 2011), with one exception of a study that was conducted in Nigeria (Adeosun, 2016). Adolescents in Nigeria have also endorsed more formal sources of help for the vignette;

however, this is because the majority of participants identified the depressed vignette as having a physical/infection problem, thereby justifying endorsing help from formal sources (Adeosun, 2016).

(c) **Stigmatising attitude responses towards depression**

Overall, most studies used a measure of personal stigma and social distance when reporting on the stigmatising attitudes component of depression literacy followed by perceived stigma and self-stigma. This review indicates first that adolescents tend to display higher perceived stigma than personal stigma towards depression. Second, a high desire for social acceptance towards someone with depression is reported among adolescents.

Both adolescents in Australia and Jordan demonstrated higher levels of perceived stigma than personal stigma, which was examined using the same tool (Depression stigma scale) (Calear et al., 2011; Dardas et al., 2017). This finding is mediated by the concept of "pluralistic ignorance", which states that the majority of individuals mistakenly feel that they display dissimilar attitudes to others and believe that others have more stigmatising attitudes than they do (Reavley & Jorm, 2011d). Adolescents in Jordan have also been reported to have more personal stigma than those in Australia. One of the possible explanations for this is the variation in sampling method utilized by both these studies. A non-random sampling method performed among Australian adolescents could have introduced selection bias and social desirable bias among respondents answering the questionnaire, resulting in lower personal stigma. Second, the greater exposure of young Australians to various mental health education programmes could have led to lower stigmatising attitudes. The other studies all used different tools to measure stigmatising attitudes, making comparisons difficult across studies (Arbanas, 2008; Dolphin & Hennessy, 2014; Kelly & Jorm, 2007; Mason et al., 2015; Sharma et al., 2017; Yoshioka et al., 2014).

Both Japanese and Indian adolescents demonstrated a lower desire for social distance towards a depressed vignette (Sharma et al., 2017; Yoshioka et al., 2014). The reason for this is unclear; nevertheless, some evidence proposes that adolescents have a tendency to be more socially accepting of a peer with depression if they believe that the depressed peer has little control over the cause of depression (Dolphin & Hennessy, 2014).

The majority of adolescents personally (personal stigma) agree that depression is a sign of personal weakness, that they would not tell anyone about the problem and that people with depression are dangerous to others (Sharma et al., 2017; Yoshioka et al., 2014). This is a concerning finding as it reflects the lack of understanding adolescents have with regard to depression being a medical problem that requires professional help. The summary of findings and recommendations from review is shown in Figure 2.6.

Findings	Recommendations

Vignette-based methodology:

- Commonly used approach to examine DL.
- Able to simultaneously examine multiple components of DL.
- No standardize use of vignettes.

→ **Future use of vignette-based methodology:**

- Need to use standardize vignettes.
- Utilize both a male and female vignette.
- Match gender and age of vignettes with that of participants.

Lack of uniformity in reporting of DL:

- Lack of assessment of DL among younger adolescents ages 11 to 14.
- Limited DL studies involving non-school going adolescents.
- Single components of DL are frequently examined.
- Knowledge and help seeking component of DL is most commonly reported on.
- Within each component of DL that is examined, there lack of uniformity.
- Disparate measures used when examining various components of DL.
- This lack of uniformity and disparate measures results in:
  a) Inadequate assessment of DL.
  b) Inability to report on the overall adequacy of DL.
  c) Poor recommendations to DL based interventions.

→ **Future studies of depression literacy among adolescents should:**

- Focus on younger adolescents and non-school going adolescents.
- Come to a consensus on a theoretical mental health literacy framework.
- Aim to examine all components and subcomponents of DL.
- This would allow for:
  a) Adequate assessment of DL.
  b) Increase ability to report on the overall adequacy of DL.
  c) Generate more wholistic recommendations for DL based interventions.

Adolescent understanding of DL:

- Adolescents from developed nations are better able to correctly recognize depression compared to adolescents from developing nations.
- Females are better able to recognize depression compared to males.
- Suicidal thoughts, weight loss and decreased appetite are frequently regarded as symptoms of depression.
- Majority have intention to seek more informal sources of help.
- More perceive stigma compared to personal stigma towards depression.
- A high desire for social acceptance towards individuals with depression.

→ **Future DL based interventions:**

- Educate adolescents on signs and symptoms of depression in order to improve recognition of depression.
- Different approaches may be required to improve DL among male adolescents.
- Educated adolescents on the various symptoms of depression so that they are able to pick up these symptoms early on.
- Need to focus on increasing awareness of roles and responsibility of professional source of help for depression among adolescents.
- Anti stigma measures should aim to destigmatize depression by making adolescents understand that depression is a medical disorder that requires medical help.

Figure 2.5: Summary of findings and recommendations from review.
Note. DL, Depression literacy.

2.4   Theoretical framework

Three frameworks were identified from the literature review that guided the researcher in this study. The social ecological model, the MHL framework by Jorm et al. (1997) and the MHL framework by Kutcher et al. (2016) were used to generate the conceptual framework. In addition, the help-seeking measurement framework was used to identify which help-seeking components to examine (Rickwood & Thomas, 2012) and the individual cognitive model was used to examine the stigma components (Corrigan et al., 2005), as described in Sections 1.1.5.2 and 1.1.5.3. The following paragraphs describe the application of these frameworks.

2.4.1   The social ecological model

The SEM assesses the development of individuals within the context of their environment (Paquette & Ryan, 2001). This model is a comprehensive one that has been used in the public health field to identify, examine and address individuals' risk factors (Centers for Disease Control and Prevention, 2012). These risk factors are identified within this model through four levels: namely, the microsystem, which focuses on individual-level influences; the mesosystem, which describes interpersonal relationship-level influences; exosystems, which are community-level influences; and finally the macrosystem, which includes societal-level influences as shown in Figure 2.7 (Paquette & Ryan, 2001).

In this review, several risk factors for depression among adolescents have been identified at each level. Individual-level influences consist of gender, age, ethnicity, feeling lonely, alcohol intake, smoking, substance abuse, being bullied and academic stress. A lack of parental supervision, parental marital status and parent income were examples of interpersonal relationship-level influences identified. Finally, community-level influences included involvement in co-curricular activity and change of school. This

model was therefore adapted to be able to better identify risk factors of depression among adolescents based on each level of influence.

Figure 2.6: The Social Ecological Model.

Source: Centers for Disease Control and Prevention (CDC). (2012). *The Social-Ecological Model: A Framework for Prevention*. Retrieved November 15, 2017, from http://www.cdc.gov/violenceprevention/overview/social-ecologicalmodel.html

2.4.2 MHL framework

Currently there is no established theory of MHL and MHL has been operationalized as a concept that has multiple components (Spiker & Hammer, 2018). The initial concept of MHL as defined by Jorm et al. (1997) focuses on seven primary components: namely, "recognition of mental disorders, knowledge of how to seek mental health information, knowledge of mental health risk factors, knowledge of aetiology/causes of mental illness, knowledge of self-treatment, knowledge of professional help available, and attitudes that promote recognition of appropriate help-seeking behaviour" (Jorm et al., 1997), as shown in Figure 2.8.
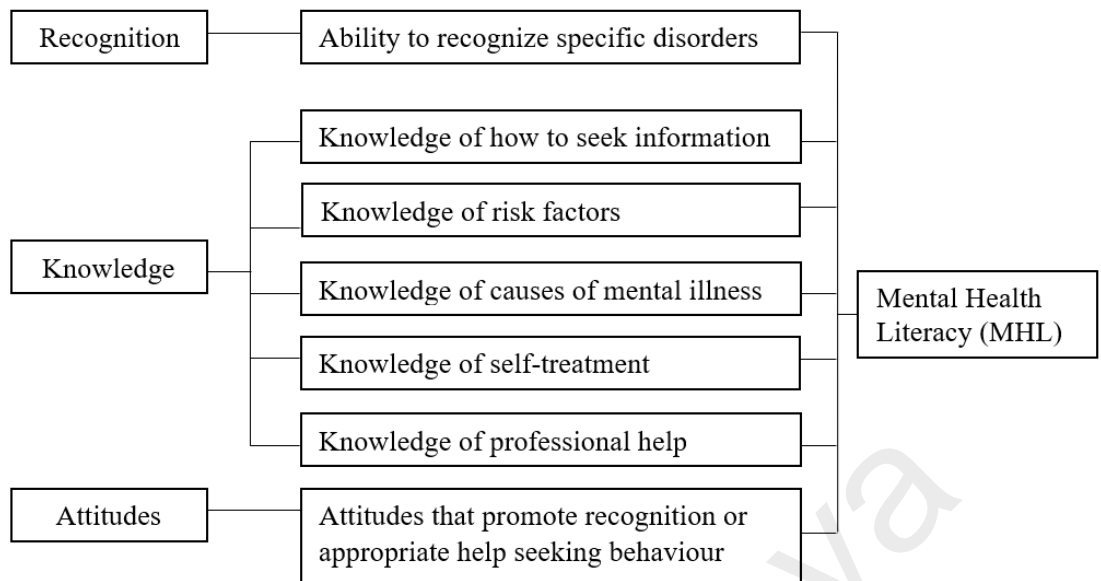
Figure 2.7: MHL Framework 1.

Source: O'Connor, M., Casey, L., & Clough, B. (2014). Measuring mental health literacy-a review of scale-based measures. *Journal of Mental Health*, *23*(4), 197–204.

The second concept of MHL as defined by Kutcher et al. (2016) focuses on three primary components: namely, "(a) mental health knowledge (recognition of symptoms, how to obtain and maintain positive mental health, and treatments of mental disorders); (b) stigma (decreasing stigma); and (c) help-seeking efficacy" (Kutcher, Wei, & Coniglio, 2016), as shown in Figure 2.9.
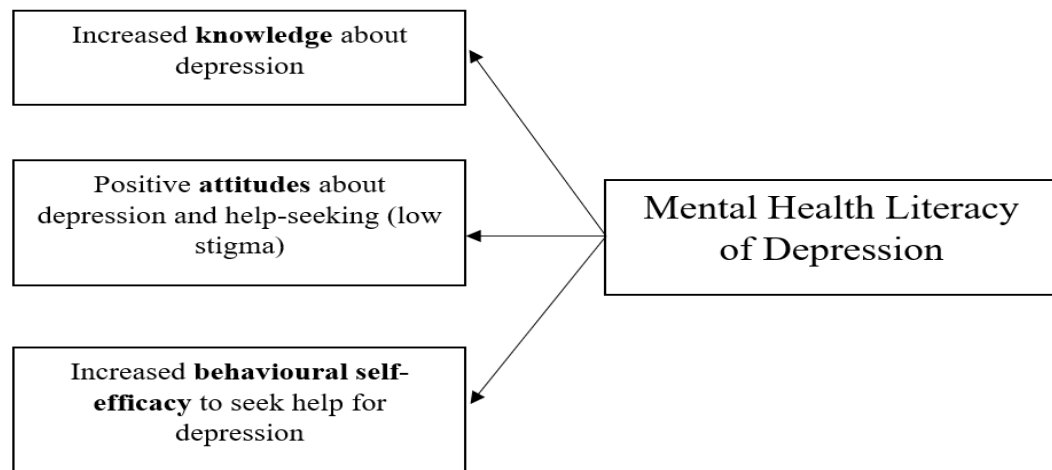
Figure 2.8: MHL Framework 2.

Source: Anjo, S. E. N. (2018). Applying What is Known About Adolescent Development to Improve School-Based Mental Health Literacy of Depression Interventions: Bridging Research to Practice. *Adolescent Research Review*, 1–14.

2.5 Conceptual framework

In order to examine the various components of MHL relating to depression (depression literacy) in a holistic manner, the conceptual framework used in this study was derived from the framework of MHL as defined by both Jorm et al. (1997) and Kutcher et al. (2016), which comprised three components, namely knowledge of depression, help seeking and stigma. The knowledge component of depression literacy included the ability to recognize depression, knowledge of first aid, intervention (self-treatment, professional help) and prevention. The help-seeking component included intention to seek help, sources of help and perceived barriers. The stigma component included personal stigma, perceived stigma and social distance. In addition, the adequacy of depression literacy (defined as the ability to correctly recognize depression with the intention to seek help) was also examined. After examining the association between depression literacy and depression symptoms, potential confounders needed to be controlled, and based on the SEM the determinants of adolescent depression identified were included in this study's variables. Figure 2.10 shows the conceptual framework used in this study.

Individual:	Interpersonal:	Community:
• Gender • Age • Ethnicity • Feeling lonely • Alcohol intake • Smoking • Substance abuse • Bullied	• Lack of parental supervision • Parental marital status • Parental income	• Involvement in co-curricular activity • Change of school

DEPRESSION LITERACY

Knowledge
• Ability to recognize illness
• About first aid for mental disorder
• About interventions of mental disorder
• About prevention of mental disorder

Help seeking (intention and attitudes)

• Intention to seek help
• Sources of help
• Perceive barriers

Stigmatising attitude

• Personal stigma
• Perceive stigma
• Social distance

Adequacy of depression literacy
• Correct recognition of depression with intention to seek help

Depression symptoms

Figure 2.9: Conceptual framework.

2.6   Gaps in the review

The systematic review highlights certain gaps in the literature such as a lack of uniformity and disparate reporting of studies examining depression literacy among adolescents, which occurs as a result of a lack of consensus in the definition of the concept of MHL. There is limited evidence on the reporting of the overall adequacy of depression literacy among adolescents in the existing body of literature. Furthermore, there is a lack of evidence relating to the assessment of depression literacy among Malaysian adolescents, which is a serious concern due to the rising prevalence of depression among Malaysian adolescents.

2.7   Summary of Chapter 2

This chapter has reported on the prevalence of adolescent depression worldwide. It also identified several determinants (many of which were individual-level determinants based on the SEM) of adolescent depression, which are important to control for when examining the association between depression literacy and depression symptoms. Finally, findings from this chapter provided some direction in deciding on an appropriate tool for screening for depression and examining depression literacy among Malaysian adolescents, and on developing a conceptual framework for this project.

CHAPTER 3: METHODOLOGY

3.1   Introduction

The specific research method used for collection and analysis of data in order to fulfil the objectives, along with the flow of the study, are described in this chapter. The sections below are discussed based on the phases of the study. The methodology for phase 1 (validation of the MHL and stigma questionnaire, and CES-D Malay version questionnaire) and phase 2 (assessment of depression literacy and its association with depression symptoms) is described in Sections 3.2 and 3.3.

Within Sections 3.2 and 3.3, there are various subsections that describe the methodology in detail, e.g., Sections 3.2.1 and 3.3.1 explain the design. The processes of ethical clearance and application for permission to use the schools are described in Sections 3.2.2 and 3.3.2. These are followed by Sections 3.2.3 and 3.3.3, which explain the study setting. The study population is described in Sections 3.2.4 and 3.3.4. Sampling methods are described in Sections 3.2.5 and 3.3.5. These are followed by Sections 3.2.6 and 3.3.6, which describe the required sample size and sample size calculation. Sections 3.2.7 and 3.3.7 describe the study variables. Sections 3.2.8 and 3.3.8 describe the study instrument and the measurement scale. Methods of data collection are described in Sections 3.2.9 and 3.3.9. All statistical software and the statistical methods used for data analysis also also described in this chapter. Data management and analysis are described in Sections 3.2.12, 3.2.13, 3.3.11 and 3.3.12. The results and a summary of phase 1 are described in Sections 3.2.14 and 3.2.15.

3.2 Phase 1 (validation study)

3.2.1 Study design

Phase 1 of the study was a cross-sectional study design whose aim was to validate the MHL and stigma questionnaire and CES-D Malay version questionnaire. More specifically, the validation performed in this phase was content validation and translation of the MHL and stigma questionnaire. Reliability analysis of both the MHL and stigma questionnaire and the CES-D Malay version questionnaire was also performed. The justification for selecting a cross-sectional design is because it is practical for obtaining baseline data (British Medical Journal, 2011).

3.2.2 Ethics and permission

3.2.2.1 Ethical application and approval

The ethical code of this study is in line with the Declaration of Helsinki (1974) and the 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 17th February 2017 and ethical approval was obtained on 19th April 2017 (UMREC reference number: UM. TNC2/RC/H&E/UMREC-156). The ethical approval for this study is valid from June 2017 to December 2019. This study was also registered with the National Medical Research Registry (NMRR identification number: 18-719-40569). Participants that were identified as having severe depression were referred to a family medicine specialist at the nearest government health clinic with parental consent, while those with mild to moderate depression received interventions from school counsellors, such as counselling, and subsequently were reassessed to ensure depression symptoms had been resolved.

3.2.2.2 Permission to use schools

Permission to use national secondary schools was requested from the Malaysia MOE on 28th March 2017 and approval was obtained on 21st April 2017. Following this, permission to use national secondary schools in the Federal Territory of Kuala Lumpur was applied for from the Federal Territory of Kuala Lumpur Education Department on 27th April 2017 and approval was obtained on 3rd May 2017. There were three conditions that the research needed to meet before this study could be conducted at the respective schools, which were the following: (a) approval needed to be obtained from the respective school principal; (b) written parental/guardian consent needed to be obtained from the participant; (c) the period allowed for data collection from the respective schools was from 1st June to 30th November 2017. Upon obtaining approval, the major work of data collection was initiated.

3.2.3 Setting

3.2.3.1 The study area phase 1: Federal Territory of Kuala Lumpur

West Malaysia is also known as Peninsular Malaysia as shown in Figure 3.1 (Department of Information Malaysia, 2018). Kuala Lumpur is a Federal Territory that is located in the central west coast region of Peninsular Malaysia and is enclaved within the state of Selangor as shown in Figure 3.2 (Department of Information Malaysia, 2018). It is the national capital and largest city in Malaysia. As a global city of Malaysia, it covers an area of 243,000 square kilometres (Department of Statistics Malaysia, 2018). The estimated total population of the Federal Territory of Kuala Lumpur in 2018 was 1.8 million people (Department of Statistics Malaysia, 2018), and the estimated number of adolescents in the year 2015 was 34,099 (Institute for Public Health, 2015).

Figure 3.1: Peninsular Malaysia.

Source: Department of Information Malaysia. (2018). Geography. Retrieved January 6, 2019, from http://pmr.penerangan.gov.my/

Figure 3.2: Location of Federal Territory of Kuala Lumpur on Peninsular Malaysia.

Source: Department of Information Malaysia. (2018). Geography. Retrieved January 6, 2019, from http://pmr.penerangan.gov.my/

3.2.3.2 Malaysia education system: background information

The education system in Malaysia offers both public and private options for education. The government-funded educational institutes comprise over 95% of all primary and secondary education facilities and about half of the tertiary training institutions (Hays, 2015). The second level of formal education in Malaysia is the secondary schooling system, a phase of scholastic improvement where the foundations created at the primary schooling levels are fortified in readiness for tertiary or professional education (Hays, 2015). The public secondary education in Malaysia is categorized into national schools, arts and sports schools, technical/vocational schools and national religious schools (Hays, 2015). National secondary schools use both Malay (*Bahasa Malaysia*) and English as their medium of instruction; however, Malay (*Bahasa Malaysia*) is the principal language of instruction (Hays, 2015).

A uniform curriculum guarantees consistency in learning, norms and standards among schools. Secondary schooling normally begins at the age of 13 and continues for a span of six years. A form is an educational stage, class or grouping of students in a secondary national school. Students are usually grouped in forms according to their age and will stay with the same group for several years. Form 1 is defined as students that are typically aged 12 or 13 and is equivalent to the 7th Grade in the United States and Year 8 in the United Kingdom (Hays, 2015). In the context of the Malaysian education system, a student is enrolled in Form 1 when they have completed their primary school education (Hays, 2015). Academic performance is assessed at various levels with a set of standardized public examinations at the end of lower secondary and upper secondary levels (Hays, 2015).

3.2.3.3 National secondary schools Federal Territory Kuala Lumpur

Data were collected from national secondary schools in the Federal Territory of Kuala Lumpur, which are governed by the Federal Territory of Kuala Lumpur Education Department under the directive of the MOE, Malaysia. There are three District Education Offices under the administration of the Federal Territory of Kuala Lumpur Education Department, namely Bangsar Pudu, Keramat and Sentul District Education Offices, within which there are a total of 89 national secondary schools. Table 3.1 shows the number of national secondary schools in the Federal Territory of Kuala Lumpur by district as obtained from the MOE, Malaysia in the year 2017 (MOE Malaysia, 2017a).

Table 3.1: National secondary schools in the Federal Territory of Kuala Lumpur

District		No of Schools
Bangsar Pudu		47
Keramat		20
Sentul		22
	Total	89

3.2.4 Study population

For this phase, the study population comprised adolescents studying at Form 1 level in national secondary schools in the Federal Territory of Kuala Lumpur. These adolescents were recruited as this phase is a validation phase of the instrument that is going to be used in phase 2 of this project, which involves adolescents at Form 1 level. Therefore, to ensure compatibility of use of this instrument in phase 2, a similar study population was selected for the validation phase. The inclusion criteria included adolescents schooling at Form 1 level. The only exclusion criterion in this study was participants who were not willing to participate or who did not obtain consent.

3.2.5   Sampling method

Sampling was conducted through two stages. Stage 1 sampling included randomly selecting two schools via simple random sampling from the list of the 89 national secondary schools in the Federal Territory of Kuala Lumpur, which was obtained from the Federal Territory of Kuala Lumpur Education Department. Random selection was done using an Excel RAND function. A list of 89 randomly generated numbers was obtained from the Excel RAND formula, then the random values generated were ordered from lowest to highest and the first two schools in the sorted list were selected. Stage 2 involved universal sampling of all the Form 1 students in each selected school for participation in the validation of the questionnaires.

The two schools randomly sampled were Kepong Baru School from the Sentul district and Bangsar Integrated School from the Bangsar Pudu district. There were around 113 and 500 Form 1 students studying in Kepong Baru and Bangsar Integrated schools, respectively. The total number of students that participated in the study was 65. The sampling method is shown in Figure 3.3. The names of the schools selected based on districts are shown in Table 3.2 and the locations of the schools selected are shown in Figure 3.4.
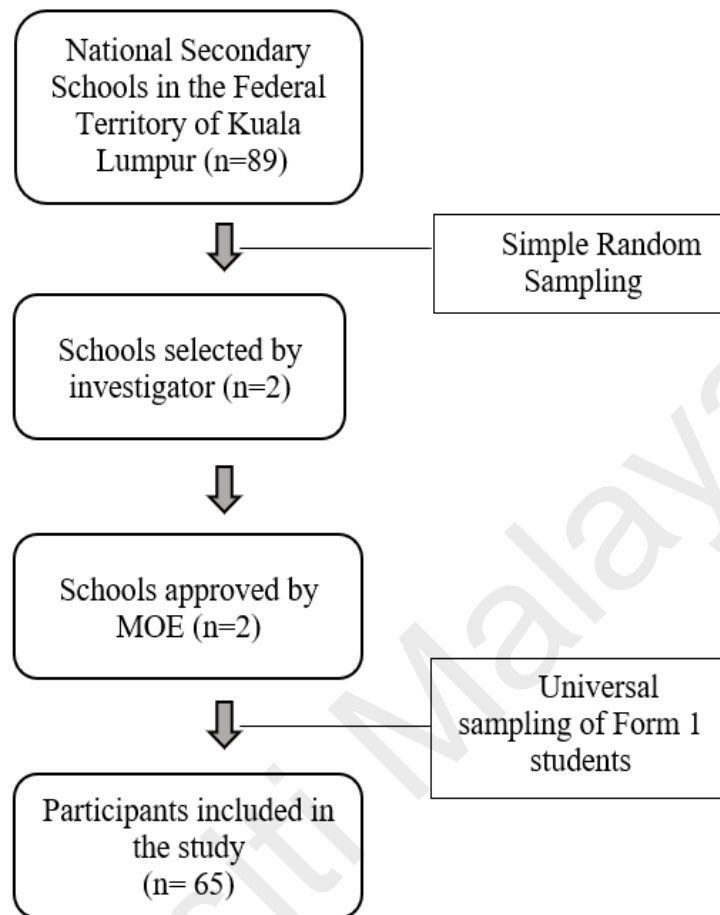
Figure 3.3 :Selection of study participants (Phase 1).

Table 3.2: National secondary schools selected based on districts (Phase 1)

No	Name of School	District
1	SMK Kepong Baru	Bangsar Pudu
2	SMK Bangsar Integrated	Sentul

SMK
Kepong Baru

SMK
Bangsar
Integrated
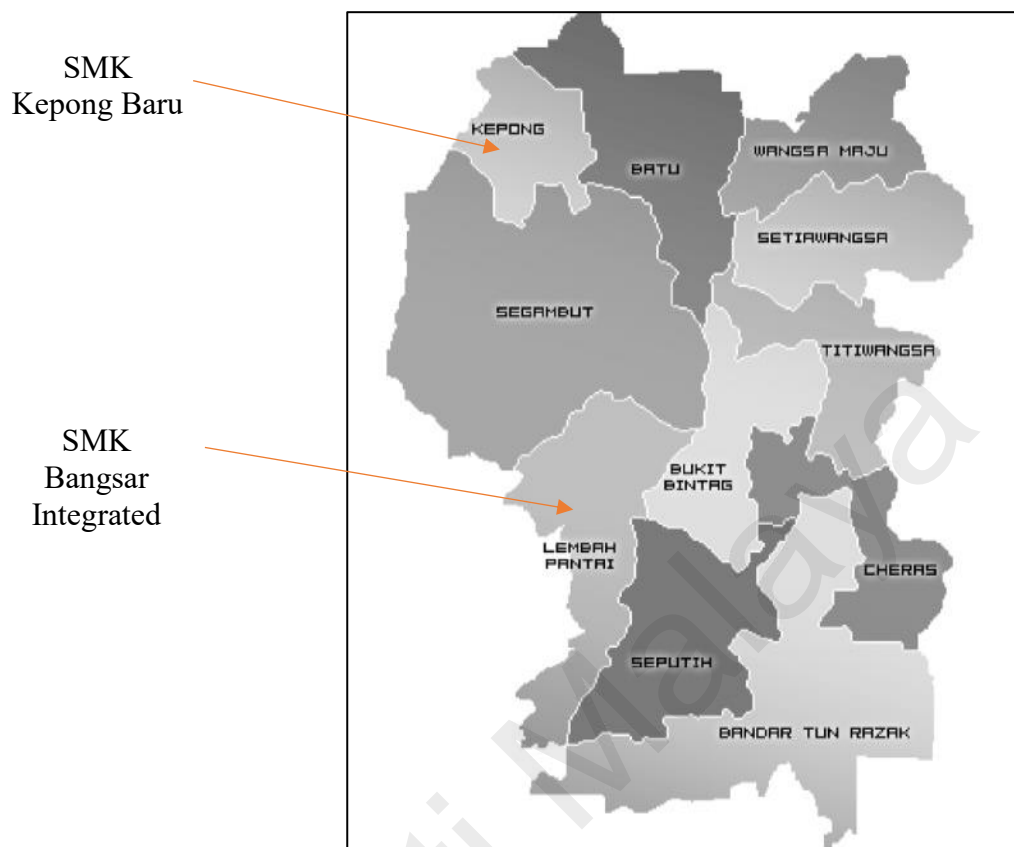
Figure 3.4: Location of schools in the Federal Territory Kuala Lumpur (Phase 1).
SMK, National secondary school.

3.2.6   Sample size calculation

Sample size was calculated based on the statistical analysis required in this phase. In this phase, two statistical analyses were run, which showed internal consistency (Cronbach's alpha), along with test-retest reliability analysis. Therefore, sample size was calculated individually for each of the statistical analyses and the largest sample size was selected.

3.2.6.1 Internal consistency

For internal consistency analysis, a minimum sample of 50 respondents is suggested (Javali, Gudaganavar, & Raj, 2011). This is because at a sample size of 50 and above the alpha coefficient of internal consistency is higher and consistent in terms of efficiency (Javali et al., 2011). An additional 20% dropout rate was set, thus the sample size was inflated to 60 participants (Mazlan & Ahmad, 2013).

3.2.6.2 Intraclass correlation coefficient

The intraclass correlation coefficient (ICC) test sample size calculation was derived from the formula of the ICC test using Power Analysis and Sample Size software version 11.0.7 (Bujang & Baharum, 2017a; Winer, Brown, & Michels, 1991). The ICC formula for sample size calculation is shown in Figure 3.5.

$$n = 1 + \frac{2(Z_\alpha + Z_\beta)^2 k}{(lnC_0)^2(k-1)}$$

$$\text{where: } C_0 = \frac{1+k\theta_0}{1+k\theta_1}$$

$$\theta_0 = \frac{R_0}{1-R_0}$$

$$\theta_1 = \frac{R_1}{1-R_1}$$

Figure 3.5: ICC sample size calculation.

k is the number of raters

R_0 is the value of ICC that is pre-specified in the null hypothesis if it is true

R_1 is the value of ICC that is pre-specified in the alternative hypothesis

Bujang and Baharum (2017a) suggested that when alpha and power were fixed at 0.05 and 80%, respectively, observation per subject was 2 and R_0 was set at 0, a minimum sample size of 36 is sufficient to detect a value of 0.40 for the ICC as shown in Table 3.3 (Bujang & Baharum, 2017a). An additional 20% dropout rate was set, thus the sample size was inflated to 43 participants.

Table 3.3: Sample size requirement for ICC

Observation per subject	ICC	Number of subjects (power=80%)
2	0.2	152
	0.3	66
	0.4	36
	0.5	22
	0.6	15
	0.7	10
	0.8	7
	0.9	5

3.2.6.3 Cohen's Kappa

Sample size for test-retest analysis for Cohen's Kappa statistics was derived based on the three-category response option as there were three response options in the MHL and stigma questionnaire (Bujang & Baharum, 2017b). When alpha and power were fixed at 0.05 and 80%, respectively, a minimum sample size of 52 was required. An additional 20% dropout rate was set, thus the sample size was inflated to 63 participants (Bujang & Baharum, 2017b).

The largest sample size required based on the above calculation was 63 participants. The formal sample size obtained for this phase was 65 participants. All the 65 participants were included for the test-retest but only 52 subjects were present during the second session. The remaining 13 students were absent during the second session of the questionnaire. Table 3.4 shows the required sample size based on statistical analysis.

Table 3.4: Required sample size based on statistical analysis

Statistical analysis	Sample size required (n)
Internal Consistency	60
Test retest reliability analysis (ICC)	36
Test retest reliability analysis (Cohen's Kappa)	63

3.2.7 Study variables

The variables that were collected were gender, age, ethnicity and depression symptoms. The operational definitions that were used were the measured operational definitions, also known as the working definitions (Bishop et al., 2004). Table 3.5 shows the operational definitions and measurement scales of the variables in this phase.

Table 3.5: Operational definitions and scales of measurement of variables (Phase 1)

Operational variables	Operational definitions	Scale of measurement
Gender	As per identification card status.	Male/ Female
Age	As at last birth day.	11,12,13,14,15 years
Ethnicity	As per identification card status.	Malay, Chinese, Indian, Others
Depression symptoms	Symptoms of depression based on the DSM 4 criteria: Changes from previous functioning either depressed mood or loss of interest or pleasure within the past one week including today (Bienenfeld, 2016).	Score below 27 denotes no depression Score 27 and above denotes depression

Note. DSM, Diagnostic and statistical manual of mental disorders.

3.2.8 Study instruments

The study instruments that were validated were the MHL and stigma questionnaire, and the CES-D Malay version questionnaire. The methods used for validating these questionnaires are shown in Figure 3.6. A description of the study instruments is provided in the following paragraphs.
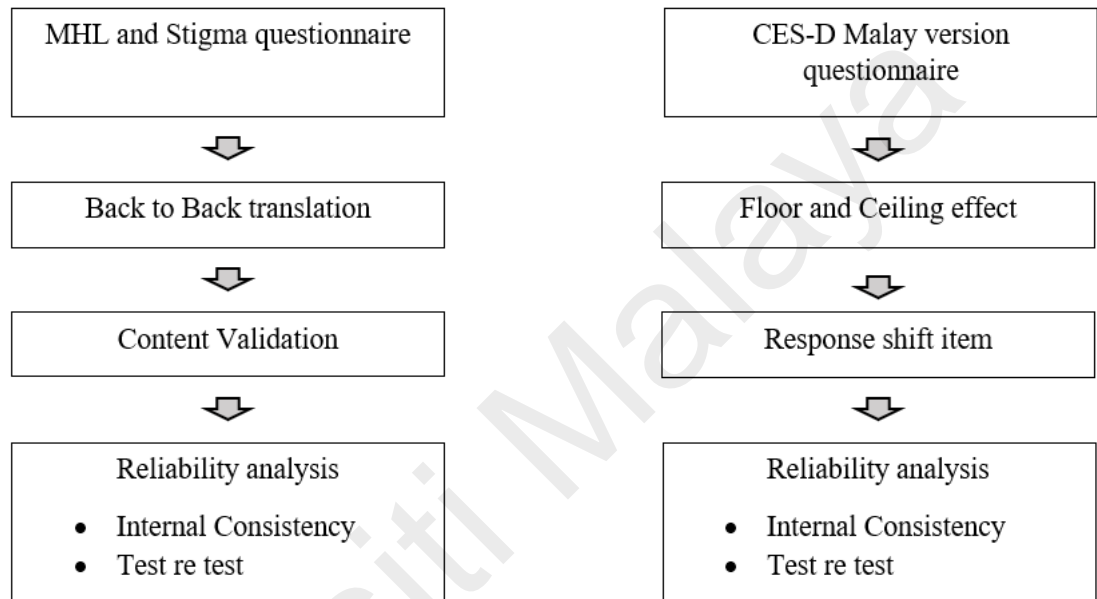
Figure 3.6: Questionnaire validation process.

3.2.8.1 MHL and stigma questionnaire

(a) **Description of the questionnaire**

The MHL and stigma questionnaire version 5 was developed by Reavley and Jorm (2011a) and is based on the MHL framework, which is consistent with the concept of health literacy (Jorm, 2000). This questionnaire is able to simultaneously examine all the components of depression literacy (Rickwood & Thomas, 2012; Wei et al., 2015). The MHL and stigma questionnaire was used in the Australian National MHL and Stigma Youth Survey (Reavley & Jorm, 2011c). This questionnaire has been adopted, translated and widely used by many studies across various countries to assess MHL among

adolescent and adult populations (Bradford & Rickwood, 2014; Essau et al., 2013; Hernan et al., 2010; Jaladin et al., 2016; Jorm et al., 2006; Kelly & Jorm, 2007; Kelly et al., 2006; Lam, 2014; Ogorchukwu et al., 2016; Olsson & Kennedy, 2010; Yoshioka et al., 2014). It has been validated among adolescents and youths internationally and found to have acceptable reliability measures (Jorm, Christensen, et al., 2000; Jorm, Korten, Rodgers, et al., 1997; Jorm et al., 2005; Loureiro, 2015).

This tool has been used to examine depression literacy among university students in Malaysia; however, to date it has not been validated among the Malaysian population (Jaladin et al., 2016). Therefore, there is a need to validate this tool among Malaysian adolescents to further strengthen the findings obtained from using this tool. Permission to use, validate and modify this tool was obtained from the original authors via email in March 2017.

The MHL and stigma questionnaire presents a scenario of a depressed vignette based on the DSM-IV-text revision criteria, following which participants are presented with questions in each section relating to each component of depression literacy, which is based on the person described in the vignette. So as to adjust the survey to Malaysian adolescents, the name in the vignette was changed to a common Malaysian name. John was changed to Ali. The vignette used in this study was as follows:

"Ali is a 15-year-old who has been feeling unusually sad and miserable for the last few weeks. He is tired all the time and has trouble sleeping at night. Ali doesn't feel like eating and has lost weight. He can't keep his mind on his studies and his marks have dropped. He puts off making any decisions and even day-to-day tasks seem too much for him. His parents and friends are very concerned about him."

In total, there are 90 statements from the MHL and stigma questionnaire of which 55 were regarding the knowledge component of depression literacy, while the help-seeking and stigma components comprised 16 and 19 statements, respectively. Statements regarding each component of depression literacy are as follows:

The knowledge component includes the following: To assess knowledge of recognition of depression, respondents were asked the following question. *"What, if anything, do you think is wrong with Ali?"* The responses were composed of several terms or expressions, including "depression", "schizophrenia", "psychosis", "cancer", "mental illness", "psychological, mental, emotional problem", "bulimia", "stress", "substance abuse", "age crisis", "has a problem" and "nothing", which participants are supposed to answer and have the following response format: "yes", "no" or "don't know".

Knowledge of first aid was assessed by presenting participants with the following question: *"Do you think it would be helpful or harmful for Ali if you were to do these things?"* "Listen to his problems in an understanding way", "talk to him firmly about getting his act together", "suggest he seek professional help", "make an appointment for him to see a GP if necessary", "rally friends to cheer him up", "ignore him until he gets over it", "keep him busy to keep his mind off problems" or "encourage him to become more physically active". Responses were coded as "helpful", "harmful" or "don't know".

Knowledge about interventions was assessed with a series of questions asking the respondents to rate the likely helpfulness of various interventions (rated as likely to be "helpful" or "harmful" or "don't know" for the person in the vignette). The interventions covered a wide range of professional and non-professional individuals/organizations (e.g., doctor or family doctor, teacher, counsellor, kids helpline, psychologist, psychiatrist, close family member, close friend), medications (e.g., vitamins, antidepressants, tranquillizers, antipsychotics, sleeping pills) and other interventions

(e.g., becoming more physically active, participating in relaxation training, practising meditation, receiving acupuncture, getting up early each morning and getting out in the sunlight, receiving counselling, receiving cognitive-behaviour therapy, searching websites that provide information about his problem, reading a self-help book on his problem, joining a support group of people with similar problems, going to a local mental health service, drinking alcohol to relax, smoking cigarettes to relax, using marijuana to relax, cutting down on drinking alcohol, cutting down on smoking cigarettes, cutting down on use of marijuana).

Knowledge about prevention strategies for depression was assessed by asking participants the following question: *"If a young person did the following, do you think that it would reduce their risk of developing a problem like Ali's?"* The preventive strategies that followed were: keeping physically active, avoiding situations that might be stressful, maintaining regular communication with friends, keeping in regular contact with family and making regular time for relaxing activities. Responses were coded as "yes", "no" or "don't know".

The help-seeking component included the following: to assess the help seeking of participants for the person described in the vignette, three questions were asked. First, the intention to seek help was assessed by asking participants the question: *"If you had a problem right now like Ali's would you go for help?"* Second, attitudes towards sources of help were examined by asking participants: *"Where would you go to seek help?"* The source of help included family, counsellor/psychiatrist, teacher, peer (friend). Third, to assess attitudes towards barriers to help seeking, participants were asked: *"What might stop you from seeking help from this (person/service)?"* A wide list of barriers was included, such as not having enough money to get help, concern that the person might feel negatively about you, concern that the person might give wrong information, being

worried about what other people might think of you for seeking someone to help, the person/service is too far to travel to, it is too hard to get an appointment, concern about the negative effects of treatment, not liking the type of treatment that is likely to be offered, feeling that nothing can help your problem, having to wait for an appointment, too embarrassed/shy. Responses for all three questions were coded as "yes", "no" or "don't know".

Finally, the stigma components included the following: stigmatising attitudes were assessed by asking participants whether they "agree", "disagree" or "don't know" regarding the following question on personal stigma: *"Please indicate how strongly you personally agree or disagree with each statement."* The statements included were: Ali could snap out of it if he wanted, Ali's problem is a sign of personal weakness, Ali's problem is not a real medical illness, Ali is dangerous to others, it is best to avoid Ali so that you don't develop this problem yourself, Ali's problem makes him unpredictable, you would not tell anyone if you had a problem like Ali's. Participants' perceived stigma was assessed by asking them: *"We would like you to tell us what you think most other people believe about Ali."* The statements included on perceived stigma were: most other people believe that Ali could snap out of it if he wanted, most people believe that Ali's problem is a sign of personal weakness, most people believe that Ali's problem is not a real medical illness, most people believe that Ali is dangerous to others, most people believe that it is best to avoid Ali so that they don't develop this problem themselves, most people believe that Ali's problem makes him unpredictable, most people would not tell anyone if they had a problem like Ali's. Social distance was examined by asking participants: *"How would you feel about spending time with Ali?"* The items included were going out with Ali at the weekend, working on a project with Ali, inviting Ali round to your house, going to Ali's house, developing a close friendship with Ali.

In this study, adequate depression literacy is defined as the correct recognition of depression with intention to seek help (Lam, 2014). Correct recognition of depression is assessed under the knowledge of recognition of depression, whereby correct recognition of depression is reported if a participant replies "yes" to a statement on depression, mental illness or stress and "no" to other statements, which include eating disorder, substance abuse, nothing in this section (Lam, 2014; Loureiro et al., 2013), while intention to seek help is assessed under the help-seeking component of depression literacy and those participants who reply "yes" to intention to seek help are classified as having intention to seek help. Participants who were able to correctly recognize depression with intention to seek help were classified as having adequate depression literacy.

(b) **Back to back translation**

A translation was carried out of the MHL and stigma questionnaire as it was initially constructed in English. It was subsequently translated into *Bahasa Malaysia* and afterwards it was back-translated into English by four Malaysian translators with a similar educational background and similar command of English and *Bahasa Malaysia* working at Learning Port Bangsar South, Kuala Lumpur (Learning Industry, 2012). Learning Port is the producer of Malaysia's first online interactive textbook with comprehensive module content for primary and secondary schools. A forward and backward translation process was used as this would ensure consistency (Su & Hoe, 2008). Variations in the original and back-translated versions were discussed and resolved by joint agreement involving all four translators. The final questionnaire was presented in a dual-language format (English and *Bahasa Malaysia*). The translation of the questionnaire was carried out between May and June 2017.

3.2.8.2 CES-D questionnaire

The CES-D is a well-established instrument that is used to screen for depression symptoms among adolescents. Its original English version was designed in 1977 by the American National Institute of Mental Health and reported to have satisfactory psychometric properties (Radloff, 1977; Sheehan, Fifield, Reisine, & Tennen, 1995). The CES-D is a 20-item self-administered questionnaire based on four-point Likert scale response options. The items comprise six scales representing various key domains of depression, namely six scales reflecting major dimensions of depression: depressed mood, feelings of guilt and worthlessness, feelings of helplessness and hopelessness, psychomotor retardation, loss of appetite and sleep disturbance. The main components of depressive symptomatology were identified from clinical literature and factor analyses. The items were selected from a pool of items from previously validated depression scales (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961; Raskin, Schulterbrandt, Reatig, & McKeon, 1969; Zung, 1965). Items 4, 8, 12 and 16 are scored in the reverse order. The total score for all items provides a continuous CES-D score value ranging from 0 to a maximum of 60.

The CES-D instrument has been translated into many languages including Malay. The Malay version of the CES-D instrument used in this study was translated by Ghazali et al (2016) (as shown in Appendix D) and is a valid tool used to screen for depression symptoms among the Malaysian adolescent population (Ghazali et al., 2016). The Malay version of the CES-D instrument has been validated previously among the Malaysian adolescent population and found to have satisfactory psychometric properties and a specificity of 90% (Ghazali et al., 2016, 2014). However, this instrument still awaits a test-retest reliability analysis among the Malaysian adolescent population (Ghazali et al., 2016). This instrument is based on DSM-IV diagnostic criteria for depression and a cut-off point of 27 has been determined to differentiate between depressed and non-depressed

adolescents in Malaysia (Ghazali et al., 2016, 2014). Since this tool is available in Malay, no translation was required and the questionnaire was presented to participants in Bahasa Malaysia. Permission to use the CES-D Malay version questionnaire was obtained from the author, Prof. Dr Siti Raudah Ghazali, of the University of Malaysia, Sarawak, via email in April 2017. Table 3.6 shows the items in the CES-D questionnaire.

Table 3.6 : Items in the CES-D questionnaire

Item	Statement
1.	I was bothered by things that usually don't bother me
2.	I did not feel like eating; my appetite was poor
3.	I felt that I could not shake off the blues even with help from my family or friends
4.	I felt I was just as good as other people
5.	I had trouble keeping my mind on what I was doing
6.	I felt depressed
7.	I felt that everything I did was an effort
8.	I felt hopeful about the future
9.	I thought my life had been a failure
10.	I felt fearful
11.	My sleep was restless
12.	I was happy
13.	I talked less than usual
14.	I felt lonely
15.	People were unfriendly
16.	I enjoyed life
17.	I had crying spells
18.	I felt sad
19.	I felt that people dislike me
20.	I could not get going

3.2.9   Data collection

This section started with the planning and printing of work (for the subject information sheet, consent form and questionnaire), along with contacting school principals and counsellors. The researcher had to get authorization to utilize the schools from the respective school principals and obtain written parental consent forms from the participants. Therefore, the researcher personally met all the respective school principals to explain and obtain permission to conduct the study. Following that, the principals appointed a teacher or school counsellor to facilitate the process of obtaining consent and

conducting the delivery of the questionnaire to the students. All Form 1 students were assembled in a hall in the respective schools on certain dates and briefed about the study (the purposes of the study, the benefits of the study, the need for test-retest reliability analysis, the consent form, including how to fill in the consent forms, and who and where to sign were explained to the students by the researcher).

All questions and queries from the students were answered during this period, following which, the consent forms and the study information sheets were given to the students. Students filled in their particulars, including their name and identification number, on the consent forms. Students were allowed to take the consent forms back to their parents, to read and approve or disapprove.

All students had the choice of whether to participate in the research or not. Respondents were also allowed to withdraw from this research at any time during the study period. However, none of the respondents requested to withdraw. Students were advised to return the consent forms within two days to the respective school counsellors or teachers. The contact number of the researcher was also available on the consent form, so all parents or guardians were able to contact the researcher if they required more information regarding the study. Students not present were given the consent forms by the counsellors the following day.

The researcher then collected the consent forms from the respective school counsellor or teacher and reported on the number of consent forms collected with signed parental or guardian consent. To ensure confidentiality there were no personal identifiers present on the questionnaires. A record log was created on an Excel sheet whereby each participant was given a unique serial code that was written on the respective questionnaire. Written consent was obtained from the participants in May 2017.

Data collection in this phase was conducted from June to July 2017. A date was set for the distribution of the questionnaire to the participants in the respective schools. The researcher was given two teaching sessions (45 minutes) to distribute the questionnaire to the participants. The researcher was accessible in every session to give help and furthermore to guarantee autonomous responding. Participants completed the questionnaire within 30 to 40 minutes. Upon completion of the questionnaire session the researcher personally collected all completed questionnaires and simultaneously missing values were identified and clarified with the participants.

For the test-retest reliability analysis an interval of two weeks was used for the second session. T1 refers to the first time the assessment was done and T2 is the second time the assessment was done (Khan et al., 2010). Participants answered the questionnaire twice with an interval of two weeks between T1 and T2. Data from 65 participants were collected from the first questionnaire session (T1) in June 2017 and data from 52 participants were collected in the retest session (T2) in July 2017.

3.2.10 Software tool

(a) **SPSS version 24.0**

The Statistical Package for the Social Sciences (SPSS) is a statistical package for data analysis. This statistical software can be utilized to perform profoundly complex data manipulation and analysis with simple instructions. Numerous highlights of SPSS can be opened by means of a drop-down menu or can be customized with a syntax linguistic structure order. All raw data were entered into this software, following which, cleaning of data and descriptive analyses were performed using this software. Internal consistency (Cronbach's alpha), ICC and Cohen's Kappa statistics were also performed using this software.

(b) **Microsoft Excel 2010**

Microsoft Excel is one of the functions of Microsoft Office. It contains the fundamental highlights of all spreadsheets utilizing a lattice of cells to sort information. This software additionally has graphical, essential numerical and statistical analysis capacities. It was used for data transfer of hard copy to soft copy formats, content validation index calculation, response shift estimation, the designing of bar charts and the function of simple random sampling.

3.2.11 Statistical methods used

The various statistical methods that were used for validation of the questionnaires in this phase are described in this section. The statistical method used for this phase for each questionnaire is described in Table 3.7.

Table 3.7 : Statistical methods of validation based on each questionnaire

Statistical methods	MHL and stigma questionnaire	CES-D Malay version questionnaire
Content validation	Item-content validity index	-
Internal consistency	Cronbach's alpha	Cronbach's alpha
Test re-test	Cohen's kappa statistics	Intraclass correlation coefficient
Response shift of items	-	Percentage of item response shift
Floor and ceiling effect	-	Percentage of the highest and lowest possible scores

Note. -, Not performed.

3.2.11.1 Content validation

Content validity examines the extent to which the concepts of interest are comprehensively represented by the items in the questionnaire (Terwee et al., 2007). There are a few things that need to be considered when performing content validation: first, the aim of the questionnaire, whether it is discriminative, evaluative or predictive; second, the target population for which the questionnaire is intended; third, the concepts that the questionnaire is intended to measure; fourth, item selection and reduction, which is decided based on item readability and comprehension (tested during the pilot study); and finally, the interpretability of the items, whereby completing the questionnaire should not require reading skills beyond that of a 12th grader (equal to Form 5 in the Malaysian context) – this is to avoid missing values and unreliable answers (Streiner & Norman, 2003). Usage of the Item-Content Validity Index (I-CVI) is suggested. However, this is dependent on the number of experts as follows: (a) number of experts ≤ 5, all must agree: I-CVI = 1 (5/5 = 1); (b) number of experts ≥ 6, one could disagree: I-CVI ≥ 0.83 (5/6 = 0.83); and (c) number of experts ≥ 9, two could disagree: I-CVI ≥ 0.78 (7/9 = 0.78) (Terwee et al., 2007).

Five psychiatrists with experience in child and adolescent psychiatry were selected as subject matter experts for the process of content validation. The five subject matter experts were selected from Kuala Lumpur Hospital, Sungai Buloh Hospital, University Malaya Medical Centre and University Kebangsaan Malaysia Medical Centre, using the convenient sampling method, following which, the researcher approached all five psychiatrists and explained the study to them and provided the content validation evaluation sheet.

The subject matter experts reviewed each item in the MHL and stigma questionnaire and provided a score on how important or relevant the item was in measuring the concept. There were four response options: not relevant, not important, relevant and very important. Responses of relevant or very important were considered to agree with the item and responses of not relevant or not important were considered to disagree with the item. Also, subject matter experts provided relevant comments on the understanding and comprehensiveness of each item in regard to its use among Malaysian adolescents. Finally, subject matter experts also provided some suggestions of alternative terminologies for items that may be more suitable for use among Malaysian adolescents.

After one week, the content validation evaluation sheet was collected back from the subject matter experts. The I-CVI was calculated for each item and items with a I-CVI < 1 were removed and those items with a I-CVI =1 were retained (Sangoseni, Hellman, & Hill, 2013). Summary measures (number of agreements and I-CVI) were calculated. Calculation of I-CVI was performed using Microsoft Excel 2010. The content validation was performed from April 2017 to May 2017.

3.2.11.2 Internal consistency

Internal consistency is a measure of the extent to which items on a questionnaire scale are correlated (homogeneous), thereby measuring the same concept. Internal consistency is an important measurement property for questionnaires that aim to measure a single underlying concept (construct) by using multiple items. It also affects the likelihood of producing false positives and false negatives (Terwee et al., 2007). To assess the internal consistency among the items of the questionnaire and the intercorrelation among them, the Cronbach's alpha test was used. The level of consistency was calculated and interpreted as suggested by Gliem and Gliem (2003) as shown in Table 3.8 (Gliem &

Gliem, 2003). Summary measures (Cronbach's alpha) were calculated and presented in a table. Calculation of Cronbach's alpha was performed using SPSS 24.0 software.

Table 3.8: Cronbach's alpha value interpretation

Cronbach's alpha	Interpretation
$\alpha \geq 0.9$	Excellent
$0.9 > \alpha \geq 0.8$	Good
$0.8 > \alpha \geq 0.7$	Acceptable
$0.7 > \alpha \geq 0.6$	Questionable
$0.6 > \alpha \geq 0.5$	Poor
$0.5 > \alpha$	Unacceptable

Note. >, More than; ≥, More than or equals to.

The Cronbach's alpha was calculated for the MHL and stigma questionnaire and the CES-D questionnaire. For the MHL and stigma questionnaire the Cronbach's alpha was calculated based on the various constructs in the questionnaire such as the knowledge about recognition of depression, knowledge about first aid for depression, knowledge about interventions for depression, knowledge about prevention of depression, help-seeking, personal stigma, perceived stigma and social distance constructs, while for the CES-D Malay version questionnaire Cronbach's alpha was calculated for all 20 items overall. Both the Cronbach's alpha and the Corrected Item-Total Correlation (CITC) were calculated for both questionnaires. The Cronbach's alpha calculation was carried out from June 2017 to July 2017.

3.2.11.3 Reproducibility

Reproducibility is the degree to which repeated measurements in stable persons (test-retest) provide similar answers. Reproducibility involves both agreement and reliability. Agreement focuses on the absolute measurement error. Reliability focuses on the degree of difference among individuals from one another, despite measurement error (Zaki, Bulgiba, Nordin, & Ismail, 2013). For quantitative variables, reliability can be measured by ICC, using the intraclass correlation coefficient for agreement (ICC_A). For qualitative

nominal variables, reliability can be measured using Cohen's Kappa statistics. As the items in the MHL and stigma questionnaire are nominal (qualitative) in nature and items in the CES-D are continuous (quantitative) in nature, Cohen's Kappa statistics and ICC_A were used, respectively (Cyr & Francis, 1992). Calculation of both ICC_A and Cohen's Kappa statistics was performed using SPSS 24.0 software. Reliability analysis was performed in July 2017.

(a) **Intraclass correlation coefficient**

ICC is suitable for assessing the reliability of continuous and ordinal data such as Likert scale data as it is a mathematical equivalent of weighted Kappa for ordinal data and it addresses some of the limitations of using weighted Kappa such as bias and non-independence of ratings (Fleiss & Cohen, 1973). Both total score reliability and item by item reliability were calculated for the CES-D Malay version questionnaire. The ICC calculation used in this study was based on the two-way mixed-effect model and absolute agreement as these options are recommended when assessing test-retest reliability using ICC (Koo & Li, 2016; Weir, 2005). A two-way mixed-effect model was used as the test-retest reliability analysis involved selected raters (young adolescents), who are the only raters of interest. With this model, the results only represent the reliability of the specific raters involved in the reliability experiment (Koo & Li, 2016). Absolute agreement was used in the calculation of ICC as in test-retest reliability studies, measurements would be meaningless if there was no agreement between repeated measurements (Koo & Li, 2016).

In this study, the reference values of the ICC are categorized as suggested by Portney & Watkins (2009) as < 0.5, 0.5 to 0.75, 0.75 to 0.9, and > 0.90, which indicate poor, moderate, good and excellent reliability, respectively, based on 95% CI, as shown in Table 3.9 (Portney & Watkins, 2009). For this study, a retest interval of two weeks was used as this probably eliminates any potential effects of memory, while at the same time reducing the potential for change in symptoms of depression (Streiner & Norman, 1995). Both the total and item by item ICC estimates and their 95% confident intervals were calculated.

Table 3.9: ICC coefficient value interpretation

ICC	Interpretation
Less than 0.50	Poor agreement
0.50 to 0.75	Moderate agreement
0.75 to 0.90	Good agreement
More than 0.90	Excellent agreement

(b) Cohen's Kappa statistics

The inter-rater reliability analysis was calculated using the Cohen's Kappa statistic to determine consistency among rater's response in T1 and T2. The Cohen's Kappa statistic was used as all the questions were in the nominal scale (Sim & Wright, 2005). The overall measure of true agreement is Kappa, which indicates the proportion of agreement beyond that expected by chance (Sim & Wright, 2005). Cohen's Kappa can be used to measure the agreement between two time points in the response to an item. The equation for κ is the following:

$$K = \frac{P_{observed} - P_{chance}}{1 - P_{chance}}$$

κ = Kappa statistic

P_0 = proportion of observed agreements

P_c = proportion of agreements expected by chance

If the raters are in complete agreement then $\kappa = 1$.

Landis and Koch (1977) suggested that Kappa values of 0.21 and above were accepted as this indicates fair agreement (Landis & Koch, 1977) as shown in Table 3.10.

Table 3.10: Cohen's kappa value interpretation

Kappa	Interpretation
Less than 0	Poor agreement
0.0 to 0.20	Slight agreement
0.21 to 0.40	Fair agreement
0.41 to 0.60	Moderate agreement
0.61 to 0.80	Substantial agreement
0.81 to 1.00	Almost perfect agreement

3.2.11.4 Response shift of items

Overall stability rates of items were given by the proportion of subjects showing no response shift on the items between test (T1) and retest (T2) (Liu et al., 2010). The response shift of items was calculated as part of the validation for the CES-D Malay version questionnaire. The frequency of response shifts on one, two and three categories of response options was also computed. The following steps were used to obtain the response shift for the items in the CES-D Malay version questionnaire using Microsoft Excel. First the difference in response for each item in T1 and T2 was calculated (e.g., numerical response option in T2 for item 1 minus numerical response option in T1 for item 1). The second step involved calculating the percentages of response shift based on each category of response for each item. Finally, using the sort function, the response shift of each item was sorted as follows: (a) percentages of no category shift; (b) percentages of one category shift; (c) percentages of two category shifts; and (d) percentages of three category shifts. The data were then presented in a horizontal bar chart.

3.2.11.5 Floor and ceiling effects

Floor and ceiling effects were examined as part of the validation for the CES-D questionnaire. A ceiling effect is said to occur when a high proportion of subjects in a study have maximum scores in the observed variable. This makes discrimination among subjects at the top end of the scale impossible (Li, 1998). The presence of ceiling effects could indicate that the questions are too easy for the subjects. A floor effect occurs when most of the subjects obtain scores near the bottom of the observed variable. In the presence of either floor or ceiling effects this indicates there is very little variance (Li, 1998). Floor and ceiling effects are considered to be present if more than 15% of respondents have achieved the lowest or highest possible score, respectively (Terwee et al., 2007). Floor and ceiling effects were examined simply by running the frequency analysis in SPSS on the variable for total depression score, then the frequency of the highest and lowest possible scores was identified and it was checked whether they were more than 15%, respectively.

3.2.12 Data management

The SPSS 24.0 software was used for all the processes involved in data management, including entry and cleaning of data. During the process of data collection, all primary data were documented by hand on the questionnaires. Subsequently a worksheet was created in SPSS and all raw data were imported into this worksheet. To maximize accuracy and reduce error during the entry of data, double data entry was performed. The first data entry was performed in June 2017, and the second data entry was performed from July 2017. Two sets of files were created for the same variable, then those two files were compared using SPSS to see whether there were any variations (mismatches) using the compare data set function. The maximum reported number of mismatches was set at 500. There were 16 mismatches identified. Variations or missing data were cross-checked with the original questionnaires. The purpose of data cleaning is to ensure that high-

quality data are generated that have no or minimal errors, before proceeding to data analysis. The SPSS output table of the merge files matched summary and mismatched by cases are shown in Tables 3.11 and 3.12. Following double data entry, data were merged and then checked for abnormal values (abnormal data points).

Table 3.11: Matched summary (Phase 1)

| | | Matched summary | |
| | | Datasets | |
Results	Statistics	Active	Comparison
Cases	Count	65	65
Cases compared	Count	65	65
	Percent	100.0%	100.0%

Table 3.12: Mismatched by cases (Phase 1)

Mismatched by cases		
Cases compared	Count	65
Cases containing mismatches	Count	16
	Percent	24.6%

3.2.13 Data analysis

Data analysis of 65 participants was performed in the first session (T1) and of 52 participants in the second session (T2). Data were analysed using SPSS 24.0 software (International Business Machines [IBM] Corporation, 2016). Sociodemographic data were analysed using descriptive statistics. The following paragraphs describe the data analysis based on specific objectives.

First objective: to validate the MHL and stigma questionnaire. Content validation was performed on all the items in the MHL and stigma questionnaire and the results of content validation were presented based on the I-CVI for each item. The mean I-CVI for each construct of the MHL and stigma questionnaire, number of items retained and number of items dropped were reported. Internal consistency was calculated for each construct in the MHL and stigma questionnaire. Cronbach's alpha and CITC values were also

reported. For the reliability analysis (two-week test-retest), Cohen's Kappa statistics for each item in the MHL and stigma questionnaire were reported.

Second objective: to validate the CES-D Malay version questionnaire. Percentages of floor and ceiling effects and percentages of response shift of items were reported. For the internal consistency analysis, Cronbach's alpha and CITC values were also reported. For the reliability analysis (two-week test-retest), the total ICC, item by item ICC and the 95% CI were presented.

3.2.14 Results of validation

Section 3.2.14.1 describes the samples and variables in phase 1 of the study. The results of validation of the MHL and stigma questionnaire and the CES-D Malay version questionnaire are described in Sections 3.2.14.2 and 3.2.14.3.

3.2.14.1 Description of samples and variables in phase 1

During data collection in this phase, four variables were collected, namely gender, age, ethnicity and depression score. A total of 65 samples were collected for each variable. Of these, 21 samples were from the Integrated Bangsar School and 44 were from the Kepong Baru School. The majority of participants were Chinese (56.9%), followed by Malay (32.3%), Indian (3.1%) and other races (7.7%). The majority of participants were aged 13 (92.3%), followed by those aged 14 (6.2%) and those aged 12 (1.5%). There were 52 (80.0%) female participants and 13 (20.0%) male participants. Table 3.13 shows the demographic characteristics of the participants

Table 3.13: Demographic characteristics of participants (N= 65)

Characteristics	Frequency N (%)
Gender	
Male	13 (20)
Female	52 (80)
Age (Years)	
12	1 (1.5)
13	60 (92.3)
14	4 (6.2)
Ethnicity	
Malay	21 (32.3)
Chinese	37 (56.9)
Indian	2 (3.1)
Others	5 (7.7)

3.2.14.2 Validation of MHL and stigma questionnaire

(a) Content validation

The original number of items in the MHL and stigma questionnaire was 90. All items in the construct of knowledge about prevention, help-seeking and stigmatising attitudes obtained an I-CVI of 1 and a mean I-CVI of 1, thus all items within these constructs were retained. A total of 12 items obtained an I-CVI of less than 1, thus these 12 items were dropped. These 12 items were from the constructs of knowledge about recognition of disorder (6 items), knowledge about first aid for mental disorder (3 items) and knowledge about interventions for mental disorder (3 items). The remaining 78 items were then subjected to internal consistency and test-retest reliability analysis. Table 3.14 shows the number of items obtaining an I-CVI of 1 and less than 1 in each construct.

Table 3.14: Number of items obtaining I-CVI = 1 and < 1 in each construct

Construct	Total item	Number of item with I-CVI = 1	Number of item with I-CVI < 1
Knowledge on recognition of disorder	12	6	6
Knowledge about first aid for mental disorder	8	5	3
Knowledge about interventions of mental disorder	30	27	3
Knowledge about prevention of mental disorder	5	5	0
Help seeking	16	16	0
Personal stigma	7	7	0
Perceived stigma	7	7	0
Social distance	5	5	0
Total	90	78	12

Note. I-CVI , Item-content validity index; =, Equals to; < , Less than.

From the knowledge about recognition of disorder, the items dropped were "schizophrenia", "psychosis", "cancer", "psychological, mental and emotional problem", "age crisis" and "has a problem". The item labelled "bulimia" was changed to "eating disorder". From the knowledge about first aid for mental disorder, the items dropped were "talk to him firmly about getting his act together", "make an appointment for him to see a GP if necessary: this would be with his knowledge" and "rally friends to cheer him up". From the knowledge about interventions for mental disorder, the items dropped were "tranquillizers", "antipsychotics" and "receiving cognitive-behaviour therapy". The total mean I-CVI and item I-CVI for the items in the MHL and stigma questionnaire are shown in Tables 3.15 to 3.22.

Table 3.15: I-CVI for items in knowledge of recognition of disorders

Items	Expert					Number of agreement	I-CVI
	1	2	3	4	5		
Depression	✓	✓	✓	✓	✓	5	1
Schizophrenia	✓	X	✓	✓	X	3	0.6
Psychosis	X	X	✓	✓	✓	3	0.6
Cancer	✓	✓	✓	✓	X	4	0.8
Mental illness	✓	✓	✓	✓	✓	5	1
Psychological, mental,emotional problem	✓	X	✓	✓	X	3	0.6
Bulimia	✓	X	X	X	X	1	0.2
Stress	✓	✓	✓	✓	✓	5	1
Substance abuse	✓	✓	✓	✓	✓	5	1
Age crisis	✓	X	✓	✓	✓	4	0.8
Has a problem	✓	✓	✓	✓	X	4	0.8
Nothing	✓	✓	✓	✓	✓	5	1
				Mean I-CVI		All item	0.78

Note. ✓ denotes agree to item; X denotes disagree to item; I-CVI, Item-content validity index.

Table 3.16: I-CVI for items in knowledge about first aid for mental disorder

Items	Expert					Number of agreement	I-CVI
	1	2	3	4	5		
Listen to his problems	✓	✓	✓	✓	✓	5	1
Talk to him firmly about getting his act together	✓	✓	X	✓	✓	4	0.8
Seek professional help	✓	✓	✓	✓	✓	5	1
Make an appointment for him to see a GP	X	X	✓	✓	X	2	0.4
Rally friends to cheer him up	✓	✓	X	✓	X	3	0.6
Ignore him	✓	✓	✓	✓	✓	5	1
Keep him busy	✓	✓	✓	✓	✓	5	1
Encourage him to become more physically active	✓	✓	✓	✓	✓	5	1
				Mean I-CVI		All item	0.85

Note. GP, General practitioner; ✓ denotes agree to item; X denotes disagree to item; I-CVI, Item-content validity index.

Table 3.17: I-CVI for items in knowledge about interventions of mental disorder

Items	Expert 1	2	3	4	5	Number of agreement	I-CVI
Doctor or family doctor	✓	✓	✓	✓	✓	5	1
Teacher	✓	✓	✓	✓	✓	5	1
Counsellor	✓	✓	✓	✓	✓	5	1
Kids helpline	✓	✓	✓	✓	✓	5	1
Psychologist	✓	✓	✓	✓	✓	5	1
Psychiatrist	✓	✓	✓	✓	✓	5	1
Close family member	✓	✓	✓	✓	✓	5	1
Close friend	✓	✓	✓	✓	✓	5	1
Vitamins	✓	✓	✓	✓	✓	5	1
Antidepressants	✓	✓	✓	✓	✓	5	1
Tranquillizers	X	X	✓	X	X	1	0.2
Antipsychotics	✓	X	✓	✓	X	2	0.4
Sleeping pills	✓	✓	✓	✓	✓	5	1
Becoming more physically active	✓	✓	✓	✓	✓	5	1
Participate in relaxation training	✓	✓	✓	✓	✓	5	1
Practicing meditation	✓	✓	✓	✓	✓	5	1
Getting acupuncture	✓	✓	✓	✓	✓	5	1
Getting out in the sunlight	✓	✓	✓	✓	✓	5	1
Receiving counselling	✓	✓	✓	✓	✓	5	1
Receiving cognitive-behaviour therapy	✓	X	✓	✓	X	3	0.6
Search web sites for information	✓	✓	✓	✓	✓	5	1
Reading a self-help book	✓	✓	✓	✓	✓	5	1
Join a support group	✓	✓	✓	✓	✓	5	1
Going to a local mental health service	✓	✓	✓	✓	✓	5	1
Drinking alcohol to relax	✓	✓	✓	✓	✓	5	1
Smoking cigarettes to relax	✓	✓	✓	✓	✓	5	1
Using marijuana to relax	✓	✓	✓	✓	✓	5	1
Cutting down on drinking alcohol	✓	✓	✓	✓	✓	5	1
Cutting down on smoking cigarettes	✓	✓	✓	✓	✓	5	1
Cutting down on use of marijuana	✓	✓	✓	✓	✓	5	1
				Mean I-CVI		All item	0.94

Note. ✓ denotes agree to item; X denotes disagree to item; I-CVI, Item-content validity index.

Table 3.18: I-CVI for items in knowledge about prevention of mental disorder

Items	Expert					Number of agreement	I-CVI
	1	2	3	4	5		
Keeping physically active	✓	✓	✓	✓	✓	5	1
Avoid stressful situation	✓	✓	✓	✓	✓	5	1
Keeping regular contact with friends	✓	✓	✓	✓	✓	5	1
Always spend time with family	✓	✓	✓	✓	✓	5	1
Regular relaxing time	✓	✓	✓	✓	✓	5	1
				Mean I-CVI		All item	1

Note. ✓ denotes agree to item; X denotes disagree to item; I-CVI, Item-content validity index.

Table 3.19: I-CVI for items in help-seeking

Items	Expert					Number of agreement	I-CVI
	1	2	3	4	5		
Intention to seek help	✓	✓	✓	✓	✓	5	1
Family	✓	✓	✓	✓	✓	5	1
Counsellor / Psychiatrist	✓	✓	✓	✓	✓	5	1
Teacher	✓	✓	✓	✓	✓	5	1
Peers (Friend)	✓	✓	✓	✓	✓	5	1
Financial cost	✓	✓	✓	✓	✓	5	1
The person might feel negatively about you	✓	✓	✓	✓	✓	5	1
What person might say is wrong	✓	✓	✓	✓	✓	5	1
Worried what others might think	✓	✓	✓	✓	✓	5	1
The person/service is too far to travel to	✓	✓	✓	✓	✓	5	1
Difficult to get an appointment	✓	✓	✓	✓	✓	5	1
Concern about the side effects of treatment	✓	✓	✓	✓	✓	5	1
Not liking treatment offered	✓	✓	✓	✓	✓	5	1
Thinking that nothing can help	✓	✓	✓	✓	✓	5	1
Having to wait for an appointment	✓	✓	✓	✓	✓	5	1
Too embarrassed/shy	✓	✓	✓	✓	✓	5	1
				Mean I-CVI		All item	1

Note. ✓ denotes agree to item; X denotes disagree to item; I-CVI, Item-content validity index.

Table 3.20: I-CVI for items in personal stigma

Items	Expert					Number of agreement	I-CVI
	1	2	3	4	5		
Could snap out of it	✓	✓	✓	✓	✓	5	1
Sign of personal weakness	✓	✓	✓	✓	✓	5	1
Not a real medical illness	✓	✓	✓	✓	✓	5	1
Dangerous to others	✓	✓	✓	✓	✓	5	1
Best to avoid	✓	✓	✓	✓	✓	5	1
Unpredictable	✓	✓	✓	✓	✓	5	1
Not tell anyone	✓	✓	✓	✓	✓	5	1
					Mean I-CVI	All item	1

Note. ✓ denotes agree to item; X denotes disagree to item; I-CVI, Item content validity index.

Table 3.21: I-CVI for items in perceive stigma

Items	Expert					Number of agreement	I-CVI
	1	2	3	4	5		
Could snap out if	✓	✓	✓	✓	✓	5	1
Sign of personal weakness	✓	✓	✓	✓	✓	5	1
Not a real medical illness	✓	✓	✓	✓	✓	5	1
Dangerous to others	✓	✓	✓	✓	✓	5	1
Best to avoid	✓	✓	✓	✓	✓	5	1
Unpredictable	✓	✓	✓	✓	✓	5	1
Not tell anyone	✓	✓	✓	✓	✓	5	1
					Mean I-CVI	All item	1

Note. ✓ denotes agree to item; X denotes disagree to item; I-CVI, Item content validity index.

Table 3.22: I-CVI for items in social distance

Items	Expert					Number of agreement	I-CVI
	1	2	3	4	5		
Go out on weekends	✓	✓	✓	✓	✓	5	1
Work on a project	✓	✓	✓	✓	✓	5	1
Invite to your house	✓	✓	✓	✓	✓	5	1
Go to his house	✓	✓	✓	✓	✓	5	1
Develop friendship	✓	✓	✓	✓	✓	5	1
					Mean I-CVI	All item	1

Note. ✓ denotes agree to item; X denotes disagree to item; I-CVI, Item content validity index.

(b) **Internal consistency**

The Cronbach's alpha across all constructs ranged from 0.52 to 0.76, indicating acceptable levels of internal consistency as shown in Table 3.23. The minimum CITC ranged from 0.08 to 0.34.

Table 3.23: Cronbach alpha across constructs in the MHL and stigma questionnaire

Construct	Number of item	Minimum CITC	Cronbach's alpha
Knowledge on ability of recognition of disorder	6	0.19	0.64
Knowledge about first aid for mental disorder	5	0.10	0.52
Knowledge about interventions of mental disorder	27	0.10	0.76
Knowledge about prevention of mental disorder	5	0.15	0.52
Help seeking	16	0.11	0.63
Personal stigma	7	0.28	0.62
Perceive stigma	7	0.34	0.71
Social distance	5	0.08	0.66

Note. CITC, Corrected Item-Total Correlation

(c) **Test-retest reliability analysis**

Of the 78 items evaluated in this study, 46 items (59%) showed moderate agreement, 25 items (32%) displayed fair agreement, five items (6.4%) indicated substantial agreement and two items (2.6%) reported having slight agreement. Kappa values for the majority of items indicated a moderate level of agreement (0.41 and above). Figure 3.7 shows the frequency (%) of Kappa agreement across all items in the MHL and stigma questionnaire.
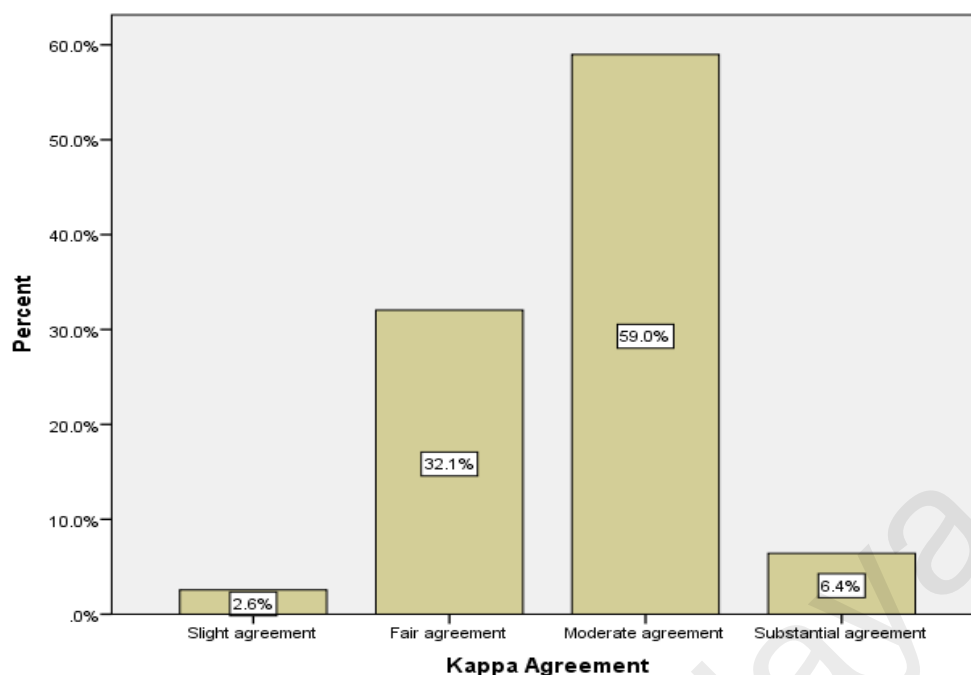
Figure 3.7: Frequency of Kappa agreement across items in the MHL and stigma questionnaire.

Twelve items obtained kappa values of less than 0.3, namely kids helpline (item 15), antidepressants (item 21), become more physically active (item 23), using alcohol to relax (item 33), smoking cigarettes to relax (item 34), using marijuana to relax (item 35), keeping regular contact with friends (item 41), the cost of seeing the person (item 49), concern that what the person might say is wrong (item 51), concern about what other people (item 52), concern about the side effects of treatment (item 55) and thinking nothing can help (item 57).

Following discussion with subject matter experts, two items were dropped, namely kids helpline (item 15) and being more physically active (item 23). Of the remaining 10 items with Kappa values < 0.3, eight items were reworded, as shown in Table 3.24, and two items, namely antidepressants and thinking nothing can help, were maintained. A second test-retest was repeated for these 10 items among 30 subjects. All of the 10 items that underwent second test-retest analysis obtained Kappa values of 0.21 and above and thus were retained in the final MHL and stigma questionnaire. Table 3.25 presents the

values of Kappa based on each item as well as the repeat Kappa values for the 12 items

that were subjected to a second test-retest.

Table 3.24: Items reworded and subjected to a second test re-test reliability analysis

Original item	Reworded item
Using alcohol to relax	Drinking alcohol to relax
Smoking cigarettes to relax	Smoking cigarettes
Using marijuana to relax	Using marijuana
Keeping regular contact with friends	Keeping regular communication with friends
The cost of seeing the person	Not enough money to get help
Concern that what the person might say is wrong	Concern if the person gives wrong information
Concern about what other people might think of you seeing the person	Concern about what other people might think of you for seeking the person for help
Concern about the side effects of treatment	Concern about the side effects of treatment. Example itchiness/ stomach pain

Table 3.25: Cohen's kappa values for items across constructs of the MHL and stigma questionnaire

No	Item	Kappa	Repeat Kappa
	Knowledge on ability of recognition of disorder		
1	Depression	0.409	
2	Mental illness	0.585	
3	Eating disorder	0.665	
4	Stress	0.453	
5	Substance abuse	0.454	
6	Nothing	0.460	
	Knowledge about first aid for mental disorder		
7	Listen to his problems	0.485	
8	Seek professional help	0.414	
9	Ignore him	0.441	
10	Keep him busy	0.309	
11	Encourage to be more physically active	0.343	
	Knowledge about interventions of mental disorder		
12	Doctor	0.407	
13	Teacher	0.629	
14	Counsellor	0.406	
15	Kids Help line	0.111	
16	Psychologist	0.326	
17	Psychiatrist	0.480	
18	Family	0.514	
19	Friends	0.438	
20	Vitamin	0.507	
21	Antidepressant*	0.297	0.256
22	Sleeping pill	0.402	
23	Become more physically active	0.091	
24	Participate in relaxation training	0.481	
25	Practicing meditation	0.445	
26	Getting acupuncture	0.500	
27	Getting out in the sunlight	0.383	
28	Receiving counselling	0.359	
29	Search web sites for information	0.463	
30	Reading a self-help book	0.418	
31	Join a support group	0.521	
32	Going to a local mental health service	0.476	
33	Drinking alcohol to relax*	-0.026	0.455
34	Smoking cigarettes*	-0.048	0.375
35	Using marijuana*	-0.028	0.268
36	Cutting down on drinking of alcohol	0.552	
37	Cutting down on smoking cigarettes	0.749	
38	Cutting down on use of marijuana	0.625	

Note. * Item subjected to a second test re-test reliability analysis.

No	Item	Kappa	Repeat Kappa
	Knowledge about prevention of mental disorder		
39	Keep physically active	0.485	
40	Avoid stressful situation	0.451	
41	Regular communication friends*	0.229	0.247
42	Always spend time with family	0.371	
43	Regular relaxing time	0.380	
	Help seeking		
44	Intention to seek help	0.405	
45	Family	0.562	
46	Counsellor/Psychiatrist	0.526	
47	Teacher	0.516	
48	Friend	0.397	
49	Not enough money to get help*	0.016	0.232
50	Person might feel negatively about you	0.401	
51	Concern if the person gives wrong information*	0.271	0.281
52	Concern about what other people might think*	0.264	0.280
53	The person/service is too far to travel	0.435	
54	Difficult to get an appointment	0.480	
55	Concern about the side effects of treatment*	0.192	0.235
56	Not liking treatment offered	0.311	
57	Thinking that nothing can help*	0.289	0.304
58	Having to wait for an appointment	0.396	
59	Too embarrassed/shy	0.501	
	Personal Stigma		
60	Could snap out of it	0.420	
61	Sign of personal weakness	0.423	
62	Not a real medical illness	0.433	
63	Dangerous	0.435	
64	Best to avoid	0.463	
65	Unpredictable	0.388	
66	Not tell anyone	0.402	
	Perceive Stigma		
67	Could snap out of it	0.463	
68	Sign of personal weakness	0.420	
69	Not a real medical illness	0.443	
70	Dangerous	0.445	
71	Best to avoid	0.400	
72	Unpredictable	0.401	
73	Not tell anyone	0.424	
	Social Distance		
74	Go out on weekends	0.435	
75	Work on a project	0.477	
76	Invite to your house	0.430	
77	Go to his house	0.509	
78	Develop friendship	0.659	

'Table 3.25, continued'

Note. * Item subjected to a second test re-test reliability analysis.

3.2.14.3 Validation of CES-D Malay version questionnaire

(a) **Floor and ceiling effects**

The mean score for the CES-D Malay version for this study was 19.65 with a range of 1 to 44. To assess any floor and ceiling effects the percentages of participants having the lowest and highest possible score were calculated and the results were zero, indicating no floor and ceiling effects. Around 32.3% of the sample obtained a score of more than the cut-off score, which was 27. Participants were divided into four groups, those with CES-D scores below and above the mean score and the cut-off point of depression symptom. Some 55.4% of participants scored below the mean score while 44.6% scored above the mean score. The majority of the participants (67.7%) obtained a total CES-D score below 27. Depression symptoms were reported in 32.3% of participants. The CES-D Malay version results is shown in Table 3.26.

Table 3.26: Results of the CES-D questionnaire

Measurement	Frequency (%)	Floor effect (%)	Ceiling effect (%)
Mean score (SD)	19.65 (11.03)	0	0
Below mean score	36 (55.4)		
Above mean score	29 (44.6)		
Below 27	44 (67.7)		
27 and above	21 (32.3)		

Note. SD, Standard deviation.

(b) **Internal consistency**

The Cronbach's alpha value was 0.88, indicating good internal consistency for the overall CES-D Malay version questionnaire. The majority of the items' lowest CITC values were more than 0.3 except for item 8 (felt hopeful about the future) and item 16 (enjoyed life), which reported lowest lowest CITC values of 0.08 and 0.28. Item-wise deletion revealed that the Cronbach's alpha did not increase by more than 0.01 with the exclusion of any item. The CITC and item-wise deletion Cronbach's alpha values for all items are shown in Table 3.27.

Table 3.27: CITC and item-wise deletion Cronbach's alpha values for CES-D questionnaire

Item	Corrected Item-Total Correlation	Cronbach's alpha if item deleted
Item 1	0.47	0.88
Item 2	0.33	0.88
Item 3	0.46	0.88
Item 4	0.33	0.88
Item 5	0.51	0.88
Item 6	0.55	0.88
Item 7	0.61	0.87
Item 8	0.08	0.89
Item 9	0.46	0.88
Item 10	0.73	0.87
Item 11	0.48	0.88
Item 12	0.52	0.88
Item 13	0.40	0.88
Item 14	0.53	0.88
Item 15	0.40	0.88
Item 16	0.28	0.88
Item 17	0.68	0.87
Item 18	0.73	0.87
Item 19	0.65	0.87
Item 20	0.59	0.87

(c) **Test-retest reliability analysis**

The proportions of no response shift between test and retest varied from 29% for item 11 (sleep was restless) to 73% for item 2 (not feel like eating) as shown in Figure 3.8. The test-retest reliability for the total CES-D score ICC = 0.93 (95% CI 0.85, 0.96) and for item by item reliability analysis the ICC ranged from the lowest value ICC = 0.50 for item 11 (sleep was restless) and 14 (felt lonely) to the highest value ICC = 0.87 for item 18 (felt sad). Of all the 20 items evaluated in this study, 13 items (65%) showed moderate reliability, six items (30%) displayed good reliability and one item (5%) demonstrated poor reliability. The ICC for total and individual items is shown in Table 3.28.
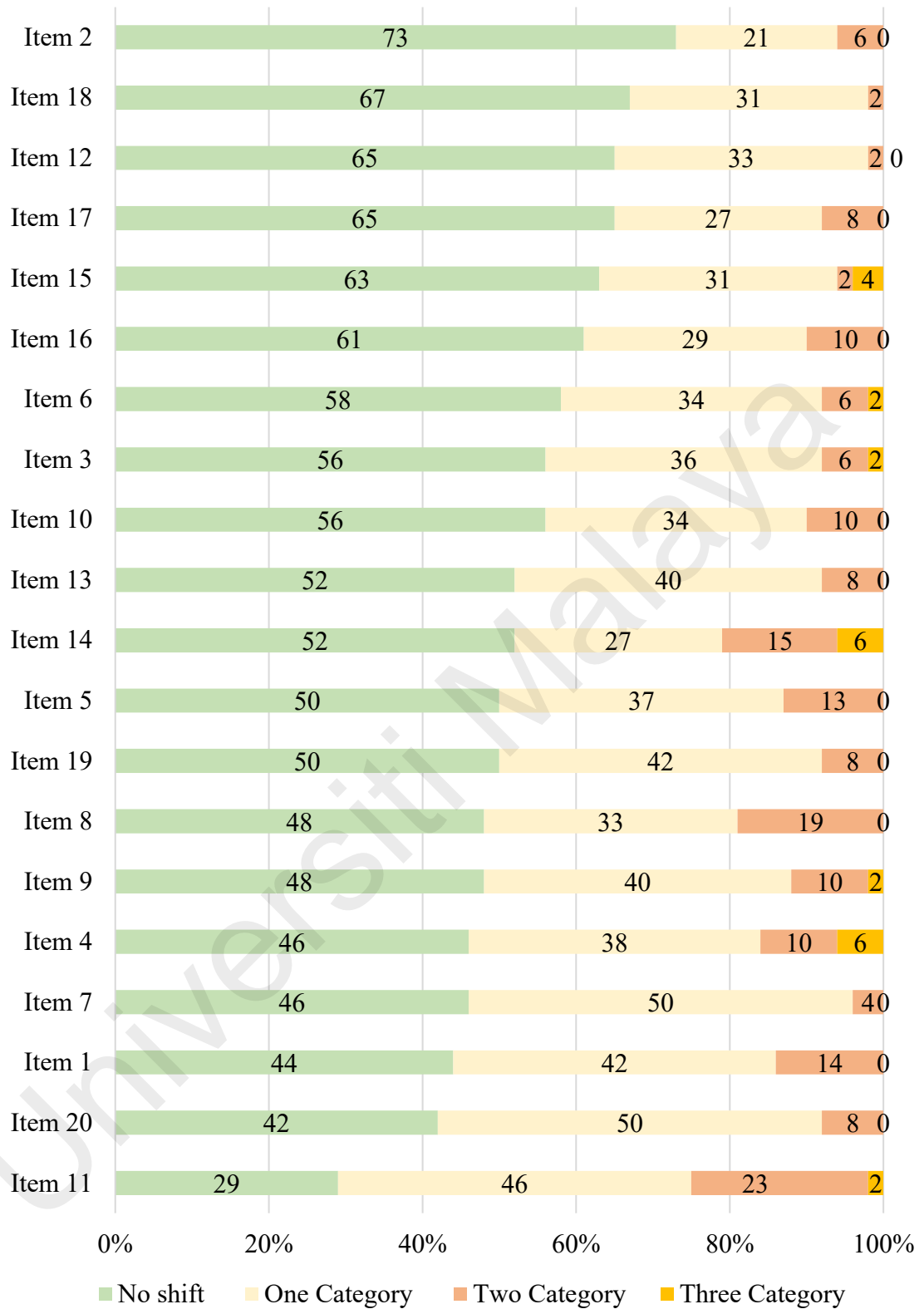
Figure 3.8: Frequencies of test-retest shifts on all CES-D items.

Table 3.28: ICC and 95% CI for total and individual CES-D items

Item	Intraclass correlation coefficient	95% CI (LL, UL)
Item 1	0.55	0.22, 0.74
Item 2	0.80	0.65, 0.89
Item 3	0.61	0.32, 0.78
Item 4	0.55	0.23, 0.74
Item 5	0.74	0.54, 0.85
Item 6	0.59	0.28, 0.77
Item 7	0.81	0.67, 0.89
Item 8	0.71	0.50, 0.83
Item 9	0.58	0.27, 0.76
Item 10	0.76	0.57, 0.87
Item 11	0.50	0.15, 0.71
Item 12	0.84	0.72, 0.91
Item 13	0.70	0.48, 0.83
Item 14	0.50	0.14, 0.71
Item 15	0.68	0.44, 0.82
Item 16	0.72	0.51, 0.84
Item 17	0.83	0.70, 0.90
Item 18	0.87	0.78, 0.93
Item 19	0.81	0.66, 0.89
Item 20	0.72	0.50, 0.84
Total	0.93	0.85, 0.96

Note. ICC, Intraclass correlation coefficient; CI, Confidence interval; LL, Lower limit; UL, Upper limit.

3.2.15 Summary of validation analysis

Four types of validation analysis were performed, namely content validation, floor and ceiling effects, internal consistency analysis (Cronbach's alpha) and test-retest reliability analysis (Cohen's Kappa and ICC). The MHL and stigma questionnaire originally had 90 items, of which 14 were removed following content validation (12 items were dropped as they obtained an I-CVI of less than 1) and test-retest reliability analysis (2 items dropped). The Cronbach's alpha across all constructs in the MHL and stigma questionnaire ranged from 0.52 to 0.76, indicating acceptable levels of internal consistency. Kappa values for the majority (59%) of items in the MHL and stigma questionnaire indicated a moderate level of agreement (0.41 and above). The CES-D Malay version questionnaire reported no floor and ceiling effects, good internal consistency (Cronbach's alpha 0.88) and excellent test-retest reliability analysis, ICC = 0.93 (95% CI 0.85, 0.96). Overall, both the MHL and stigma questionnaire and the CES-D Malay version questionnaire were found to be valid instruments for use among Malaysian adolescents.

3.3   Phase 2 (cross-sectional study)

3.3.1   Study design

Phase 2 of the study aimed to determine the prevalence of depression, adequacy of depression literacy, knowledge of depression, help seeking and stigmatising attitudes, and their association with depression symptom among adolescents. This phase utilized a cross-sectional design to help with data collection. The justification for selecting a cross-sectional design is that it is practical for obtaining baseline data (British Medical Journal, 2011).

3.3.2   Ethics and permission

The process of ethical application and approval has been described in Section 3.2.2. Permission to use national secondary schools in Selangor was applied for from the Selangor State Education Department on 27th April 2017 and approval was obtained on 4th May 2017. The research needed to comply with three conditions (as mentioned in Section 3.2.2, which includes obtaining written parental/guardian consent from the participant) before this study could be conducted at the respective schools. Upon obtaining all approvals, the main process of data collection was initiated.

3.3.3   Setting

3.3.3.1 The Study area for phase 2: Selangor state

In Malaysia there are 13 states, Selangor being one of them. Selangor state is further divided into nine districts. Selangor is located on Peninsular Malaysia and is bordered in the north by Perak, in the east by Pahang, in the south by Negeri Sembilan and in the west by the Strait of Malacca as shown in Figure 3.9 (Department of Information Malaysia, 2018). As the most developed state in Malaysia it has an area span of 793,100 square kilometres c. The estimated total population of Selangor state in 2018 was 6.47

million people (Department of Statistics Malaysia, 2018), and the estimated number of adolescents in the year 2015 was 127,308 (Institute for Public Health, 2015).

Figure 3.9: Location of Selangor state on Peninsular Malaysia.

Source: Department of Information Malaysia. (2018). Geography. Retrieved January 6, 2019, from http://pmr.penerangan.gov.my/

3.3.3.2 National secondary schools in Selangor state

Data were collected from national secondary schools in Selangor state, which are under the administration of the Selangor Education Department, under the governance of the MOE of Malaysia. There are nine District Education Offices under the administration of the Selangor Education Department, within which there are a total of 225 national

secondary schools. Table 3.29 shows the number of national secondary schools in Selangor by district as obtained from the MOE, Malaysia (MOE Malaysia, 2017a).

Table 3.29: National secondary schools in Selangor State, 2017

District	No of schools
Petaling	74
Hulu Langat	36
Klang	32
Gombak	27
Kuala Selangor	15
Hulu Selangor	14
Kuala Langat	12
Sabak Bernam	8
Sepang	7
Total	225

3.3.4 Study population

For this project, the study population comprised adolescents studying at Form 1 level in national secondary schools in Selangor. There are several reasons for selecting this population. First, students who are in Form 1 are aged between 12 and 13 and are considered to be early adolescents. Studies have reported that almost half of all mental health problems develop before the age of 14 (Kessler et al., 2005). The severity of depression also tends to increase across both genders by the age of 12 (Dekker et al., 2007). Major depressive disorders tend to start as early as 13 or 14. The mean age for adolescent MHDs is 15 and symptoms usually develop three to four years before diagnosis, meaning that at the ages of 11 and 12 adolescents may have symptoms of MHDs (Bostic & Bagnell, 2012). Thus there is a need to educate young adolescents aged 11 to 14 about MHDs when symptoms are present but before full-blown diagnosis is made

(Bostic & Bagnell, 2012). The NHMS (2015) has also reported that there is a rising prevalence of depression symptom among early adolescents (Institute for Public Health, 2015). Second, studies in Malaysia have reported that young adolescents aged 11 to 13 are significantly more depressed than older adolescents. This could be because early adolescence is a time of life when there are high levels of stressful challenges, which may cause depressive symptoms (Latiffah et al., 2016). Furthermore, the risk of adolescent depression increases three- to fourfold between the ages of 15 and 16 (Burns & Rapee, 2006). Therefore, it is important to assess and improve depression literacy among young adolescents aged 11 to 14 in order to minimize the risk of depression later on. Third, previous studies have reported that younger adolescents show less preference towards professional sources of help; instead they indulge in activities that are of poor value in addressing depression (Yap & Jorm, 2012). Therefore, there is an urgency to improve depression literacy among young adolescents, especially knowledge about first aid and help seeking. This is because limited use of professional help often results in a poor quality of first-aid actions (Yap & Jorm, 2012).

Fourth, the NHMS (2017) reported that suicidal behaviour was highest among Form 1 students, as depression increases the risk of suicide among adolescents, and therefore more emphasis should be given to these adolescents (Institute for Public Health, 2017). Fifth, it was felt that Form 1 students have an advantage over other students as they are not under exam pressure (lower secondary- and upper secondary-level examinations) and so any change in their classroom routine would not impact negatively on their academic work (Moffatt, 2007). Finally, due to the limited time frame provided for data collection in the respective schools, which was from June 2017 to November 2017, it could be possible that some schools' consent was obtained during this time frame but the questionnaire sessions could not be completed within this period. In such cases, if Form 2 or Form 4 students were sampled, then during the next year they would be considered

as exam takers and this would hamper the process of questionnaire distribution to these students. The inclusion criteria included adolescents studying at Form 1 level. The only exclusion criterion in this study was participants who were not willing to participate or who did not obtain consent.

3.3.5 Sampling method

The sampling method was divided into two stages. Stage 1 sampling included randomly selecting 50 schools via simple random sampling from the list of the 225 national secondary schools in Selangor state, which was obtained from Selangor State Education Department. Random selection was performed using an Excel RAND function. A list of 225 randomly generated numbers was obtained from the Excel RAND formula, then the random values generated were ordered from lowest to highest and the first 50 schools in the sorted list were selected. Four schools refused to participate in this study, therefore data were only collected from 46 schools. The reason for non-participation was the existing ongoing research in those four schools. Stage 2 involved universal sampling of all the Form 1 students in each selected school for participation in the survey. The total number of students that participated in the study was 1815. The sampling method is shown in Figure 3.10. School names selected based on districts are presented in Table 3.30 and the locations of schools selected are shown in Figure 3.11.
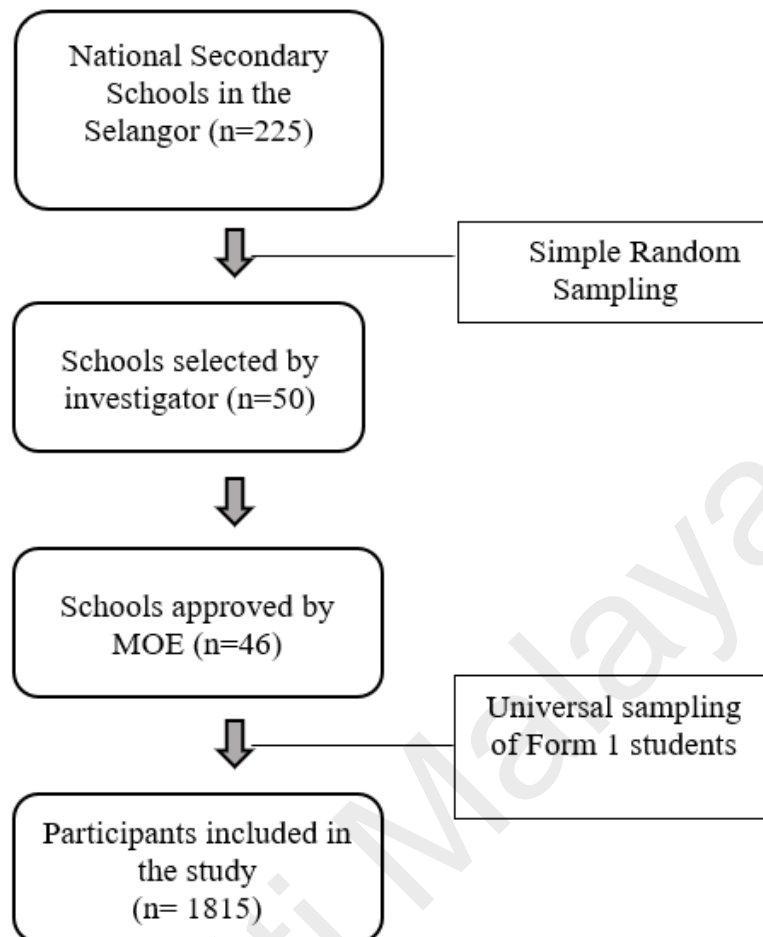
Figure 3.10: Selection of study participants (Phase 2).

Table 3.30: National secondary schools selected based on districts (Phase 2)

No	Name of Schools	District
1	SMK Katholik (M)	Petaling
2	SMK Bandar utama	(Utama/Perdana)
3	SMK Bandar utama damansara (4)	
4	SMK Damansara utama	
5	SMK USJ 12	
6	SMK Seksyen 16	
7	SMK USJ 4	
8	SMK Seksyen 27	
9	SMK Seksyen 19	
10	SMK Shah Alam	
11	SMK Subang Jaya	
12	SMK Pusat Bandar Puchong 1	
13	SMK Subang	
14	SMK Puchong Perdana	
15	SMK Chung Hwa	Klang
16	SMK Methodist (ACS)	
17	SMK (P) Kapar	
18	SMK Bandar Baru Sultan Suleiman	
19	SMK (P) Methodist	
20	SMK Telok Gadong	
21	SMK (P) Raja Zarina	
22	SMK Tengku Ampuan Jemaah	
23	SMK Batu Unjur	
24	SMK La Salle	
25	SMK Lembah Keramat	Gombak
26	SMK Bukit Gading	
27	SMK Darul Ehsan	
28	SMK Taman Ehsan	
29	SMK Taman Melawati	
30	SMK Rawang	
31	SMK Taman Kosas	Hulu Langat
32	SMK Jalan Bukit	
33	SMK Yu Hua	
34	SMK Bandar Tasik Kesuma	
35	SMK Desa Serdang	
36	SMK Ampang Pecah	Hulu Selangor
37	SMK Dato' hj Kamaruddin	
38	SMK Gedangsa	
39	SMK Bukit Kuching Tengah	Kuala Selangor
40	SMK Seri Tanjung	
41	SMK Dato Harun	
42	SMK Banting	Kuala Langat
43	SMK Batu Laut	
44	SMK Bandar Baru Salak Tinggi	Sepang
45	SMK Pantai Sepang Putra	
46	SMK Yoke Kuan	Sabak Bernam

Note. SMK, National secondary school.
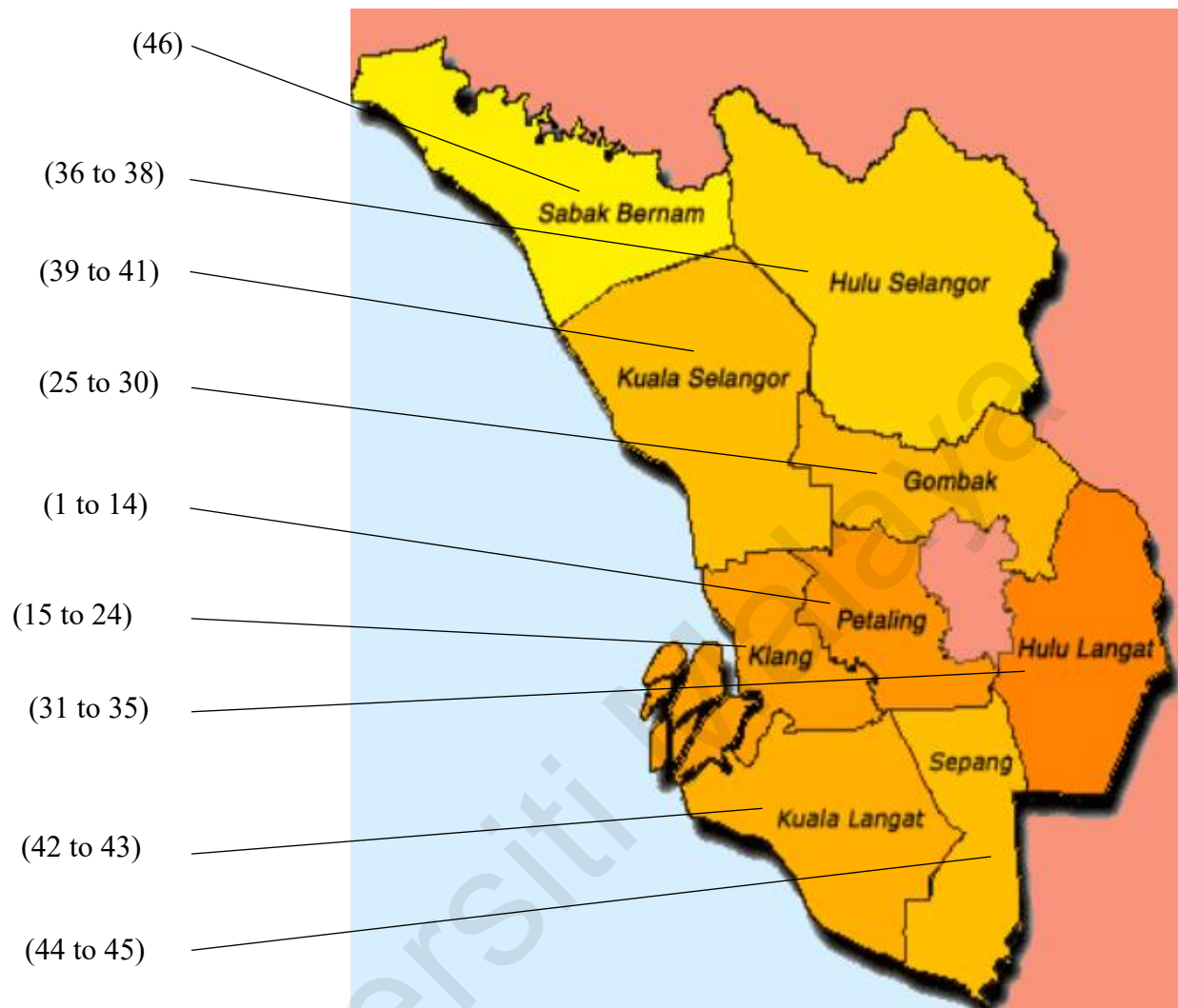
Figure 3.11: Location of schools in Selangor.

Note. (number) denotes the name of schools as described in Table 3.30.

3.3.6 Sample size calculation

Sample size was calculated based on the respective objectives as stated in Table 3.31. The largest sample size finally selected was based on the sample size calculation for the objective to determine the association between adequacy of depression literacy and depression symptom among adolescents (Lam, 2014). Lam (2014) reported that adolescents with inadequate MHL have a significantly higher odds of depression symptom with an OR of 1.52, a p-value of 0.039 and 95% CI of 1.01, 2.3. Lam's (2014) study reported the smallest effect size (for the variable on adequacy of depression literacy) with a fairly narrow CI when compared to other significant variables from other studies as depicted in Table 3.31.

OpenEpi software version 3.01 was used for sample size calculation (Dean, Sullivan, & Soe, 2013). The following parameters in OpenEpi were used: (a) CI was set at 95%; (b) power was set at 80%; (c) the ratio of unexposed to exposed in sample 5.1; (d) the percentage of unexposed with an outcome of 52%; and (e) an odds ratio of adequacy of depression literacy and depression symptoms of 1.52. Parameters c, d and e were obtained from the study by Lam (2014) based on the objective association between the adequacy of depression literacy and depression symptom. Figure 3.12 shows the sample size calculation using OpenEpi. A minimal total of 1417 participants were required to participate in the self-administered questionnaire as shown in Table 3.32. An additional 20% dropout rate was set, thus the sample size was inflated to 1700 participants (Mazlan & Ahmad, 2013). The actual sample size obtained was 1815.

Table 3.31: Estimation of sample size based on study objectives

Author, Year	Objectives	α	Power	A	B	C	Required sample size
Kaur et al.,2014	Determine prevalence of depression symptom	0.05	0.8				291
Zawaha et al.,2011	Determine the knowledge of depression among adolescents	0.05	0.8				500
Lam,2014	Determine help seeking for depression among adolescents	0.05	0.8				340
Lam,2014	Determine the association of adequacy of depression literacy and depression symptom among adolescents	0.05	0.8	52	1.52	5.1	1417 After 20% inflation = 1700
Rose et al., 2011	Determine the association of stigmatising attitude and depression symptom among adolescents	0.05	0.8	0.28	4.80	0.1	365
Mariu et al.,2011	To determine the association of intention to seek help and depression symptom among adolescents	0.05	0.8	77.6	1.86	3.4	1181
Sawyer et al.,2012	To determine the association of sources of help and depression symptom among adolescents	0.05	0.8	51	0.36	0.37	237

Note. α, Type I error; A, Percentage of unexposed with outcome; B, Odds ratio; C, ratio of unexposed to exposed in the sample.

Sample Size: Cross Sectional, Cohort & Randomized Clinical Trial		
Two-sided confidence level (%)	95	(1-alpha) usually 95%
Power (1-beta or % chance of detecting)	80	Usually 80%
Ratio of Unexposed to Exposed in sample	5.1	For equal sample, use 1.0
Percentage of Unexposed with Outcome	52	Between 0.0 and 99.9
Please fill in 1 of the following. The others will be calculated.		
Odd ratio	1.52	
Percent of Exposed with Outcome	62.22	Between 0.0 and 99.9
Risk/Prevalence Ratio	1.20	
Risk/Prevalence difference	10.22	Between -99.99 and 99.99

Figure 3.12: Sample size output table open epi.

Table 3.32: Sample size calculation, open epi output table

Sample Size: Cross sectional, cohort and randomized clinical trials			
Two-sided significance level (1-alpha):			95
Power (1-beta, % chance of detecting):			80
Ratio of sample size, Unexposed/Exposed:			5.1
Percent of Unexposed with Outcome:			52
Percent of Exposed with Outcome:			62
Odds Ratio			1.5
Risk/ Prevalence Ratio:			1.2
Risk/ Prevalence difference:			10
	Kelsey	**Fleiss**	**Fleiss with CC**
Sample Size-Exposed	224	221	233
Sample Size-Nonexposed	1141	1125	1184
Total sample size:	1365	1346	1417

3.3.7 Study variables

The sociodemographic variables collected were gender, age, ethnicity, feeling lonely, alcohol intake, smoking status, substance abuse, being bullied, parental supervision, parental marital status, parental income, change of school and co-curricular involvement. The independent variables collected were depression literacy variables, namely knowledge of depression, help seeking, stigmatising attitude towards depression and adequacy of depression literacy. The dependent variable collected was depression symptoms. The independent and dependent variables for the respective objectives in this phase are shown in Table 3.33. The operational definition and measurement scales of the sociodemographic variables are shown in Table 3.34, while depression literacy variables and depression symptoms are shown in Table 3.35.

Table 3.33: Independent and dependent variables (Phase 2)

Objectives	Independent variables	Dependent variables
To determine the prevalence of depression symptom among adolescents.	Depression symptoms	-
To determine the adequacy of depression literacy among adolescents.	Adequacy of depression literacy	-
To examine knowledge of depression, help seeking and stigmatising attitudes among adolescents.	Knowledge of depression Help seeking Stigmatising attitudes	-
To determine the association between knowledge of depression, intention to seek help, stigmatising attitudes and depression symptoms among adolescents.	Knowledge of depression Intention to seek help Stigmatising attitudes	Depression symptoms
To determine the association between help seeking and depression symptoms among adolescents intending to seek help.	Help seeking (sources of help and barriers to help seeking) Knowledge of depression Stigmatising attitudes	Depression symptoms
To determine the association between adequacy of depression literacy and depression symptoms among adolescents.	Adequacy of depression literacy	Depression symptoms

Note. -, No variable.

Table 3.34: Operational definitions and scales of measurement of sociodemographic variables (Phase 2)

Operational variables	Operational definitions	Scale of measurement
Gender	As per identification card status.	Male/ Female
Age	Age as at last birth day.	11,12,13,14,15 years
Ethnicity	As per identification card status.	Malay, Chinese, Indian, Others*
Smoking	Ever smoked cigarettes in the past 30 days (Kaur et al.,2014).	Yes/No
Alcohol intake	Ever consumed alcoholic drink in the past 30 days (Kaur et al.,2014).	Yes/No
Parental supervision	Participants perceptions on if their parents or guardians know what they were doing in the past 30 days. (Kaur et al.,2014).	Yes/No/Don't know
Change of school	Ever shifted or changed schools in the past 30 days (Kaur et al.,2014).	Yes/No
Substance abuse	Taking heroin, morphine, glue, amphetamine or methamphetamines, marijuana (non-prescribed medication) in the past 30 days (Kaur et al.,2014).	Yes/No
Bullied	Being on the receiving end of "bad and unpleasant" actions, such as "teasing a lot in an unpleasant way", or being "left out of things on purpose in the past 30 days (Kaur et al.,2014).	Yes/No/Don't know
Feeling lonely	During the past 12 months have you ever felt lonely (Kaur et al.,2014).	Yes/No
Co-curricular activity	Activities, programme, and learning experiences that complement, in some way, what students are learning in school (Gyan, 2017).	Yes/No
Parental marital status	He or she has, or has had, a registered marriage with another person with whom he or she holds, or held, a valid marriage certificate (Kaur et al.,2014).	Married living together/ Married living apart/ Divorce/Separated[a]/ Don't Know
Parental income	Total household monthly income (Ibrahim et al.,2017).	< RM3000, > RM 3000 Don't know

Note. < , Less than; >, More than; *, Malaysians of European or Middle Eastern ancestry, the Madhesi Nepalese, Filipinos, Burmese, Vietnamese, and Chinindians. Eurasian Malaysians; [a] Separated is indicative when the spouse are separated as a result of death of one spouse or stop living together without getting a divorce

Table 3.35: Operational definitions and scales of measurement of depression literacy variables and depression symptom (Phase 2)

Operational variables	Operational definitions	Scale of measurement
Depression Symptoms	Symptoms of depression based on the DSM IV criteria: Changes from previous functioning either depressed mood or loss of interest or pleasure within the past 1 week including today.	< 27 denotes no depression symptom ≥ 27 denotes depression symptom
Knowledge of depression	Ability to identify depression Knowledge about first aid Knowledge on intervention Knowledge on prevention	Yes/No/Don't know Helpful/harmful/Don't know Helpful/harmful/Don't know Yes/No/Don't know
Help seeking	Intention to seek help for own self with depression, attitude towards source of help and barriers to help seeking (Hart et al.,2014).	Yes/No/ Don't know
Stigmatising attitudes	Personal stigma is defined as personal perceptions regarding beliefs and thoughts of depression (Calear et al.,2011).	Agree/Disagree/ Don't know
	Perceived stigma is characterized as the possible criticization, discouraging attitudes and isolation from the society as a result of suffering from depression or utilization of health modalities for treatment of depression (Calear et al.,2011).	Agree/Disagree/ Don't know
	Social distance is defined as one's desire to maintain distance from the stigmatised individual (Jorm & Griffiths, 2008).	Agree/Disagree/ Don't know
Recognition of depression	Ability to identify depression, mental illness and stress as problems faced by the person described in the vignette (Lam, 2014; Loureiro et al.,2013).	Yes/No
Adequacy of depression literacy	Correct recognition of depression with intention to seek help (Lam, 2014; Loureiro et al.,2013).	Adequate /Inadequate

Note. $<$, Less than; $\geq$, Equal or more than.

3.3.8 Study instrument

This phase utilizes two instruments, which are self-administered and validated questionnaires. The two instruments are the MHL and stigma questionnaire and the CES-D Malay version questionnaire. These two questionnaires were described in phase 1 of this study (Section 3.2.8). The questionnaire used in this phase is divided into three parts.

Part 1 includes instructions for completion and questions on sociodemographic characteristics. There are 13 statements in this section concerning demographic characteristics, namely gender, age, ethnicity, feeling lonely, alcohol intake, smoking status, substance abuse, being bullied, parental supervision, parental marital status, parental income, change of school and co-curricular activity involvement.

Part 2 is based on the MHL and stigma questionnaire version 5 (which presents a depressed vignette), which was developed by Reavley and Jorm (2011a) and was validated among young Malaysian adolescents in phase 1 of this study. In this part of the questionnaire there are 41 statements examining knowledge related to information about depression, 16 statements relating to help seeking for depression and 19 statements on stigmatising attitude towards depression as presented in Table 3.36. There is no specific scoring of the MHL and stigma questionnaire aside from the adequacy of depression literacy which is scored if participants correctly recognise depression along with intention to seek help (Lam, 2014; Loureiro et al.,2013).

Part 3 is based on the CES-D Malay version questionnaire, which includes screening for depression symptoms. There are 20 statements in this section as shown in Appendix D. Depression symptoms is present is participants obtain a score of more than or equal to 27.

Table 3.36: List of statements in each section and response options of the MHL and stigma questionnaire

Statement	Response option
Knowledge about recognition of depression What, if anything, do you think is wrong with Ali? • Depression • Mental illness • Stress • Substance abuse • Eating disorder • Nothing	Yes/No/ Don't know
Knowledge about first aid for mental disorder Do you think it would be helpful or harmful for Ali if you were to do these things? • Listen to his problems in an understanding way • Suggest he seek professional help • Ignore him until he gets over it • Keep him busy to keep his mind off problems • Encourage him to become more physically active	Helpful/ Harmful/ Don't know
Knowledge about interventions of mental disorder Do you think the following people/medicine/activities would be helpful or harmful for Ali? • Doctor • Teacher • Counsellor • Psychologist • Psychiatrist • Close family member • Close friend • Vitamins • Antidepressants • Sleeping pills • Participate in relaxation training • Practicing meditation • Getting acupuncture • Getting up early each morning and getting out in the sunlight • Receiving counselling • Search web sites that provide information about his problem • Reading a self-help book on his problem • Join a support group of people with similar problems • Going to a local mental health service • Drinking alcohol to relax • Smoking cigarettes • Using marijuana • Cutting down on drinking of alcohol • Cutting down on smoking cigarettes • Cutting down on use of marijuana	Helpful/ Harmful/ Don't know

Statement	Response option
Knowledge about prevention of mental disorder	
If a young person did the following, do you think that it would reduce their risk of developing a problem like Ali's?	Yes/No/ Don't know
• Keeping physically active	
• Avoiding situations that might be stressful	
• Keeping regular communication with friends	
• Keeping regular contact with family	
• Making regular time for relaxing activities	
Help seeking for depression	
If you had a problem right now like Ali would you go for help?	Yes/No/ Don't know
Where would you go for to seek help?	Yes/No/ Don't know
• Family	
• Counsellor/ psychiatrist	
• Teacher	
• Peers (friend)	
What might stop you from seeking help from this (person/service)?	Yes/No/ Don't know
• Not enough money to get help	
• Concern that the person might feel negatively about you	
• Concern that person might give wrong information	
• Worried about what other people might think of you for seeking the person for help	
• The person/service is too far to travel to	
• It is too hard to get an appointment	
• Concern about the negative effects of treatment	
• Not liking the type of treatment that is likely to be offered	
• Feeling that nothing can help your problem	
• Having to wait for an appointment	
• Too embarrassed/shy	
Stigmatising attitudes towards depression	
Please indicate how strongly you personally agree or disagree with each statement? (Personal stigma)	Agree/ Disagree/ Don't know
• Ali could snap out of it if he wanted	
• Ali's problem is a sign of personal weakness	
• Ali's problem is not a real medical illness	
• Ali is dangerous to others	
• It is best to avoid Ali so that you don't develop this problem yourself	
• Ali's problem makes him unpredictable	
• You would not tell anyone if you had a problem like 's Ali	

'Table 3.36, continued'

Statement	Response option
We would like you to tell us what you think most other people believe about Ali? (Perceived stigma) • Most other people believe that Ali could snap out of it if he wanted • Most people believe that Ali's problem is a sign of personal weakness • Most people believe that Ali's problem is not a real medical illness • Most people believe that Ali is dangerous to others, most people believe that it is best to avoid Ali so that they don't develop this problem themselves • Most people believe that Ali's problem makes him unpredictable • Most people would not tell anyone if they had a problem like Ali's	Agree/ Disagree/ Don't know
How you would feel about spending time with Ali? (Social distance) • To go out with Ali on the weekend • To work on a project with Ali • To invite Ali around to your house • To go to Ali house • To develop a close friendship with Ali	Agree/ Disagree/ Don't know

'Table 3.36, continued'

3.3.9 Data collection

A period of five months was allocated for data collection from 46 national secondary schools in Selangor state, with strategic organization, planning and time management being major contributors that enabled the completion of data collection within this time frame. This is because each school was visited twice by the researcher, with the first visit being for the distribution of consent forms and the second visit for the questionnaire session (distribution and collection of the questionnaire). Also, factoring issues such as school holidays and examination weeks meant that the time frame provided for using the schools for data collection was actually less than six months. Some schools within close proximity to each other agreed to select a common date for the consent distribution and questionnaire session, thereby helping the process of data collection to run reasonably well.

The MHL and stigma questionnaire and the CES-D Malay version questionnaire, which are self-administered, structured questionnaires, were distributed to all participants who complied with the inclusion criteria. 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 parental consent (written consent was obtained in July 2017), data collection began.

Detailed instruction on how to answer the questionnaire was provided to all respondents. Participants filled in the questionnaire in the classroom, 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.

During the first few weeks of August 2017 data collection was slow as participants were appearing for midterm school examinations. The progress of data collection gradually improved from September 2017 to November 2017, and the total number of samples collected by the end of November 2017 was 1815. Thus a total of 1815 questionnaires were collected from 46 national secondary schools during the process of data collection.

3.3.10 Software tool

The software tool used in this phase of the study was SPSS version 24.0. Raw data were entered into SPSS software, following which data cleaning was performed. In addition, descriptive analyses, Little's test for missing data, tests for interactions and multicollinearity, and logistic regression analyses were also performed using this software.

3.3.11 Data management

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

3.3.11.1 Data entry and cleaning

During the process of data collection, all primary data were documented by hand on the questionnaires. Subsequently a worksheet was created in SPSS 24.0 and all raw data were imported into this worksheet. Information entered included participants' demographic details, depression literacy variables (knowledge, help seeking, stigmatising attitudes, adequacy of depression literacy) and the depression symptom variable. To minimize error and increase the accuracy of data entry, double data entry was performed. The first data entry was performed from August 2017 to November 2017, while the second data entry was performed from December 2017 to January 2018. The data were entered by the researcher at a rate of 90 cases per day, with one-hour intervals after each session of 30 cases being entered into SPSS.

There were 424 mismatches identified, which were subsequently cross-checked with the original raw data set. The SPSS output table of the merged files matched summary and mismatched by cases are shown in Tables 3.37 and 3.38. Following double data entry, data were merged and then checked for abnormal values (abnormal data points). As all data were measured on a categorical scale there was no need for testing for normality or outliers.

Table 3.37: Matched summary (Phase 2)

Matched summary			
		Datasets	
Results	Statistics	Active	Comparison
Cases	Count	1815	1815
Cases compared	Count	1815	1815
	Percent	100.0%	100.0%

Table 3.38: Mismatched by cases (Phase 2)

Mismatched by cases		
Cases compared	Count	1815
Cases containing	Count	424
Mismatches	Percent	23.4%

3.3.11.2 Missing data

There was a small amount of missing data present in this phase of the study. Despite efforts such as reminding respondents to complete all questions, this problem still persisted. The analysis of missing data is further discussed across three sections in the following paragraphs.

(a) **Summary of missing data**

A total of 1815 participants responded to the questionnaire, with 1707 (94%) questionnaires being completed and usable with no missing data. There was a total of 108 (6%) cases with evidence of missing data that were excluded from this study. A summary of the missing data was analysed using the analyse pattern function in SPSS. The minimum percentage missing for a variable to be displayed was set at 0.01%. The summary of missing values is shown in Figure 3.13.
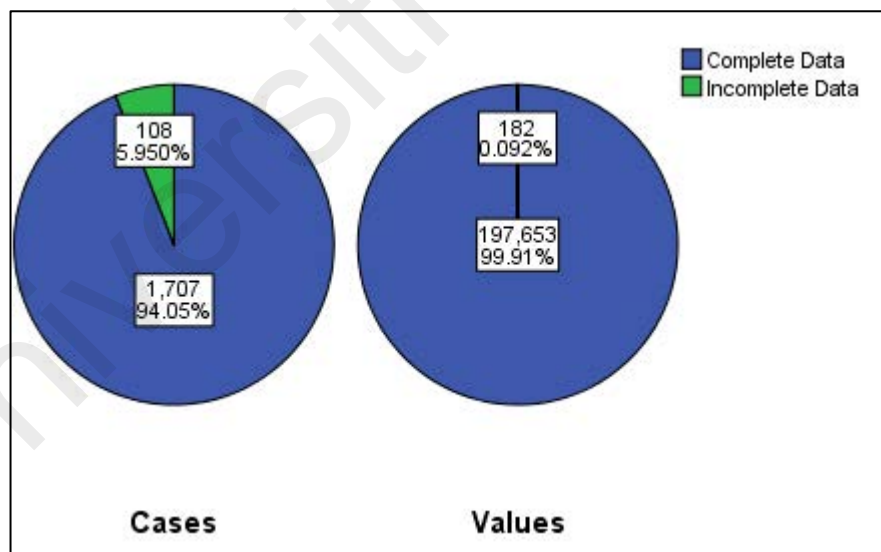
Figure 3.13: Summary of missing data.

All the missing data in the questionnaire came from the last section of the questionnaire, which assessed symptoms of depression using items from the CES-D Malay version questionnaire as shown in Table 3.39. The reasons for missing data in this study are identified as item non-response, with some participants only providing information for some of the items in the questionnaire (Garson, 2015). This was possibly because all the missing data originated from the last section of the questionnaire, which examines depression symptoms, and could have occurred as a result of participants' fatigue as they came to the end of the instrument (Garson, 2015). There is no significant difference in baseline characteristics between participants included in the analytical sample and those excluded as shown in Table 3.40.

Table 3.39: Frequency of missing data for items in the CES-D questionnaire

Item	Frequency (%)
1	10 (0.6)
2	6 (0.3)
3	10 (0.6)
4	8 (0.4)
5	12 (0.7)
6	7 (0.4)
7	5 (0.3)
8	5 (0.3)
9	8 (0.4)
10	3 (0.2)
11	9 (0.5)
12	9 (0.5)
13	19 (0.1)
14	10 (0.5)
15	15 (0.8)
16	12 (0.7)
17	10 (0.5)
18	10 (0.5)
19	7 (0.4)
20	7 (0.4)

Table 3.40: Comparison of characteristics of the included and excluded population

Characteristics	Included N=1707 N (%)	Excluded N=108 N (%)	p-value
Gender			
Male	676 (39.6)	44 (40.7)	0.814
Female	1031 (60.4)	64 (59.3)	
Age (Years)			
12	25 (1.5)	2 (2.0)	0.333
13	1598 (93.6)	104 (96.0)	
14	84 (4.9)	2 (2.0)	
Ethnicity			
Malay	1118 (65.5)	63 (58.3)	0.250
Chinese	337 (19.7)	25 (23.1)	
Indian	215 (12.6)	19 (17.6)	
Others	37 (2.2)	1 (1.0)	
Ever smoked cigarettes (past 30 days)			
Yes	80 (4.7)	7 (6.5)	0.397
No	1627 (95.3)	101 (93.5)	
Ever consumed alcohol (past 30 days)			
Yes	145 (8.5)	8 (7.4)	0.693
No	1562 (91.5)	100 (92.6)	
Drug use (past 30 days)			
Yes	10 (0.6)	1 (0.9)	0.659
No	1697 (99.4)	107 (99.1)	
Bullied (past 30 days)			
Yes	191 (11.2)	14 (12.9)	0.051
No	1385 (81.1)	79 (73.1)	
Don't know	131 (7.7)	15 (14.0)	
Shifted or changed school (past 30 days)			
Yes	22 (1.3)	4 (3.7)	0.128
No	1685 (98.7)	104 (96.3)	
Involved in co-curricular activities			
Yes	1479 (86.6)	95 (88.0)	0.695
No	228 (13.4)	13 (12.0)	
Ever felt lonely (past 12 months)			
Yes	703 (41.2)	51 (47.2)	0.217
No	1004 (58.8)	57 (52.8)	
Parents know what you were doing (past 30 days)			
Yes	1126 (66.0)	77 (71.3)	0.314
No	206 (12.0)	14 (13.0)	
Don't know	375 (22.0)	17 (15.7)	

Note. Chi Square test was used to examine this difference as variables were categorical; RM; Ringgit Malaysia;*Significant set at p value < 0.05.

Characteristics	Included N=1707 N (%)	Excluded N=108 N (%)	p-value
Parental marital status			
Married and living together	1505 (88.2)	95 (88.0)	0.617
Married and living apart	31 (1.8)	1 (0.9)	
Divorce	102 (6.0)	5 (4.6)	
Separated	32 (1.9)	4 (3.7)	
Don't know	37 (2.2)	3 (2.8)	
Parental monthly income			
Low (less than RM3000)	639 (37.4)	40 (37.0)	0.780
High (more than RM 3000)	502 (29.4)	29 (26.9)	
Don't know	566 (33.2)	39 (36.1)	

'Table 3.40, continued'
Note. Chi Square test was used to examine this difference as variables were categorical;
RM; Ringgit Malaysia; *Significant set at p value < 0.05.

(b) **Classification of missing data**

The next stage is classifying the type of missing data in this study into one of the following categories, namely missing completely at random (MCAR), missing at random (MAR) or missing not at random (MNAR) (Garson, 2015). In order to identify whether missing data are MCAR, a non-significant result has to be reported from Little's Missing Completely at Random test (Garson, 2015).

Little's MCAR test was performed using SPSS; the individual score of 20 items on the CES-D depression scale was selected from the quantitative variable box and the independent variables (which were all categorical independent variables) were selected from the categorical variable box. The expectation-maximization (EM) estimation function was selected in order to determine whether there was any difference between respondents with and without missing values as shown in Figure 3.14.

Little's MCAR test reported a non-significant p-value (p = .213), indicating that the data were MCAR (there were no systematic differences between the missing values and the observed values) as shown in Table 3.41. A group comparison between missing and valid data across all the variables with missing data reported that there was no significant group difference (p-value in separate variance T-test was > 0.05).
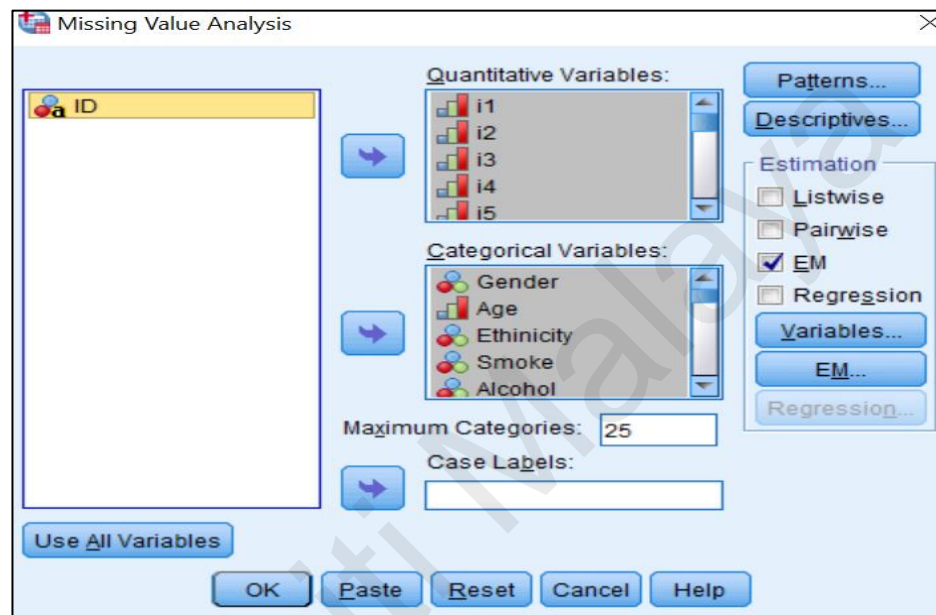
Figure 3.14: Little's MCAR test.

Table 3.41: Analysis of Little's MCAR test

EM Means[a]																			
i1	i2	i3	i4	i5	i6	i7	i8	i9	i10	i11	i12	i13	i14	i15	i16	i17	i18	i19	i20
.93	.94	.65	.76	1.08	.78	1.10	1.08	1.18	1.06	.94	.60	.88	.86	.85	.81	.97	.96	1.11	1.13

Note. i, Item; a, Little's MCAR test; Chi-Square = 577.181; DF = 551; Sig. = .213.

(c) **Handling of missing data**

In this study, the missing data were handled using complete-case analysis (listwise deletion). In order to treat missing data with listwise deletion the missing data must be MCAR (Kang, 2013). In this study, Little's MCAR test was not significant, thereby meeting the assumption of listwise deletion. There was no significant difference in baseline characteristics and variables, with missing values across both included and excluded groups, thereby indicating that there was no potential selection bias as a result of listwise deletion (Kivimäki et al., 2009). Listwise deletion was performed using the syntax command in SPSS as shown below in Figure 3.15.

```
filter off.
use all.
select if(not missing(V1-V2-V3-V5-V6-V7-V8-V9-V10-V11-V12-V13-V14-
V15-V16-V17-V18-V19-V20-V21-V22-V23-V24-V25-V26-V27-V28-V29-
V30-V31-V32-V33-V34-V35-V36-V37-V38-V39-V40-V41-V42-V43-V44-
V45-V46-V47-V48-V49-V50-V51-V52-V53-V54-V55-V56-V57-V58-V59-
V60-V61-V62-V63-V64-V65-V66-V67-V68-V69-V70-V71-V72-V73-V74-
V75-V76-V77-V78-V79-V80-V81-V82-V83-V84-V85-V86-V87-V88-V89-
V90-V91-V92-V93-V94-V95-V96-V97-V98-V99-V100-V101-V102-V103-
V104-V105-V106-V107-V108-V109)).
execute.
```

Figure 3.15: SPSS syntax command for listwise deletion.

After inserting the above command in the syntax of SPSS, the run icon was selected and listwise deletion was performed in SPPS on the data set. In total, there were 1815 cases after dealing with missing data using listwise deletion; the final data set contained 1707 usable cases with no missing data.

3.3.12 Data analysis

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

(a) Statistical analysis used based on objectives

This section included the analysis of 1707 participants using the SPSS 24.0 software (IBM Corporation, 2016). Data analyses for the specific objectives are described in Table 3.42. Sociodemographic data were analysed 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 p-value < 0.05.

It is important to note that there were many variables tested in this study which may produce significant statistical test by chance (however, the possibility is less than 5% as the significance level was set at p<0.05). Inorder to address this issue several measures were taken. First, the rule of outcome events per predictor variable (EPV) used for this study was a range of 4 to 9 EPV. This range has been reported to have uncommon problems i.e. type 1 error & relative bias (Vittinghoff & McCulloch, 2007). Furthermore in analysis of causal influences in observational data, control of confounding may require adjustment for more covariates than the rule of 10 EPV and therefore this results in the violation of the rule of thumb 10 EPV (Vittinghoff & McCulloch, 2007). Second, independent variables with evidence of interaction and multicollinearity were excluded from multivariate analysis. Finally a large sample size estimated for this study would increase the power of the study and therefore reduce possibility of significant statistical test by chance.

Table 3.42: Statistical analysis based on study objectives

Objective	Statistical analysis	Summary measure
To determine the prevalence of depression symptom among adolescents.	Descriptive statistics*	Frequency (%)
To determine the adequacy of depression literacy among adolescents.	Descriptive statistics*	Frequency (%)
To examine knowledge of depression among adolescents.	Descriptive statistics*	Frequency (%)
To examine help seeking for depression among adolescents.	Descriptive statistics*	Frequency (%)
To examine stigmatising attitudes towards depression among adolescents.	Descriptive statistics*	Frequency (%)
To determine the association between knowledge of depression, intention to seek help, stigmatising attitudes and depression symptoms among adolescents.	Multivariate binary logistic regression (Enter method)*	Adjusted odds ratio 95% CI P-value
To determine the association between help seeking (sources of help and barriers to help seeking) and depression symptoms among adolescents intending to seek help.	Multivariate binary logistic regression (Enter method)[a]	Adjusted odds ratio 95% CI P-value
To determine the association between adequacy of depression literacy and depression symptoms among adolescents.	Multivariate binary logistic regression (Enter method)*	Adjusted odds ratio 95% CI P-value

Note. %, Percentages; CI, Confidence interval; *Data was analysed for all participants (N=1707); [a] Data was analysed for participants with intention to seek help (N=1365).

201

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

Several assumptions needed to be fulfilled in order 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 (only for quantitative dependent variables) (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 depression symptom, which is categorized into two levels, namely depressed or not depressed. Assumption (b) is met as the dependent variable in this study is either having depression symptom or not, 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 nominal association because it gives good norming from 0 to 1 regardless of table size when row marginals equal column marginals (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 is 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. Assumption (d) is not applicable as the dependent variable in this study is measured on a categorical scale.

(c) **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). The steps used are described in the following paragraphs:

i. Univariate logistics calculation

First, a binary logistic is selected from the analyse and regression menu as shown in Figure A (Appendix I). The outcome variable is shifted into the dependent box and the independent variable is shifted into the covariate box as shown in Figure B (Appendix I). The categorical box is selected to determine the reference group for the covariates as in Figure C (Appendix I). The statistics and plot box are selected, following which the CI for the Exp(B) box is checked and the CI is set at 95% as shown in Figure D (Appendix I). Table 3.43 shows the SPSS output generated for the univariate logistic regression. The same steps as those above were repeated for all the independent variables to be tested against the dependent variable.

Table 3.43: Analysis of univariate logistic regression

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for Exp (B)	
	Variables in the Equation							Lower	Upper
Step 1ᵃ	Gender (1)	.976	.139	49.185	1	.000	2.654	2.021	3.487
	Constant	-2.022	.120	285.377	1	.000	.132		

Note. a, Variable(s) entered on step 1: Gender.

ii.   Multivariate logistics calculation

All variables significant at p < 0.25 in univariate analysis are included in multivariate logistic regression analysis (Sperandei, 2014). The same steps as those in Figures 3.16 to 3.18 were repeated, with the only difference being that all the significant variables were included in the covariate box simultaneously. Then reference categories were selected. In the statistics and plot section, the CI for exp(B) was set at 95% and the Hosmer goodness-of-fit box (whose p-value should ideally be > 0.05) was checked as in Figure E (Appendix I). Table 3.44 shows the SPSS output generated for the Hosmer goodness of fit for multivariate logistic regression. Table 3.45 shows the results of adjusted OR and the 95% CI for the variables.

Table 3.44: Analysis of Hosmer goodness-of-fit

Hosmer and Lemeshow Test			
Step	Chi-square	df	Sig.
1	4.138	3	.247

Table 3.45: Analysis of multivariate logistic regression

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
	Variables in the Equation							Lower	Upper
Step 1ᵃ	Gender (1)	.865	.149	33.779	1	.000	2.374	1.774	3.177
	Lonely (1)	2.078	.146	202.079	1	.000	7.987	5.998	10.637
	Adequacy of depression literacy (1)	1.069	.548	3.814	1	.051	2.914	.996	8.522
	Constant	-4.166	.563	54.799	1	.000	.016		

Note. a,Variable(s) entered on step 1: Gender, lonely, adequacy of depression literacy.

(d) **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 using SPSS. The following were the steps taken to test for interaction. First, the binary logistic regression was selected from the SPSS menu as in Figure A (Appendix I). The dependent variable was entered into the dependent box and all the independent variables (significant at 0.25) were shifted into block 1 of one section by selecting the $>a^*b>$ function as shown in Figure F (Appendix I). Then ok was selected. Table 3.46 shows the analysis of interaction whereby a significant value ($p < 0.05$) indicates that interaction is present.

Table 3.46: Analysis of interaction

Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Age by Ethnicity by Gender	.027	.017	2.598	1	.107	1.027
	Constant	-1.448	.080	330.694	1	.000	.235

Note. a, Variable(s) entered on step 1: Age * Ethnicity * Gender.

3.4   Summary of Chapter 3

A detailed account of this study's methodology based on each study phase (phases 1 and 2) is presented separately in this chapter. Both phases utilized a cross-sectional study design. The validation component (phase 1) validated the MHL and stigma questionnaire as well as the CES-D Malay version questionnaire. Data were collected from two national secondary schools in the Federal Territory of Kuala Lumpur from a total of 65 adolescents between April and July 2017. Internal consistency and test-retest reliability analysis were examined using SPSS version 24.0 for both questionnaires. Both the MHL and stigma questionnaire and the CES-D Malay version questionnaire were found to be reliable and valid instruments for use among young Malaysian adolescents.

Phase 2 of this study utilized a self-reported questionnaire that was validated in phase 1. Data were collected from 46 national secondary schools in Selangor from a total of 1815 adolescents between August and November 2017. Missing data were treated with listwise deletion as the assumptions of MCAR were met. A formal total of 1707 data were analysed using SPSS version 24.0. Data analysis involved descriptive, univariate and multivariate logistic regression analysis. Figure 3.16 depicts the flow of this study.
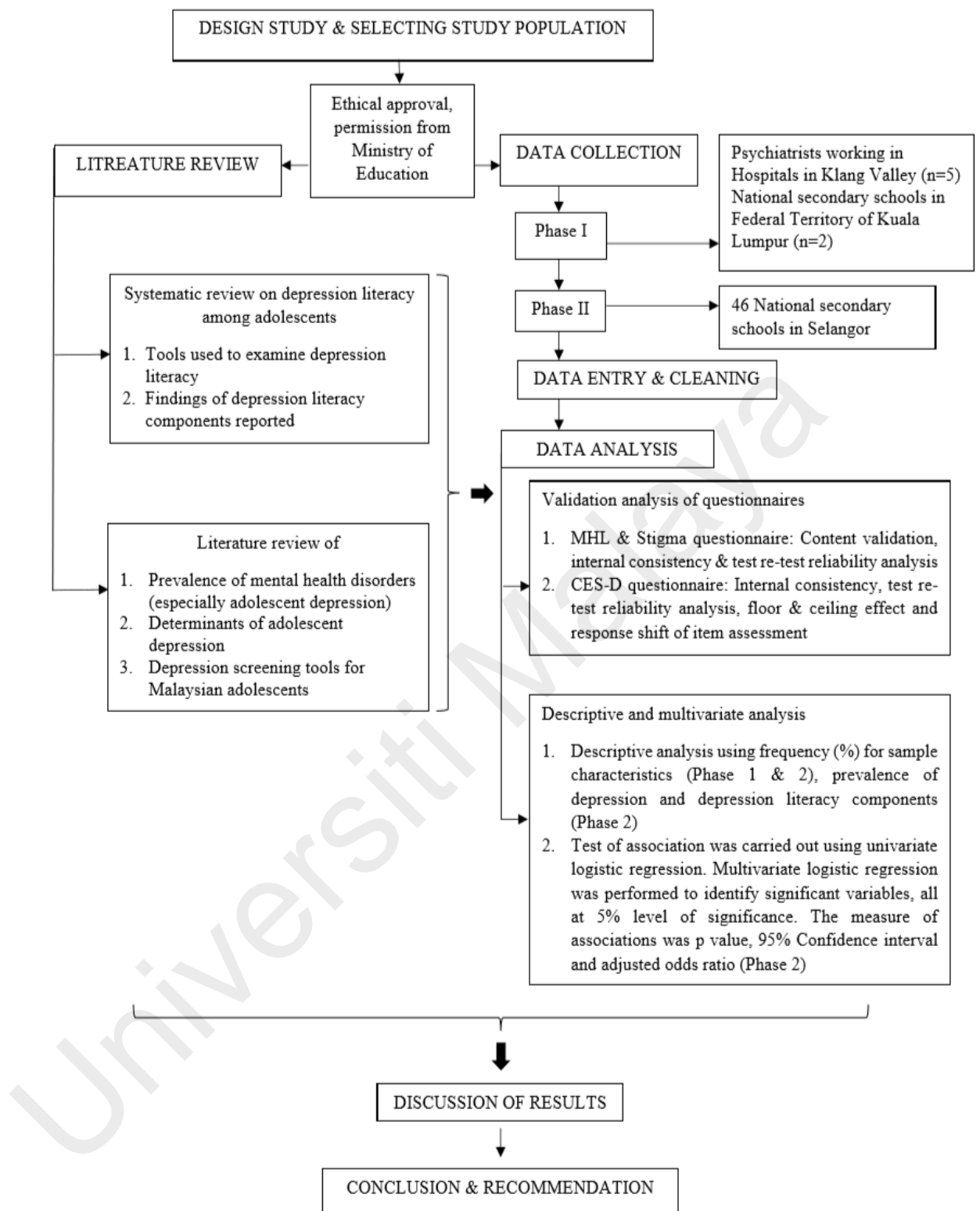
Figure 3.16: Study flow.

CHAPTER 4: RESULTS

4.1   Introduction

The results of phase 2 are described in this chapter. Section 4.2 describes the sample and variables in this study. All variables are described according to percentages and frequency. Section 4.3 presents descriptive analysis of the prevalence of depression symptom, adequacy of depression literacy, knowledge of depression, help seeking and stigmatising attitudes towards depression. This section gives us an understanding regarding the ability of adolescents to recognize depression, and their understanding of the helpfulness or harmfulness of various first-aid, preventive and interventional strategies, and intention to seek help. Further, it also sheds some light on adolescents' agreement to various sources of help, barriers to help seeking, stigmatising attitudes towards depression and the overall adequacy of depression literacy. The results of the final analysis of logistic regression (univariate and multivariate) are presented in Section 4.4. The aim of this section is to identify which variables (namely sociodemographic, knowledge of depression, help seeking, stigmatising attitudes and adequacy of depression literacy variables) are significantly associated with depression symptoms 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: (a) demographic (13 variables), (b) knowledge of depression (41 variables), (c) help seeking (16 variables), (d) stigmatising attitudes (19 variables), (e) adequacy of depression literacy (1 variable) and (f) depression symptoms (1 variable). Out of the 50 schools that were invited to participate in this study, only 46 agreed to participate. A total of 2560 adolescents expressed interest in the study, and 1815 agreed to participate and received parental consent, giving a response rate of 71% (1815/2560).

Of these 1815 respondents who completed the questionnaire, 1707 provided usable questionnaires with no missing data. A total of 1707 samples were collected for each variable. The majority of participants were Malay (65.5%), followed by Chinese (19.7%), Indian (12.6%) and other races (2.2%). The majority of participants were aged 13 (93.6%), followed by those aged 14 (4.9%) and those aged 12 (1.5%). There were 1031 (60.4%) female participants and 676 (39.6%) male participants.

The majority of participants had never smoked cigarettes (95.3%), had never consumed alcohol (91.5%) or drugs (99.4), had never been bullied (81.1%) and had not recently changed school (98.7%). Only 41.2% of participants had felt lonely in the past year. Most participants lived in an intact family with both parents (88.1%) and most parents were aware of what their child had been doing in the past 30 days (66%). The majority of participants reported a parent monthly income of less than 3000 *Ringgit Malaysia* (RM) per month (37.4%).

Depression symptoms was seen more among female (26%) than male participants (11.7%). Adolescents aged 14 were reported to have more depression symptoms (33.3%) than their younger counterparts. Based on ethnicity, the prevalence of depression symptom was highest among other races (37.8%), followed by Malays (23.9%), Chinese (13.4%) and Indians (9.8%). A higher prevalence of depression symptom was also reported among those who smoked (22.5%), had been bullied (35.1%), had recently changed school (22.7%), were not involved in co-curricular activities (29.8%), felt lonely (39.1%), lacked parental supervision (38.3%), had experienced parental divorce (29.4%) and had low parental income (19.7%). Table 4.1 shows the demographic characteristics of the participants.

Table 4.1: Sociodemographic characteristics of participants (N=1707)

Characteristics	Frequency N (%)	Depression symptom N (%)		OR (95% CI)	p-value
		No	Yes		
Gender					
Male	676 (39.6)	597 (88.3)	79 (11.7)	1	<0.0001*
Female	1031 (60.4)	763 (74.0)	268 (26.0)	2.65 (2.20, 3.49)	
Age (Years)					
12	25 (1.5)	20 (80.0)	5 (20.0)	1.02 (0.38, 2.75)	0.012*
13	1598 (93.6)	1284 (80.4)	314 (19.6)	1	
14	84 (4.9)	56 (66.7)	28 (33.3)	2.05 (1.28, 3.27)	
Ethnicity					
Malay	1118 (65.5)	851 (76.1)	267 (23.9)	1	<0.0001*
Chinese	337 (19.7)	292 (86.6)	45 (13.4)	0.49 (0.35, 0.69)	
Indian	215 (12.6)	194 (90.2)	21 (9.8)	0.35 (0.21, 0.55)	
Others	37 (2.2)	23 (62.2)	14 (37.8)	1.94 (0.98, 3.82)	
Smoked cigarettes in the past 30 days					
Yes	80 (4.7)	62 (77.5)	18 (22.5)	1.15 (0.67, 1.96)	0.621
No	1627 (95.3)	1298 (79.8)	329 (20.2)	1	
Consumed alcohol in the past 30 days					
Yes	145 (8.5)	120 (82.8)	25 (17.2)	0.80 (0.51, 1.26)	0.335
No	1562 (91.5)	1240 (79.4)	322 (20.6)	1	
Drug use in the past 30 days					
Yes	10 (0.6)	9 (90.0)	1 (10.0)	2.31 (0.29, 18.26)	0.429
No	1697 (99.4)	1351 (79.6)	346 (20.4)	1	
Bullied in the past 30 days [a]					
Yes	191 (11.2)	124 (64.9)	67 (35.1)	2.77 (1.99, 3.85)	<0.0001*
No	1385 (81.1)	1159 (83.7)	226 (16.3)	1	

Note. 1 indicate reference group; RM, *Ringgit Malaysia*; OR, Odds ratio; CI, Confidence interval; *, Statistically significant ($p < 0.05$); [a], actual observed values excluding the don't know response option.

Characteristics	Frequency N (%)	Depression status N (%) Normal	Depression	OR (95% CI)	p-value
Shifted or changed school in the past 30 days					
Yes	22 (1.3)	17 (77.3)	5 (22.7)	1.16 (0.42, 3.15)	
No	1685 (98.7)	1343 (79.7)	342 (20.3)	1	0.779
Involved in co-curricular activities					
Yes	1479 (86.6)	1200 (81.1)	279 (18.9)	1	<0.0001*
No	228 (13.4)	160 (70.2)	68 (29.8)	1.83 (1.34, 2.50)	
Felt lonely in the past 12 months					
Yes	703 (41.2)	428 (60.9)	275 (39.1)	8.32 (6.26, 11.04)	<0.0001*
No	1004 (58.8)	932 (92.8)	72 (7.2)	1	
Parents know what you were doing in the past 30 days [a]					
Yes	1126 (66.0)	966 (85.8)	160 (14.2)	1	<0.0001*
No	206 (12.0)	127 (61.7)	79 (38.3)	3.76 (2.71, 5.21)	
Parental marital status [a]					
Married and living together	1505 (88.1)	1212 (80.5)	293 (19.5)	1	0.033*
Married and living apart	31 (1.8)	22 (71.0)	9 (29.0)	1.69 (0.77, 3.71)	
Divorce	102 (6.0)	72 (70.6)	30 (29.4)	1.72 (1.11, 2.69)	
Separated	32 (1.9)	22 (68.8)	10 (31.2)	1.88 (0.88, 4.01)	
Parental monthly income [a]					
Low (less than RM3000)	639 (37.4)	513 (80.3)	126 (19.7)	1	0.174
High (more than RM 3000)	502 (29.4)	410 (81.7)	92 (18.3)	0.91 (0.68, 1.23)	

'Table 4.1, continued'   Note. 1 indicate reference group; RM, *Ringgit Malaysia*; OR, Odds ratio; CI, Confidence interval; *, Statistically significant (p < 0.05); [a], actual observed values excluding the don't know response option.

4.3 Descriptive analysis

The results of descriptive analysis are presented in the sections below.

4.3.1 Prevalence of depression symptoms, adequacy of depression literacy

The prevalence of depression symptoms among participants was 20.3%. As shown in Table 4.1, females are more likely to have depression symptoms than males with an OR of 2.65 (95% CI 2.02, 3.49). Depression symptoms was significantly associated with adolescents aged 14 (OR = 2.05; 95% CI 1.28, 3.27), Chinese and Indian ethnicity groups (OR = 0.49; 95% CI 0.35, 0.69) (OR = 0.35; 95% CI 0.21, 0.55), being bullied (OR = 2.77; 95% CI 1.99, 3.85), having no involvement in co-curricular activities (OR = 1.83; 95% CI 1.34, 2.50), feeling lonely (OR = 8.32; 95% CI 6.26, 11.04), lacking parental supervision (OR = 3.76; 95% CI 2.71, 5.21) and experiencing parental divorce (OR = 1.72; 95% CI 1.11, 2.69). Only 3.5% of the respondents were able to correctly recognize depression as the problem described by the vignette. The majority of the participants were classified as having inadequate depression literacy (97.0%). Table 4.2 shows the prevalence of depression symptoms, the ability to correctly recognize depression and the adequacy of depression among adolescents.

Table 4.1: Prevalence of depression symptoms, ability to correctly recognize depression and adequacy of depression literacy among adolescent (N= 1707)

Characteristics	Frequency N (%)
Depression symptoms	
No	1360 (79.7)
Yes	347 (20.3)
Correct recognition of depression	
Yes[a]	60 (3.5)
No	1647 (96.5)
Adequacy of depression literacy	
Adequate[b]	51 (3.0)
Inadequate	1656 (97.0)

Note. [a] Correct recognition of depression is defined as the ability to identify depression, mental illness and stress as problems faced by the person described in the vignette; [b]Adequate depression literacy is defined as the ability to correctly recognize depression with an intention to seek help.

4.3.2 Knowledge of depression

With regard to knowledge about recognition of disorder, the majority of participants thought the individual described in the vignette was suffering from stress (88.3%), followed by depression (87.1%) and an eating disorder (53.9%). Only 29.4% of participants regarded the person described in the vignette as suffering from mental illness. A minority of participants thought the person in the vignette was suffering from substance abuse (8.0%) or did not have any problems (3.8%).

First-aid actions such as listening to his problems (97.1%), suggesting seeking professional help (82.8%) and being physically active (76.0%) were regarded by the majority of participants as helpful first-aid actions for the person described in the vignette. Items on keep him busy (51.7%) and ignore him (5.9%) were generally regarded by many participants as being of unhelpful first-aid value.

Knowledge regarding interventions was divided into three broad categories, namely people, medication and activities-based interventions. Family members (90.2%), counsellors (87.2%), friends (81.0%), teachers (80.4%) and doctors (79.9%) were endorsed by the majority of the participants as helpful sources of people-based

intervention for the person described in the vignette, while psychiatrists (44.3%) and psychologists (47.7%) were identified as the least helpful forms of intervention. The majority of participants endorsed vitamins (72.9%) as a helpful source of medication followed by antidepressants (53.4%), while sleeping pills were regarded by the majority as unhelpful.

In terms of activities that might help the person in the vignette's problem, the majority of participants endorsed receiving counselling (90.1%), relaxation training (83.4%), reading a self-help book (72.9%), getting out in the sunlight (62.9%) and searching the web for information (59.9%). Cutting down on high-risk activities such as smoking cigarettes (74.6%), drinking alcohol (72.1%) and using marijuana (70.6%) were also regarded by the majority of participants as helpful forms of intervention. Interventions such as getting acupuncture (14.1%), joining a support group (39.0%) and going to a local mental health service (44.1%) were considered by the majority of participants to be unhelpful for the person described in the vignette. Involvement in high-risk behaviours such as drinking alcohol, smoking cigarettes and using marijuana was identified by the majority as being unhelpful for the person described in the vignette. The majority of the participants regarded all the items under the knowledge of prevention as having preventive value for depression. Table 4.3 presents the response to the knowledge component of depression literacy (which includes percentages of participants endorsing yes to the various labels under the recognition of disorder and prevention section; and helpfulness of various first aid and interventions) for the person described in the vignette.

Table 4.2: Response to the knowledge component of depression literacy (N = 1707)

Knowledge component	Frequency N (%)
Recognition of disorder (Yes to the following:)	
Stress	1508 (88.3)
Depression	1486 (87.1)
Eating disorder	920 (53.9)
Mental illness	502 (29.4)
Substance abuse	137 (8.0)
Nothing	65 (3.8)
First aid (Helpful of the following:)	
Listen to his problems	1657 (97.1)
Suggest seeking professional help	1413 (82.8)
Be physically active	1298 (76.0)
Keep him busy	458 (51.7)
Ignore him	100 (5.9)
Intervention (Helpful of the following:)	
Family member	1539 (90.2)
Receiving counselling	1538 (90.1)
Counsellor	1489 (87.2)
Relaxation training	1423 (83.4)
Friend	1383 (81.0)
Teacher	1372 (80.4)
Doctor	1361 (79.7)
Cutting down on smoking cigarettes	1273 (74.6)
Reading a self-help book	1245 (72.9)
Vitamin	1244 (72.9)
Cutting down on drinking of alcohol	1230 (72.1)
Cutting down on use of marijuana	1205 (70.6)
Getting out in the sunlight	1074 (62.9)
Search web for information	1023 (59.9)
Antidepressants	911 (53.4)
Practicing meditation	889 (52.1)
Psychologist	814 (47.7)
Psychiatrist	757 (44.3)
Going to a local mental health service	753 (44.1)
Join a support group	665 (39.0)
Sleeping pill	316 (18.5)
Getting acupuncture	240 (14.1)
Smoking cigarettes	12 (0.7)
Drinking alcohol to relax	11 (0.6)
Using marijuana	11 (0.6)
Prevention (Yes to the following:)	
Always spend time with family	1588 (93.0)
Keeping physically active	1512 (88.6)
Keep regular communication with friends	1510 (88.5)
Avoiding stressful situations	1465 (85.8)
Making regular time for relaxing activities	1393 (81.6)

4.3.3 Help seeking

The majority of the participants would seek help if they were suffering in the same way as the person in the vignette (80.0%). Among those participants who were willing to seek help, family was the most commonly endorsed source of help (91.3%) followed by a counsellor/psychiatrist (68.5%), a friend (67.4%) and a teacher (61.0%). The most commonly identified barriers to help seeking were the person might give wrong information (61.4%) and the person might feel negatively about you (58.5%). Almost half of the participants identified being worried what others might think if help is sought (43.7%) and being worried about the negative effects of treatment (43.1%) as potential barriers to help seeking. Feeling that nothing can help (20.8%), the person or service is far away (25.8%), finding it difficult to get an appointment (27.0%), not liking the treatment (29.4%), not having enough money (30.4%), the waiting time for an appointment (31.0%) and being too embarrassed/shy (39.9%) were also reported by a minority of participants as barriers to help seeking. Table 4.4 shows the percentages of respondents agreeing to the help-seeking component of depression literacy for the person described in the vignette.

Table 4.3: Percentages of respondents agreeing to the help seeking component of depression literacy

Help seeking component	Frequency N (%)
Help seeking intention (N=1707)	
Yes	1365 (80.0)
No/Don't know	342 (20.0)
Of those with help seeking intention (N=1365), seek help from**	
Family	1246 (91.3)
Counsellor/Psychiatrist	935 (68.5)
Friend	920 (67.4)
Teacher	832 (61.0)
Barriers of seeking help (N=1365)**	
The person might give wrong information	838 (61.4)
The person might feel negatively about you	798 (58.5)
Worried what others might think of you	597 (43.7)
Worried about the negative effects of treatment	588 (43.1)
Too embarrassed/shy	544 (39.9)
Waiting time for appointment	423 (31.0)
Not enough money	415 (30.4)
Not liking the treatment	401 (29.4)
Difficult to get appointment	369 (27.0)
The person or service is far	352 (25.8)
Feeling that nothing can help	284 (20.8)

Note. **Follow-up question only for those who answered yes to help seeking intention.

4.3.4   Stigmatising attitudes

For the items regarding personal stigma, the majority of participants agreed that the person described in the vignette could snap out of his problem if he wanted (71.9%) and was unpredictable due to his underlying problem (71.9%), whereas the statement least agreed upon by the participants was that the person described in the vignette was dangerous to others (7.1%), followed by it was best to avoid the person described in the vignette (20.3%), they would not tell anyone if they had a problem like the person described in the vignette (22.1%) and the person in the vignette's problem was not a real medical illness (36.4%). Almost half of the participants agreed that the problem faced by the person described in the vignette was a sign of personal weakness (49.1%).

With regard to what the participants thought others believed regarding the person described in the vignette (perceived stigma), almost the same results were seen as for the items regarding personal stigma. Participants agreed that most other people would believe that the person described in the vignette could snap out of his problem if he wanted (74%) and that the person was unpredictable due to his underlying problem (67.5%). Almost half of the participants believed that other people would agree that the problem faced by the person described in the vignette was a sign of personal weakness (48.3%). Other items regarding others believing the person described in the vignette was dangerous to others (21.6%), it was best to avoid him (33.1%), the person in the vignette's problem was not a real medical illness (38.5%) and not disclosing the problem to anyone if they had a similar problem to that of the person described in the vignette (38.3%) were least agreed upon by the majority of the participants.

Participants demonstrated low desire for social distance towards the person described in the vignette, with the majority of participants agreeing to develop a friendship (86.8%), go out at weekends (80.7%) and work on a project together (76.2%) with the person described in the vignette. Inviting (63.9%) and going to the house (66.0%) of the person described in the vignette was agreed upon by the majority of participants. Table 4.5 shows the percentages of respondents agreeing to the stigmatising attitudes component of depression literacy for the person described in the vignette.

Table 4.4: Percentages of respondents agreeing to the stigmatising attitudes component of depression literacy (N =1707)

Stigmatising attitude component	Frequency N (%)
Personal Stigma (You personally agree to the following:)	
Could snap out of it if he wanted	1227 (71.9)
Ali's problem makes him unpredictable	1227 (71.9)
Ali's problem is a sign of personal weakness	838 (49.1)
Ali's problem is not a real medical illness	621 (36.4)
Would not tell anyone if you have a problem like Ali	378 (22.1)
Best to avoid him	347 (20.3)
Ali is dangerous to others	121 (7.1)
Perceive Stigma (Most people agree to the following:)	
Could snap out of it if he wanted	1264 (74.0)
Ali's problem makes him unpredictable	1153 (67.5)
Ali's problem is a sign of personal weakness	825 (48.3)
Ali's problem is not a real medical illness	657 (38.5)
Would not tell anyone if you have a problem like Ali	653 (38.3)
Best to avoid him	565 (33.1)
Ali is dangerous to others	368 (21.6)
Social Distance (Agree to the following:)	
Develop friendship	1482 (86.8)
Go out on weekends	1377 (80.7)
Work on a project together	1300 (76.2)
Go to his house.	1126 (66.0)
To invite to your house	1091 (63.9)

4.4 Logistic regression

4.4.1 Association between knowledge of depression, intention to seek help, stigmatising attitudes and depression symptoms

In total there were 50 variables that were significant at 0.25 in the univariate analysis and were entered into the multivariate analysis as shown in Appendix F. The 50 variables that were significant at 0.25 in univariate analysis were tested for interaction and there was no significant interaction present between these 50 variables and the outcome variable as the p-value was 0.792 as shown in Table 4.6.

Table 4.5: Test of interaction (a)

	Variables in the Equation	**B**	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
Step 1[a]	Age by Suggest seeking help by Ignore him until he gets over it by Keep him busy by Be physically active by Bullied in the past 30 days by Antidepressants by ...)	.000	.000	.069	1	.792	1.000
	Constant	-1.365	.060	515.127	1	.000	.255

Note. a. Variable(s) entered on step 1: Age * Suggest seeking help * Ignore him until he gets over it * Keep him busy * Be physically active * Bullied in the past 30 days * Antidepressants * Practicing meditation * Getting out in the sunlight * Search web for information * Reading a self-help book * Join a support group * Doctor or family doctor * Going to local mental health service * Smoking cigarettes * Teacher * Counsellor * Psychiatrist * Family member * Friend * Vitamin * Involved in co-curricular activities * Correct recognition of depression * Keeping physically active * Regular communication with friends * Spend time with family * Time for relaxing activities * Ethnicity * Ali could snap out of it if he wanted * Ali's problem is not a real medical illness * Ali is dangerous to others * It is best to avoid Ali so that you don't develop this problem yourself * Ali's problem makes him unpredictable * You would not tell anyone if you had a problem like Ali's * Most other people believe that Ali could snap out of it if he wanted * Most people believe that Ali's problem is not a real medical illness * Most people believe that Ali is dangerous to others * Most people believe that it is best to avoid Ali so that they don't develop this problem themselves * Most people believe that Ali's problem makes him unpredictable * Most people would not tell anyone if they had a problem like Ali's * Gender * To go out with Ali on the weekend * To invite Ali around to your house * Go to Ali house * To develop a close friendship with Ali * If you are a having problem like Ali would you seek help * Felt lonely in the past 12 months * Parental monthly income * Parental marital status * Parents know what you were doing in the past 30 days.

Testing for multicollinearity among these 50 variables revealed that no two variables had a Cramer's V value of more than 0.3, thereby indicating no presence of multicollinearity. Out of the 50 variables entered into the multivariate analysis level, 10 were significantly associated with depression symptoms, including Chinese descent (AOR = 0.42; 95% CI 0.25, 0.71) and, to a lesser extent, Indian descent (AOR = 0.26; 95% CI 0.13, 0.51) and being female (AOR = 3.08; 95% CI 2.12, 4.49). Having felt lonely in the past 12 months (AOR = 7.29; 95% CI 5.12, 10.37) and no involvement in school co-curricular activities (AOR = 1.58; 95% CI 1.02, 2.44) were also significantly associated with depression symptoms. The following risk factors in the past 30 days, namely a lack of parent or guardian supervision (AOR = 2.37; 95% CI 1.50, 3.75) and having been bullied (AOR = 2.87; 95% CI 1.79, 4.61), were significantly associated with depression symptoms. With regard to depression literacy variables, multivariate analysis revealed that the following knowledge about depression variables, namely keeping the person described in the vignette busy as a helpful first-aid action (AOR = 1.75; 95% CI 1.19, 2.59) and regarding getting out into the sunlight as a harmful intervention (AOR = 1.96; 95% CI 1.12, 3.45), were significantly associated with a higher odds of depression symptoms. In regard to personal stigmatising attitudes, not telling anyone if you have a problem like the person described in the vignette (AOR = 3.80; 95% CI 2.55, 5.67) and perceiving the person described in the vignette as being dangerous to others (AOR = 1.83; 95% CI 1.13, 2.95) was also significantly associated with depression symptoms. Table 4.7 shows the results of both univariate and multivariate logistic regression for the association of knowledge of depression, intention to seek help and stigmatising attitudes variables that are significant (p < 0.05) with depression symptoms in multivariate analysis while adjusting for demographic variables. The Hosmer-Lemeshow test p-value was 0.904 (not significant), meeting the assumption of logistic regression. The association between knowledge of depression (recognition of depression, first aid,

intervention and preventive measures), intention to seek help, stigmatising attitudes (personal stigma, perceived stigma and social distance) variables and depression symptoms for all the variables is shown in Appendix F.

Table 4.7: Association between knowledge of depression, intention to seek help and stigmatising attitudes variables with depression symptoms (N=1707)

Variable	Univariate logistic regression		Multivariate logistic regression	
	Crude OR (95% CI)	p-value	Adjusted OR (95%CI)	p-value
Gender				
Male	1		1	
Female	2.65 (2.20, 3.49)	<0.0001*	3.08 (2.12, 4.49)	<0.0001**
Ethnicity				
Malay	1		1	
Chinese	0.49 (0.35, 0.69)	<0.0001*	0.42 (0.25, 0.71)	0.001**
Indian	0.35 (0.22, 0.55)	<0.0001*	0.26 (0.13, 0.51)	<0.0001**
Others	1.94 (0.98, 3.82)	0.056	1.59 (0.61, 4.13)	0.344
Involved in co-curricular activities				
Yes	1		1	
No	1.83 (1.34, 2.50)	<0.0001*	1.58 (1.02, 2.44)	0.039**
Felt lonely in the past 12 months				
Yes	8.32 (6.26, 11.04)	<0.0001*	7.29 (5.12, 10.37)	<0.0001**
No	1		1	
Bullied in the past 30 days[a]				
Yes	2.77 (1.99, 3.85)	<0.0001*	2.87 (1.79, 4.61)	<0.0001**
No	1		1	
Parents know what you were doing (30days) [a]				
Yes	1		1	
No	3.76 (2.71, 5.21)	<0.0001*	2.37 (1.50, 3.75)	<0.0001**

Note. OR, Odds ratio; CI, Confidence interval; *Variables significant at 0.25 from 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 = 3.44 (df = 8), p = 0.904; [a], actual observed values excluding the don't know response option (values with don't response are available in Appendix F).

Variable	Univariate logistic regression		Multivariate logistic regression	
	Crude OR (95% CI)	p-value	Adjusted OR (95%CI)	p-value
First aid actions				
Keep him busy [a]				
Helpful	1.38 (1.05, 1.83)	0.022*	1.75 (1.19, 2.59)	0.005**
Harmful	1		1	
Intervention				
Getting out in the sunlight [a]				
Helpful	1		1	
Harmful	1.71 (1.16, 2.51)	0.007*	1.96 (1.12, 3.45)	0.018**
Personal Stigma				
Would not tell anyone if having a problem [a]				
Agree	6.43 (4.84, 8.54)	<0.0001*	3.80 (2.55, 5.67)	<0.0001**
Disagree	1		1	
Perceive Stigma				
Dangerous to others [a]				
Agree	1.70 (1.26, 2.24)	<0.0001*	1.83 (1.13,2.95)	0.014**
Disagree	1		1	

'Table 4.7, continued' Note. OR, Odds ratio; CI, Confidence interval; *Variables significant at 0.25 from 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 = 3.44 (df = 8), p = 0.904; [a], actual observed values excluding the don't know response option (values with don't response are available in Appendix F).

4.4.2 Association between sources of help, barriers to help seeking and depression symptoms among adolescents with intention to seek help

The following analysis was to examine the association between the help-seeking component of depression literacy (more specifically the attitudes towards the source of help and barriers to help seeking) and depression symptoms among adolescents who have the intention to seek help ($N = 1365$). In total there were 61 variables that were significant at 0.25 in univariate analysis as shown in Appendix G.

Testing for multicollinearity among these 61 variables revealed that there were eight variables in four pairs that had evidence of multicollinearity (Cramer's V value of > 0.3) as follows: (a) alcohol intake and ethnicity, (b) family member (knowledge of intervention) and family (source of help), (c) teacher (knowledge of intervention) and teacher (source of help) and (d) counsellor (knowledge of intervention) and counsellor (source of help). The four variables removed were alcohol intake and knowledge of intervention (family, teacher and counsellor). These variables were removed from the analysis and finally a total of 57 variables were entered into multivariate analysis.

The 57 variables that were significant at 0.25 in the univariate analysis with no evidence of multicollinearity were tested for interaction and there was no significant interaction present between these 57 variables and the outcome variable as the p-value was 0.392 as shown in Table 4.8.

Table 4.6 : Test of interaction (b)

		B	S.E.	Wald	df	Sig.	Exp(B)
	Variables in the Equation						
Step 1ᵃ	Suggest seeking help by Keep him busy by Be physically active by Bullied in the past 30 days by Antidepressants by Relaxation training by ...)	.000	.000	.732	1	.392	1.000
	Constant	-1.644	.073	500.184	1	.000	.193

Note. a. Variable(s) entered on step 1: Suggest seeking help * Keep him busy * Be physically active * Bullied in the past 30 days * Antidepressants * Relaxation training * Practicing meditation * Getting acupuncture * Getting out in the sunlight * Search web for information * Reading a self-help book * Join a support group * Going to local mental health service * Smoking cigarettes * Cutting down use of marijuana * Psychiatrist * Friend * Involved in co-curricular activities * Correct recognition of depression * Keeping physically active * Avoiding stressful situations * Regular communication with friends * Spend time with family * Time for relaxing activities * Worried about what other people might think of you for seeking the person for help * The person or service is too far to travel to * It is too difficult to get an appointment * Concern about the negative effects of treatment: Example itchiness/stomach pain * Not liking the type of treatment that is likely to be offered * Feeling that nothing can help your problem * Having to wait for an appointment * Too embarrassed/shy * Family * Counsellor / Psychiatrist * Teacher * Not enough money to get help * Concern that the person might feel negatively about you * Concern that person might give wrong information * Ethnicity * Ali is dangerous to others * It is best to avoid Ali so that you don't develop this problem yourself * Ali's problem makes him unpredictable * You would not tell anyone if you had a problem like Ali's * Most other people believe that Ali could snap out of it if he wanted * Most people believe that Ali's problem is a sign of personal weakness * Most people believe that Ali is dangerous to others * Most people believe that it is best to avoid Ali so that they don't develop this problem themselves * Most people believe that Ali's problem makes him unpredictable * Most people would not tell anyone if they had a problem like Ali's * Gender * To go out with Ali on the weekend * To invite Ali around to your house * Go to Ali house * To develop a close friendship with Ali * Felt lonely in the past 12 months * Parents know what you were doing in the past 30 days * Smoked cigarettes in the past 30 days.

Following multivariate analysis, 13 variables were significantly associated with depression symptoms. Indian descent (AOR = 0.22; 95% CI 0.08, 0.55), being female (AOR = 2.08; 95% CI 1.28, 3.37) and having felt lonely in the past 12 months (AOR = 7.43; 95% CI 4.73, 11.66) were significantly associated with a higher odds of depression symptoms. The following risk factors in the past 30 days, namely a lack of parent or guardian supervision (AOR = 2.30; 95% CI 1.27, 4.17) and having been bullied (AOR = 2.76; 95% CI 1.53, 4.97), were also significantly associated with depression symptoms.

With regard to depression literacy variables, multivariate analysis revealed that the following help-seeking variables regarding sources of help and barriers to help seeking, namely not endorsing family as a source of help (AOR = 2.19; 95% CI 1.02, 4.69), being worried what others might think if help is sought (AOR = 1.67; 95% CI 1.02, 2.75), feeling that nothing can help (AOR=1.66 ; 95% CI 1.01, 2.70) and difficult to get an appointment (AOR=1.85 ; 95% CI 1.07, 3.19), were also significantly associated with depression symptoms. In addition, two knowledge of depression variables, namely regarding getting out into the sunlight as a harmful intervention (AOR = 2.22; 95% CI 1.10, 4.50) and regarding antidepressants as a harmful medication (AOR = 1.87; 95% CI 1.12, 3.12), were significantly associated with a higher odds of depression symptoms. In regard to personal stigmatising attitudes, not telling anyone if you have a problem like the person described in the vignette (AOR = 2.52; 95% CI 1.50, 4.26) and perceiving the person described in the vignette as being dangerous to others (AOR = 2.49; 95% CI 1.36, 4.55) was also significantly associated with depression symptoms.

Table 4.9 shows the results of univariate and multivariate logistic regression for the association between sources of help and barriers to help seeking variables that are significant ($p < 0.05$) and depression symptoms in multivariate analysis among adolescents with intention to seek help after adjusting for demographic, knowledge of depression and stigmatising attitudes variables. The Hosmer-Lemeshow test p-value was 0.559 (not significant), meeting the assumption of logistic regression. The table showing the association between source of help, barriers to help seeking and depression symptoms among adolescents with intention to seek help (N = 1365) for all the variables is available in Appendix G.

Table 4.9: Association between sources of help and barriers to help seeking with depression symptoms among adolescents with intention to seek help (N=1365)

Variable	Univariate logistic regression		Multivariate logistic regression	
	Crude OR (95% CI)	p-value	Adjusted OR (95%CI)	p-value
Gender				
Male	1		1	
Female	2.14 (1.56, 2.95)	<0.0001*	2.08 (1.28, 3.37)	0.003**
Ethnicity				
Malay	1		1	
Chinese	0.39 (0.25, 0.62)	<0.0001*	0.58 (0.29, 1.17)	0.127
Indian	0.30 (0.17, 0.56)	<0.0001*	0.22 (0.08, 0.55)	0.001**
Others	1.34 (0.56, 3.21)	0.505	1.41 (0.39, 5.58)	0.599
Felt lonely in the past 12 months				
Yes	7.90 (5.62, 11.11)	<0.0001*	7.43 (4.73, 11.66)	<0.0001**
No	1		1	
Bullied in the past 30days[a]				
Yes	3.07 (2.08, 4.54)	<0.0001*	2.76 (1.53, 4.97)	0.001**
No	1		1	
Parents know what you were doing (30days) [a]				
Yes	1		1	
No	2.86 (1.92, 4.27)	<0.0001*	2.30 (1.27, 4.17)	0.006**
Sources of help				
Family[a]				
Yes	1		1	
No	4.12 (2.55, 6.66)	<0.0001*	2.19 (1.02, 4.69)	0.044**

Note. OR, Odds ratio; CI, Confidence interval; *Variables significant at 0.25 from 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, knowledge of depression and stigmatising attitudes variable; Hosmer-Lemeshow goodness-of-fit test chi square = 6.79 (df = 8), p = 0.559; [a], actual observed values excluding the don't know response option (values with don't response are available in Appendix G).

Variable	Univariate logistic regression		Multivariate logistic regression	
	Crude OR (95% CI)	p-value	Adjusted OR (95%CI)	p-value
Barriers to help seeking				
Worried what others might think[a]				
Yes	3.36 (2.37, 4.76)	<0.0001*	1.67 (1.02, 2.75)	0.041**
No	1		1	
Feeling that nothing can help [a]				
Yes	3.63 (2.61, 5.07)	<0.0001*	1.66 (1.01, 2.70)	0.044**
No	1		1	
Difficult to get an appointment [a]				
Yes	1.87 (1.33, 2.62)	<0.0001*	1.85 (1.07, 3.19)	0.027**
No	1		1	
Intervention (Knowledge)				
Antidepressants[a]				
Helpful	1		1	
Harmful	1.39 (0.99, 1.97)	0.059*	1.87 (1.12, 3.12)	0.017**
Getting out in the sunlight[a]				
Helpful	1		1	
Harmful	1.63 (1.03, 2.60)	0.039*	2.22 (1.10, 4.50)	0.027**
Personal Stigma				
Would not tell anyone if having a problem[a]				
Agree	4.77 (3.40, 6.70)	<0.0001*	2.52 (1.50, 4.26)	0.001**
Disagree	1		1	
Perceive Stigma				
Dangerous to others[a]				
Agree	1.80 (1.29, 2.51)	0.001*	2.49 (1.36, 4.55)	0.003**
Disagree	1		1	

'Table 4.9, continued' Note. OR, Odds ratio; CI, Confidence interval; *Variables significant at 0.25 from 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, knowledge of depression and stigmatising attitudes variable; Hosmer-Lemeshow goodness-of-fit test chi square = 6.79 (df = 8), p = 0.559; [a], actual observed values excluding the don't know response option (values with don't response are available in Appendix G).

4.4.3 Association between adequacy of depression literacy and depression symptoms

Following univariate analysis, 10 variables were significant at 0.25 and were tested for interaction. There was no significant interaction present between these 10 variables and the outcome variable as the p-value was 0.999 as shown in Table 4.10. Testing for multicollinearity among these 10 variables revealed that no two variables had a Cramer's V value of more than 0.3, thereby indicating no evidence of multicollinearity.

Table 4.7: Test of interaction (c)

	B	S.E.	Wald	df	Sig.	Exp(B)
Variables in the Equation						
Step 1[a] Adequacy of depression literacy by Age by Bullied in the past 30 days by Involved in co-curricular activities by Ethnicity by Gender by Felt lonely in the past 12 months by Parental monthly income by Parental marital status by Parents know what you were doing in the past 30 days	0.00	0.00	0.00	1	.999	0.00
Constant	-1.239	.062	404.876	1	.000	.290

Note. a. Variable(s) entered on step 1: Adequacy of depression literacy * Age * Bullied in the past 30 days * Involved in co-curricular activities * Ethnicity * Gender * Felt lonely in the past 12 months * Parental monthly income * Parental marital status * Parents know what you were doing in the past 30 days.

Univariate analysis reported that those with inadequate depression literacy had a significant odds of having depression symptoms (OR = 3.07; 95% CI 1.10, 8.58). Following multivariate analysis, several variables were significantly associated with depression symptoms, namely Chinese descent (AOR = 0.61; 95% CI 0.41, 0.91) and, to a lesser extent, Indian descent (AOR = 0.40; 95% CI 0.24, 0.68), being female (AOR = 2.72; 95% CI 1.98, 3.74), older adolescents (AOR = 2.41; 95% CI 1.37, 4.23), having felt lonely in the past 12 months (AOR = 6.71; 95% CI 5.00, 9.06) and not being involved in

school co-curricular activities (AOR = 1.54; 95% CI 1.05, 2.24). The following risk factors in the past 30 days, namely a lack of parent or guardian supervision (AOR = 2.49; 95% CI 1.69, 3.64) and having been bullied (AOR = 2.84; 95% CI 1.90, 4.24), were also significantly associated with depression symptoms. However, after multivariate analysis, adequacy of depression literacy was not significantly associated with depression symptoms (AOR = 2.24; 95% CI 0.74, 6.80). Table 4.11 shows the results of univariate and multivariate logistic regression for the association between adequacy of depression literacy and depression symptoms while adjusting for demographic variables. The Hosmer-Lemeshow test p-value was 0.202 (not significant), meeting the assumption of logistic regression.

Table 4.11 : Association between adequacy of depression literacy with depression symptoms (N=1707)

Variable	Univariate logistic regression		Multivariate logistic regression	
	Crude OR (95% CI)	p-value	Adjusted OR (95%CI)	p-value
Gender				
Male	1		1	
Female	2.65 (2.20, 3.49)	<0.0001*	2.72 (1.98, 3.74)	<0.0001**
Age (Years)				
12	1.02 (0.38, 2.75)	0.965	1.33 (0.42, 4.27)	0.629
13	1		1	
14	2.05 (1.28, 3.27)	0.003*	2.41 (1.37, 4.23)	0.002**
Ethnicity				
Malay	1		1	
Chinese	0.49 (0.35, 0.69)	<0.0001*	0.61 (0.41, 0.91)	0.014**
Indian	0.35 (0.22, 0.55)	<0.0001*	0.40 (0.24, 0.68)	0.001**
Others	1.94 (0.98, 3.82)	0.056*	1.77 (0.78, 4.00)	0.171
Smoked cigarettes in the past 30 days				
Yes	1.15 (0.67, 1.96)	0.621		
No	1			
Consumed alcohol in the past 30 days				
Yes	0.80 (0.51, 1.26)	0.335		
No	1			
Drug use in the past 30 days				
Yes	2.31 (0.29, 18.26)	0.429		
No	1			
Shifted or changed school in the past 30 days				
Yes	1.16 (0.42, 3.15)	0.779		
No	1			

Note. OR, Odds ratio; CI, Confidence interval; *Variables significant at 0.25 from univariate analysis are entered into multivariate analysis. **Variables significant at 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 = 10.99 (df = 8), p = 0.202; [a] , actual observed values excluding the don't know response option.

232

Variable	Univariate logistic regression		Multivariate logistic regression	
	Crude OR (95% CI)	p-value	Adjusted OR (95%CI)	p-value
Involved in co-curricular activities				
Yes	1		1	
No	1.83 (1.34, 2.50)	<0.0001*	1.54 (1.05, 2.24)	0.026**
Felt lonely in the past 12 months				
Yes	8.32 (6.26, 11.04)	<0.0001*	6.71 (5.00, 9.06)	<0.0001**
No	1		1	
Bullied in the past 30 days[a]				
Yes	2.77 (1.99, 3.85)	<0.0001*	2.84 (1.90, 4.24)	<0.0001**
No	1		1	
Parents know what you were doing (30days) [a]				
Yes	1		1	
No	3.76 (2.71, 5.21)	<0.0001*	2.49 (1.69, 3.64)	<0.0001**
Parental marital status[a]				
Married living together	1		1	
Married living apart	1.69 (0.77, 3.71)	0.190*	2.05 (0.82, 5.18)	0.127
Divorce	1.72 (1.11, 2.69)	0.016*	1.43 (0.83, 2.48)	0.200
Separated	1.88 (0.88, 4.01)	0.103*	1.15 (0.48, 2.79)	0.752
Parental monthly income[a]				
Low (less than RM3000)	1		1	
High (more than RM 3000)	0.91 (0.68, 1.23)	0.193*	1.02 (0.72, 1.80)	0.896
Adequacy of depression literacy				
Adequate	1		1	
Inadequate	3.07 (1.10, 8.58)	0.032*	2.24 (0.74, 6.80)	0.154

'Table 4.11, continued' Note. OR, Odds ratio; CI, Confidence interval; RM, Ringgit Malaysia; *Variables significant at 0.25 from 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 = 10.99 (df = 8), p = 0.202; [a] , actual observed values excluding the don't know response option.

233

4.5   Summary

This chapter presents the results of phase 2 of this study. Variables were collected from national secondary schools in Selangor. A total of 1707 samples were collected per variable for this study, which examined depression literacy and its association with depression symptoms. Section 4.2 dealt with the descriptive analysis of sociodemographic characteristics of participants in this project. The prevalence of depression symptoms and depression literacy variables was presented descriptively in Section 4.3. The overall prevalence of depression symptoms was 20.3%. Only a minority of participants were able to correctly recognize depression (3.5%) and were classified as having adequate depression literacy (3.0%). Items under each component of depression literacy are presented in Section 4.3.1 to Section 4.3.4.

Section 4.4 dealt with the association between depression literacy variables and depression symptoms while adjusting for sociodemographic variables. Specifically, Section 4.4.1 examined the relationship between knowledge of depression, intention to seek help, stigmatising attitudes and depression symptoms. Following multivariate analysis, only 10 variables were significantly associated with depression symptoms, namely Chinese and Indian descent, being female, feeling lonely, having been bullied, a lack of parent or guardian supervision, not being involved in school co-curricular activities, keeping the person described in the vignette busy as a helpful first-aid action, regarding getting out into the sunlight as a harmful intervention, not telling anyone if you have a problem like the person described in the vignette (personal stigma) and perceiving that the person described in the vignette is dangerous to others (perceived stigma).

Section 4.4.2 examined the relationship between help-seeking variables of depression literacy, such as source of help and barriers to help seeking, and depression symptoms among adolescents with intention to seek help (N = 1365). Following multivariate

analysis, only 13 variables were found to be significantly associated with depression, namely Indian descent, being female, feeling lonely, having been bullied, a lack of parent or guardian supervision, not endorsing family as a source of help, being worried what others might think if help is sought, feeling that nothing can help, difficult to get an appointment, regarding getting out into the sunlight and antidepressants as harmful interventions, not telling anyone if you have a problem like the person described in the vignette (personal stigma), and perceiving that the person described in the vignette is dangerous to others (perceived stigma). Finally, Section 4.4.3 examined the relationship between the adequacy of depression literacy and depression symptoms. Inadequate depression literacy was significantly associated with depression in univariate analysis; however, after multivariate analysis, adequacy of depression literacy was found to be not significantly associated with depression symptoms.

CHAPTER 5: DISCUSSION

5.1 Introduction

Depression literacy is an important determinant in addressing depression. This study was designed to validate the MHL and stigma questionnaire which is used to examine the various components of depression literacy and its relationship with symptoms of adolescent depression. The findings of this study are discussed in this chapter, which begins with a discussion of the results of the analysis of validation for both the MHL and stigma questionnaire and the CES-D Malay version questionnaire in section 5.2. Content validation, internal consistency, reliability analysis, response shift, floor and ceiling effects were tested based on data collected from five psychiatrists and two national secondary schools in the Federal Territory of Kuala Lumpur. Results regarding the prevalence of depression symptoms and the analysis of various depression literacy components in adolescents are discussed in Sections 5.3 and 5.4. Sections 5.5 to 5.7 provide a discussion of the direction of the association between depression literacy components and symptoms of depression. Sections 5.3 to 5.7 are based on data collected from 46 national secondary schools in Selangor state. The strengths and limitations of this study are discussed in Section 5.8. Finally, Section 5.9 summarises the findings in this study.

5.2 Analysis of validation

5.2.1 MHL and stigma questionnaire

5.2.1.1 Content Validation

The majority of the items in the MHL and stigma questionnaire were retained after the process of content validation, however, there were 12 items considered not appropriate and therefore removed. Items regarding knowledge about recognition that were dropped included labels such as 'schizophrenia', 'psychosis', 'cancer',

'psychological/mental/emotional problem' and 'age crisis'. Items relating to knowledge about intervention, such as 'tranquiliser' and 'receiving cognitive behavioural therapy' were also dropped. Other studies performing content validation on the MHL and stigma questionnaire among adolescents in Sri Lanka had similar results regarding these labels, and also removed them (Amarasuriya et al., 2015; Attygalle et al., 2017). Most developed countries using the MHL and stigma questionnaire have retained all labels with regards to recognition of the disorders faced by the characters in the vignette; this is probably because the MHL and stigma questionnaire was designed in Australia, which is a developed nation, and therefore these labels would have been designed to suit similar populations and elements of culture (Reavley & Jorm, 2011). A few other countries, such as Iran and China, also include all the original items of the MHL and stigma questionnaire when examining depression literacy among their adolescents (Essau et al., 2013; Lam, 2014). This is because the views of mental health experts in specific cultural contexts may vary from region to region, resulting in the exclusion and inclusion of certain response options. Mental health experts are also not only knowledgeable about treatments routinely prescribed by professionals, but also about practices that have beneficial effects in their culture (Amarasuriya et al., 2015). Some studies that have utilised the MHL and stigma questionnaire did not validate the questionnaire among their specific population, and simply used the exact same items as the original instrument (Essau et al., 2013; Lam, 2014). Finally, the more mental health experts involved in the process of content validation, the less probability of an item being excluded (Chepko, 2015). In this study five mental health experts were consulted, which means that items will be retained only if all five experts agree on their content validity (I-CVI=1), unlike studies that used much larger mental health experts (more than five) to validate the MHL and stigma questionnaire where the probability of items being retained at I-CVI= 1 was not required

(Terwee et al., 2007). There is still limited evidence for the content validation of the MHL and stigma questionnaire, although this tool has been used extensively.

5.2.1.2 Internal Consistency analysis

The Cronbach alpha across all constructs of the MHL and stigma questionnaire ranged from 0.52 to 0.76, indicating acceptable levels of internal consistency. This study reported Cronbach alpha values of 0.64, 0.52, 0.76, 0.52 for the ability to recognise a disorder, first aid, intervention and prevention knowledge constructs, respectively. Similar findings were also reported for the validation of the knowledge component of the MHL and stigma questionnaire among adolescents in Portugal, with internal consistency values of 0.50, 0.59, 0.72, 0.60 (Loureiro, 2015). There was slight variation with regards to these internal consistency values for several reasons. The sample size used in this study is much smaller than that used in Portugal. This study reported the Cronbach alpha as a measure of internal consistency for all the components in the MHL and stigma questionnaire, unlike in the Portugal study where the internal consistency of the recognition of disorders knowledge construct was measured using the Kuder-Richardson formula (KR-20), due to the nature of the multiple choice response options (Kuder & Richardson, 1937).

This study reported a much lower Cronbach alpha value for constructs about stigmatising attitudes, specifically personal stigma (0.62) and perceived stigma (0.71) compared to the Cronbach alpha values of 0.77 and 0.82 reported by studies conducted in Australia (Griffiths, Christensen, & Jorm, 2008). This variation could be due to the use of older participants in the Australian study, Cronbach alpha values of a scale tend to be higher when assessed among older individuals due to their higher educational achievments and levels which results in better understanding and comprehension of the items in a questionnaire (Ursachi, Horodnic, & Zait, 2015). To date there is limited evidence about the internal consistency of the help-seeking component of the MHL and stigma questionnaire among adolescent populations.

5.2.1.3 Test-retest reliability analysis

Overall, the test-retest reliability (kappa statistics) results showed fair to moderate agreement for most of the items, except for two items regarding knowledge about interventions for depression: the 'kids help line' (Item 15) and 'being more physically active' (Item 23). Young adolescents in Malaysia may not be familiar with the term 'kids help line' or the role that physical activity plays on depression, therefore creating a sense of hesitancy when answering these items. A lack of familiarity of these items would result in adolescent guessing the responses of these items at both assessment intervals (T1 and T2) therefore resulting in lack of consistency and reliability for these items. It could also be possible that these adolescents following the first test session (T1), get clarification of these items and upon the re test session (T2), they would provide a different response to these items therefore resulting in an inconsistent results across T1 and T2 for these items. The 'kids help line' is commonly used in Western settings (Childline, 2010), but within the Malaysian context more common terms are 'Child Helpline' or '*Talian Nur*' (International Telecomunication Union, 2013).

It is also possible that Asian adolescents have limited knowledge regarding the use and availability of helplines, as suggested by the International Statistics of Child Helplines, which reported the relatively higher use of helplines among children and adolescents in Western countries compared to South East Asian countries such as Thailand, Singapore and Indonesia (Childline, 2010). The NHMS 2017 reports that the majority of Malaysian adolescents are not physically active, which could be a reflection of poor adolescent understanding about the role of physical activity in health (Institute for Public Health, 2017).

It is unclear whether a shortened test-retest period (less two weeks) would improve reliability analysis. A two week test-retest interval was selected in this study so as to avoid having the participants remember the subject responses, which is common in short test-

retest intervals (Streiner & Norman, 1995), however, it is plausible that a longer period may have eliminated this potential source of bias. To date there is limited evidence about test-retest reliability analysis for the MHL and stigma questionnaire among adolescents.

5.2.2 CES-D Malay version questionnaire

5.2.2.1 Internal Consistency analysis

Many studies have examined the internal consistency of the various translated versions of the CES-D questionnaire, the majority of which were validated among the adult population. This study reported a Cronbach alpha value of 0.88 which is satisfactory and is considered reliable (Field, 2009). The Cronbach alpha value reported in this study for the CES-D Malay version questionnaire was consistent with the original English version of CES-D questionnaire, which reported a Cronbach alpha value of 0.85 (Radloff, 1977), however this was higher than most Cronbach alpha values reported in previous studies conducted among adolescents in the United States (0.84), Switzerland (0.80), Malaysia (0.85), Colombia (0.85) and Turkey (0.74) (Aebi, Metzke, & Steinhausen, 2009; Camacho et al., 2009; Garrison, Addy, Jackson, Mckeown, & Waller, 1991; Ghazali et al., 2016; Logsdon & Myers, 2010; Tatar, Kayiran, Saltukoglu, Ozkut, & Emeksiz, 2013; Thrane, Whitbeck, Hoyt, & Shelley, 2004). A few studies conducted among adolescents in the Netherlands (0.93), Taiwan (0.90) and the United States (0.89) reported higher Cronbach alphas than this study (Cuijpers, Boluijt, & van Straten, 2008; Roberts, Lewinsohn, & Seeley, 1991; Yang, Soong, Kuo, Chang, & Chen, 2004).

The variation in Cronbach alpha values could be due to variations in study characteristics such as participants, sample size, sampling method and methods of data collection (Mazlan & Ahmad, 2013). This study population comprised young adolescents, for example, while the other studies were conducted among older adolescents in the Netherlands, Taiwan and the United States (Cuijpers et al., 2008;

Roberts et al., 1991; Yang et al., 2004). The difference in age groups could have contributed to lower Cronbach alpha values, as previous studies have consistently reported increasing Cronbach alpha values with the increasing age of participants (Cuijpers et al., 2008; Roberts et al., 1991; Yang et al., 2004). This study sample size was also much smaller than in studies conducted among adolescents in the Netherlands, Taiwan and the United States (Cuijpers et al., 2008; Roberts et al., 1991; Yang et al., 2004) which had sample sizes of more than 1000 participants. Evidence has suggested that although a sample size of 50 is sufficient for Cronbach alpha estimation, a substantial increase in Cronbach alpha values are reported when sample sizes are more than 140 (Javali et al., 2011). Studies conducted in Switzerland and the United States involved samples of adolescents with clinical depression, whereas the rest of the studies, like this one, sampled non-clinical adolescents (Aebi et al., 2009; Logsdon & Myers, 2010). A direct comparison of the Cronbach alpha value is probably thus not appropriate, as evidence has suggested that reliability assessment varies across the depressive and non-patient populations (Ghubash, Daradkeh, Al Naseri, Al Bloushi, & Al Daheri, 2000). This study sampled participants via universal sampling, which could have introduced selection bias, as participants with problems may be more inclined to participate in the study (Yaacob et al., 2009). Finally, a self-administered questionnaire was used for data collections, and studies using interview-based methods could possibly have introduced information bias.

5.2.2.2 Test-retest reliability analysis

Overall, the test-retest reliability results showed moderate to excellent agreement for most of the items, except for 'felt lonely' (Item 14). Findings in this study suggest that the CES-D Malay version questionnaire is reliable for measuring depression symptoms among secondary school-aged adolescents in Malaysia. This study reported a total ICC value of 0.93 (95% CI 0.85, 0.96) which is higher than the ICC values reported by

previous studies conducted in Canada (0.85) and the United Arab Emirates (0.59) (Ghubash et al., 2000; Miller, Anton, & Townson, 2008), and similar to an ICC value reported in a study conducted in China 0.91 (Chin, Choi, Chan, & Wong, 2015). There are several reasons that could explain the variation in ICC results across the studies.

Differences between study populations may explain the variation. Evidence suggests that early adolescents and younger children might have difficulties completing such lengthy self-screening questionnaires (20 items) due to the concrete operational nature of their developmental stage (individuals aged 8 to 12 years), explaining low levels of ICC in studies with younger participants (Piaget, 1963). Other studies in Canada and China were conducted among the adult patient population, and therefore a direct comparison is inappropriate (Chin et al., 2015; Miller et al., 2008).

The second mechanism that may explain this findings is variation in calculating ICC, as there are various types of ICCs and models that would produce different ICC values if repeated with the same set of data (Koo & Li, 2016). This study used a two-way mixed-effects model to calculate the ICC, while other studies used different models, such as the two-way random model (Chin et al., 2015). This could lead to variation in the ICC reported. Other factors such as participant levels of literacy could also affect the ICC values. For example, adolescents in an African study had poor literacy levels, which contributed to their poor understanding of the items in the questionnaire, resulting in low ICC values. In further support, the ICC was still low after a three day test-retest interval which is unusual, as short test-retest intervals tend to lead to bias due to the memory effect (Streiner & Norman, 1995). Similar ICC values despite variations in study populations could possibly be explained by the similar sample sizes used for test-retest analysis, which ranged from 46 to 52 subjects, and the same two week retest interval, thus reducing recall error and memory bias (Chin et al., 2015).

The lowest and highest item by item ICC values reported in this study were for Item 14 (ICC= 0.50), 'felt lonely', and Item 18 (ICC=0.87), 'felt sad', respectively. One explanation for the low reliability of Item 14 could be that feeling lonely is subject to wide variation, and does not indicate perseverance and persistence, meaning that there would be higher reliability in this item among depressive population rather than non-patient populations (Ghubash et al., 2000). Evidence has suggested that individuals from less developed societies focus more on somatic idioms rather than depressed idioms, due to various reasons, such as having a less differentiated language for expressing depressive affect and the somatisation of distress as a 'norm' in less developed societies (Ghubash et al., 2000), however, this evidence is not in line with this study, where Item 18 was reported as having the highest ICC correlation, and both Item 14 and 18 are considered depressed idioms.

Unlike this study, previous studies have reported Items 3 and 15 as having the highest correlation, while Items 4 and 10 having the lowest correlations (Miller et al., 2008; Tatar et al., 2013). There are several possible reasons for the variation between the highest and lowest item by item correlation reported by studies, such as the various measures and models used to examine correlation. For example, Pearson correlation was used as a measure of correlation among Turkish adolescents (Tatar et al., 2013) while a study in Canada reported on ICC (Miller et al., 2008). Intercultural differences would also result in this variation, as noted previously (Ghubash et al., 2000).

Many studies examining the test-retest reliability of the CES-D questionnaire did not report on the 95% CI for the ICC estimate, nor were there any item by item ICC values reported (Chin et al., 2015). Reporting only on the ICC point estimate value is insufficient, as the point estimate does not reflect a true estimate. It is thus important to report the 95% CI of the ICC, as this indicates the degree of confidence with which the true estimate would fall within the 95% CI range (Koo & Li, 2016).

5.3   Prevalence of depression symptoms

The prevalence of depression symptoms in this study was 20.3%, which was similar to the recent prevalence of sympotms of adolescent depression reported by NHMS 2017 at 22.6% (Institute for Public Health, 2017), however it is much higher than previous findings in 2007 and 2014 when the prevalence of depression symptoms among secondary school-going adolescents in Malaysia was reported at 10.3% and 17.7% (Adlina et al., 2007; Kaur et al., 2014), and lower compared to a more recent study among Malaysian adolescents in 2016, which reported a prevalence of depression symptoms at 25.6% (Ghazali et al., 2016). Variation in the prevalence of depression symptoms among adolescents can be explained in several ways, such as being due to sample characteristics (gender, age) and the instrument used to screen for depression symptoms.

This study sample had a higher ratio of females to males compared to previous studies conducted among Malaysian adolescents (Adlina et al., 2007; Kaur et al., 2014), and this could be a reason for the higher depression score in this study, as females have been identified as significant determinants of depression (Wright & Jorm, 2009). It is worth noting that the Malaysian child and adolescent gender ratio in 2017 was reported as 1.07 male(s)/female (Department of Statistics Malaysia, 2017), however the enrolment of male to female students (Form 1) in national secondary schools in Malaysia in 2017 was reported as 1.00 (MOE, Malaysia 2017b). The gross enrolment ratio of female to male students in national secondary schools within Selangor state in 2010 was reported as 1.05 (United Nations Educational, Scientific and Cultural Organization, 2011). This may be a reason for the higher female to male ratio among participants in this study. The previous studies conducted in Malaysia (Ghazali et al., 2016) involved older adolescents, aged 14 to 19 years, possibly explaining the higher prevalence of depression symptoms in those studies, as the risk of depression increases by six-fold among adolescents aged 15 to 18 years (Lewinsohn et al., 1994; McCarthy et al., 2011).

When compared with studies of adolescents that used the same instruments to measure depression symptoms as this study, the prevalence of adolescent depression symptoms ranged from 10% to 35 % in Australia, America, Malaysia, the United Kingdom, Nigeria, Iran, South Africa and France, whereas, in Korea, China, Thailand and Indonesia it ranged between 36% to 52% (Barhafumwa et al., 2016; Busari, 2012; Chabrol, Montovany, Chouicha, & Duconge, 2002; Ghazali et al., 2016; McCann, Lubman, & Clark, 2012; Modabber-Nia, Shodjai-Tehrani, & Moosavi, 2007; Mukhripah, 2016; Vatanasin, Thapinta, Thompson, & Thungjaroenkul, 2012; Walsh, 2010). This may be because, despite all using the CES-D questionnaire, any variation in cut-off scores also affects the reported prevalence of depression symptoms. For instance, a cut-off point of 27 was used in this study, and other studies used lower cut-off points of 16 and 24 (Barhafumwa et al., 2016; Chabrol et al., 2002; Stockings et al., 2015). A lower cut-off point could therefore possibly result in a higher reported prevalence of depression symptoms.

Since the sample was selected from mutilpe setting in Selangor, it is important to ensure homogeneity across the sample. Several measures were taken to ensure homogeneity across the sample. First all the schools from which the samples were selected were National Secondary Schools. All National Secondary School share similar characteristics in terms of curriculum structure, mental health program/service availability and availability of counsellors (MOE Malaysia, 2014). All National Secondary Schools in Malaysia follow a standaridize national curriculum (MOE Malaysia, 2014). Similarly the healthly mind program (which delivers mental health program/services) is a program that has been implemented across all National Secondary Schools in Malaysia. With regards to the number of schools counsellor across the schools the MOE has set a ratio of students to school counsellors in secondary schools at 500:1, (MOE Malaysia, 2014) and all of the 46 schools included in this study had more than 500 secondary students and they complied to this ratio. Therefore the number of school

counsellor across schools were homogenous. With regards to homogeneity of student characteristics of the sample, the participants did not differ grossly in terms of gender, age and ethinicity when compared to the Malaysian secondary school students profile. For example in this study majority of participants were female (60%; female to male ratio of 1.5), ages 13 (94%) and Malay in ethnicity (66%), When compared to the Malaysian secondary school students profile, the gross enrolment ratio of female to male students in national secondary schools within Selangor state was reported as 1.05 (United Nations Educational, Scientific and Cultural Organization, 2011). The average age for majority of the Form 1 students in Malaysia is 13years (MOE, Malaysia 2017b) and based on the current Malaysian population of citizen by ethinic groups majority (62%) are Bumiputera (which include Malays) (Department of Statistics Malaysia, 2019).

There were 25 participants who were aged 12 years in the sample. Generally Form 1 students in Malaysia should be individuals whose ages are more than 12 years old, several reasons can explain this finding. First it could be possible that at the time of the survey these participants have not reached their 13th birthday date and therefore selected the 12 year old category. Second there could be a possibility that these individual may have enrolled in private based primary school in Malaysia (which generally enrol at ages 6) and subsequently transferred to secondary government at age 12.

5.4   Depression literacy variables

The findings from this study support the hypothesis that adolescents have poor understanding of depression literacy. Several variables in the knowledge, help seeking and stigma components were found to be significantly associated with depression symptoms, following adjustment for potential confounders. Therefore partially supporting the hypothesis regarding every component of depression literacy being associated with depression symptoms among adolescents. Finally the hypothesis that

adequate depression literacy is associated with depression symptoms among adolescents was not support.

5.4.1   Adequacy of depression literacy

This study reported that only 3% of adolescents could be classified as having adequate depression literacy according to the aforementioned definition (i.e. the correct identification of depression with the intention to seek help). This is an important finding because it provides a baseline assessment of the adequacy of depression literacy among Malaysian adolescents which has not previously been examined or reported (Marhani Midin et al., 2018). Such low adequacy in depression literacy would result in the poor early recognition of depression, and delay the search for professional help-seeking, all of which would result in poor depression outcomes among young adolescents. This is a concerning finding, as such a low adequacy of depression literacy could possibly be a reflection of inadequate school-based mental health programs (Kutcher, Wei, Gilberds, et al., 2016).

Adolescents in the United States (Ruble et al., 2013; Swartz et al., 2017; Swartz et al., 2007; Townsend et al., 2017) and China (Lam, 2014) demonstrated higher levels of adequacy of depression literacy (ranging between 12% to 27%) compared to those found in this study. This variation could have been due to variation in participant ages. The adolescents in this study were much younger than those in the studies conducted in China and the United States. Depression literacy tends to improve with advancing adolescent age (Essau et al., 2013). Differences in the instruments used to examine depression literacy levels could also have contributed to these findings; the ADKQ was used to examine depression literacy levels among adolescents in the United States, while the MHL and stigma questionnaire was used in this study, and among Chinese adolescents. Higher adequacy of depression literacy among adolescents in the United States could be

attributed to a greater exposure to MHL-based interventions such as ADAP (Swartz et al., 2007). Despite the majority of participants having the intention to seek help (80%), the relatively poor ability of respondents to correctly recognise depression (3.5%) was reported. A low ability to correctly recognise depression among adolescents in this study could be attributed to the poor recognition of symptoms or signs of depression, and a poor understanding of mental illness (Nik Murni Nik Mustafa et al., 2015).

5.4.2 Knowledge of recognition of disorders

The majority of participants in this study felt that the person described in the vignette was suffering from stress and depression, similar to the findings of previous studies involving adolescents (Hernan et al., 2010; Lam, 2014; Loureiro et al., 2013), however, alarmingly, many adolescents were unable to identify depression as a mental illness, as also found in other studies (Lam, 2014; Loureiro et al., 2013). It is reassuring to see that the majority of participants felt that the person described in the vignette was having a problem, and similar findings have been reported for adolescents in India, China and Australia (Hernan et al., 2010; Lam, 2014; Sharma et al., 2017). This is important, as appropriate help-seeking is related to the ability of individuals to correctly recognise a problem to begin with (Wright et al., 2007).

An abysmally low ability to correctly recognise depression was found in this study, whereby only 3.5% of participants correctly identified depression according to the aforementioned definition (i.e. endorsement of depression, mental illness and stress). Similar findings were reported whereby only a minority of adolescents in Nigeria (4.8%; 10.4%), China (23%) and India (29%) were able to correctly label depression (Adeosun, 2016; Aluh et al., 2018; Lam, 2014; Ogorchukwu et al., 2016). In contrast, many other studies reported much higher rates of the correct recognition of depression (60% to 96%), especially those conducted among adolescents in Australia (Bruno et al., 2015; Hernan et al., 2010; Lubman et al., 2017; Marshall & Dunstan, 2011; Mason et al., 2015; McCarthy

et al., 2011). There are several mechanisms that explain this variation in the ability to correctly recognise depression, as previously discussed in Chapter 2 (Section 2.3.5.3). A variation in the presence of the symptoms presented by the vignette could affect the findings, whereby the presence of suicidal ideations or intentions increases the chances of correct recognition of depression among adolescents (Bruno et al., 2015; Burns & Rapee, 2006; McCarthy et al., 2011). This is because depression is strongly associated with suicide among adolescents, and presenting a red flag symptom such as suicidal ideation in the vignette could led to greater suspicion of depression by participants. The symptoms presented in the vignette used in this study did not include suicidal ideation, unlike in some other studies (Bruno et al., 2015; Burns & Rapee, 2006; Lubman et al., 2017; McCarthy et al., 2011). Assigning a female character to the vignette also results in a higher likelihood of correctly recognising depression among adolescents (Bruno et al., 2015; Burns & Rapee, 2006; Marshall & Dunstan, 2011; McCarthy et al., 2011), because female characters tends to be given more sympathy, taken more seriously by participants, and appear more distressing (Swami, 2012). Respondents may also be less likely to view a male vignette with depression symptoms as suffering from MHD, due to gender role ideologies such as hegemonic masculinity, which stress that toughness and strength in males which should prevent them from falling ill (Swami, 2012). This study used a male character only in the vignette, unlike other studies that presented both male and female characters (Bruno et al., 2015; Burns & Rapee, 2006; McCarthy et al., 2011).

Another reason for variations in the ability to recognise depression is that a self-administered questionnaire was used in this study, whereas some other studies presented the vignette via a short film (Marshall & Dunstan, 2011). It is possible that adolescents can relate better to a film-based scenario, which tends to be more realistic than written vignettes.

Finally, a glaring mechanism to explain this finding is geographical and cross-cultural variation. Many studies that were conducted among adolescent in developing countries (Adeosun, 2016; Aluh et al., 2018; Lam, 2014; Ogorchukwu et al., 2016), including this one, reported lower rates of the correct recognition of depression than studies conducted in Australia and the United States (Bruno et al., 2015; Hernan et al., 2010; Mason et al., 2015; McCarthy et al., 2011). This is due to the availability of school-based mental health programs in developed countries such as the United States and Australia, such as ADAP and the Beyond Blue Program, which have helped to increase the awareness of depression among adolescents.

Interestingly, this study found a substantial number of adolescents (53.9%) regarded the character in the vignette as having an eating disorder. This finding is not surprising as adolescents could have misidentified symptoms such as not feeling like eating, and losing weight as the results of an eating problem. Depression in adolescence frequently co-occurs with eating disorders. Being severely underweight and malnourished, which is common in anorexia (an eating disorder), can cause physiological changes that are known to negatively affect mood states and lead to depression (Jaret, 2018). Symptoms of depression and eating disorders often overlap, explaining why participants believed that the person described in the vignette had an eating disorder (Jaret, 2018). These findings reflect the lack of ability in adolescents to differentiate between depression and eating disorders.

It is not surprising that the majority of adolescents described stress as the problem faced by the character in the vignette, because from a lay person's perspective the symptoms are similar (Mental Health America, 2018). The indirect symptoms of stress, such as the disruption of healthy coping mechanisms, also cause depression to take hold (Boyes, 2013). There are certain key symptoms, however, that differentiate depression from stress, including suicidal thoughts and a prolonged duration of symptoms which is

only present in depression (Mental Health America, 2018). As mentioned earlier, suicidal thoughts/ideation were not presented in this study vignette and this could have led many participants to feel that the person described in the vignette was suffering from stress. The duration of symptoms was mentioned in the scenario (a few weeks) but was possibly not picked up by participants. Malaysian adolescents tend to report stress as the commonest possible symptom of mental illness (Nik Murni Nik Mustafa et al., 2015). This also reflects the inability of adolescents to differentiate depression from other disorders. A relatively low number of participants thought that the person described in the vignette had a substance abuse problem, probably because the use of substances was not mentioned in the scenario.

Alarmingly, mental illness was identified by only 29.4% of the participants as the problem faced by the person in the vignette. Similar findings were reported in studies conducted among adolescents in Malaysia and Nigeria, whereby only 26% and 45% of participants saw depression as a form of mental illness (Dogra et al., 2012; Nik Murni Nik Mustafa et al., 2015). These findings could be attributable to a lack of awareness and a great deal of public ignorance among Malaysia population regarding mental health and mental illness, which can result in the further stigmatisation of depression (Yeap & Low, 2009). It is also possible that the participants felt that the person described in the vignette was not mentally disturbed, therefore not identifying mental illness as a problem (Yeap & Low, 2009).

The importance of these findings is that they show that respondents in this study have a poor ability to correctly recognise depression, an inability to differentiate depression symptoms from other disorders, such as eating disorders, and a gross lack of awareness with regards to mental illness. Such findings would not only result in delayed help-seeking, but also in seeking inappropriate sources of help due to a failure to recognise the

underlying problem. On a more positive note, the majority of participants acknowledged that the person described in the vignette was having a problem.

5.4.3   Knowledge of first aid

Five items in the survey assessed the participants' first aid for a person suffering from depression. These items can be categorised as first aid actions that are considered to be supportive, non-supportive, basic minimal and distractive forms of first aid. 'Listen to the person's problems in a supportive way' and 'ignoring the person' are examples of supportive and non-supportive first aid actions (Jorm et al., 2007). 'Encouraging the person to be physically active' and 'keeping the person busy' are examples of distraction forms of first aid action (Yap, Reavley, & Jorm, 2012a).

'Listen to the person's problems in a supportive way' was identified as the most helpful form of first aid action in this study. Similar findings have been reported among adolescents in Australia, Portugal and China (Jorm et al., 2007; Kelly & Jorm, 2007; Lam, 2014; Loureiro et al., 2013; Yap & Jorm, 2012).The strong endorsement of this response could be because it is considered as one of the simplest yet crucial forms of providing supportive first aid for a person suffering from MHD (Nadia Badarudin, 2018). It is also possible that adolescents genuinely care about their peers who are suffering from MHD such as depression, and thus would naturally want to help by means of lending an ear (Ashley, 2018). This finding is reassuring, as this method is also considered a helpful form of social support for those suffering from MHD, and able to relieve their suffering to a certain extent (Ashley, 2018).

The second most helpful first aid action endorsed by participants in this study was 'suggest seeking professional help', a finding that has been replicated previously (Jorm, Morgan, & Wright, 2008a; Loureiro et al., 2013). The reason for this finding could be that participants possibly regard the problem described by the character in the vignette as

a clinic problem that requires professional intervention (Yap et al., 2012a). A high level of knowledge and resourcefulness in younger adolescents with regards to professional help could have also mediated these findings (Yap et al., 2012a). It would be easier to suggest that another person seek professional help for an underlying mental problem, but this is harder when it comes to an individual's self. These findings are inconsistent with the findings of previous studies, however, which reported that the majority of Australian and Iranian adolescents do not suggest seeking professional help, or tend to identify suggesting seeking professional help as a unhelpful first aid action (Essau et al., 2013; Jorm et al., 2007; Yap & Jorm, 2012).

There are several mechanisms that can explain the higher identification of the helpfulness of 'suggesting to seek professional help' among participants in this study compared to other studies. In this study we used a close ended question to present this statement to participants, while an open ended question was used in the study conducted among Australian adolescents (Jorm et al., 2007), with no prompt or clue provided to the participants therefore. The studies conducted among Australian and Iranian adolescents were in 2007 and 2013, while this study was conducted in 2017, and the difference in time could reflect a possible increase in the awareness of adolescents regarding the helpfulness of suggesting that a person seek professional help for depression. Finally, social desirability bias could result in the higher identification of suggesting a person seek professional help as a helpful first aid action in this study.

A more concerning finding is that a minority of participants in this study saw suggestions to seek professional help as an unhelpful form of first aid. There are several mechanisms that can explain these findings. One is that young adolescents could have concerns about professionals, including their ability to provide help and their credibility, forming a barrier to seeking professional help-seeking for mental health problems (Gulliver, Griffiths, & Christensen, 2010). Another reason that seeking professional help-

seeking was not identified among young adolescents may be the less sophisticated first-aid beliefs of young adolescents have compared to adults, whereby young adolescents would seem to view professional help-seeking as more pertinent for a depressed peer with suicidal thoughts or psychosis (Yap et al., 2012a).

Non-supportive forms of social interaction and unhelpful responses as first aid actions, such as ignoring the person described in the vignette, were generally not identified as helpful by the majority of participants in this study. Similar findings have been reported among adolescents in Australia, Iran, China, Portugal, India and Canada (Essau et al., 2013; Gressier, Calati, & Serretti, 2016; Jorm et al., 2007; Kelly & Jorm, 2007; Lam, 2014; Loureiro et al., 2013; Marcus & Westra, 2012; Sharma et al., 2017). A smaller proportion of adolescents in developed countries such as Canada (2.4%), Australia (4%) and Portugal (3.1%) felt that ignoring a person with mental health problems is helpful, compared to studies conducted in other developing countries like Malaysia (5.6%), India (6.2%) and China (8.2%). These findings reflect a gap in knowledge about first aid actions among adolescents in developing countries, and therefore highlights an important area that needs to be emphasised during health promotion activities.

Distraction refers to the diversion of attention away from the depressed mood and turning it into neutral or pleasant thoughts and actions. Forms of distraction as first aid actions such as 'encourage to be physically active' (76%) were considered more helpful compared to 'keep the person busy' (51%) in this study. This finding is similar to those of studies conducted among adolescents in Iran and China but differs compared to other studies conducted in Australia and Portugal (Essau et al., 2013; Jorm et al., 2007; Lam, 2014; Loureiro et al., 2013). The majority of adolescents in Australia considered both items of distraction to be helpful first aid actions, while in Portugal adolescents believed keeping the person busy to be more helpful than encouraging the person to be physically

active. This may be because adolescents in various populations may have different views on how distraction forms of first aid might be helpful. For example, some adolescents might believe that keeping the person busy would temporarily help them forget their problem and that therefore it is helpful, but unfortunately this is not conducive to help-seeking (Loureiro et al., 2013). Adopting distraction forms of first aid such as keeping a person busy could reflect an underlying preference for self-reliance, which is associated with stigmatising attitudes and embarrassment surrounding mental illness and professional treatment, and found to be prominent barriers to help-seeking in young people and also result in delays to help-seeking (Gulliver et al., 2010).

A reassuring finding is that the majority of participants in this study reported that being physically active was a more helpful form of first aid than keeping the person busy. The extensive literature has reported that physical activity such as exercise has been found to be a better form of distraction in reducing depression symptoms compared to other forms of distraction actions (Craft & Perna, 2004).

Respondents in this study appear to be aware of the helpfulness of supportive forms of first aid actions, which can benefit those suffering from MHD by providing a certain level of social and emotional relief. Participants in this study also believe basic minimal first aid action to be helpful, such as 'suggest seeking professional help', therefore reflecting knowledge of problems that require professional help. This is particularly important as individuals who are suffering from depression are more likely to seek help when it is suggested by someone close to them, whether it is a friend or a family member (Cusack, Deane, Wilson, 2004). This would further translate to more prompt and appropriate help-seeking among those suffering from depression. The respondents' strong agreement about helpfulness of physical activity, which is a form of appropriate distraction first aid, reflects an awareness among adolescents about the role of physical activity in improving mental health outcomes, a finding that has been extensively established in the literature

(Craft & Perna, 2004). It is reassuring that participants do not consider non-supportive first aid (avoiding the person) as helpful, as this translates to a certain degree of acceptance of those suffering with MHD, and an understanding that this problem is actually medical and not an act of pretence. Finally, the lack of knowledge about the effects of negative distractive action (such as keeping someone busy) which can result in delays seeking help.

5.4.4   Knowledge about the prevention of depression

The majority of the participants in this study (more than 80%) indicated that all the items under the knowledge of prevention have a preventive value in reducing the risk of developing mental health problems such as depression. Similar findings have been reported among young adolescents in Australia, Portugal and India (Essau et al., 2013; Jorm, Morgan, & Wright, 2010; Loureiro et al., 2013; Ogorchukwu et al., 2016; Yap, Reavley, & Jorm, 2012b). Adolescents in Australia had reported all preventive strategies as helpful which is very similar to this study. These findings are further validated by previous studies that supported the role of physical activity (Penedo & Dahn, 2005), social support (Van Voorhees, Paunesku, Kuwabara, Basu, Gollan, & Hankin, 2008), relaxing activities (Morgan & Jorm, 2008) and avoiding stressors (Garber, 2006) in the prevention of mental disorder. There may be several reasons for this finding. Adolescents experience great relief when they talk to their parents and friends, as this is a form of problem solving strategy that has been found to prevent depression (Chan, 2012). It could also be possible that adolescents have an increased awareness of the preventive values of each of these statements, or have even tried them to address their own underlying depression with success. In contrast, however, adolescents in Iran reported preventive strategies as much less helpful, especially the items 'avoiding stressful situations' and 'keeping in regular communication with friends' (Essau et al., 2013). A possible reason

for the discrepancy between these findings may be a result of voluntary bias, due to variation in sampling methods.

The majority of adolescents (89%) in this study regarded keeping physically active as having helpful preventive value against depression. These findings are much higher than previously reported among adolescents in Portugal (64%), Iran (71%) and India (78%). This may be because there is a higher degree of awareness regarding the positive effect that physical activity has on health among the respondents. This is evident as there has been an increase in engagement with physical activity among Malaysian adolescents from 27.9% in 2012 to 37.3% in 2017 (Institute for Public Health, 2017; Noor, 2012). Participants in this study may also have had experience with physical activity preventing the problem experienced by the character in the vignette. One study reports that adolescents in Malaysia who experience depression do consider engagement in physical activity as having preventive value in dealing with their depression (Nik Murni Nik Mustafa et al., 2015).

One concern that arises is that participants in this study also identify 'avoiding stressful situations' as having a high preventive value. This may be because the general public has many incorrect beliefs about stressful situations and avoidance behaviours (Clark, 1999). Many professionals disagree about this, however, primarily because such stressful situations create an opportunity to learn more effective coping strategies (Yap et al., 2012b). Learning to master stressful situations is also beneficial, especially for young people (Andrews, Page, & Neilson, 1993). Finally, studies have reported that the avoidance of unpleasant internal experiences can contribute to the development of mental disorders (Berman, Wheaton, McGrath, & Abramowitz, 2010). It is therefore clear that avoiding stressful situations would result in adolescents having poor and underdeveloped coping skills, that would further predispose them to mental health problems.

It can be concluded that the respondents are aware of various strategies that have preventive value against depression, such as spending time with family, keeping in regular communication with friends, keeping physically active and making regular time for relaxing activities, however the lack of understanding regarding the effect of avoiding stressful situations, which results in poor coping skill development, is more concerning.

5.4.5   Knowledge of interventions

Knowledge of interventions will be discussed based on three types of intervention: people, medication and activities-based intervention.

5.4.5.1 People-based source of intervention

The individuals considered most helpful by the majority of participants (more than 80%) in this study, in dealing with MHD such as depression, were family members, counsellors, friends and teachers. Psychiatrists and psychologists were seen as helpful by less than 50% of the participants. It is clear that young adolescents prefer informal, rather than formal, sources of intervention. There are several reasons for this. Adolescents are more familiar with informal sources of help, as they are in constant daily contact with them. This creates a sense of trust, whereas there could be fears of breaches of confidentiality with formal sources of intervention, due to a lack of trust (Burns & Rapee, 2006; Wilson & Deane, 2001). Because of their more limited life experience, adolescents are likely to seek assistance from others in their social network, such as family and close friends, before actually seeking appropriate professional help (Jorm & Wright, 2007). Furthermore, adolescents are not very knowledgeable about the availability and role of mental professionals such as psychiatrists and psychologists (Dubow et al., 1990). These findings are in line with previous studies that have concluded that families are major players in determining the mental health of youth, as they are frequently recommended

as primary source of help for externalising and internalising personal problems (Patel et al., 2007; Swords et al., 2011). Participants in this study who were unable to correctly recognise depression would also result in the greater identification of more informal sources of help, as evidence suggests that the correct recognition of depression is a key predictor of professional help-seeking (Amarasuriya, Jorm, & Reavley, 2018).

The preference of Malaysian adolescents for counsellors rather than psychologists or psychiatrists may relate to a better understanding and awareness of the role of counsellors compared to that of a psychologist or psychiatrist (Farrer, Leach, Griffiths, Christensen, & Jorm, 2008). Each National Secondary school in Malaysia includes counsellors, and there may not be access to mental health professionals for various logistic and financial reasons, which could have led to the increasing awareness and dependence of adolescents on school counsellors for mental health problems (Caldwell et al., 2004; Goldney et al., 2007). Previous studies have also pointed out the lack of public awareness of the role of mental health professionals such as psychologists or psychiatrists, and the prevalent stigmatising attitudes towards these mental health professionals could mediate this finding (Williams et al., 2001; Wisdom et al., 2006).

Although doctors such as GPs are considered a formal source of intervention, there was a relatively high identification of them (79%) as helpful among participants. This finding could be mediated by several mechanisms. GPs are more easily assessable, as they are widely available in all health clinics and private clinics throughout the country (Burgess et al., 2009). In order to consult a public psychiatrist, in the Malaysian healthcare system patients need a referral letter from a GP, except in emergency cases. Visiting a GP tends to be the first line of consultation before more specialised services such as psychiatrists are utilised, because adolescents or family members might misunderstand depression symptoms as somatic symptoms and thus seek help from a GP (Zachrisson et al., 2006). It is also possible that adolescents have been taught about the availability of

help from people outside their immediate family (Mariu et al., 2011). Adolescents with more active coping styles are more likely to seek out services and support when needed (Ciarrochi, Wilson, Deane, & Rickwood, 2003). Finally, a lack of adult support within the family could lead these adolescents to seek help from outside (Mariu et al., 2011). This could all explain why participants in this study were more inclined to consider doctors (GPs) as a more helpful formal source of intervention compared to psychiatrists (Zachrisson et al., 2006).

Similar findings were reported among adolescents in Iran, South Africa, Australia and Ireland, whereby family, friends and counsellors were considered helpful sources of intervention by the majority of the adolescents (Aggarwal, Berk, Taljard, & Wilson, 2016; Bruno et al., 2015; Coles et al., 2016; Essau et al., 2013; Jorm & Kelly, 2007; Jorm et al., 2007; Reavley & Jorm, 2011c; Swords et al., 2011). In contrast, studies conducted in Portugal reported that the majority of adolescents regard mental health professionals as helpful people-based interventions for depression (Psychologists 89% and Psychiatrists 55%) and there was a much lower preference for the helpfulness of teachers (21%) when compared to this study. This may be because participants in the Portugal study were older adolescents and young adults, aged between 15 to 19 years, which is much older than the participants in this study. Previous studies have reported an increased preference for formal sources of intervention with advancing age (Aggarwal et al., 2016; Essau et al., 2013; Reavley, Yap, Wright, & Jorm, 2011).

Interestingly the majority of participants consider family (90.2%) a more helpful source than friends (81%), however it has been reported otherwise in the literature, because a higher degree of autonomy among adolescents often results in a desire to be more independent and to separate from parents, and therefore they would prefer to seek help form their peer or friends instead (Adams & Adams, 1996). A possible reason for these findings is that the participants in this study were young adolescents, and therefore

their development of autonomy is not as established as that in older adolescents (Fleming, 2005).

It can be concluded that the participants in this study preferred informal sources of people-based intervention. This finding is slightly encouraging in that adolescents do consider counsellors, teachers and family as helpful sources of intervention. It also reflects the high level of trust and familiarity that adolescents have with their teachers, whereby they are not worried about their teacher's perceptions of their current situation affecting their academic performance unlike reports of adolescents in Iran and Portugal (Essau et al., 2013; Loureiro et al., 2013). There are a few issues of concern, however. The lack of exposure and knowledge that adolescents have regarding the role of mental health professionals, which reflects a lack of proximity to mental health professionals in terms of school-based health interventions (Essau et al., 2013). There may also be some confusion about the role of doctors and that of mental health professionals among adolescents. A study among Malaysian adolescents reported that only 35% regarded psychiatric services as a helpful source for those with MHD (Nik Murni Nik Mustafa et al., 2015). There is a need to establish whether family members and friends are able to provide interventions which promote professional help-seeking when a depressed adolescent seeks help from them (Ko & Choi, 2015). Finally are there an adequate number of school counsellors (Murty, 2018) who are well enough trained to address problems faced by depressed adolescents (Ching & Ng, 2010)?

5.4.5.2 Medication-based sources of intervention

There is limited supporting evidence that non-prescription products such as vitamins are effective in depression, but they are believed by many adolescents to be useful, followed by antidepressants. Sleeping pills were rated as the most harmful treatment for the person described in the vignette. Similar findings were also reported among adolescents in Australia, Iran, Portugal and India (Essau et al., 2013; Jorm & Wright,

2007; Loureiro et al., 2013; Reavley & Jorm, 2011; Reavley et al., 2011c; Sharma et al., 2017). This finding is consistent with the latest NHMS 2017, which reports that 1 in 3 Malaysian adolescents consume vitamins, and young adolescents are the top consumers of dietary supplements (Institute for Public Health, 2017).

There are several mechanisms that can mediate variation in the identification of the helpfulness of medications. It is possible the high identification of helpfulness of vitamin is due to the common understanding and frequent use of vitamins among the public, for general wellbeing and health, without proper understanding of evidence-based treatments (Reavley & Jorm, 2011c). Most vitamins are widely available and can be purchased without the need for a prescription, unlike antidepressants. Parents tend to encourage their children to consume vitamins (Institute for Public Health, 2017). A lack of knowledge regarding antidepressants, and negative views of pharmacological treatments would result in their low identification as helpful (Biddle, Donovan, Gunnell, & Sharp, 2006). This finding is consistent with the earlier finding that suggests participants in this study do not regard psychiatrists as a helpful source of people-based intervention, which may reflect the low identification of antidepressants as helpful.

The concern here is that these findings indicate adolescent uncertainties as to the usefulness of antidepressants, or stigmatising attitudes towards the use of antidepressants, which may result in non-adherence to treatment when prescribed by a healthcare professional (Loureiro et al., 2013). Antidepressants are not recommended for mild depression in adolescents, or as a first-line treatment for moderate or severe depression, due to their potential side effects (Lawton & Moghraby, 2016), although antidepressant medication is recommended as a core intervention in adults (The Royal Australian and New Zealand College of Psychiatrists Guidelines Team for Depression, 2004).

It is encouraging to know that using sleeping pills to deal with a problem is considered harmful by most participants. This is probably because such medication offers a short term solution to insomnia, which is a relatively common symptom of depression that is possibly not foreseen by respondents who have not developed depression (Reavley et al., 2011). It is also possible that adolescents or family members are aware that sleeping pills do not resolve the underlying depression, but merely provide symptomatic relief and may even lead to abuse and side effects (DiGiulio, 2018).

It can be concluded that respondents regard vitamins as the most helpful medications to deal with depression, followed by antidepressants. Concerns about these findings are that the use of vitamins to deal with depression may not be supported by evidence. There may also be future noncompliance with antidepressants. More reassuringly, adolescents are aware that sleeping pills are not helpful in dealing with depression.

5.4.5.3 Activities-based sources of intervention

Commonly reported activities for helping the person described in the vignette were: receiving counselling, relaxation training, cutting down on substances (alcohol, smoking and marijuana), reading self-help books and getting out in the sunlight. Similar findings were also reported among adolescents in Iran, Australia, and Portugal (Essau et al., 2013; Jorm & Wright, 2007; Loureiro et al., 2013; Reavley et al., 2011), and adults in Australia (Jorm, Medway, et al., 2000).

Receiving counselling was strongly seen as a helpful source of intervention by the majority of participants, due to the presence of school counsellors in schools, which would increase their awareness and understanding of counselling (Farrer et al., 2008). Participants may also have attended counselling sessions in school and found it beneficial, therefore increasing identification of the helpfulness of this activity. This is supported by evidence that suggests that interventions used on a regular basis and found to be helpful

increase belief in the helpfulness of these activities (Jorm, Medway, et al., 2000). The relatively small number of psychologists and psychiatrists compared to counsellors in Malaysia could further contribute to the high identification of counselling as helpful (Lin, 2017b; Ministry of Health [MOH] Malaysia, 2017). According to WHO, 2017, there is one psychiatrist per 200,000 people in Malaysia, which is far below the recommended ratio set by WHO (Lim, 2017). There is a similar situation in Iran (Essau et al., 2013).

Lifestyle, complementary and self-help activities such as relaxation training, getting out in the sunlight and reading self-help books were regarded as helpful by the majority of participants. This is possibly because people with mental disorders frequently use self-help interventions, probably because they are relatively accessible, easy to implement, inexpensive and may also have less stigma attached (Jorm, Medway, et al., 2000). The higher identification of self-help strategies as helpful is in line with the concept of naturopathy, which people believe in more than evidence-based medicine (Jorm, Medway, et al., 2000). There is known to be some evidence for such complementary and self-help activities as effective in treating depression in adults (Jorm, Christensen, Griffiths, & Rodgers, 2002), however the evidence for these therapies among adolescents is much poorer (Parslow et al., 2008).

The high identification of cutting down of substance use, such as alcohol, smoking and marijuana, as a helpful intervention could that indicate adolescents are aware of the dangerous effects of these substances (Loureiro et al., 2013; Sharma et al., 2017). It is alarming, however, that there were some participants who did not see cutting down on these substances as helpful (cutting down alcohol 28%; cutting down smoking cigarettes 25%, cutting down use of marijuana 29%). This may be because they are either unaware that these actions are actually helpful, due to a lack of education about the undesirable effects of these substances or because they have become involved in these risky behaviours due to peer pressure, and for pleasure (Arshad, Omar, & Shahdan, 2015). It is

also possible that these statements may be only relevant to those who smoke, drink alcohol or use marijuana (Reavley et al., 2011). In practice, it is often very difficult to cut down on the use of alcohol, cigarettes or marijuana due to the addictive nature of these substances and particularly even more difficult for those with mental health problems, who are more likely to self-medicate with substances (Baker, Turner, Kay-Lambkin, & Lewin, 2009).

'Getting acupuncture', 'practicing meditation' and 'going to the local mental health service' were not highly rated as helpful, but these findings are largely due to ignorance (don't know) and a lack of knowledge rather than concerns about possible harms or benefits (Nik Murni Nik Mustafa et al., 2015). This causes adolescents to simply not associate these methods with sources of helpful intervention when dealing with emotional difficulties (Loureiro et al., 2013). Similar findings were reported among Malaysian and Portuguese adolescents (Loureiro et al., 2013; Nik Murni Nik Mustafa et al., 2015). 'Going to the local mental health service' may not have been identified as helpful due to fears of stigmatisation (Corrigan, 2004; Rickwood et al., 2005).

It can be concluded that participants appear to understand the importance of receiving counselling, certain self-help activities and reducing the use of high-risk substances and behaviours in helping alleviate the problems described by the person in the vignette. On the other hand, there are some forms of interventional activities, such as going to the local mental health service and joining a support group that adolescents do not understand as helpful.

5.4.6 Help-seeking

Consistent with previous findings, the majority of participants in this study (80%) intended to seek help from informal sources such as family, if they had similar problems as the person described in the vignette (Aluh et al., 2018; Bruno et al., 2015; Burns & Rapee, 2006; Coles et al., 2016; Marcell & Halpern-Felsher, 2007; Marshall & Dunstan, 2011; McCarthy et al., 2011; Olsson & Kennedy, 2010; Schiller et al., 2014). This is a reassuring finding, which indicates an understanding of the need for intervention by another person, professional or not, to help with the difficulties experienced by the person facing these symptoms. Similar findings were also reported in previous studies among adolescents in Australia and India (Hernan et al., 2010; Lubman et al., 2017; Sharma et al., 2017).

The majority of the participants identified more attitudinal barriers than structural barriers to help-seeking. For example, 'concern that people might feel negatively about you' and 'the person might give the wrong information' were thought to be the most common reasons for not seeking help. Statements that a person or service is far away, and feeling that nothing can help, were considered by the majority as unlikely barriers to help-seeking. This is a welcome finding, as it suggests that logistic barriers are not a major concern among adolescents and also simply that adolescents perceive that something can help if they have similar problems to those of the person in the vignette. This increases the probability of help-seeking intentions and actual help-seeking behaviours. These attitudinal barriers to help-seeking may still delay professional help-seeking, however, and result in the use of self-medication and increased noncompliance with therapy.

There are several mechanisms that can explain the high intention to seek help for depression found among adolescents in this study. As the prevalence of depression among adolescents is increasing, it is possible that adolescents could have either experienced depression themselves, or known peers with symptoms of depression, and had previously

sought help for it (Adlina et al., 2007; Kaur et al., 2014; Wilson, Rickwood, & Deane, 2007). It is also possible that an increasing reliance on coping skills and an increasingly perceived need for help among participants would lead to an increase in help-seeking intentions (Gould et al., 2004; Wilson et al., 2007). It is possible that a low severity of depression among participants would still prompt help-seeking intentions, unlike in the case of severe depression (Sen, 2004). Finally, this finding is consistent with the findings that the majority of participants thought the person describe in the vignette had a problem and therefore needed help (Wilson et al., 2007). Although it is welcome that there was a high intention to seek help among participants in this study, only a minority were able to correctly identify this problem as depression. This could potentially result in the seeking of inappropriate sources of help, due to the failure to correctly identify the underlying problem (Adeosun, 2016).

The possible reasons that adolescents prefer informal sources of help to formal were discussed in Section 5.4.5.1 (Knowledge of intervention: People based source of intervention).

The frequent identification of 'people might feel negatively about you' as a barrier to help-seeking among participants could be explained by several mechanisms. There is very strong evidence of taboo and stigma related to seeking help, especially from mental health professionals, for mental health problems in developing countries, which gives rise to several concerns among adolescents (Dardas, 2017). The most common concerns among adolescents that give rise to this finding were reported as feeling shameful and self-consciousness when a diagnosis of MHD, such as depression, is made (Nasir & Al-Qutob, 2005); having a fear of being considered 'crazy' and being negatively evaluated (Deane & Chamberlain, 1994). This occurs because of the negative conceptualisation of individuals who suffer from psychological difficulties by the public (Kushner & Sher, 1989). There is a fear of being punished due to these negative public conceptions, which

could result in social isolation, distress, difficulties in social life and employment (Crisp, Gelder, Rix, Meltzer, & Rowlands, 2000). Adolescents believe that the public perceive them to be self-sufficient in dealing with mental health-related problems and therefore seeking help reflects a sense of inadequate self-sufficiency (Deane & Chamberlain, 1994). Finally, a lack of confidence among adolescents regarding levels of confidentiality provided by formal sources of help might have resulted in the more common identification of 'people feel negatively about you', as these adolescents may fear that their underlying mental health problem would be revealed to everyone following consultation with formal sources of help.

The reasons that adolescents are concerned about receiving the wrong information could be explained by several mechanisms. First, it depends who these adolescents seek help from in the first place. Concern about receiving the wrong information usually arises when informal or traditional sources of help are sought. For example, seeking help form spiritual healers or religious sources for such mental problems may result in skewed information, as these individuals are not experts, and, furthermore, their beliefs and practices may not be in line with evidence-based medicine. Another mechanism that could mediate this finding is the lack of knowledge adolescents have with regards to the functions, roles and responsibilities of mental health professionals (Shukair, 2012). This results in the fear of receiving the wrong information even from mental health professionals who are actually subject matter experts. The majority of adolescents also prefer not to approach formal sources of help due to issues of trust and confidentiality (Burns & Rapee, 2006; Wilson & Deane, 2001). It could be possible that adolescents seeking help from formal sources of help such as doctors or mental health professionals may be not fully transparent when presenting their symptoms, due to their underlying concerns of confidentiality or lack of trust, resulting in misleading diagnosis and therefore the wrong information given to them by health professionals (Dardas, 2017). Although

rare, receiving the wrong information as a result of a misleading diagnosis could occur due to the failure of adolescents to present their symptoms sufficiently, if there is a tendency to normalise symptoms (Kessler et al., 1999) and present their distress as somatic rather than emotional (Hartman et al., 2008), all of which may be the result of poor MHL in relation to depression (Haller, Sanci, Sawyer, & Patton, 2009). Negative past experience involving a particular source of help, either formal or informal, could also mean that concerns about receiving the wrong information become a barrier to seeking help from the same source in the future (Lubman et al., 2017). Finally certain characteristics of the person potentially providing help could also mediate this finding, for example adolescents may perceive a provider as having a judgmental attitude, a tendency to show favouritism, to be too busy or to be playing a role as an enforcer (Gulliver et al., 2010).

There could be several reasons for the low identification of logistic barriers, such as people or services being far away, by participants in this study. First, Selangor is the wealthiest, most developed, most populous state in the Malaysia, although other states are larger (Ghazali & Azhar, 2015). Due to these factors Selangor is considered an urbanised state with better transport that would improve connectivity (with other people) within this state. The higher socioeconomic status of the population in Selangor can enables the privilege of owning personal vehicles which would further improve transportation (Department of Statistics Malaysia, 2015). Finally the existence of many private and public health clinics and hospitals in Selangor improves accessibility to healthcare providers and could contribute to these findings as well (Department of Statistics Malaysia, 2015).

Feeling that nothing can help was not seen as a major barrier to help-seeking among adolescents. This finding could possibly show that adolescents believe in the existence of solutions to their problems, which could echo the increased availability and access to

information on help for mental disorders on the web, more effective coping skills and positive reinforcement parenting styles.

The majority of participants did not see a dislike of treatment as a barrier to help-seeking, which could simply be because of two possible reasons. It is possible that the majority of respondents have not tried treatments for depression such as antidepressants or behavioural therapy, and therefore a lack of personal experience regarding treatment for depression would result in this finding. Antidepressants are not a first line treatment option for depression among adolescents (Lawton & Moghraby, 2016), therefore further reducing personal experience in the use of such treatments for depression.

Surprisingly, respondents also did not regard waiting time for an appointment as a barrier to help-seeking, for several possible reasons. The good availability of both private and public mental health services, which is more concentrated in the Peninsular states of Malaysia such as Selangor, could reduce waiting time (MOH Malaysia, 2016). A recent survey reported that the average waiting time of patients in primary healthcare clinics in Malaysia are within the targets set by Malaysia MOH (Ahmad, Khairatul, & Farnaza, 2017). Participants prefer seeking help from more informal sources, and therefore concerns about waiting times for appointments does not arise in this context.

A lack of money was also not regarded as a potential barrier to seeking help for depression. This could be because the cost required for the treatment of MHD such as depression in public hospitals in Malaysia is much less than in the private sector (Quek, 2014). Although rare, it is possible that the availability of private healthcare insurance could alleviate the fear of financial constraints.

Surprisingly, the majority of respondents did not identify feeling too embarrassed or shy as barriers to help-seeking for depression, although the previous literature reports otherwise (Churchill et al., 2000). A possible explanation for this is social desirability bias. The relatively poor ability of participants to correctly recognise depression in the

first place could suggest that adolescents regard the problem faced in the vignette as some other problem (not mental illness such as depression), which may have reduced the stigma attached to it (Rössler, 2016). It can be concluded that, encouragingly, the majority of respondents intended to seek help, however from more informal sources of help. Two prominent barriers to help-seeking that need to be addressed immediately are; 'the person might feel negatively about you' and a fear of 'receiving the wrong information'. This reflects the existence of a stigma in help-seeking for MHD, inappropriate help-seeking and a lack of awareness regarding the role of mental health professionals in providing information.

5.4.7 Stigmatising attitudes

(a) Personal and perceived stigma of depression

According to this study, adolescents were most likely to agree with statements regarding both personal and perceived stigma regarding 'unpredictability' and that 'the person could snap out of it'. There were similar findings among Nigerian adolescents (Dogra et al., 2012). Participants in this study were least likely to agree that the person described in the vignette is 'dangerous to others', that it was 'best to avoid the person' or that they 'would not tell anyone if you have a problem like the person describe in the vignette'.

The high agreement with regards to the statement about unpredictability could be the result of some respondents having had personal experience of unpredictability involving someone with depression. It is likely that the media, such as films, newspapers, magazines, television shows, and advertisements, often make inaccurate and damaging portrayals of mental health patients, such as reports associating irresponsibility with depression or describing mentally ill people as violent and criminal, which may contribute to perceptions of unpredictability (Cutcliffe & Hannigan, 2001; Hocking, 2003; Morgan & Jorm, 2009). It is also possible that people with low levels of mastery view the actions

of people with depression as out of their control, therefore eliciting feelings of uncertainty and unpredictability (Calear et al., 2011).

While the reasons for high agreement that 'the person could snap out it' could be contributed by, a belief that depression is a normal process during the adolescence period which will resolve with time, a poor understanding of the symptoms of depression and recognition of depression as an illness which requires urgent intervention (Kok & Goh, 2011). An increased belief in the use of self-reliance to deal with a problem may also mediate these findings (Gulliver et al., 2010). Poor knowledge of the causes of depression, including that it is self-triggered or that people are responsible for their own depression may encourage people to think that these are individuals who self-created their depression and could as well snap out of it if they wanted to (Weiner et al., 1988). Finally, a lack of personal experience where someone fails to snap out of depression could also contribute to this finding.

The low agreement for the statement about being dangerous to other people could be explained by a higher degree of tolerance in the population for those with depression (Amarasuriya, Jorm, Reavley, & Mackinnon, 2015), however these findings are inconsistent with previous findings that report a higher belief among adolescents that people suffering from depression are dangerous to others due to the higher perception of violence associated with depression (Walker et al., 2008).

The low agreement that it is best to avoid the person described in the vignette could be explained by several mechanisms. It is possible that there is a higher degree of self-compassion among young adolescents, which fosters a sense of caring and kindness towards oneself and others (Bluth & Blanton, 2015). A lack of recognition of depression as a form of mental illness, as evident among participants in this study, would reduce stigma, as conventionally stigma is strongly associated with mental illness (Rössler, 2016). The failure of adolescents to identify depression as a medical problem would

create a perception that the person described in the vignette is not suffering from a medical problem, and that there is thus a lesser need for avoidance. Finally, depression generally does not present with any obvious physical symptoms, which may result in the lesser occurrence of avoidance (Karson, 2014).

There may be several reasons why participants agreed that they would not tell someone if they are having a problem like that described by the person in the vignette. As the majority of participants in this study intended to seek help, this shows that adolescents are willing to talk, or share their problem with others. It is also possible that adolescents have an understanding and awareness that not telling anyone that you are having a problem results in delayed appropriate help-seeking, which would worsen mental health outcomes (Tait, 2009). Finally adolescents suffering from depression, especially in case of mild to moderate depression, could be overwhelmed with their symptoms, thus creating an urgent desire to seek help by sharing their problems, emotions and feelings with others (Sen, 2004).

Personal stigma and perceived stigma are similar in some items to other stigma surveys (Reavley & Jorm, 2011; Yoshioka, Reavley, Hart, & Jorm, 2015), but a larger proportion of Malaysian adolescents compared to Australian adolescents believe that the problem of the person described in the vignette is a sign of personal weakness and not a real medical illness. There are many possible explanations for this. The higher identification of personal weakness could explain why the Asian population tends to have a greater tendency to perceive the onus of the illness to be on the individual, resulting in more attitudes of blame (Fernando, Deane, & McLeod, 2010). The adolescents in the Australian surveys were also much older (14 to 18 years old) compared to the participants in this study. Studies have suggested that stigma declines with increasing age (Dietrich, Heider, Matschinger, & Angermeyer, 2006; Jorm, Morgan, & Wright, 2008b). A third possible contribution to this perceived difference in stigma between Australian and Malaysian

adolescents might lie in the wider availability of public health education and stigma reduction programs among adolescents in Australia, such as Beyond Blue and Mind Matters. Such programs are able to educate adolescents on mental illness such as depression. The difference in stigma might also be mediated partly by the different values placed on conformity and individualism in Malaysia and Australia. Since people who are mentally ill deviate from the norm, it might be expected that this would impact more negatively in Asian countries, where conformity is said to be more highly valued than in western countries (Ellis, 2001). Another possible mechanism for this difference in stigma in the two countries may lie in their variation in healthcare systems. In Malaysia, healthcare service for mental disorders are often focused primarily on long term hospitalisation, whereas the Australian healthcare system emphasises de-institutionalisation and the provision of community and rehabilitation services (Griffiths et al., 2006). Long-term institutionalisation would further reinforce stigmatising attitudes in the community. This finding is concerning as it reflects the existence of stigmatising attitudes towards mental disorders, along with poor knowledge of mental disorders among young adolescents.

The overall items regarding perceived stigma received much higher agreement than those assessing personal stigma in this study; findings that replicate those of other studies conducted among adolescents and adults in Australia and Japan (Calear et al., 2011; Jorm & Wright, 2008; Reavley & Jorm, 2011; Yoshioka et al., 2015). This variation could be first explained by the concept of 'pluralistic ignorance', a phenomenon in which most people erroneously perceive that they have different attitudes to the majority, and are therefore more likely to claim that others hold more stigmatising beliefs (Reavley & Jorm, 2011). It is also possible that an increasing awareness of the issue of stigma in the community has contributed to the overestimation of stigmatising beliefs (Griffiths et al., 2006). A social desirability bias could also have contributed in part to these findings, in

which respondents are reluctant to report their true attitudes to a person with a mental disorder (Gaebel, Baumann, Witte, & Zaeske, 2002).

(b) Social distance

It is encouraging to see that adolescents demonstrated a low desire for social distance, although a minority of adolescents were unwilling to invite the person described in the vignette to their house. The current findings are also in keeping with those of other studies involving adolescents and young adults in Australia, Japan, Sri Lanka and India (Amarasuriya et al., 2015; Reavley & Jorm, 2011; Sharma et al., 2017; Yoshioka et al., 2015). The welcome finding of a high willingness of adolescents to have social interactions with the person described in the vignette could be explained by existing evidence which suggests that attributing a disorder to an external cause, such as that described in the vignette, makes it less likely that it be seen as a character problem or source of shame (Reavley & Jorm, 2011). The social desirability effect could also play a role in depicting a picture of greater willingness for social interaction with the person described in the vignette, unlike among adolescents in Japan (Yoshioka et al., 2015). Findings regarding social distance could be interpreted in relation to a concept which suggests that in Asian countries, the basic unit of a society is not an individual but instead is a family. The family or larger social network therefore does not alienate the mentally ill, but considers it their responsibility to act collectively to assist these persons to re-integrate into society (Waxler, 1977), resulting in lower desire for social distance among participants. On the other hand a lower desire to invite the person described in the vignette to their house may be because of parental attitudes towards individuals with mental disorders, as there is a possibility that some parents would not agree to allow this (Jorm & Wright, 2008). Previous studies have also shown that stigmatising attitudes are affected by personal experience of a mental disorder, contact with others who are affected and

have sought professional help, exposure to campaigns and parental attitudes (Jorm & Wright, 2008).

It can be concluded that the low agreement about danger to others, best avoiding the person described in the vignette, not telling anyone if you have a problem like that of the person described in the vignette, and a low desire for social distance in this study shows that the respondents have a positive attitude towards patients with mental illness, as they offer support, believe that mental illness sufferers should be accepted into society and are open about mental illness, a finding supported by previous studies (Nik Murni Nik Mustafa et al., 2015). Strong agreement about unpredictability and that a person could 'snap out of it' suggests that participants still have poor knowledge regarding the causes of depression and understanding depression as an illness.

5.5 Relationship between knowledge of depression, intention to seek help, stigmatising attitudes and depression symptoms.

5.5.1 Sociodemographic variables and depression symptoms

Previous studies conducted among Malaysian adolescents have found that being female, (Adlina et al., 2007; Kaur et al., 2014), feeling lonely (Kaur et al., 2014; Yaacob et al., 2009), being bullied (Kaur et al., 2014; Uba et al., 2010; Wan Ismail et al., 2014) and a lack of parental supervision (Kaur et al., 2014) are all significant determinants of depression. This study also reports these variables as being significantly associated with depression symptoms.

There are several reasons why females may be significantly associated with depression symptoms. Depression has always been more common among females for various reasons, such as those attributed to genetics, higher anxiety disorder, biological changes

associated with puberty, cognitive predisposition (negative perception), and sociocultural factors (Adeniyi et al., 2011; Birmaher et al., 1996; Yaacob et al., 2009). There are several theories to explain this gender difference, including the gender intensification hypothesis which indicates that depression symptoms are more associated with feminine roles or stereotypes (Hill & Lynch, 1983). Both internal and external coping resource theory suggests that for males their relationship with their fathers serves as a protective factor against depression, and males also tend to engage in more distracting behaviours when depressed, unlike females who are more likely to amplify their moods by ruminating about their depressed states and the possible causes of these states (Thoits, 1986). Stressful life events theory suggests that females are more vulnerable to psychological problems than males during adolescence, as they are subjected to more stressful life events (Kessler & McLeod, 1984).

Other explanation that can mediate this findings include the variation in triggers for depression which appear to differ across gender, with women more often presenting with internalizing symptoms and men presenting with externalizing symptoms (Albert, 2015). Men would externalize depression symtoms (emotions) in ways such substance and drug abuse, suiside and violence. Internalization of symptoms among women would further worsening the underlying depression. Women generally display more sensitivity to interpersonal relationships, whereas men displayed more sensitivity to external career and goal-oriented factors (Albert, 2015). These variation also increase the risk depression among women. Women also experience specific forms of depression-related illness, including premenstrual dysphoric disorder, postpartum depression and postmenopausal depression and anxiety, that are associated with changes in ovarian hormones and could contribute to the increased prevalence in women (Albert, 2015). Biologically studies have also reported that the male brain testosterone is converted into estrogen which provides protection towards depression (Albert, 2015).

Feeling lonely due to social isolation causes adolescents to have a sense of perceived low social acceptance and poor self-esteem regarding their social skills when among their peer groups, which would increase the odds of depression symptoms, especially among adolescents ages 11 to 14 years old (Witvliet et al., 2010). Adverse life events among adolescents, such as being bullied, would also result in low self-esteem (Bhasin et al., 2010). A lack of parental supervision reflects poor a parent-child emotional connection which means that adolescents might not disclose their problems to their parents, which would delay help-seeking. A greater sense of freedom resulting from a lack of parental supervision might encourage adolescents to be involved in high risk behaviours such as substance abuse, all of which increases the odds of depression symptoms (Bhasin et al., 2010; Kaur et al., 2014). In contrast to previous studies conducted in Malaysia, this study found that participation in co-curricular activities reduces the odds of depression symptoms. Similar findings have been reported among British adolescents (Driessens, 2015). Several mechanisms mediate this finding. Involvement in co-curricular activities reduces the likelihood of substance abuse (Darling, 2005), increases the sense of wellbeing (Mahoney & Vest, 2012), improves emotional regulation (Larson, Hansen, & Moneta, 2006) and reduces internalising/externalising behaviour (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996).

5.5.2 Knowledge of depression and depression symptoms

Several items across the various components of depression literacy were found to be significantly associated with depression symptoms. This study found that suggesting keeping the person busy as helpful first aid (knowledge about first aid) is significantly associated with an increased odds of depression symptoms among adolescents. This finding infers that individuals who adopt distraction forms of first aid, such as keeping a person busy when dealing with depression, could cause a worsening of depression symptoms. This is an important finding because it suggests that adolescents should be

informed and educated in order to avoid such distraction first aid when dealing with depression. There are several mechanisms that can explain this finding. Keeping the person busy is an example of distraction first aid which hinders the development of coping skills among adolescents when faced with such problems (Gulliver et al., 2010). Instead of dealing with the underlying problem, adolescents deflect or ignore it by keeping themselves busy. This would also result in delay help-seeking and a worsening of depression symptoms (Gulliver et al., 2010). It is also possible that such forms of distraction first aid would only momentarily suppress symptoms while the person is actively involved in these activities and once the activity is over their symptoms would return, resulting in a temporary suppression of depressive symptoms. The distraction hypothesis also suggests that, aside from physical activity (exercise), other forms of distractive activities which are more self-focused or introspective activities (such as relaxation, assertiveness training, health education, and social contact) tend to have limited value in their ability to reduce depression symptoms (Craft & Perna, 2004). Another mechanism that mediates these findings is the adaptation of negative forms of distractive activities, whereby if a person keeps themselves busy by, for example, eating indulgently, drinking alcohol and binge-watching/using electronic media for hours (Primack, Swanier, Georgiopoulos, Land, & Fine, 2009), this would worsen symptoms of depression (Sedas, 2018). The existing literature on the relationship between distractive actions and depressed mood in adolescents is also inconclusive. Some studies have found support for distraction actions being associated with lower concurrent levels of negative mood states (Muris, Roelofs, Meesters, & Boomsma, 2004; Schwartz & Koenig, 1996) whereas other studies did not (Abela, Brozina, & Haigh, 2002).

In this study depression symptoms was also found to be significantly associated with those who regarded going out into sunlight as harmful (knowledge on intervention). These findings suggest that depression symptoms worsen with a lack of exposure to sunlight.

This finding can be explained by several mechanisms. First, exposure to light in the morning produces a phase advance that relieves depression. The reduced availability of sunlight, especially during winter, causes a phase delay in the circadian rhythm, which in some people leads to depression (Jorm et al., 2002). Sunlight exposure has been found to have an effect on cognition function whereby inadequate exposure to sunlight results in a reduction in the brain blood flow and altered serotonin levels resulting in depression (Dani et al., 2004; Leonard & Myint, 2006), however although such complementary and self-help activities have been found effective in treating depression in adults, their effectiveness among adolescents is still unclear (Jorm et al., 2002; Parslow et al., 2008). It is therefore important that adolescents be taught about the role sunlight has in reducing depression symptoms.

5.5.3 Help-seeking intention and depression symptoms

This study initially (univariate analysis) found that having no intention to seek help is significantly associated with an increased odds of depression symptoms. These findings are supported by the literature, which reports that Australian adolescents with no intention of seeking help experienced a worsening of depression symptoms as a result of self-medication and delays in professional help-seeking (Burns & Rapee, 2006). Adolescents with depression may also have low intentions to seek help due to underlying feelings of alienation, low expectations of the future, pessimism, indecisiveness and negative thinking (Boyd et al., 2011; Dardas et al., 2017).

The multivariate analysis in this study suggested that intention to seek help was not significantly associated with depression symptoms. This contrasts with previous studies conducted among adolescents in New Zealand, Tokyo, Australia and Jordan, which reported a significant association between help-seeking intention and depression symptoms (Ando et al., 2018; Boyd et al., 2011; Dardas et al., 2017; Mariu et al., 2011),

however, several mechanisms can explain this variation in results. Our study sample size was smaller than that of the study conducted among adolescents in New Zealand, Tokyo and Jordan (Greenwald, Gonzalez, Harris, & Guthrie, 1996). Variables adjusted for across studies varied therefore this could have resulted in a possible confounding effect for unadjusted variables on the association. For example variables such as gender, education level, age, ability to recognise mental health problems, personal experience of problems or experience of it through their family, and stigmatising attitudes are established predictors of intention to seek help for depression among adolescents in the literature (Amarasuriya et al., 2018). We included all the mentioned predictors in this study with the exception of education level and personal experience of problem, while the study conducted in Tokyo did not include the ability to recognise mental health problem, personal experience of problems or stigmatising attitudes as potential confounders. Finally, this study only examined the intention to seek help for depression, whereas the studies conducted in New Zealand and Jordan specifically examined the association of intentions to seek help from various sources (professional and non-professional) and depression. A direct comparison of results may therefore not be appropriate.

5.5.4 Stigmatising attitudes and depression symptoms

This study analysis revealed that depression symptoms is significantly associated with perceived dangerousness of a person with depression. These findings simply mean that adolescents suffering from depression generally have a higher perception that other people would regard them as being dangerous. This is a concerning finding as such a perception would result in avoidance behaviours, refusal to seek help and reluctance to disclose the underlying problem to anyone, due to the fear of being rejected because of the underlying perception of dangerousness that others have towards a person suffering from depression. Similar findings were reported in Sweden (Fazel et al., 2015). There are several mechanisms that can explain this finding. Low impulse control and impaired

affect regulation among depressed individuals might result in violence (Nestor, 2002). Depressed adolescents often turn to substance use as a form of coping mechanism, and this could increase the risk of violence (Danielson et al., 2010; Elbogen & Johnson, 2009; Oakley, Hynes, & Clark, 2009; Schimelpfening, 2018). The risk of violence is also increased in cases of non-adherence to treatment (Yee, Large, Kemp, & Nielssen, 2011). A perception of dangerousness might be due to several other sources of information, such as information about symptoms or deviant behaviour by individuals suffering from mental disorders, which might originate from reports in the media of violent crimes committed by people with mental disorders which can increase belief in danger (Jorm, Reavley, & Ross, 2012). Information that a person has been treated in a psychiatric hospital might also mediate this finding (Sowislo, Gonet-Wirz, Borgwardt, Lang, & Huber, 2017). A lack of contact with individuals suffering from depression and a lack of personal experience of depression among young participants magnifies the perception of a depressed individual being dangerous to others (Jorm et al., 2012), however, these findings are inconsistent with those from previous studies conducted among adolescents in Australia and Jordan, which both reported no significant association between perceived stigma and depression symptoms (Calear et al., 2011; Dardas et al., 2017). The variations in findings could be because this study looked into the individual item-wise association of perceive stigma with depression, while the other studies examined the overall score of perceived stigma, and therefore a direct comparison may not be appropriate. Findings regarding the significant association between perceived dangerousness and depression symptoms must be interpreted with caution, however, as although there is a risk of violence among individuals suffering from MHD such as depression, the overwhelming majority of people with mental disorders are not violent (Pulay et al., 2008).

This study results also support a statistically significant association between depression symptoms and 'not telling anyone if you are having a problem like the person described in the vignette' (personal stigma). Adolescents who do not disclose or share their problems with others tend to have an increased odds of depression symptoms. There are several possible reasons for this finding. Not telling anyone, or disclosing the underlying problem, could cause delays in help-seeking, wrong diagnosis, noncompliance to treatment, the internalisation of problems and the use of inappropriate forms of interventions (substance abuse) to deal with the underlying problems, which would increase the likelihood of depression (Aromaa, Tolvanen, Tuulari, & Wahlbeck, 2011). If a person believes that they are responsible for their depression, they bear more feelings of guilt and shame and may decide not to tell anyone about their problem (Aromaa et al., 2011). A lack of knowledge regarding depression as a disorder that requires treatment, along with poor understanding of the consequence of depression on adolescent health would mean there is no sense of urgency to tell anyone if one is suffering from depression. It is also possible that individuals suffering from depression prefer not to disclose their problem (not telling anyone) to others for several reasons, such as fear of being prescribed medication, being unsure of how to raise the issue with others, a fear of being referred to a counsellor or psychiatrist, and being labelled a psychiatric patient (Bell et al., 2011).

5.6 Relationship between help-seeking (source of help and barriers to help-seeking) and depression symptoms

In the present study, depression symptoms was significantly related to not seeking help from family members by two-fold. These findings show that family members are important sources of help for adolescents who are suffering from depression. Similar findings were reported among adolescents in Australia (Sawyer et al., 2012). This finding can be explained in several ways. The phenomenon of help negation, which suggests that

mood disorders such as depression result in a lack of motivation, increase the desire to keep feelings and concerns to oneself, therefore resulting in less frequently seeking help for problems (Wilson & Deane, 2010). Adolescents who tend not to seek help from family members such as parents generally experience a delay in professional help-seeking as parental recognition of a problem often acts as a crucial filter in the trajectory along which adolescents make timely utilisation of mental health services (Goldberg & Huxley, 1980). It is also possible that adolescents believe their family members would disapprove the use of the mental health service, and they would thus demonstrate less intent to seek help from family or even mental health professionals, ultimately worsening their underlying depression (Chandra & Minkovitz, 2006). A lack of family involvement, especially parental involvement, in the process of help-seeking for adolescents who suffer from depression would impair maintenance of the professional relationship between adolescents and mental healthcare professionals over time, which would affect adherence to treatment and follow up, resulting in undesirable depression outcomes (Houle et al., 2013). Finally the positive participation of family members, especially parents, is considered an important factor in establishing a work alliance with adolescents in distress, which can improve symptoms (Shirk & Karver, 2003). Considering the above reasons, the next step is to ensure that both adolescents and family members (especially parents) are familiar with the role each should play to address emotional problems among adolescents.

Depression symptoms was significantly related in this study to being worried about what other people might think of you if help is sought, feeling that nothing can help and difficult to get an appointment. Considering the high rate of those who screened positive for depression, this perception is quite concerning, as it may affect the help-seeking attitudes of adolescents. Similar findings were reported in studies conducted among adolescents and adults in the United States and Australia (Dubow et al., 1990; Mojtabai,

2009; Barney et al., 2006). Several mechanisms can explain this finding. Adolescence is a period whereby embarrassment occurs constantly, because this is the age when one is no longer a child but not yet an adult, and can be criticised on both fronts for either presuming to act too old or for not acting old enough (Pickhardt, 2013). Depression is a disorder with a certain degree of stigma attach to it, and once again this could result in a magnification of feelings of embarrassment and worries about what others might think if help is sought, among depressed adolescents (Dardas, 2017). According to social rank theory, adolescents with depression perceive that by seeking help they will be looked down on upon by others and therefore feel inferior to others, resulting in the notion of being 'worried what others might think of you' (Gilbert, 2000). Finally, knowledge due to a previous experience of stigmatisation among depressed adolescents who sought help could cause worries about what others might think if help is sought in the future.

5.7 Relationship between adequacy of depression literacy and depression

This study initially (univariate analysis) suggested that an inadequate depression literacy level is significantly associated with depression symptoms. These findings are supported by evidence in the literature, which reports that the incorrect recognition of depression could result in a delay seeking professional help, which would result in a worsening of depression symptoms (Burns & Rapee, 2006).

After adjusting for other variables, the adequacy of depression literacy was not significantly associated with depression symptoms. These findings are in contrast with those of a previous study conducted among adolescents in China (Lam, 2014). A possible explanation for this contradictory phenomenon is that young adolescents who are in a depressive mood in this study, consciously or unconsciously, labelled the symptoms as depression, mental illness and stress, therefore correctly identifying the problem

described by the character in the vignette, as well as showing a positive attitude towards help-seeking (Lam, 2014). Methodological variation in this study and that of the study conducted in China could also explain the variation in results. The respondents in this study were young adolescents, and according to evidence, both depression literacy and the prevalence of depression symptoms tend to be lower in younger adolescents compared to older adolescents (Essau et al., 2013). We used close ended questions, which could reduce the rate of correct recognition of depression as participants had to provide answers to all the statements listed in the question, unlike other studies that utilised an open-ended question for this section. The reason for not utilising an open ended question about the recognition of depression in this study was simply that open-ended questions are dependent on the adolescent's motivation to provide descriptive and comprehensive responses (Amarasuriya et al., 2018). This study had controlled for many more confounders when examining this association, and it is possible that some unadjusted confounders such as feeling lonely or being bullied, are established predictors of adolescent depression but were not adjusted for in previous studies, which could result in a biased association (Kaur et al., 2014; Wan Ismail et al., 2014). Finally it is important to note that, the number of participants classified as having adequate depression literacy was very small and therefore would be unlikely to claim a significant result.

The development of good MHL in relation to depression during the adolescent period of the life cycle is a key factor in improving depression awareness, reducing the stigma associated with depression and improving health-related decision making (Kutcher et al., 2015). It is thus essential that adolescents become literate in mental health.

5.8   Strengths and limitations

There are several strengths of this study. This is the first study of depression literacy and its association with depression symptoms among young Malaysian adolescents (Marhani Midin et al., 2018). The validation of the MHL and stigma questionnaire provides some evidence for its use among Malaysian young adolescents, as there has been a lack of evidence reporting on the validity of this instrument among this population. To improve the precision of this study, sample size calculation was based on the smallest effect size with a fairly narrow 95% CI which yield a relatively large sample size (n > 1000) (Carlson & Morrison, 2009). Most variables that were found to be significant for depression symptoms had a relatively narrow CI, however due to the absence of randomisation, some degree of random error may be present. Several threats to the internal validity of this study were addressed, such as; confounding bias which was addressed by including potential confounders identified in previous literature as variables in this study, and controlling them during statistical analysis. Measurement error was reduced by using instruments that were validated, the exposure variables were selected based on existing concepts of MHL and double data entry was performed as the method of quality control. To increase the external validity of this study a large sample (n=1707) was sourced from multiple settings (school, n=46). The findings from this study can therefore be generalised to young adolescents, especially those age 13 years within Selangor state, and maybe young adolescents in other neighbouring states, such as Negeri Sembilan and Perak, as these states have similar sociodemographic characteristics to Selangor. Finally, the review of depression literacy among adolescents provides evidence about the common tools used to examine depression literacy and adolescent understandings of depression literacy.

There are several limitations of this study. It utilises a written hypothetical vignette to examine the depression literacy of participants. Unfortunately written hypothetical vignettes may not truly reflect the actual experience of having depression, and the extent to which these beliefs may translate into actual behaviours is unknown (Essau et al., 2013). The majority of research on MHL relating to depression to date, however, has relied on a hypothetical written vignette. A self-reported questionnaire could lead to information bias as a result of social desirability bias, especially regarding questions about stigmatising attitudes. Participants may be more inclined to answer certain questions in a socially desirable manner. The researchers tried to minimise this by ensuring that participants had no personal identifiers written on the questionnaire, so that confidentiality was maintained. Most participants in this study were young adolescents, aged 13, and therefore generalising the findings to older adolescents must be done with caution. It was important to focus on young adolescents as this is the point when depression first tends to begin, and there is a crucial need to educate adolescents early, as negative attitudes tend to calcify with time and become more resistant to change (Dardas et al., 2017). As this study used a cross-sectional design, the researchers are unable to establish temporal relationships (Wei et al., 2015). A larger sample would have enabled this study to assess the factor structure of the MHL and stigma questionnaire for the target population. The use of a male vignette only in this study could possibly result in bias due to gender assigned to vignette, however as this is the first study to report on depression literacy among adolescents in Malaysia, findings from this study could be used as a baseline for other futures studies which should utilize both gender for the vignette.

Finally to avoid the possibility of selection bias, several measures we taken, such as performing random selection of schools and universal sampling (including all Form 1 students in the respective schools) at the school level, re-distribution of consent forms to students who were not present on the day of briefing about the study and sampling from

multiple settings (school, n=46). This study required active parental consent as the participants were minors (under 18 years of age), but previous evidence has suggested that response rates are poor in cases when active parental consent is required (Courser, Shamblen, Lavrakas, Collins, & Ditterline, 2009). The use of multi-level approaches (such as personal calls and meeting with individual parents, pre-notification) in order to improve parental consent and response rate was not possible in this study due to human resources and time constraints (Schilpzand, Sciberras, Efron, Anderson, & Nicholson, 2015). For these reasons universal sampling was done at the school level.

5.9 Summary

Both the MHL and stigma questionnaire and CES-D Malay version questionnaire demonstrated acceptable internal consistency and two-week test-retest reliability analysis, however, there is a need to perform factor analysis for the MHL and stigma questionnaire in future studies. Although a poor rate of correct recognition of depression was reported, and the majority of participants intended to seek help. An important issue that may arise here is that despite having the intention to seek help, when one is unable to correctly identify the problem then the help sought may be inappropriate, resulting in a delay to appropriate help-seeking. A more holistic indicator of the overall measure of depression literacy, such as the adequacy of depression literacy, was examined, and was found to be fairly low among participants. Several variables across the knowledge, help seeking and stigma components were finally found to be significantly associated with depression symptoms, following adjustment for potential confounders.

The results of this study supports the conceptual framework used in this study as several demographic variables (identified through the SEM) and depression literacy variables (identified through the MHL framework by Jorm et al. (1997) and Kutcher et al. (2016) significantly increased the odds of depression symptoms among adolescents.

Additional variables that should be added into this conceptual framework in the future would include educational achievements, previous diagnosis of MHDs and knowledge on causes of depression.

There were several variables that had relatively small representation for each levels within the groups for example the other races (2.2%), smoked cigrattes (4.7%), used drugs (0.6%), changed school (1.3%), not involved in co-curiculum activities (13.4%) and divorce (6.0%). For variables which had small representation within each level, if an association is found it is important to be clear that these associations was from a hypothesis-generating study and a larger confirmatory study is needed later on (Hackshaw, 2008).

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This study examined adolescent understandings of depression literacy components and their association with depression symptoms, and discussed the findings. 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.

The literature review reported that depression was one of the most common MHDs, affecting adolescents worldwide. There also appears to be a rising prevalence of depression symptoms among young Malaysian adolescents. Several individual (such as gender, age, ethnicity, feeling lonely, alcohol intake, smoking, substance abuse, being bullied and academic stress), interpersonal (lack of parental supervision, parental marital status and parental income) and community (such as poor involvement in co-curricular activity and changes of school) determinants of adolescent depression were identified in this review.

The systematic review found that vignette-based methodology were the most commonly used tool for examining depression literacy among adolescents. There also appears to be a lack of uniformity and disparate reporting in the field of depression literacy among adolescents. The majority of studies reported on a single component of depression literacy and even within each component of depression literacy examined there was a lack of uniformity in the reporting of the various subcomponents. Only a

minority of studies actually reported on the overall adequacy of depression literacy. This review found that adolescents from developing countries had a better ability to correctly recognise depression. Adolescents also have high intentions to seek more informal sources of help for depression.

The validation phase of this study (Phase 1) reported that both the MHL and stigma questionnaire and the CES-D Malay version questionnaire demonstrated acceptable levels of reliability analysis. Both instruments are considered to be valid tools for use among young Malaysian adolescents, in order to examine depression literacy and assess depression symptoms.

Phase 2 of this study reported that only a minority of participants were able to correctly recognise depression (3.5%), and were classified as having adequate depression literacy (3%). Adolescents in this study also demonstrated a poor understanding of the helpfulness and harmfulness of various first aid, preventive measures, interventional sources and help-seeking sources for depression. For example, in the context of knowledge of first aid, non-supportive and distraction first aid such as ignoring the person and keep the person busy, which ideally should be avoided when dealing with a problem like depression (Kelly & Jorm, 2007), were regarded as helpful by participants. Mental health professionals such as psychiatrists, psychologists and attending the local mental health service, which are appropriate professional sources of help, were regarded by the majority as unhelpful; and self-help activities such as reading self-help books, which lack evidence of effectiveness on depression among adolescents (Parslow et al., 2008), were regarded by the majority as helpful. Knowledge about the prevention of depression indicated that the majority of adolescents regard avoiding stressful situations as helpful, despite evidence suggesting that exposure to stressful situations results in the development of more effective coping skills (Yap et al., 2012b). Although there was high intention to seek help reported among participants in this study (80%), the majority prefer more informal

sources of help. A more reassuring finding is that adolescents in this study demonstrated a low desire for social distance from a person suffering from depression symptoms.

Finally there were several items across the various components of depression literacy that were significantly associated with an increased odds of depression symptoms, such as keeping the person busy as a helpful form of first aid, regarding going out into the sunlight and the use of antidepressants as harmful forms of intervention, not getting help from family members, being worried what others might think of you if help is sought, the perceived danger of a person with depression to others and not telling anyone if you are having a problem like that of the person described in the vignette.

6.3 Recommendations

It is imperative that depression literacy among adolescents is assessed properly, adequately and improved accordingly from time to time. Educating adolescents about mental health has the potential to increase the ability to correctly recognise MHD, encourage the adoption of effective first aid, and preventive and coping strategies, and to enhance early appropriate help-seeking behaviours, especially among those adolescents experiencing mental health problems. This simultaneously creates a sense of general acceptance of mental health issues by reducing stigmatising attitudes (Lam, 2014; Sharma et al., 2017; Wei et al., 2013, 2015, 2016). As discussed in Chapter 5, there are several reasons for the responses of adolescents with regards to depression literacy and its relationship with depression symptoms. Translating these findings into recommendations and disseminating them to the relevant agencies might improve adolescent depression literacy, which in turn will improve depression outcomes. While the responsibility for equipping adolescents with adequate depression literacy might largely fall on the health and education system, the broader societal context also needs to be considered. The recommendations in this review will specifically be focused on the relevant stakeholders at each level within the SEM.

6.3.1   Recommendations for family, peers and teachers

Family, friends, teachers and health care providers are potential sources of support within the interpersonal level that are able to facilitate adolescent behaviour change by affecting social and cultural norms that would eventually overcome individual level barriers to help-seeking. Adolescents commonly turn to family members and peers when they needed help, as evident in this study. These individuals are seen as gate keepers who play an important role in enhancing professional help-seeking among adolescents with depression (Moffatt, 2007). Family members and peers therefore need to be actively involved in school mental health programs so that they can be educated regarding the early recognition of depression, the prompt delivery of appropriate first aid, as well as when and where to get additional help if needed. For example, peers have become increasingly influential during the adolescent period, and therefore non-supportive forms of first aid, that would result in delayed professional help-seeking among adolescents, should be avoided (Cartmill, Deane, & Wilson, 2009).

If typical gatekeepers, such as teachers, parents and peers, hold negative attitudes themselves towards help-seeking they will be less likely to ensure that adolescents are directed towards appropriate help providers, and therefore these individuals also have to be in cooperated in anti-stigma mental health programs in schools (Jorm & Wright, 2007; Moffatt, 2007). Such measures would encourage gatekeepers to actively engage with young adolescents experiencing depressive symptoms rather than waiting for them to initiate help-seeking.

Family members and peers should also communicate with school teachers and counsellors to collaborate on findings whenever there is a suspicion of depression among adolescents. Evidence has suggested that such measures would ensure the early detection of depression symptoms among adolescents with prompt professional help, translating to less intrusive interventions being required to address their problems (Moffatt, 2007).

School mental health programmes should therefore adopt both a targeted and a universal approach. Targeted interventions are focused on adolescents while universal interventions should involve teachers, parents and friends (Dardas et al., 2017). There is a pressing need to improve parent's depression literacy, as well as to strengthen the role of school counsellors in tackling mental health problems.

6.3.2 Recommendations for school mental health services

Activities or services implemented at the community level are able to facilitate adolescent behaviour changes by influencing the organisational systems. In this context schools represent a potential source of community messages and support. Schools are an ideal place to provide mental health services to adolescents as most adolescents spend at least six hours a day in schools. WHO advocates for mental health promotion and prevention in schools (WHO, 1996). Currently more policy makers, mental health professionals and educators are recognising the important role that schools may play in addressing the mental health needs of young people, especially in more developed countries such as the United Kingdom, the United States and Australia (Kutcher, 2011). Evidence suggests that the knowledge and attitudes of young people can be changed when school mental health services incorporate mental health programs into the school curriculum, as mental health promotion studies (McCarthy et al., 2011; Swartz et al., 2007). Examples of such programs are Adolescent Depression Awareness Programs and the Beyond Blue Program in the United States and Australia (McCarthy et al., 2011; Swartz et al., 2007). School Mental Health Services such as school mental health programs and screening are examples of school-based approaches that can benefit from such recommendations. In order to be able to provide high quality school mental health services to school-going adolescents, it is important to identify the components to emphasise within these school mental health services.

6.3.2.1 School-based mental health programs

School mental health programs needs to be available in every school. Below are specific recommendations for such programs. These programs can be delivered both using the conventional face to face method as well as online learning system.

(a) Knowledge-based recommendations

School mental health programs need to aim to educate adolescents regarding the definition of mental illness as an overview, as many adolescents may be able to label depression without knowing that depression is actually a form of mental illness. Adolescents should be educated to at least recognise the problem as being a mental health related illness, as this would in turn improve help-seeking among adolescents (Amarasuriya et al., 2018). Subsequently school mental health programs should focus on educating adolescents regarding the symptoms and signs of depression. It would also be beneficial to improve the understanding of adolescents regarding other common mental disorders, so that they are able to differentiate depression from other disorders such as stress, eating disorders, and substance abuse, as this would determine the appropriate help-seeking attitudes and behaviours.

The importance, potential helpfulness and harmfulness of various first aid, and preventive and interventional strategies should be taught to adolescents, and is discussed more specifically below.

In the context of enhancing knowledge about first aid, more specifically, mental health programs should encourage first aid that is basic, minimal and supportive in nature, such as encouraging professional help-seeking and listening to problems in an understanding way; and discourage non-supportive first aid such as ignoring a person with mental health problems, and distractive forms of first aid such as keeping the person busy. An explanation of why distractive and non-supportive forms of first aid are to be avoided, and supportive and basic minimal forms of first aid are to be adopted should be provided

to adolescents so that they can understand better and make more informed decisions. For example, basic minimal first aid such as suggesting seeking professional help could facilitate the appropriate help, such as engaging a parent, teacher, school counsellor or even mental health professional to help in a timely manner. Providing supportive first aid such as listening to a person's problem in an understanding way would show that person that they are not alone and are loved, overall providing a platform of social support among those suffering from depression (Ashley, 2018). Distraction types of first aid such as keeping the person busy hinder the development of healthy coping skills. Adolescents should be educated on the importance of being physically active, as there is strong evidence that such forms of first aids improve mental health outcomes (Craft & Perna, 2004). By equipping adolescents with the appropriate first aid knowledge and skills needed to help their peers suffering from MHDs, it will also facilitate their own help-seeking behaviour.

Adolescents should be educated about what they can do to reduce their risk of depression. One message that needs to be made clear to adolescents during school-based mental health programs, is the importance and reasons behind not avoiding stressful situations as a preventive strategy for MHDs, instead teaching adolescents methods to cope with stressful situations, which would improve their coping mechanisms and skills, and therefore, turning adolescents into both providers and receivers of help.

When it comes to educating adolescents regarding knowledge about interventions, clear reference must be made to the basic functions of more formal sources of help, such as psychiatrists, psychologists, counsellors and GPs. The active involvement of psychiatrists and psychologists in school mental health programs is also warranted. For example, involvement of the district school health team in school mental health programs could be a start. This is to ensure that these mental health care providers can promote their roles, responsibilities and address the broad range of adolescent mental health care needs

and concerns. This would further increase adolescent awareness of mental health professionals, MHDs and MHL (Marcell & Halpern-Felsher, 2007). Creating awareness of the availability of mental health services should be emphasised during these mental health programs. Educating adolescents about the appropriate medications and those for general use, such as that for vitamins, antidepressants and sleeping pills is warranted, as there is still a considerable gap between the public understanding of these medications and clinical practice guidelines (Reavley & Jorm, 2011c). Finally, it is necessary to teach adolescents to ascertain what self-help interventions (reading self-help book or getting information about problems over the web) are evidence-based and most effective in dealing with MHDs. How to access and use these interventions appropriately should made clear to adolescents as well.

(b) Help-seeking recommendations

It is important to cultivate a habit of seeking the appropriate help on behalf of both the self and others when in psychological distress (Moffatt, 2007). Adolescents need to be educated on the importance of disclosing their emotional problems to family, especially parents. This is because parents play an important role in the outcome of depression. Since counsellors are regarded as one of the most helpful sources of help for adolescents when dealing with depression, there needs to be an adequate number of school counsellors (Low, Kok, & Lee, 2013), who play an active role not only in screening and managing adolescents with mental health problems, but also actively educating adolescents in the knowledge of depression, help-seeking and stigmatising attitudes. It is important to ensure that school counsellors receive the necessary and adequate training to be competent   advocators of MHL in schools (Low et al., 2013). One example is by familiarising them with the barriers to help-seeking, and the stigmatising attitudes towards depression that adolescents face so that these counsellors become aware of such

barriers and stigmatising attitudes. Counsellors have to be approachable for adolescents, due to the presence of stigma with MHDs and they also have to promote confidentiality among adolescents.

It is crucial that mental health programs sensitise adolescents to potential barriers to help-seeking and the methods used to address these barriers, especially attitudinal barriers such as worrying what others might think and being too embarrassed or shy to seek help. One of the measures that can be taken to address these barriers, is increasing adolescent understanding of the roles of mental health professionals. There is also a need to promote the confidentiality of mental health services among adolescents, by raising awareness about the confidential nature of services during initial encounters with mental health professionals (Marcell & Halpern-Felsher, 2007). These measures might remove most barriers and promote more professional help-seeking behaviours.

(c) Stigmatising attitude-based recommendations

School mental health programs should also aim to reduce stigma by adopting anti-stigma measures which needs to be initiated early on. The general goals of anti-stigma programs should be to; (a) eliminate the formation of negative attitudes towards mental illness, (b) generate a more precise understanding of mental illness, (c) create a greater acceptance of individuals suffering from MHDs, and (d) address misconceptions and eliminate the stereotypes of adolescents relating to MHDs (e.g. perceptions of the dangerousness and unpredictability of people with MHDs such as depression, and a refusal to disclose their problem to others). The above goals can all be achieved by educating adolescents about mental illness. Similar approaches have been recommended by the Global Programme of the World Psychiatric Association to reduce the stigma of mental illness (Sartorius & Schulze, 2005).

These goals can be achieved if anti-stigma programs first educate adolescents about the known causes of depression (which includes both genetic and environmental causes) as evidence has suggested that when a cause is perceived as under low personal control, responsibility is not inferred, sympathy is felt, and this has a positive effect on social acceptance (Weiner et al., 1988). Second, there is a need to bring beliefs about public perceptions (perceive stigma) in line with personal beliefs (personal stigma), particularly those concerning the non-disclosure of mental disorders, dangerousness to others and avoidance of people with MHDs (Reavley & Jorm, 2011).This can be achieved by reducing perceived stigma by publicising the actual levels of personal stigma (Griffiths et al., 2008). Anti-stigma programs should be both broad-based so as to target young adolescents in general, as well as specific campaigns aimed at reducing stigma in young adolescents with little experience or knowledge of depressive disorders who currently exhibit the highest levels of stigma. Finally, adolescents should be taught that mental disorders are not qualitatively different from somatic illnesses (Arbanas, 2008). In summary, adolescents should be convinced that MHDs such as depression are a common aspect of life that can be talked about openly and treated effectively. Previous evidence has suggested that anti-stigma measures are more likely to be successful if they focus on individual disorders rather than on mental illness in general (Reavley & Jorm, 2011b). This highlights the importance of specific recommendations for specific mental disorders, such as those offered in this study. Endorsing these recommendations in the Malaysian school-based mental health program may have similar positive outcomes as in countries that have implemented school-based mental health programmes, such as Australia.

6.3.2.2 School-based mental health screening

In the context of school mental health screening, it is recommended that the screening of depression symptoms, which is currently routinely conducted among Form 4 students (16 years), be conducted among Form 1 (13 years) adolescents. This due to, first, the rising prevalence of depression symptoms among younger adolescents, as evident in this study (20%) and also many others (Institute for Public Health, 2017). Depression tends to first occur during the early adolescent period, and therefore an early detection would improve the outcome of these adolescents (Hankin, 2006; Kessler et al., 2005). It is also important that information such as the need for mental health screening in schools, intentions to screen and the benefits of screening be made clear to both adolescents and parents. This is important as it would increase the understanding and acceptance of both parents and adolescents regarding the screening of MHDs. With regards to referral to MHP, school counsellor be clear regarding the referral process and procedure (when to refer, where to reffer and who to reffer to). Also school counsellors should work closely with the School health team in the District Health Offices and other MHP which would expedidite the referral process.

In summary, school-based mental health services have been found to be effective in increasing the ability of students to seek help (Slade, 2002), reducing special education and disciplinary referrals (Bruns, Walrath, Glass-Siegel, & Weist, 2004), enhancing students' social and academic performance (Greenberg et al., 2003) and reducing emotional and behavioural problems (such as depression) (Hussey & Guo, 2003). Incorporating these recommendations into the school mental health service will help to improve depression literacy among young Malaysian adolescents.

6.3.3 Recommendations for Health Policy

The findings from this study could be used as evidence to inform policy making for the Malaysian MOH and MOE, and to first develop a school-based depression educational program with the aim of increasing depression literacy among young adolescents. To date there is no standardised school-based depression educational program in Malaysia. As mentioned previously, these depression educational programs should focus on educating adolescents regarding knowledge of depression, help-seeking and stigmatising attitudes, which are all vital components of depression literacy. For example school-based depression educational programs such as ADAP have been initiated and cooperated as a routine school-based curriculum in the United States, and found to be effective in increasing the awareness of depression among adolescents (Swartz et al., 2007).

Health policies should also focus on the development of more attractive youth friendly health services, as this would reduce barriers to help-seeking for mental health problems. Also, as many adolescents regard GPs as a helpful source of people-based intervention it is important that health policies focus on improving the competencies of GPs and primary healthcare doctors in dealing with MHDs among adolescents. Health polices aiming to improve the competencies of informal sources of help, such as parents and peers, and to educate these individuals so as to be able to provide basic first aid mental health actions for adolescents suffering from MHD, should be considered.

There is a need to re-orientate the existing school health service in Malaysia, as it was last evaluated in 2013 (Lin, 2017b; Nik Murni Nik Mustafa et al., 2015). Several issues need to be considered, namely widening the scope to include more school-based mental health services, instead of a narrow focus on physical health. School health teams such as school counsellors must be trained to detect school-going adolescents with mental health problems and help students manage stress. Finally, both the MOH and MOE should

collaborate with non-governmental organisations such as the Malaysian Mental Health Association (MMHA) and relevant youth groups to increase MHL among teachers and students. In particular, having younger advocates address the students may help overcome the age distance barrier and encourage more openness. As long as mental health remains a sensitive issue in our society, it will be difficult to implement effective support systems, as students may feel too ashamed to seek help.

6.4   Study contribution

This study makes several contributions, especially to the field of mental health research and to local communities.

6.4.1   Contribution to mental health research

6.4.1.1 Systematic review

This study presents the first ever systematic review that provides evidence on depression literacy among adolescents. Specifically, this review has two main areas of focus. It is designed to retrieve information from the tools used to examine depression literacy among adolescents. Vignette-based methodology were found to be the most commonly used tool to examine depression literacy among adolescents. This review identified the components of depression literacy assessed among adolescents. The recognition of depression, symptoms of depression, intention to seek help, source of help and personal stigma were the most commonly reported components of depression literacy.

6.4.1.2 Adolescent depression literacy in Malaysia

This is a cross-sectional study that makes three important contributions to the body of research on MHL. It provides evidence of the validation of the MHL and stigma questionnaire; it provides evidence about adolescent understandings of depression literacy, and finally, it examines the relationship between the component of depression literacy and depression symptoms. This study found that the MHL and stigma questionnaire is a valid tool with which to examine depression literacy among young Malaysian adolescents. This study found that adolescents demonstrated poor ability to correctly recognise depression, a poor understanding of the helpfulness and harmfulness of various first aid, preventive measures, interventional sources and a grossly inadequate depression literacy.

The third contribution relating to the association of depression literacy and depression symptoms identifies several components of depression literacy, specifically items regarding knowledge of first aid and intervention, barriers to help-seeking, and personal and perceived stigma as significantly associated with depression symptoms. The findings from this cross-sectional study provide a platform for the validity of the MHL and stigma questionnaire, current adolescent understandings of depression literacy and its association with depression symptoms among young Malaysian adolescents, which has not been previously examined.

6.4.2 Contribution to community

During the process of data collection in the various National Secondary Schools in Selangor, two activities contributed to the local community. The participants of this study were screened for depression symptoms as a part of the study, creating an opportunity for young adolescents to have a free screening for depression symptoms instead of waiting for the routine depression screening at 16 years of age. Participants (n=12) who were

identified as having severe depression were referred to the Family Medicine Specialist working with the MOH, Malaysia. Those with mild to moderate depression received intervention from their school counsellors. The researcher met the parents of the students who were found to have symptoms of depression in the respective schools. During this session the researcher briefed each parent on the results of depression screening and provided referral letters to parents who agreed for their child to be referred to a family medicine specialist at the nearest health clinic for further evaluation and assessment. Questions from parents were also addressed during this session.

After data collection, all the participants were given a talk on depression literacy by the researcher in the respective schools with a specific focus on introduction to depression literacy and its components. The participants had an opportunity to be exposed to, and increase their understanding of, depression literacy.

6.5   Future research directions

This research project can be extended in a number of areas in the future.

a) The findings generated from the systematic review in Chapter 2 could be used as a baseline for depression literacy among adolescents, however future reviews should include searches for unpublished articles and those in different languages to capture more evidence and thus avoid publication bias. Future studies should also aim to examine all the components of depression literacy, including help-seeking and the stigma component, in a holistic manner, as this would enable an assessment of the overall adequacy of MHL and aid the development of more comprehensive MHL interventions. There needs to be an attempt to come to a consensus to develop a standardised theoretical MHL framework so as to ensure uniformity and consistency in MHL research. There is also a need to utilise a uniform standardised measure of MHL for the adolescent population in order to

enable the appropriate comparison of results from various MHL research. Studies should also examine whether the intention to seek help actually translates into help-seeking behaviours among adolescents. Although not a focus of this review, future studies should examine the validity of vignette-based instruments for examining MHL among adolescents, as such tools are very commonly used to assess MHL relating to depression. Future studies should attempt to identify studies reporting on depression literacy by using the health literacy principals as this would enable comparison of studies that examine depression using both the traditional MHL framework and the health literacy framework.

b) It would also be important that gender and age matched vignette-based instruments be used to assess depression literacy in future research in order to avoid gender or age-related bias in the vignettes.

c) Alternatively the use of real-life interactions such filmed role play, instead of written vignettes (which may unintentionally give more clues) to examine depression literacy could improve the accuracy of the collected data and might therefore be a tool that future studies could use when assessing MHL (Marshall & Dunstan, 2011).

d) This study validation of the MHL and stigma question only focused on content validation and reliability analysis, and therefore future studies should perform factorial analysis of the MHL and stigma questionnaire to further establish the validity of this tool for its use among Malaysian adolescents.

e) Future studies should examine knowledge of maintaining good (positive) mental health, as this was not examined in this study (Wei et al., 2015). One challenge that may arise is identifying a valid instrument with which to examine knowledge on maintaining good (positive) mental health (Kutcher, Wei, & Coniglio, 2016).

f) Whilst various types of first aid, prevention and interventions (e.g. listening to the person's problems in a supportive way, spending time with family, keeping in regular communication with friends, keeping physically active, making regular time for relaxing activities and avoiding stressful situations, getting out in the sunlight, and reading a self-help book) are frequently reported as having preventative and helpful value against depression, as described in Chapter 4, their effectiveness has received little research attention. Future research needs to consider the effectiveness of these sources in controlled trial studies.

g) Examining the predictors of MHL in relation to depression among Malaysian adolescents is another aspect that is worth looking into, especially sociodemographic characteristics such as gender, age and educational level which have been found to be significant predictors of MHL among adolescents in international studies (Dunn, Goldney, Grande, & Taylor, 2009).

h) Future longitudinal studies are required to better understand the relationship between the depression literacy components and depression symptoms over time, among both younger and older adolescents. It is also important to examine the actual help-seeking behaviour of adolescents with regards to MHL. Potential confounders such as education level and previous exposure to MHD should be included when examining this relationship in future studies. Finally, it may be worth looking into the relationship between each component of depression literacy, such as knowledge of depression, help-seeking and stigmatising attitudes among Malaysian adolescents

i) Future studies should also aim to examine MHL among adolescents schooling in national religious and private schools in Malaysia

6.6   Summary

Several recommendations are made in this chapter, based on the findings obtained from the assessment of depression literacy among adolescents. These recommendations include the following; (a) educating family, peers and teachers regarding depression literacy, as this would reinforce their roles as efficient gatekeepers who could improve professional help-seeking among adolescents with MHDs; (b) incorporating all of the components of depression literacy into the existing school-based mental health programs, which should be implemented across all national schools in Malaysia in order to improve adolescent understandings of depression literacy; (c) young adolescents should be screened for depression early on via the school-based mental health screening services; and (d) there needs to be a policy for developing school-based depression educational programs. The recommendation discussed is a holistic one, involving relevant stakeholders that play an influential role in addressing MHL relating to depression among adolescents, but there are many other stakeholders that influence MHL in adolescents, and that should be addressed in the future. Although future research is required to replicate this study findings, the implementation of these recommendations should not be delayed.

Finally, this chapter describes the contribution of this study to MHL research and to the community, and specifically secondary school-going adolescents. Several suggestions are made for future research in the field of MHL relating to depression at the end of the thesis. These include more systematic reviews of studies published in other languages and unpublished studies, factorial analysis of the MHL and stigma questionnaire among Malaysian adolescents, utilising gender and age matched vignette-based questionnaires or real-life interaction instruments to assess depression literacy and the need for longitudinal studies to determine the temporal relationship between depression literacy and depression symptoms.

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List of Publications and Papers Presented

The following papers have been published, submitted or presented from this thesis

Journal:

1. Singh, S., Zaki, R., & Farid, N. (2018). Mental health literacy among young adolescents in Selangor. *Malaysian Journal of Youth Studies*, *2*, 68-97.

2. Singh, S., Zaki, R., & Farid, N. (2019) A systematic review on Depression literacy: knowledge, help seeking and stigmatising attitudes among adolescen*ts*. *Journal of Adolescence*, 74, 154-172. Doi*.* org/10.1016/j.adolescence.2019.06.004.

3. Singh, S., Zaki, R., & Farid, N. Adolescent mental health literacy and its association with depression. Accepted by ASM Science Journal.

Conference/seminar:

1. Singh, S., Zaki, R., & Farid, N. Validation of the Mental Health Literacy and Stigma Questionnaire in an Urban Community of Malaysian Young Adolescents. Poster presentation: The 5th AHLA International Health Literacy Conference, Kuala Lumpur, Malaysia. 12th – 14th November 2017.

2. Singh, S., Zaki, R., & Farid, N. Association between knowledge of depression, help seeking, stigmatising attitudes and depression symptoms among Malaysian adolescents. Oral presentation: The 12th APRU Global Health Conference, Kuala Lumpur, Malaysia. 28th – 30th October 2018.

3. Singh, S., Zaki, R., & Farid, N. Mental Health Literacy among young adolescents in Selangor. Oral presentation: YOURS'18 National Conference, Kuala Lumpur, Malaysia. 12th – 13th November 2018.

4. Singh, S., Zaki, R., & Farid, N. Mental Health Literacy and depression. Oral presentation: Three Minute Thesis Competition (UM3MT), Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia. 21st March 2019. (Second place runner up).

5. Singh, S., Zaki, R., & Farid, N. Mental Health Literacy and depression. Oral presentation: Three Minute Thesis Competition (UM3MT), University of Malaya, Kuala Lumpur, Malaysia. 25th April 2019. (Winner).

6. Singh, S., Zaki, R., & Farid, N. Mental Health Literacy and depression. Oral presentation: Three Minute Thesis Competition (UM3MT), National level, Sultan Idris Education University, Perak, Malaysia. 25th June 2019. (Top 5 Shortlist)