**VALIDATION OF THE MENTAL HEALTH LITERACY
QUESTIONNAIRE (MHLq) AMONG UNDERGRADUATE
STUDENTS IN MALAYSIA**

By

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ABSTRACT

VALIDATION OF THE MENTAL HEALTH LITERACY QUESTIONNAIRE (MHLq) AMONG UNDERGRADUATE STUDENTS IN MALAYSIA

Low Kah Yue

Mental health literacy (MHL) is crucial to recognising, managing, and preventing mental illnesses. However, the study values of MHL studies in Malaysia have been limited as most findings are derived from instruments that have not been properly validated. To provide a validated MHL instrument, this study aimed to examine the suitability of the Mental Health Literacy questionnaire (MHLq) among Malaysian undergraduate students. Study 1 employed a cross-sectional survey to examine the factor structure of the MHLq with 618 undergraduate students. The sample was split randomly into two halves for exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). From EFA results, 12 items with the highest factor loadings were retained. CFA results confirmed the first-order four-factor structure with one error covariance of the 12-item MHLq among other competing models (i.e., the one-factor model and the second-order model with one general factor and four first-order factors). Study 2 recruited new samples to verify the model revealed in Study 1 and examine the MHLq-12's validity. Consistent with Study 1, CFA results showed that the first-order four-factor structure fit the data, and all 12 items were significant. Most MHLq-12 subscales displayed Cronbach's alpha values of less than 0.7, while ICC values supported their test-retest reliability.

Results did not support the convergent validity of most MHLq-12 subscales with average variance extracted values below 0.5. Divergent validity was established by a low correlation between MHLq-12 and health literacy measured by HLS-SF12. Most MHLq-12 subscales showed limited evidence for predictive validity on help-seeking and positive mental health. In summary, current findings suggested the potential utility of a brief MHL instrument and discussed reevaluating existing theoretical frameworks for MHL. Modifications on the identified items are recommended to align with the understanding of MHL in the Malaysian context.

Keywords: Mental health literacy, validity, factor structure, reliability

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And dear family and friends, your name might not be listed here, but I promise you will hear this from me in person that whenever I feel like I am letting myself down, I have the greatest relief in the knowledge that you are still with me and always accept me as how I am, that the one I meant here is you.

APPROVAL SHEET

This dissertation entitled "**VALIDATION OF THE MENTAL HEALTH LITERACY QUESTIONNAIRE AMONG UNDERGRADUATE STUDENTS IN MALAYSIA**" was prepared by LOW KAH YUE and submitted as partial fulfilment of the requirements for the degree of Master of Philosophy in Social Science at Universiti Tunku Abdul Rahman.

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SUBMISSION OF DISSERTATION

It is hereby certified that Low Kah Yue (ID No: 20AAM03716) has completed this dissertation entitled "Validation of The Mental Health Literacy Questionnaire (MHLq) Among Undergraduate Students in Malaysia" under the supervision of Mr. Pheh Kai Shuen (Supervisor) from the Department of Psychology and Counselling, Faculty of Arts and Social Science, and Dr. Tan Chee Seng (Co-Supervisor) from the Department of Psychology and Counselling, Faculty of Arts and Social Science.

I understand that University will upload softcopy of my dissertation in pdf format into UTAR Institutional Repository, which may be made accessible to UTAR community and public.

Yours truly,

_____

(Low Kah Yue)

DECLARATION

I hereby declare that the dissertation is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UTAR or other institutions.

Name   Low Kah Yue

Date   20/12/2023

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LIST OF ABBREVIATIONS

AHSQ	Actual Help-Seeking Behaviour Questionnaire
AVE	Average variance extracted
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
EFA	Exploratory Factor Analysis
ERB	Erroneous beliefs/ stereotypes
FA	First aid skills and help-seeking behaviours
GHSQ	General Help-seeking Questionnaire
HLS-SF12	Short-Form Health Literacy Instrument
KMO	Kaiser-Meyer-Olkin test
KnL	Knowledge of mental health problems
MHL	Mental Health Literacy
MHLq	Mental Health Literacy questionnaire
ML	Maximum Likelihood
PA	Parallel analysis
PMHS	Positive Mental Health Scale
RMSEA	Root-mean-square-error of approximation
SRMR	Standardised root mean square residual
SH	Self-help strategies
TLI	Tucker-Lewis Index
UTAR	Universiti Tunku Abdul Rahman

CHAPTER 1

INTRODUCTION

1.1 Background of Study

The world is currently experiencing a growing crisis in mental health. It is estimated that the prevalence of mental health conditions affects one out of eight people globally (World Health Organization [WHO], 2022). The impact of deteriorated mental health can be seen through its contribution as a leading cause of the disease burden, accounting for 18.7% of years of healthy life lost to disability among all diseases and injuries (Rehm & Shield, 2019). Mental health conditions have affected far beyond the subjective well-being of those individuals living with them: despite being unable to function in the commitments and responsibilities in their daily lives, institutional barriers such as stigma and inequalities often come in hand with the labelling of mental disorder, which makes this group of people vulnerable towards the marginalisation from the society (Bonyhady, 2014; Ringland et al., 2019).

While mental health conditions are more dominant in developing countries, Malaysia is no exception to this surging trend of mental health threats (Fu et al., 2020). Indeed, the prevalence of the adult population in Malaysia suffering from poor mental health was reported at 29.2%, which is twofold the global prevalence (Institute for Public Health [IPH], 2019; WHO, 2022). In the

same vein, there was a high mortality rate due to suicide in Malaysia, with a report of five losses of life per day in 2019 (Lew et al., 2022).

As far as mental health problems in Malaysia are concerned, the local government has been actively taking action to enhance the policy and management of the country's mental health responses. Structural barriers were identified in Malaysia, including low coverage of mental health services in rural areas (e.g., Chong et al., 2013) that refrain people from getting proper care. Another challenge possessed in Malaysia is the limited number of mental health specialists in this field (Ng et al., 2018). To tackle the issues, more community-based primary care centres have been incorporated for people in need (WHO, 2018). Meanwhile, the government have worked on the reallocation of more resources in the training of mental health personnel (Malaysian Healthcare Performance Unit, 2017).

However, attitudinal barriers such as lack of awareness about mental health have remained the strong risk factors that exacerbate the treatment gaps at the individual and societal levels (Por & Shaharom, 2017; Raaj et al., 2021). For instance, religious leaders or traditional healers have been a popular choice of informal sources for help-seeking among people with mental health issues in Malaysia (Jeyagurunathan et al., 2018). This trend may be a product of local cultural beliefs that often attribute mental health problems such as hallucinations and delusions to supernatural causes (Hanafiah & Van Bortel, 2015). These cultural factors have perpetuated the progression of poor mental health in Malaysia.

Along the same vein, the stigmatisation of mental disorders in Malaysia has negatively impacted public's attitudes toward professional mental health services (Phang et al., 2011). To illustrate, some common labels for people with mental health issues such as *orang gila* (crazy people) tend to induce feelings of shame and fear about psychiatric care, given that those are often associated with weaknesses in personal characters under such cultural backgrounds (Ahmad Ramli et al., 2017). Consequently, individuals in need may hinder themselves from professional help-seeking.

Within the general population, the treatment gap for mental health problems has been observed among university students as well. An uprising trend of poor mental well-being has been found on university campuses in recent days (DeBate et al., 2018). Back in Malaysia, researchers found that university students portrayed increased susceptibility in relation to mental disorders compared to their peers in general (Hamdan-Mansour et al., 2009; IPH, 2019). Findings showed that the prevalence of anxiety among Malaysian university students in Mohamad et al. (2021) was 29%, a much higher figure than the prevalence of anxiety among the general population, which was about 8% (Kader Maideen et al., 2015; Wong et al., 2016). Nevertheless, university students face similar challenges in seeking help for mental health problems due to societal stigmas and lack of regard towards professional mental healthcare services (Aris & Othman, 2022). Indeed, a study on 2508 university students in Malaysia revealed a low willingness to seek counselling services (Salim, 2010).

The attitudinal barriers not only have refrained people from receiving proper treatments, but they could escalate those mental health issues into urgent concerns (Hanlon et al., 2014; Thornicroft et al., 2016). In response to this, mental health literacy (MHL) has been referred to as a way to reduce the stigmatising attitudes toward mental illnesses and low help-seeking rates (Despande et al., 2020). The importance of cultivating MHL is even more emphasised among university students as they may be more responsive to MHL education to improve on their attitudes towards mental health issues and help-seeking (Berry et al., 2020).

MHL is a term first coined by Jorm et al. (1997), which refers to knowledge and beliefs that aid in the recognition, management, and prevention of mental disorders. MHL was derived initially from and considered a part of health literacy, which focused on one's ability to understand and leverage medical information, particularly for better understanding and endorsement of medication treatments. The same author later refined the concept of MHL with several specific components, including knowledge in (a) prevention of mental disorders; (b) recognition of mental disorders; (c) options for help-seeking and treatments available; (d) self-help strategies; (e) knowledge and skills in providing first aid to support other individuals experiencing mental health problems (Jorm, 2012). In recent, the concepts of MHL have been broadened by other researchers, corresponding to the evolving construct of health literacy. For example, constructs such as positive mental health, stigma and attitudes towards mental illness and help-seeking have been included as a result of the

expansion of MHL's definition (Kusan, 2013; Kutcher et al., 2016; Spiker & Hammer, 2019).

Research regarding MHL has gained enormous attention and efforts for its contribution to combating the prevalence of mental disorders (Jorm, 2012). The improvement in MHL fosters a proactive approach within the public in dealing with mental health conditions. For instance, interventions that aim to improve MHL have yielded promising effects in enhancing knowledge about mental disorders (Liddle et al., 2021), which lead to reduced mental illness stigma and positive attitudes towards mental health conditions (Chisholm et al., 2016; Kutcher, Bagnell, et al., 2015). It is vital as people seeking help in the early stage could be a strong determinant to better treatment outcomes and prevent the exacerbation of symptoms into mental disorders (Kelly et al., 2007). Indeed, past studies also reported a relationship between higher levels of MHL and lower risks of developing mental disorders (Lam, 2014; Singh et al., 2022).

Similarly, the underutilisation of mental health services among university students in Malaysia was found to be associated with a low level of MHL, leading to suggestions that universities should include MHL in the university curriculum as an initiative to prioritise students' mental health (Berry et al., 2020; Yulia et al., 2022). Studies reported encouraging results for those MHL interventions in reducing stigma and cultivating more favourable attitudes toward self-disclosure on mental health problems, which in turn encouraged help-seeking (Fernandez et al., 2016; Ibrahim et al., 2020).

1.2 Problem Statement

Improving MHL has been a continuing concern within the public health field. It is well-established in existing studies that MHL plays a pivotal role in the early identification of mental health symptoms and in reducing negative attitudes toward mental illnesses, which are the keys to fostering mental health service utilisation (Kotera et al., 2021; Munawar et al., 2022). Recently, a significant increase in MHL studies and interventions targeting different populations can be seen in Malaysia (Ibrahim et al., 2019, 2020; Mat Ruzlin et al., 2021).

However, Munawar et al. (2022) have raised questions about the difficulty of establishing the value of the study results in a systematic review of MHL studies. The absence of validation for these MHL measures poses a challenge in interpreting the study results. It would be unclear whether the measures that have not been validated used accurately capturing the constructs they intend to measure; the value of study results would be hard to establish as this lack of clarity would affect the reliability and credibility of the study findings in turn. An inaccurate measure of the underlying outcome of interest and hamper the generalisability of the study findings (Lai, 2013; Sullivan, 2011).

The adaptation and validation of research instruments are deemed necessary when using questionnaires that were developed from other cultural contexts because the interpretation and understanding of the assessment items might vary among populations (Yamaguchi et al., 2020). For instance, mental

health issues are often perceived through a lens that involves supernatural and religious explanations in Malaysia (Hanafiah et al., 2015). These cultural nuances should be considered, and it implies the necessity to assess the validity of items in MHL instruments that inquire about seeking professional help in the Malaysian context.

Moreover, a study by Pheh et al. (2018) examined the psychometric properties of Mental Health Knowledge Schedule (MAKS), a mental health instrument. However, the Malay version of MAKS reported inadequate reliability despite the good psychometric qualities that had been reported in the original study (Evans-Lacko et al., 2010) and other research from several cultural contexts, such as Iran (Hakimi et al., 2022) and Italy (Pingani et al., 2019). The observed variability in the psychometric qualities of the MAKS scale across different cultural contexts suggests that MHL instruments may not fit universally across different populations.

Considering all, validation studies should be carried out prior to utilising MHL instruments to validate and adapt mental health instruments to specific cultural contexts to ensure their suitability for the local population. Particularly, conducting EFA in the early stage of validating an existing scale in a different context, given that cultural factors can significantly influence the interpretation and response patterns in psychometric instruments (Oliveira et al., 2019). It is important as it allows researchers to identify possible errors or cultural differences before testing pre-specified models (Orcan, 2018).

On the other hand, despite there exists an extensive amount of past research and MHL instruments available in the Western context, the value of the study findings was found to be restricted due to the heterogeneity of the standardised measures used in those MHL-related studies (Munawar et al., 2022; Wei et al., 2015). One main reason that contributed to this predicament is said to be the lack of agreement in the definition of MHL, and the consensus regarding what constructs constitute MHL is rather controversial. While scholars generally refer Jorm's definition as the foundation of the MHL, the refined conceptualisation offered by Kutcher et al. (2016) that highlights the role of stigma and help-seeking efficacy, has has gained wide acknowledgement as well. The operational definitions of MHL employed by each study can vary greatly, owing to which MHL instruments the researchers have chosen. Due to the differences in the MHL components measured by each study, conclusive evidence regarding the impacts of MHL could be weak as the results and findings are not comparable across the studies.

The development of the Mental Health Literacy questionnaire (MHLq) has therefore taken the issue of controversies with the MHL constructs into consideration and sought to integrate both conceptualisations into this instrument. The MHLq is a relatively recent measurement developed by Dias et al. (2018) that assesses the level of MHL among young adults in four components, which are knowledge of mental health problems, erroneous beliefs/stereotypes, first aid skills and help-seeking behaviour, and self-help strategies. MHLq provides a comprehensive assessment of MHL about a few mental disorders that are commonly seen in most populations, compared to

other instruments that limit the assessment of MHL to the knowledge and beliefs about one specific disorder. For instance, instruments such as the Knowledge about Schizophrenia Test (KAST; Daltio et al., 2015) only assess the level of MHL limited to schizophrenia, while Depression Literacy (D-Lit; Gulliver et al., 2012) assesses only knowledge regarding depression. The evaluation of MHL based on knowledge and beliefs about more than one specific mental disorder is often recommended to reflect the multifaceted nature of MHL (Yu et al., 2015). Among those instruments that assess the general MHL, MHLq embraces some relatively new constructs in MHL (i.e., first aid skills and self-help strategies), which taps better into the current view of MHL.

To date, there are few MHL instruments that have been validated in the Malaysian context. For instance, Singh et al. (2022) employed the Malay version of the Mental Health Literacy and Stigma (MHLS) Questionnaire that was validated in their previous paper using a sample of adolescents living in an urban area. Meanwhile, Pheh et al. (2018) examined the psychometric properties of the Mental Health Knowledge Schedule (MAKS) that was translated into Malay. Despite both instruments have demonstrated adequate reliability, there was limited evidence for their validity. Notably, the validation of the Malay version of MHLS relied solely on content validity, which was determined through subjective ratings by psychiatrists on the items (Singh et al., 2017). The validity of MAKS was not examined in Pheh et al. (2018) due to the primarily exploratory nature of the study.

Given that the examination of the psychometric qualities of those instruments was incomplete, it raises concerns for other researchers to employ those instruments as valid measures for MHL. It has also been observed that some studies in Malaysia employ MHL instruments that were not validated in the Malaysian context. Researchers have implemented strategies such as pilot testing and reporting Cronbach's alphas to enhance the robustness of their research findings (Ibrahim et al., 2019; Siti Nor Amirah et al., 2020). While these strategies contribute to a preliminary understanding of the instruments and enhance their reliability and validity (Ruel et al., 2016), it remains premature to conclusively assert the psychometric soundness of these MHL instruments as valid measures.

Taken together, it is clear that a validated MHL instrument is important in aiding the development of knowledge regarding MHL in Malaysia that comes with a higher quality of evidence. Adaptation from a developed scale is often the common practice for the scale validation process in a local context.

With the previous validation studies of MHLq suggesting its potential use as a valid and reliable measure (Campos et al., 2016; Dias et al., 2018), the current study aimed to examine the psychometric properties of this instrument. This study aimed to determine whether the items and dimensions in MHLq that has its root from another context, could be used for the measurement of the level of MHL in Malaysia. In the present study, the MHLq was validated among university students, which might not allow the generalisation of validation results to other populations in Malaysia.

1.3 Research Objectives

The main objective of the current research is to understand the suitability of the MHLq by examining its psychometric properties in samples of undergraduate students in Malaysia. Below are the specific objectives of the current research:

1. To discover the factor structure of the MLHq in Malaysian undergraduate students

2. To examine the convergent validity of the MHLq in Malaysian undergraduate students

3. To examine the divergent validity of the MHLq in Malaysian undergraduate students

4. To examine the predictive validity of the MHLq in Malaysian undergraduate students

5. To examine the test-retest reliability of the MHLq in Malaysian undergraduate students

1.4 Research Questions

1. What is the factor structure of the MHLq in Malaysian undergraduate students?

2. Does the MHLq have a sound convergent validity?

3. Does the MHLq demonstrate a low or nonsignificant correlation with the Short-Form Health Literacy Scale (HLS-SF12)?

4. Does the MHLq positively predict help-seeking intention in Malaysian undergraduate students?

5. Does MHLq positively predict help-seeking behaviour in Malaysian undergraduate students?

6. Does MHLq positively predict mental health in Malaysian undergraduate students?

7. Does the MHLq scores of participants in T1 significantly positively correlate with their MHLq scores in T2?

1.5 Expected Outcomes

1. There is a latent underlying structure in the exploratory factor analysis for the MHLq among Malaysian undergraduate students.

2. MHLq would evidence convergent validity by exceeding the AVE value of 0.5 (acceptable cutoff) for the factors in the MHLq.

3. MHLq would exhibit divergent validity by demonstrating a low or nonsignificant correlation with the HLS-SF12.

4. MHLq would exhibit predictive validity by positively predicting help-seeking intention among university students in Malaysia.

5. MHLq would exhibit predictive validity by positively predicting help-seeking behaviour among university students in Malaysia.

6. MHLq would exhibit predictive validity by positively predicting positive mental health among university students in Malaysia.

7. MHLq would exhibit test-retest reliability by demonstrating a correlation coefficient of at least 0.7 between participants' scores of MHLq in T1 and T2.

1.6 Significance of Study

First, the current study intends to bridge the gap between the surging need for evaluating MHL among researchers in Malaysia and the paucity of validated MHL instruments in the local context. As this study set out to provide evidence regarding the psychometric qualities of the MHLq, a validated MHL instrument could be available in Malaysia if the results of the scale validation are promising. Researchers could have more confidence in working with the findings they derived from the analyses of a validated instrument as its validity and reliability have been tested empirically. Likewise, while more researchers are encouraged to use the same scale for measuring MHL in their works, it can ease the comparability of findings regarding MHL across different studies (Mansfield et al., 2020).

Second, this study aims to discover the facets of MHL in Malaysian undergraduate students. As there is no golden standard that has been established for the theoretical framework of MHL, it is important to examine the facets of MHL in the Malaysian context. Examination of the MHLq's factor structure may help to explain whether the inclusion of new dimensions (i.e., help-seeking efficacy) could complement the evaluation of individuals' MHL. It is hoped that the current study could contribute to a deeper understanding of the interrelationships between the constructs of MHL and facilitate the mutual agreement on the conceptualisation of MHL among researchers.

Thirdly, this study could contribute to the provision of a tool for evaluating the effectiveness of programmes and intervention that targets the improvement of MHL. Researchers are recommended to have a preliminary evaluation of respondents' MHL level on the four facets covered in the MHLq. It allows practitioners to tailor to the individualised needs of people. This instrument can also help practitioners keep track of the changes in participants of the MHL interventions to evaluate the treatment outcomes.

1.7 Definitions

1.7.1 Mental Health Literacy (MHL)

The term MHL was first introduced by Jorm et al. (1997), which refers to knowledge and beliefs that aid people in better recognition, management, and prevention of mental disorders. In recent, this definition has been refined to (a) knowledge about how to obtain and maintain positive mental health; (b) knowledge about mental disorders and the corresponding treatments; (c) reduction of stigma towards mental disorders; (d) enhancement in help-seeking efficacy (Kutcher et al., 2016). MHL is operationally defined using the total score of MHLq, which higher scores indicating a higher level of MHL. The total score for the MHLq ranges between 29 and 145 (Dias et al., 2018).

1.7.2 Help-seeking Intention

The help-seeking intention is generally referred to as individuals' reported future commitment to seek help for a given problem (Rickwood et al., 2005). It can be operationally defined as the total score of the General Help-Seeking Questionnaire (GHSQ; Wilson et al., 2005) which measures the degree to which people would seek help from a number of potential help sources for mental health problems. The total score for the GHSQ ranges from 7 to 70.

1.7.3 Help-seeking Behaviours

In the mental health context, help-seeking behaviour can be conceptualised as any action of actively seeking help from formal sources, including professional care services, or from informal sources, including trusted people in the community, with the purpose of obtaining assistance for personal, psychological or emotional problems (Rickwood & Thomas, 2012; Umubyeyi et al., 2016). Help-seeking behaviour is operationally defined by the number of categories of help sources (i.e., mental health professionals, general practitioners, hotline/internet, informal sources) that an individual is actually seeking for during a specified period for the problems faced (Rickwood et al., 2005). The total score of AHSQ ranges from 0 to 4.

1.7.4 Mental Health

Mental health is defined as the presence of emotional well-being, characterised by positive feelings and life satisfaction, and psychological well-being and social well-being, characterised by optimal functioning in individual life and social life respectively (Lukat et al., 2016). Mental health is operationally defined using the total score on the Positive Mental Health Scale (PMH-scale; Lukat et al., 2016). Higher scores indicate a higher level of positive mental health. The total score for the PMH-scale ranges between 5 and 45.

1.7.5 Health Literacy

Health literacy is defined as the knowledge, motivation, and competence that aids people in making judgements and decisions about health care based on the ability to access, understand, appraise, and apply information related to health, in order to promote quality of life in everyday life by disease prevention and health promotion (Duong et al., 2019; Sørensen et al., 2012). Health literacy is operationally defined using the Short-Form Health Literacy Instrument (HLS-SF12; Duong et al., 2019), in which higher scores indicate a higher level of health literacy. The standardised score of HLS-SF12 ranges from zero to 50.

CHAPTER 2

LITERATURE REVIEW

2.1 Origin of Mental Health Literacy (MHL)

The term MHL first appeared in the article by Jorm and his colleagues in 1997, defined as "knowledge and beliefs about mental disorders which aid their recognition, management or prevention" (p. 182). The concept of MHL was proposed in accordance with past studies in health literacy, which emphasises the ability to access and understand health information in promoting physical health (Jorm et al., 1997). Although MHL was studied as the extension of health literacy in earlier works, the need to investigate MHL in a domain-specific approach was emphasised to draw more attention to the mental health field (Jorm, 2015).

Along with the introduction of MHL, various attributes of knowledge and beliefs that are central to fostering better awareness about mental health were identified, namely (a) recognition of specific disorders, (b) knowledge of risk factors and causes, c) self-help treatments, (d) professional help available, (e) how to seek mental health information, and (f) attitudes that promote recognition and appropriate help-seeking (Jorm, 2000; Jorm et al., 1997). Those attributes have been regarded as the fundamental components of MHL despite

the ongoing evolvement of its conceptual framework (O'Connor, Casey, et al., 2014).

2.2 Facets of Mental Health Literacy

2.2.1 First-aid Skills

Ever since its existence, the constructs of MHL have experienced multiple expansions. For instance, the inclusion of mental health first aid as part of MHL was addressed in another paper by Jorm (2012). The knowledge of how to assist others was emphasised as it was argued that helpful suggestions in professional help-seeking and appropriate support from one's social network could facilitate mental health service utilisation among individuals with mental health problems among young people (MacDonald et al., 2018; Yap et al., 2013). In addition, training in mental health first aid was found to increase help-seeking intention in participants who learned those skills (Hart et al., 2016). With respect to that, the provision of first-aid skills training in psychosocial interventions has been observed increasingly as part of the evaluation regarding individuals' level of MHL (Edgar & Connaughton, 2021; Liang et al., 2021).

2.2.2 Stigma

In recent years, the understanding of MHL has experienced some considerable refinements. More components essential to improve mental health outcomes were revealed for the MHL construct to stay updated with the WHO's

revised definition of health literacy (Kickbusch et al., 2013; Liu et al., 2020). Corresponding to the latest domains for health literacy, a group of scholars reconceptualised MHL accordingly as (a) understanding of how to obtain and maintain positive mental health; (b) knowledge about mental disorders and the corresponding treatments; (c) strategies to decrease mental-illness stigma; (d) enhancement in help-seeking efficacy (Kutcher, Bagnell, et al., 2015; Kutcher et al., 2016; Kutcher, Wei, et al., 2015).

Among those, the inclusion of combating stigma toward mental illness as a new direction to address MHL has been generally acknowledged among scholars. Studies have identified that the formation of stigma could be attributed to a lack of mental health knowledge, thus inevitably leading to negative attitudes and discriminatory behaviours toward people with mental disorders (Lagunes-Cordoba et al., 2021; Reavley & Jorm, 2011). Moreover, people from societies that embrace mental illness stigma are more likely to internalise the stigmatic view, which makes them vulnerable to self-stigmatisation when experiencing mental health concerns personally (Evans-Lacko et al., 2012). The acquired negative attitudes towards mental illness from social learning could substantially impede individuals' intention to seek psychological help, as evidenced by the findings from past studies (Lannin et al., 2016; Mullen & Crowe, 2017). A study by Cheng et al. (2018) found that self-stigma could persist within those individuals who displayed an adequate level of mental health knowledge in recognising the symptoms and acknowledging the presence of mental disorders. This finding empowered the proposition to include mental

health stigma as a related yet distinct facet of MHL, as knowledge about mental disorders might not directly result in a less stigmatising attitude.

2.2.3 Positive Mental Health

Positive mental health is another component new to the definition of MHL. The definition by Jorm et al. (1997), which primarily focuses on knowledge and beliefs about mental disorders, has been criticised for overly emphasising the psychopathological perspective of mental health (Chambers et al., 2015). In view of this, more efforts were attempted to give prominence to the role of positive psychology as it was argued that the integration of knowledge from multiple disciplines of psychology could be more effective in assisting people in managing their mental health (Kusan, 2013).

Considering the importance of positive mental health, the definition of MHL, which was previously more on knowledge of mental disorders, has been advanced by Kutcher and colleagues (2016). The recent conceptualisation is more concurrent with the definition of mental health offered by MHO, which emphasises individuals' optimal functioning and well-being rather than the absence of diagnosis for any mental disorders (Bjørnsen et al., 2017).

2.2.4 Help-seeking Efficacy

Help-seeking efficacy is a concept proposed by Kutcher and colleagues (2015a) in their refined MHL conceptualisation, which refers to the individuals'

understanding of how, when and where to seek mental health care and the ability to execute help-seeking. (Kutcher et al., 2016) claimed that this concept has extended beyond the acquisition of self-help strategies and knowledge about the professional help available from the original MHL definition. Indeed, help-seeking efficacy emphasises affirmation in people to see their capabilities and the likelihood of help-seeking in improving their mental health.

Help-seeking efficacy is viewed as the key to bridging the gap between the acquired knowledge regarding help-seeking and the actual help-seeking action. One factor that affects individuals' help-seeking efficacy is the perceived effectiveness of help-seeking. Findings from a qualitative study have supported this idea, as false beliefs and a lack of confidence in the effectiveness of treatments were identified as the major barriers to the motivation to seek formal help (Staiger et al., 2017). Another determinant factor is the individuals' evaluation of their skills and resources for help-seeking. Past studies have evidenced the notable contribution of the perceived benefits and barriers of receiving treatment in determining the subsequent help-seeking actions (O'Connor, Martin, et al., 2014; Wiljer et al., 2016). Taken together, help-seeking efficacy is considered an essential part of MHL that sheds light on the interaction between factual knowledge and subjective beliefs in contributing to mental health actions.

2.3 MHL and Other Variables

Over the years, the conceptualisation of MHL has gone through several updates to determine the essential components that are crucial for people's understanding of mental health. MHL has become an important area of study due to its association with other variables, such as mental health outcomes and help-seeking behaviours. Understanding the relationship between MHL and these variables is crucial for planning better mental health initiatives at individuals' and society's levels.

2.3.1 MHL and Seeking Help

The positive relationship between MHL and help-seeking intention has been well-established (Yu et al., 2015). For instance, Smith and Shochet, 2011) found that different aspects of MHL, such as knowledge about interventions and beliefs about mental illness, significantly predicted the intention to seek help from professional help sources in a sample of psychology students. Using the theory of reasoned action, Jung et al. (2017) reported that MHL could predict favourable attitudes towards mental help-seeking. Similarly, DeBate et al. (2018) identified a significant association between poor MHL and lower intention to seek help among male college students. However, the correlation was low as self-stigma towards professional help also contributed to this relationship.

While many studies examined help-seeking intention, fewer studies were conducted to examine the impact of MHL on actual behaviours to seek

help. In Waldmann et al. (2020), intentions and actual behaviours to seek help were examined concerning general and specific MHL in depression. Findings suggested that both types of MHL could predict help-seeking intentions and behaviours among unemployed people with mental health problems. Another study conducted among a sample of refugees has found that better recognition of PTSD symptoms was a unique predictor of seeking help from mental health professionals (Slewa-Younan et al., 2017). On the other hand, research by Tomczyk et al. (2018) did not report a significant association between higher depression literacy and subsequent help-seeking behaviours in the next three months. Also, people with higher MHL were found to be less likely to seek help from informal sources such as family and friends. Moreover, findings from a systematic review on the effectiveness of promoting help-seeking indicated that most interventions had successfully increased help-seeking intention but not the help-seeking behaviours of participants (Gulliver et al., 2012).

2.3.2 MHL and Mental Health

MHL has been associated with various variables that could improve mental health, such as positive mental health attitudes and help-seeking behaviours (Venkataraman et al., 2019). Meanwhile, it is intriguing to know if there is a direct impact of MHL on mental health. Not surprisingly, Bjørnsen et al. (2019) found that knowledge of ways to obtain and sustain good mental health, which is part of MHL, correlated with better mental well-being in adolescents. Lam (2014) provided a piece of stronger evidence for this relationship, as it was found that a lower level of MHL predicted greater odds

of developing depression. Although only a few studies were found, the results seem to support the positive influence of MHL on mental health.

2.3.3 MHL and Health Literacy

MHL is an extension of the concept of health literacy, which was inspired by the movement to boost public awareness about the importance of good mental well-being as part of an individual's general health (Jorm et al., 1997). In early studies, knowledge about mental health remained a vastly neglected domain in literature and measurements designed for general health literacy, even though WHO had purported this conceptualisation back in 1946. (Jorm, 2012) pointed out the significance of studying MHL to inform the development of MHL instruments for the evaluation of the effectiveness of interventions.

Over the years, health literacy and MHL have developed different approaches to measure literacy level. Health literacy focuses on the different levels of skills in getting and applying health-related information, ranging from basic numeracy skills to the critical evaluation of health information (Choudhry et al., 2019), whereas MHL focuses on knowledge in different domains that foster early identification of symptoms and help-seeking for mental disorders (Furnham & Swami, 2018).

While health literacy and MHL are becoming disparate in their definitions and conceptualisation, they remain related to a certain extent. For

instance, a finding by Lee et al. (2020) suggested that the ability to get health-related information could predict participants' MHL, while Suka et al. (2015) found that higher health literacy could predict help-seeking intention for physical and psychological problems. However, the core content of health literacy and MHL varies greatly as one is about physical health, and another is about mental health. Therefore, MHL is studied in a domain-specific approach independent from health literacy to encourage detailed research about mental health.

2.3.4 MHL among Students in University

The importance of MHL among students has gained more attention as they are more prone to mental health issues compared to the general public, particularly with the unique stressors they are facing (Hamdan-Mansour et al., 2009). The help-seeking rate in this population is alarmingly low, and therefore the authorities have begun to initiate more movements to empower their mental health, such as institutional support and MHL programs inside campus (Yulia et al., 2022; Fernandez et al., 2016).

Stigma reduction has been regarded as a crucial aspect of students' understanding of MHL (Cogan et al., 2023). Stigma is known as a significant risk factor for delayed treatment seeking regarding mental health problems, with Malaysia has no exception to it (Petrus et al., 2023; Schnyder et al., 2018). Despite having higher education, university students have experienced personal stigma and perceived stigmas for mental health conditions out of worries about

potential impacts their academic and social lives (Wada et al., 2019). A finding by Zahid et al. (2022) indicated that Malaysia university students who do not have medical background generally less likely to seek help and vulnerable to mental health problems for those who have lower MHL. Interestingly, recent studies also discovered less stigmatising attitudes towards mental disorders and higher openness to approach mental healthcare services professional help (Berry et al., 2020; Ibrahim et al., 2019; Yee, 2018).

Another rising concern regarding MHL among university students is the knowledge regarding access to mental healthcare. Struggles for getting treatment existed due to limited exposure and understanding about potential help sources, even though people do not resist on mental help-seeking (Radez et al., 2020; Zakariah et al., 2022). Although a potential positive shift among students' attitude to seek help is encouraging, the lack of information to seek proper help need to be addressed by improving MHL as a whole within the education systems of university campuses (Yee, 2018).

2.4 Challenges in MHL Studies

Considering the continuing interest in MHL within the psychology discipline, it is not surprising that this has also brought some emerging issues and contradictions to the field of MHL. The issues could be attributed to the inconsistent view of the dimensions of MHL.

2.4.1 Overlapping Constructs

One issue that concerns scholars is the confounded distinctiveness of the constructs measured in MHL studies. Spiker and Hammer (2019) highlighted the issue of the overlapping between the dimensions measured in MHL and other variables of interest examined in the same study. For instance, while it is common to include the measure of stigma in the assessment of MHL, some studies treated MHL and stigma as two independent variables and examined the relationship using a MHL measurement that includes a subscale of stigma (e.g., Crowe et al., 2018). This could risk the possibility of correlating one variable with itself.

Although there is a plethora of studies that examine MHL, researchers are having difficulties drawing conclusive insights from their findings as the definition of MHL differs across those studies. For instance, some studies that claimed to study MHL focused mainly on the ability to recognise mental disorders (Svensson & Hansson, 2016), while other studies might adopt a broader definition of MHL. Different underlying constructs were measured in this case, but all were referred to as MHL. The opposite also happened in a systematic review conducted by Mansfield et al. (2020). Some studies that examined MHL components and fulfilled other inclusion criteria were not included in the meta-analysis because they did not mention the term MHL in their papers. The variability in conceptualisation and measurements of MHL could portend mixed patterns of results, thus increasing the difficulties in

synthesising the research findings and drawing meaningful insights for a complete understanding of MHL (Hulleman et al., 2010).

Considering all of this, the issue of construct travelling has become evident in the field of MHL as scholars adopted numerous adaptations and interpretations to fit into the nature of their studies, inevitably leading to confusion about the conceptualisation of MHL.

2.4.2 Conceptualisation of MHL as a Theory

Recently, a contrasting theme to frame MHL as a multi-construct theory instead of a construct with multiple dimensions has emerged. Spiker and Hammer (2019) raised concern that the MHL concept might be overstretched and thus, resulting in the inconsistent use of MHL definition across studies. Moreover, the repackaging of some well-established constructs into the concept of MHL (e.g., stigma and help-seeking efficacy) could face the risk of losing the meaningfulness of treating MHL as a construct when it is too broadly defined, making it difficult to delineate it from other seemingly similar concepts (Shaffer et al., 2016).

In response to it, Spiker and Hammer (2019) recommended the formulation of MHL as a theory to keep the constructs such as stigma and help-seeking efficacy independent of MHL to examine how those constructs interact to affect mental health in a theoretical framework. Some studies have adopted their suggestion and restricted the measurement of MHL to only mental health

knowledge, which is widely acknowledged as the most central component of MHL. In a review of existing conceptualisation and measurement of MHL in adolescents, Mansfield et al. (2020) identified inconsistency in research methodologies due to a lack of conceptual clarity of MHL. Thus, they supported the notion to conceptualise MHL as a multi-construct theory to acknowledge the complexity of each domain in MHL that warrants more attention to study and their unique roles in the underlying mechanism to achieve good mental health.

2.5 Measurements to Assess MHL

2.5.1 Methodologies in MHL Measurements

A review by O'Connor, Martin, et al. (2014) briefly classified the MHL instruments into two formats: vignette-based instruments and scale-based instruments. The vignette approach was first adopted by Jorm et al. (1997) in their research to study the level of MHL. Respondents would be presented with several situations describing the symptoms and presentation of a person with mental health problems to see whether they could correctly identify the mental illness as depicted in the vignette description (Jorm et al., 2006). This approach has been widely employed in earlier studies for the assessment of MHL, which focused mainly on evaluating respondents' ability to recognise mental health symptoms (W. Liu et al., 2011; Smith & Shochet, 2011; Yap et al., 2012). Some examples of vignette-based MHL instruments are the Vignette Interview (Jorm et al., 1997), the Questionnaire for Assessment of Mental Health Literacy

(QuALiSMental; Loureiro, 2015), and the Australian National Survey of Youth Mental Health Literacy and Stigma (Jorm et al., 2007).

Some works of literature have discussed the limitations of assessing MHL with the vignette approach. The administration of vignette-based instruments is criticised for being time-consuming as respondents need more time to read the case vignette, thus risks the possibility of creating response burdens (Campos et al., 2022; O'Connor & Casey, 2015; Rolstad et al., 2011). (Furnham & Swami, 2018) commented on the ecological validity of the vignette method, which could be worrying because the decision made by respondents might differ in a real-life situation, perhaps often more complex than the case described in those vignettes. Besides, it is generally acknowledged among scholars that vignette-based measurements narrow the assessment of MHL to a limited scope, covering only the ability to recognise specific mental disorders (Gibbons et al., 2015).

Scale-based measures for MHL, on the other hand, refer to instruments that use mixed methodologies such as Likert scales, multiple-choice questions, and dichotomous responses to measure different aspects of MHL and allow the composition of total and/or subscale scores (O'Connor, Martin, et al., 2014). As opposed to vignette-based instruments that come with a series of interrelated questions in which a wrong answer on the previous item can affect the accuracy of the answer for the next item, scale-based instruments outperform this limitation as respondents' MHL is assessed based on their understanding of each individual item (Yu et al., 2015). Moreover, the scale-based measure allows a

thorough assessment of more MHL attributes, given its flexibility in incorporating multiple formats that fit the nature of questions for different attributes (Jung et al., 2016).

2.5.2 Domains in MHL Measurements

To date, there exists a lack of consensus regarding the components that should be included in those instruments intended to measure the level of MHL (Mansfield et al., 2020). The earliest MHL measurement, known as the Vignette Interview, was developed by Jorm and colleagues (1997). Notwithstanding that they were the authors who first proposed the definition of MHL, some MHL attributes (i.e., knowing how to seek mental health information) outlined in their original work were not assessed in the Vignette Interview. Since then, several studies have attempted to develop instruments for assessing MHL, but only the recognition of mental disorders was consistently measured across those studies (Compton et al., 2011; Evans-Lacko et al., 2010). It was not until the development of the Mental Health Literacy Scale (MHLS) by O'Connor and Casey in 2015 allowed the assessment of all domains according to Jorm's definition.

However, the evolving definition of MHL has led to an explosion in the attributes, in which different scholars held their own views regarding the components that are central to the MHL construct. For instance, the Mental Health Positive Knowledge (MHPK; Bjørnsen et al., 2017) was developed to measure knowledge of factors promoting good mental health based on the

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postulation of including positive mental health as part of MHL. Another multicomponent mental health literacy measure developed by Jung et al. (2016) has assessed the knowledge-oriented and belief-oriented knowledge about mental health consistent with Jorm's definition. At the same time, this instrument emphasised the assessment of resource-oriented MHL, which mapped into the concept of help-seeking efficacy mentioned by (Kutcher et al., 2016). A very recent MHL instrument developed for children and adolescents incorporates the measures of stigma and avoidant coping to account for individuals' help-seeking behaviour, with less focus on the assessment of knowledge about mental disorders (Simkiss et al., 2021).

2.5.3 Existing MHL Instruments

In 2014, O'Connor and colleagues conducted a comprehensive review of MHL measurements available from 1997 to 2012 and found that most instruments were vignette-based and only covered a few attributes of MHL. This led to the publication of the Mental Health Literacy Scale (MHLS) by those authors in 2015, which is a scale-based measure that allows scoring on the level of MHL and all seven domains that constitute the MHL. As there has been no review of MHL measurements since 2015, a brief summary of the MHL measurements from 2015 is provided in this section (refer to Table 2.1). It can be seen that more instruments that measure general MHL in a scale-based format have been developed. Nonetheless, Wei et al. (2016) identified the unsatisfactory psychometric attributes of existing scale-based MHL measures in a systematic review. They found that most MHL instruments' overall quality

was inconclusive due to inadequate methodology to evaluate measurement properties.

Table 2.1

MHL measurements since 2015

Instrument	Number of items/ Format[a]	Domains measured	Methodology	Location/ Population
Mental Health Literacy Scale (MHLS; O'Connor et al., 2015)	35 items Likert scale DR MCQ	i. Ability to recognise disorders ii. Knowledge of where to seek information iii. Knowledge of risk factors and causes iv. Knowledge of self-treatment v. Knowledge of professional help available vi. Attitudes that promote recognition or appropriate help-seeking behaviour	Vignette Scale	Australia Community sample aged 17 to 55 (n=372), mental health professionals (n=43)
Mental Health Knowledge Questionnaire (MHKQ; Yu et al., 2015)	20 items DR	i. Knowledge of the characteristics of mental health and mental disorders ii. Belief in the epidemiology of mental disorders iii. Awareness of mental health promotion activities	Scale	China Community sample aged 18-60 (N= 2052)

Multicompone nt mental health literacy measure (Jung et al., 2016)	26 items Likert scale DR	i. Knowledge-oriented MHL ii. Beliefs-oriented MHL iii. Resource-oriented MHL	Scale	America Employees of public housing authority aged 22 to 64 (N=221)
Mental Health Literacy Questionnaire (MHLq; Campos et al., 2016)	33 items Likert scale	i. First aid skills and help-seeking behaviour ii. Knowledge and stereotypes iii. Self-help strategies	Scale	Portugal Students aged 11 to 17 years old (N=737)
Mental Health Literacy Questionnaire (MHLq; Dias et al., 2018)	29 items Likert scale	i. Knowledge of mental health problems ii. Erroneous beliefs/stereotyp es iii. First-aid skills and help-seeking behaviour iv. Self-help strategies	Scale	Portugal Young adults aged 18 to 25 years old (N=356)
Danish MeHLA questionnaire (Zenas et al., 2020)	29 items and five vignette s (five items per vignette) Likert scale MCQ	i. Mental health ii. Mental health problems iii. Stigma iv. Resilience v. Help-seeking efficacy	Vignette Scale	Denmark Adolescent s aged 13-17 years old (N=209)

ᵃ DR= Dichotomous response. MCQ= Multiple-choice question.

From the table, it could be observed that some MHL instruments that employ vignette methodology (i.e., MeHLA, MHLS) have more items and lengthy passages for respondents to read before answering those items. The MHL domains assessed in some MHL instruments, such as MHKQ and a multicomponent mental health literacy measure by Jung et al. (2016), do not correspond to the mainstream MHL conceptualisation as proposed by Jorm et al. (1998) and Kutcher et al. (2016).

2.5.4 Mental Health Literacy questionnaire (MHLq)

The Mental Health Literacy questionnaire (MHLq; Dias et al., 2018) is a 29-item questionnaire designed to overcome some common limitations in existing instruments. Unlike MHL instruments that cover only a single dimension, the MHLq assesses multiple aspects of MHL that align with the comprehensive understanding of MHL, which incorporates knowledge, beliefs and attitudes toward mental health issues. Notably, the authors developed the item pool of MHLq based on the MHL attributes outlined by Jorm et al. (1997). It also covers knowledge about multiple mental disorders (i.e., depression, anxiety and schizophrenia) that are more commonly seen in young adults.

In terms of the methodology, the MHLq does not employ the vignette methodology to assess the ability to recognise mental disorders to improve efficiency in test administration. Also, the MHLq offers the computation of a total score and subscale scores, allowing both general and specific evaluation of one's MHL. Given all the characteristics, the MHLq is a strong candidate with

the potential to assess the level of MHL accurately compared to other instruments.

2.6 Theoretical Framework

The proposition of MHL was aspirated by the concept of health literacy, which posits that the ability to gain access to and make use of health-related information is a determinant of better physical health. Along the same vein, Jorm et al. (1997) highlighted the importance of having proper knowledge and beliefs about mental disorders to achieve better mental health outcomes.

While there was no theory to guide the development of MHL, the author proposed that the components of MHL ought to lead people to initiate mental health actions for improved mental health in Jorm (2020). In other words, the components in MHL must be able to link people to carry out the behaviours that benefit their mental health. This proposition is consistent with the theory of planned behaviour (TPB; Ajzen, 2002), which outlines the elements that determine one's intention to perform a behaviour. Therefore, the TPB is used in this study as a guide to understand the nature of MHL components that could link people to the actual actions in managing their mental health.

TPB describes three main cognitive factors that inform behavioural intentions, which could eventually lead to behavioural performances. A core component in TPB is known as subjective norm, which is people's beliefs about the perception of others, such as their family and friends, on a particular behaviour. The predictive power of the subjective norm could be influenced by

an individual's motivation to comply with normative beliefs. Another component, attitude, is referred to as the personal evaluation of a behaviour, depending on to which extent the individual's appraisal of a particular behaviour is favourable or unfavourable. Thirdly, TPB explains perceived behavioural control, which represents the perception of people about their ability to perform a particular behaviour. Perceived behavioural control consists of two elements, namely self-efficacy and controllability. Self-efficacy refers to the extent to which a behaviour is perceived as easy to perform, while controllability refers to the extent to which individuals perceive the performance of a behaviour is within their control.

TPB proposes that subjective norms, attitudes, and perceived behavioural control can predict individuals' intention to perform a behaviour of interest. This theory has been widely applied in the health behaviour change model as well as mental health help-seeking (Bohon et al., 2016). To improve mental health outcomes, one must take action to either seek help for their problems or use self-help strategies. According to TPB, the antecedent of mental health actions is the intention to make changes to their mental health problems. Individuals who have favourable attitudes toward dealing with mental health problems and hold subjective norms that support mental health help-seeking are more likely to have stronger intentions. However, it needs to be complemented with the perceived behavioural control in their own capability to perform mental health actions.

Figure 2.1

Theoretical Framework of MHL

```
┌──────────────┐   ┌──────────────┐
│ Behavioural  │   │              │
│   beliefs    │   │   Attitude   │
└──────────────┘   └──────────────┘

┌──────────────┐  ┌──────────────┐        ┌────────────┐      ┌────────────┐
│Normative     │──│  Subjective  │───────▶│  Intention │─────▶│ Behaviour  │
│beliefs       │  │     norm     │        └────────────┘      └────────────┘
└──────────────┘  └──────────────┘

┌──────────────┐   ┌──────────────┐
│              │   │  Perceived   │
│Control beliefs│   │ behavioural  │
│              │   │   control    │
└──────────────┘   └──────────────┘
```
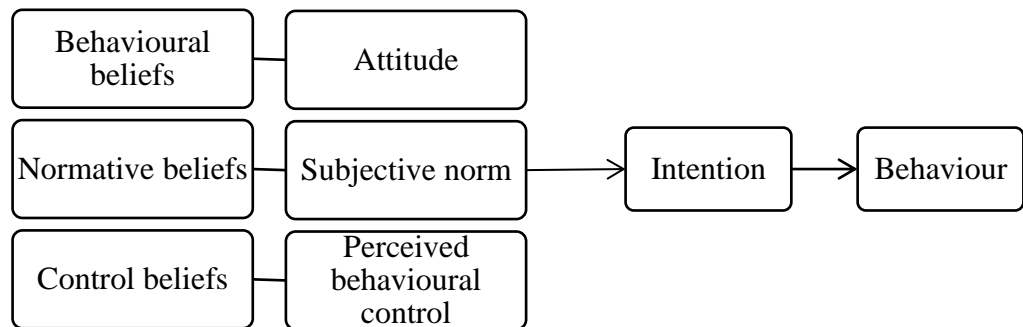
2.7 Conceptual Framework

In this study, the MHLq was chosen as the target scale for validation in the Malaysian context, as those MHLq subscales align with the essential MHL attributes. The MHLq subscales also correspond to the components in the TPB that could link people to greater intention in performing mental health actions.

The MHLq evaluates individuals' level of MHL in four components: knowledge about mental health problems, erroneous beliefs/ stereotypes, first-aid and help-seeking efficacy, and self-help strategies. Knowledge about mental health problems could influence the attitude toward mental health help-seeking. As the attitude is determined by evaluation of the favourability of the consequence brought by behaviour, knowledge about mental disorders, such as the consequences of delayed help-seeking for mental disorders, could help people to see the necessity to seek help, thus reinforcing their view of help-seeking as favourable. Moreover, as people take an illness approach to attribute

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their mental health problems to biological causes, they are more likely to seek professional help.

Tackling erroneous beliefs/stereotypes can influence people's perceived subjective norm regarding help-seeking. It is known that the perceived societal view and acceptance of mental disorders and help-seeking can be internalised as one's standard to decide whether to seek help. Therefore, combating the stereotypes regarding mental disorders can adjust one's view of the social desirability of seeking help for mental health problems, thus facilitating their intention to seek help.

The acquisition of first-aid skills, help-seeking efficacy, and knowledge about self-help strategies can contribute to the perceived behavioural control in help-seeking. Help-seeking efficacy determines people's confidence in their capacity to seek help. As people know more about the concrete details of what to do in the process of help-seeking, it reduces uncertainties and fosters people's perceived feasibility of seeking help. Similarly, when people are aware of their own potential to improve their mental health through self-help strategies, they will have more sense of control over taking action for their concerns.

Figure 2.2

Conceptual Framework of the MHLq
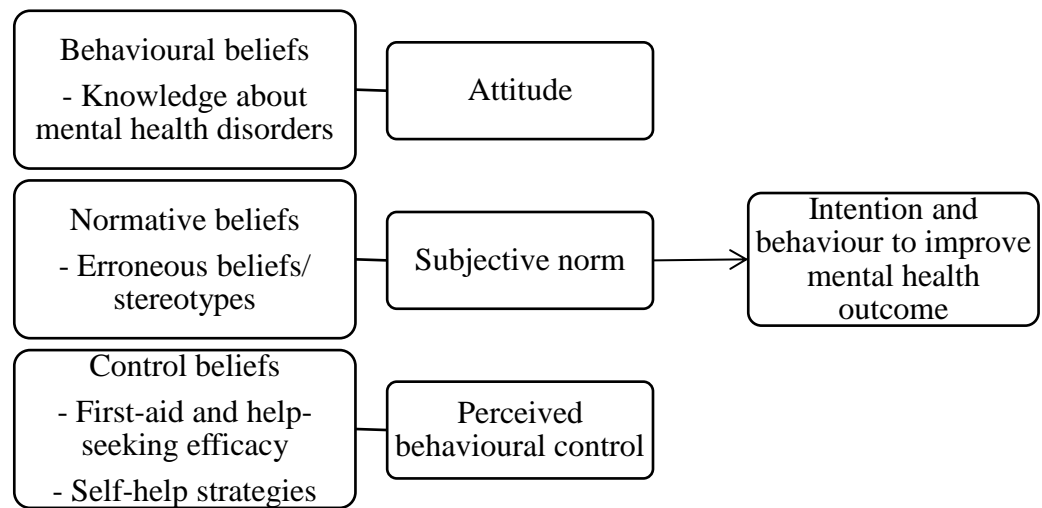
CHAPTER 3

STUDY 1

In this chapter, the methodology and results for Study 1 were reported. Study 1 aimed to determine the factor structure of the MHLq in a sample of Malaysian undergraduate students. Exploratory factor analysis (EFA) was conducted to examine the potential factorial structure of the MHLq in a Malaysian context, while confirmatory factor analysis (CFA) was conducted to examine further the model revealed by EFA and identify the best-fit model by comparison between other competing models.

3.1 Methodology

3.1.1 Research Design

Study 1 employed a cross-sectional design to examine the factor structure of the MHLq. Participants' level of MHL was assessed at one point in time. As the factor structure of the MHLq would be assessed by EFA, which generally works better with a larger sample size (Yong & Pearce, 2013), cross-sectional design was chosen because of its quick and easy administration which facilitates data collection even for large-scale studies. In this study, EFA and CFA were carried out consecutively as an overall process of factor analysis. A random split-half methodology was used to produce two equivalent subsamples

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which would be submitted to EFA and CFA respectively. The use of equivalent samples reduces the risk of confounding results that might be attributed to sources of variances between two datasets (Lorenzo-Sena, 2021). In this study, quantitative data were collected using questionnaires through an online survey.

3.1.2 Research Participants

The target population of this research was undergraduate students in either public or private higher education institutions (HEIs) in Malaysia. The minimum age requirement of participants in the current research was 18 years old. The inclusion criteria were Malaysian university students aged between 18 to 29 years old who are currently pursuing a full-time bachelor's degree program in Malaysia. The minimum age requirement for participants in this study is 18 years old, as the eligible age of entering university in Malaysia usually starts from 18 years old. Although the age of undergraduate students could be diverse, age has been found as a factor that affects the performance in MHL. According to Hadjimina et al. (2017), participants aged 18-29 years olds have better performance in identifying mental disorders compared to the middle (30-44) and old (45-71) ages. Given all, the present study has applied the age range of 18-29 years old for the recruitment criterion for our study. The exclusion criteria for this study were students from HEIs who are currently pursuing graduate programmes, foundation or pre-university programmes, as MHL was found to increase with education years (Gorczynski et al., 2017), which inclusion of students with less or more education years can affect the overall result.

Purposive sampling was used to recruit participants. Of the recorded 886 responses, a total of 248 responses were removed due to several reasons. Most responses (83%) were removed due to incomplete responses that had missing values for a whole section in the survey. This kind of incomplete response is often subjected to removal as this could imply respondents' inattention when answering the survey and might skew the study results (Qualtrics, n.d.). About 16% of responses removed were due to unfulfilled criteria for age range (i.e., exceeded 29 years old), and 1% of them were removed due to not being undergraduate students.

Among the 618 responses that remained, there were 472 females (76.4%) and 146 males (23.6%). The age of participants ranged from 18 to 28 years old (M = 21.69, SD = 1.46). Most participants were recruited from Universiti Tunku Abdul Rahman (76.5%), while the remaining were from other public and private universities in Malaysia. The sample comprised 526 Chinese (85.1%), followed by 45 Malays (7.3%), 47 Indians (6.5%), and 7 participants from other ethnicities (1.1%). The total sample was split randomly into two halves. The first half was submitted to EFA, and the second half was submitted to CFA, resulting in 309 cases for each factor analysis.

3.1.3 Research Procedures

Ethical clearance was obtained from Universiti Tunku Abdul Rahman Scientific and Ethical Review Committee (SERC) prior to the commencement of Study 1. An online survey was generated using Qualtrics, a web-based

software that allows the generation and distribution of online surveys. Participants were recruited online through flyers that contained the survey details and the Qualtrics survey link for this study. The flyers were distributed by posting on several social media platforms (e.g., Facebook, WhatsApp) and enclosed in invitation emails. Participants were required to consent to their participation in this research before they started to answer the survey. After obtaining their consent, participants would complete the online survey, which includes the demographic information questionnaire and the MHLq.

3.1.4 Research Instruments

Mental Health Literacy Questionnaire (MHLq). The MHLq was developed by Dias et al. (2018) to assess the level of MHL in young adults. The MHLq contains four subscales that add up to a total of 29 items, with five-point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree).

The first subscale consists of 11 items related to knowledge of mental health problems. A sample item in this subscale is "Changes in brain function may lead to the onset of mental disorders." The second subscale consists of eight items related to erroneous beliefs/stereotypes, with six reverse-scored items. A sample item in this subscale is "Depression is not a true mental disorder." A higher score in this subscale indicates a lower level of erroneous beliefs/stereotypes about mental health issues. The third subscale consists of six items related to first-aid skills and help-seeking behaviours. A sample item in this subscale is "If I had a mental disorder I would seek a psychologist's help."

The fourth subscale consists of four items related to self-help strategies. A sample item in this scale is "Physical exercise contributes to good mental health."

The total score for the MHLq is generated by summing the scores of all subscales, with higher scores indicating a higher level of overall MHL. The overall Cronbach's alpha for the MHLq was .84, while Cronbach's alpha for the four subscales ranged from .60 to .74 (Dias et al., 2018).

3.1.5 Analytic Plan

Data collected in Study 1 were analysed using JASP ver. 0.16.2. Data were split randomly into two halves using SPSS. The first half was submitted for EFA to explore the possible factor structures.

EFA was conducted using the JASP software and the built-in R module within this software. The factorability of data used for the EFA was determined by the Kaiser-Meyer-Olkin (KMO) measure of overall adequacy and Bartlett's test of sphericity before conducting an EFA.

Common factor analysis was chosen as the model of factor analysis for EFA to identify the underlying structure of the MHLq (Fabrigar & Wegener, 2012). Principal axis factoring (PAF) was chosen as it is recommended over maximum likelihood (ML) estimation in general due to its robustness in detecting weak factors even with unequal loadings and fewer items in each factor (Grieder & Steiner, 2021). In the original MHLq, the number of items for

the FA and SH subscales is 6 and 4 respectively, which are relatively few. Also, weak factor loadings of <0.4 were observed for some MHLq items from the EFA conducted in its original study (e.g., items 9, 11, 23). Therefore, PAF was chosen to maximise the potential to recover all major common factors, as suggested in Briggs & MacCallum (2003).

Parallel analysis was employed to determine the number of factors to retain while referring to the visual scree test, as suggested by Watkins et al. (2018). For the factor rotation, oblique rotation was chosen, given that the factors in the MHLq would be correlated in nature. Promax rotation was chosen as another alternative, oblimin, are both recommended, and their outcomes are comparable (Norman & Streiner, 2014).

For a better interpretation of the factors that emerged, some criteria were established a priori to determine the adequacy of factors and facilitate the item removal. A factor loading cutoff of 0.4 was applied to determine variables that were representative of the factors (Howard, 2016). Items with cross-loadings (with factor loadings higher than 0.32 on multiple factors) were considered problematic and opted to be dropped (Matsunaga, 2010).

For CFA, the lavaan R package (Rosseel, 2012) was used to examine the plausibility of the factor structures derived from EFA. The following goodness-of-fit model indices and the suggested cut-off values were used to evaluate and compare the competing models: Chi-square value to degrees of freedom ratio ($\chi2/df < 3$), comparative fit index (CFI > 0.95), Goodness-of-Fit

Index (GFI > 0.95), Tucker Lewis Index (TLI > 0.95), and root mean square error of approximation (RMSEA < 0.05), and standardised root mean squared residual (SRMR < 0.08) (Hu & Bentler, 1999; Kline, 2016). The robust maximum likelihood (MLR) was chosen as the estimator for CFA due to its compatibility with ordinal data, such as the Likert-scaled responses employed in the MHLq (Li, 2016).

The internal consistency of the MHLq was examined using Cronbach's alpha. Descriptive analysis such as mean, standard deviation, and percentage was conducted to analyse the demographic information.

3.2 Result

3.2.1 Data Management

Data cleaning was conducted prior to the statistical analyses. Univariate outliers were detected by screening the value of the standardised composite score of the MHLq that ranged outside ±2 standard deviations (Field, 2023). There were no univariate outliers detected from this sample. As a result, no cases were excluded from the 618 responses after screening for outliers.

According to the missing value analysis, three items (i.e., Items 3, 25, and 27) in the MHLq were found to have missing values. However, the percentage of missing values for each item did not exceed 0.01%. As suggested, a missing value of less than 5% of the total cases can be considered missing at

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random (IBM Corporation, n.d.). A Little's MCAR test was conducted on the responses, in which results indicated missing at random (MAR) as well. Expectation-maximization (EM) technique was chosen to impute missing values in this dataset as the covariance matrix generated by EM is recommended for EFA (weaver & Maxwell, 2014). The EM technique was implemented using SPSS. The maximum number of iterations was set to 100. The new dataset with imputed values was saved and applied for further EFA analysis.

The assumption of normality was checked by using the absolute value of skewness and kurtosis for each item. Results revealed that none of the items possessed a skewness value of more than two and a kurtosis value of more than seven, indicating the univariate normality for all the MHLq items (Kim, 2013).

These responses were split randomly into two halves to submit for EFA and CFA respectively. The sample size for EFA and CFA was 309 each. Following the 10-to-1 participant-to-variable ratio, the sample size for CFA is sufficient given that the minimum number of responses required for 29 items is 290. Moreover, some researchers have recommended the determination of sample size by referring to the sample size in past studies that have worked well (Bacchetti, 2010; White, 2022). The sample size used in this study for EFA was 309, which is close to the sample size of 356 participants used in Dias et al. (2018).

3.2.2 Exploratory Factor Analysis

A measure of sampling adequacy was conducted for the MHLq to inspect the plausibility of conducting factor analysis. The 29-item MHLq yielded a Kaiser-Meyer-Olkin (KMO) value of 0.813, and the result for Bartlett's test of sphericity was statistically significant, $\chi2(406) = 2850.92$, $p < 0.001$. The factorability of the MHLq items was suggested based on the results of the KMO test with an overall value > 0.6 and the statistically significant result for Bartlett's test of sphericity. The factor extraction was based on the correlation matrix of the data with the interitem correlations between the 29 items (refer to Appendix F).

To decide the number of factors to be retained was determined by parallel analysis and scree plot. The eigenvalues generated from the real data and the mean eigenvalues derived from the randomised data sets were compared for each factor (refer to Table 3.1). PA results showed that the eigenvalues of the first six factors derived from real data were greater than their respective pair of simulated eigenvalues, suggesting that six factors should be retained.

Table 3.1

Eigenvalues Derived from Real and Simulated Data

	Real data factor eigenvalues	Simulated data mean eigenvalues
Factor 1*	4.965	0.689
Factor 2*	2.372	0.534
Factor 3*	1.291	0.486
Factor 4*	0.956	0.423
Factor 5*	0.405	0.366
Factor 6*	0.367	0.321

	Real data factor eigenvalues	Simulated data mean eigenvalues
Factor 7	0.270	0.282
Factor 8	0.122	0.248
Factor 9	0.071	0.202
Factor 10	0.062	0.167

Note. * Factor with real eigenvalues greater than simulated eigenvalues. Results from FA-based parallel analysis.

However, the scree plot suggested that the fifth and sixth factor lies very close between the lines for observed eigenvalues and simulated eigenvalues (refer to Figure 3.1). Therefore, different factor solutions were compared in order to achieve a better interpretation of factors.

Figure 3.1

Scree plot Generated from Parallel Analysis
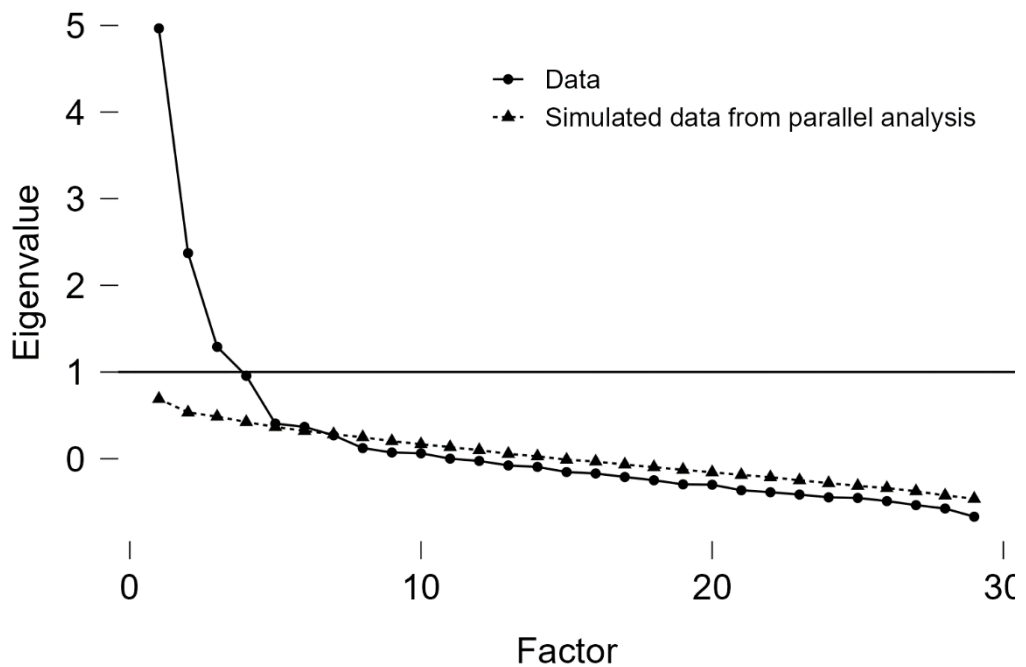
First, the six-factor solution was examined as it was the largest plausible number of factors suggested by PA. It was observed that only items 12 and 24 loaded on the fifth factor, while only items 11 and 21 loaded on the sixth factor

(refer to Appendix G). For an acceptable EFA solution, a minimum of three items must load saliently (Bandalos & Gerstner, 2016; Norman & Streiner, 2014). A similar pattern was observed for the five-factor solution, with only two items loaded saliently on the last factor (refer to Appendix H). The four-factor solution was deemed appropriate, as each factor was loaded saliently by at least three items (refer to Appendix I). Moreover, the factors discovered in the four-factor solution were theoretically aligned with the original MHLq scale. Therefore, a four-factor solution was identified for this EFA.

This four-factor solution explained 36.5% of the total variance (refer to Table 3.2). The additional fit indices provided by JASP did not suggest a good fit for this model, as the TLI and RMSEA values did not achieve the cutoff values.

Table 3.2

Goodness-of-Fit Indices for EFA Models

Model	TLI	RMSEA	Variance explained	Cronbach's alpha
MHLq (29 items)	0.823	0.058	0.365	0.825
MHLq (22 items)	0.887	0.056	0.423	0.829
MHLq (16 items)	0.856	0.057	0.476	0.787
MHLq (12 items)	1.001	0	0.520	0.724

Note. TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation.

A factor loading cutoff of 0.4 was applied to determine variables that were representative of the factors (Howard, 2016). Items with cross-loadings (with factor loadings higher than 0.32 on multiple factors) were considered problematic and opted to be dropped (Matsunaga, 2010). As a result, total of

seven items (i.e., Items 4, 11, 12, 14, 18, 21, 24) were removed in a stepwise manner.

The 22-item MHLq was submitted to another EFA and yielded a KMO = 0.816 and Bartlett's test, $\chi2(231) = 2211.45$, $p < 0.001$, which implied the suitability to perform EFA. However, the 22-item MHLq did not achieve a good model fit either.

To explore the possible improvements, a 4-factor model that retains the top four items (16 items) among the 22-item MHLq was examined. The 16-item MHLq yielded a KMO = 0.761 and Bartlett's test, $\chi2(120) = 1614.87$, $p < 0.001$, which implied the suitability to perform EFA. The results of CFA indicated some improvements, but this model did not improve significantly to achieve the cutoff for the fit indices.

To further improve the model fit, another 4-factor model with the top three items with the highest loadings for the four subscales (12 items). The 12-item MHLq (MHLq-12) reported excellent model fit indices, while the variance explained exceeded 0.5. All the items in the MHLq-12 yielded factor loadings > 0.5 except item 3.

In summary, results from EFA suggested a four-factor structure for the MHLq in the Malaysian context, which is consistent with the original study (Dias et al., 2018). The 12-item version that used the three items with the highest loadings from each factor yielded the most promising result for EFA, with all

items loaded on the factors that correspond to the subscales in the original

MHLq (refer to Table 3.3).

Table 3.3

Factor loadings of the 12-item MHLq

MHLq-12 items	Factor			
	KnL	ERB	FA	SH
3. People with schizophrenia usually have delusions (e.g., they may believe they are constantly being followed and observed).	0.41			
20. One of the symptoms of depression is the loss of interest or pleasure in most things.	0.68			
22. The symptom's length is one of the important criteria for the diagnosis of a mental disorder.	0.56			
6. Mental disorders don't affect people's behaviours.		0.75		
13. Mental disorders don't affect people's feelings.		0.82		
15. Only adults have mental disorders.		0.72		
8. If I had a mental disorder I would seek a psychologist's help.			0.84	
17. If someone close to me had a mental disorder, I would encourage her/him to see a psychiatrist.			0.59	
29. If I had a mental disorder I would seek for a psychiatrist's help.			0.95	
1. Physical exercise contributes to good mental health.				0.52
7. Sleeping well contributes to good mental health.				0.72
19. A balanced diet contributes to good mental health.				0.70

Note. KnL = Knowledge of mental health problems, ERB = Erroneous beliefs/ stereotypes, FA = First aid skills and help-seeking behaviours, SH = Self-help strategies.

3.2.3 Confirmatory Factor Analysis

Several CFAs using the robust maximum likelihood estimator (MLR) were conducted using the other half of the randomly split responses to compare among the competing models. The 29-item four-factor model was examined to verify the suitability of the original MHLq in the Malaysian context. As the four-factor model was suggested by EFA, both first-order and second-order four-factor models were examined. The second-order four-factor model was examined as past literature suggested that MHL is a multidimensional concept that composes several facets. The one-factor model was examined as well due to the scoring of the original MHLq that sums all the item scores into a total score. Table 3.4 shows the fit indices for the models.

Table 3.4

Model Fit Indices for CFA Models

Model	χ^2	df	*p*	χ^2/df	CFI	TLI	RMSEA [90% CI]	SRMR
1. 29-item four-factor model	820.948	371	< .001	2.213	0.736	0.711	.063 [.057, .068]	0.089
2. 12-item four-factor model	76.507	48	.006	1.594	0.954	0.936	.044 [.025, .061]	0.064
3. One-factor model	331.136	54	< .001	6.132	0.550	0.450	.129 [.117, .141]	0.132
4. Second-order model	100.194	50	< .001	2.327	0.919	0.892	.057 [.042, .072]	0.076
5. Four-factor (one	64.690	47	.044	1.376	0.971	0.960	.035 [.009, .053]	0.061

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error covariance)							
6. Second-order model (two error covariances)	72.686	48	.012	1.751	0.960	0.945	.041 [.021, .058]	0.063

Note. CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = standardized root mean square residual.

For the 12-item one-factor model, all the fit indices did not achieve the cut-off, thus showing a poor fit to the data. A 12-item second-order model was also tested, and a good fit was indicated by the model fit indices, except for the CFI and TLI values. As suggested by the modification indices, two error covariances were added between items 6 and 20, as well as items 15 and 17. However, the CFI and TFI values still did not achieve the cutoff for good fit (> 0.95) after modifications. Moreover, the four factors were not substantially correlated, indicating that a higher-order factor structure might not be preferable.

The 12-item four-factor model showed a good fit except for the TLI value. Modification indices were referred to identify adjustments that can be made for improvements. The inconsistency was resolved to an excellent fit after adding an error covariance between items 3 and 22. The two items ask about the criteria used to diagnose mental disorders, specifically focusing on the symptoms of schizophrenia and the duration of symptom manifestation. Both the symptoms themselves and the length of time they persist are crucial factors in making a diagnosis of a mental disorder (American Psychiatric Association [APA], 2022). Respondents may find these questions similar in nature. As these two items are interconnected conceptually, it is suggested to introduce error

, the factor loadings of the items in the KnL subscale were non-significant. As the identified best-fit model demonstrated inconsistencies in factor loadings of the KnL subscale, there was a need to verify the feasibility of the model in a new sample.

Figure 3.2

CFA of the 12-item 4-factor model (with one error covariance)
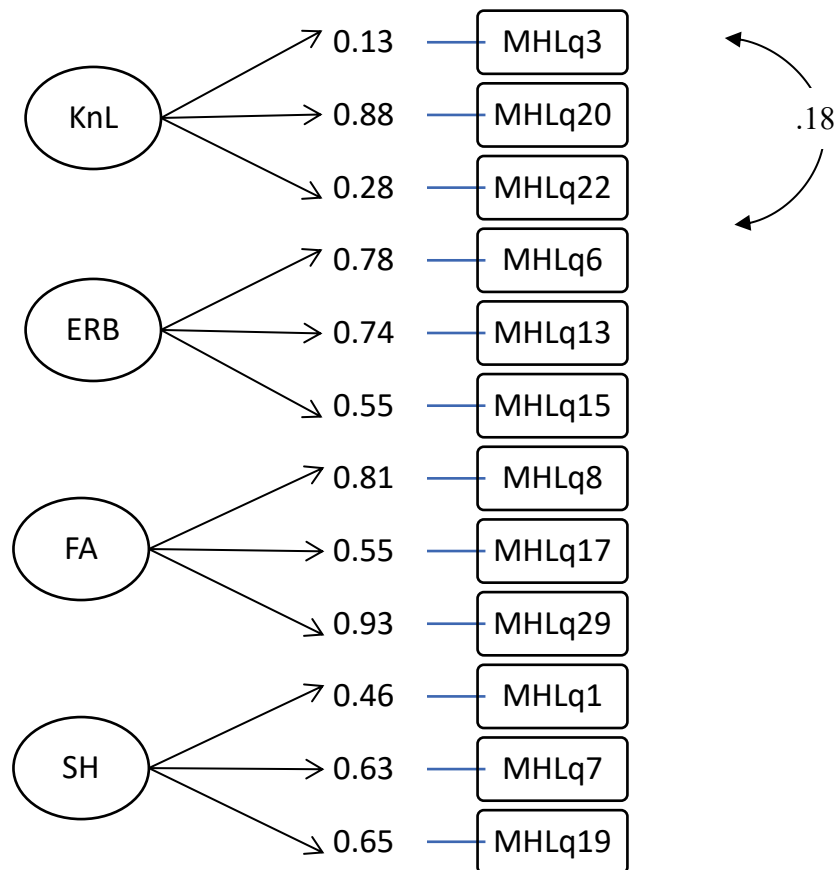
The reliability of the MHLq-12 was examined in this sample. The Cronbach's alpha values for the MHLq-12 were: 0.41 for KnL, 0.73 for ERB, 0.80 for FA, 0.60 for SH, and 0.65 for overall MHLq-12.

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CHAPTER 4

STUDY 2

This chapter provides an overview of the methodology and findings from Study 2. Study 2 aimed to assess the validity and reliability of the model derived from the CFA conducted in Study 1. In this study, a longitudinal design was employed, and a new sample of 214 participants completed the questionnaires at Time 1. Of these participants, 113 completed the same set of questionnaires again after three weeks (Time 2). The psychometric properties of the MHLq-12 were examined based on these 113 responses, including construct validity (convergent and divergent validity), predictive validity, and test-retest reliability.

To assess divergent validity, the relationship between two theoretically unrelated constructs, namely participants' level of MHL and their level of health literacy, was examined. Predictive validity was evaluated by investigating how effectively the scores obtained from the MHLq-12 predicted future outcomes in participants' help-seeking intentions and behaviours, as well as their positive mental health.

4.1 Methodology

4.1.1 Research Design

Study 2 employed a longitudinal design in which the variables of interest were repeatedly measured along two time points. A longitudinal design was chosen to allow the evaluation of the prediction power of the MHLq-12 on the theoretically related variables (e.g., subsequent help-seeking behaviours). Participants' email addresses were used to connect participants to their data across Time 1 and Time 2 of this study. According to Audette et al. (2020), one of the ways to code participants in longitudinal studies is to collect non-anonymous data and de-identified later. The way mentioned earlier could ensure a higher rate of correctly matching participants across data collection waves compared to other available methods (Davis-Kean et al., 2015).

4.1.2 Research Participants

A total of 214 responses were collected from undergraduate students at Universiti Tunku Abdul Rahman (UTAR), Kampar campus during Time 1. The 214 participants were contacted after three weeks for the data collection. However, only 113 participants answered the survey in Time 2. The age of participants ranged from 18 to 25 years (M = 20.85, SD = 1.54). There were 92 females (81.4%) and 21 males (18.6%). Most of the participants were Chinese (92.9%), while the number of Malay and Indian participants were the same (3.6%).

4.1.2 Research Procedures

Two online surveys comprising the same set of questionnaires were generated using Qualtrics. Participants were recruited through invitation emails distributed by the UTAR student intranet mailbox system. Before giving consent to participate in this study, participants were informed that another follow-up survey would be sent through emails after three weeks. Participants were required to provide their email addresses in the online surveys for identity verification to match the responses by the same participants from surveys in Time 1 and Time 2. In the informed consent, participants were briefed about the collection of non-anonymous data (i.e., email addresses) and their data would remain strictly confidential to the researchers only. Another survey was sent to participants who had fulfilled the inclusion criteria and passed the attention checkers in the Time 1 survey at an interval of three weeks.

4.1.3 Research Instruments

12-item Mental Health Literacy questionnaire (MHLq-12). MHLq-12 was adapted from the findings of Study 1. The MHLq-12 was developed based on the top three items with the highest factor loadings from each subscale of the original 29-item MHLq. A sample item from the MHLq-12 is "Only adults have mental disorders."

Positive Mental Health Scale (PMHS). The PMHS was developed by Lukat et al. (2016) in order to assess the presence of general emotional,

psychological, and social well-being within individuals. PMHS is a unidimensional scale that consists of nine items, with four-point Likert scales ranging from 0 (Do not agree) to 3 (Agree). The overall Cronbach's alpha for PMHS ranged from .82 to .93 in different samples such as students and psychosomatic patients, suggesting a high internal consistency across different groups (Lukat et al., 2016). One of the items in this scale is "I manage well to fulfill my needs." A total score is calculated by summing all the items in which higher scores indicate a higher level of positive mental health. The Cronbach's alpha values of the PMHS in the current study were .881 for Time 1 and .915 for Time 2.

Short-Form Health Literacy Instrument (HLS-SF12). HLS-SF12 was developed by Duong et al. (2019) to assess the level of health literacy for the general public in Asian countries. HLS-SF12 consists of 12 items that maintain the 12 components of the original framework of the health literacy model, with four-point Likert scales ranging from 1 (Very difficult) to 4 (Very easy). A sample item in this scale is "How easy would you say it is to call an ambulance in an emergency?". The overall Cronbach's alpha for HLS-SF12 was .85 in the Malaysian context (Duong et al., 2019). A standardised, unified metric is obtained using the formula [index = (mean − 1) × (50/3)], and the scores can range from 0 to 50. A higher score indicates a higher level of health literacy. In the current study, the reliability of HLS-SF12 was Cronbach's alpha = .792 for Time 1 and .808 for Time 2.

General Help-seeking Questionnaire (GHSQ). GHSQ was developed by Wilson et al. (2005) to measure help-seeking intentions from different sources. GHSQ consists of 10 items that represent the potential help sources and with seven-point Likert scales ranging from 1 (Extremely unlikely) to 7 (Extremely likely) to indicate to which degree the respondent is willing to seek help from the corresponding help source during the next four weeks. A sample of potential help source in this scale is "Mental health professional (e.g., school counsellor, psychologist, psychiatrist)." GHSQ showed high internal consistency with Cronbach's alpha = .83 in the original study (Wilson et al., 2005). The Cronbach's alpha values of the GHSQ in the current study were .699 for Time 1 and .749 for Time 2.

Actual Help-Seeking Behaviour (AHSQ). AHSQ was developed by Rickwood et al. (2005) to measure help-seeking behaviours from different sources. AHSQ consists of 10 items that represent the potential help source and with binary choices of "yes" and "no" to indicate whether the respondent has sought help from the corresponding help source during the past four weeks. A sample of potential help sources in this scale is "Mental health professional (e.g., school counsellor, psychologist, psychiatrist)." AHSQ showed high internal consistency with Cronbach's alpha = .83 in the original study (Rickwood et al., 2005). A total score is obtained by summing the scores of items 1 to 9 in which higher scores indicate more help-seeking behaviours from different sources. The Cronbach's alpha values of the AHSQ in the current study were .624 for Time 1 and .628 for Time 2.

4.1.4 Analytic plan

Data collected in this study were analysed using JASP ver. 0.16.2. CFA was conducted on the responses collected at Time 1 using the R beta module in conjunction with the lavaan R package. The robust maximum likelihood (MLR) estimation was used for CFA. The following cut-off values are suggested for the goodness-of-fit model indices to evaluate the CFA models as follows: $\chi2/df < 3$, $CFI > 0.95$, $GFI > 0.95$, $TLI > 0.95$, and $RMSEA < 0.05$, and $SRMR < 0.08$. Descriptive analysis such as mean, standard deviation, and percentage was conducted to analyse the demographic information.

The reliability and convergent validity were examined using the JASP and semTools R package. Cronbach's alpha was computed to investigate the internal consistencies of the MHLq-12. Average variance extracted (AVE) values were computed for the MHLq-12 subscales to examine the convergent validity with a threshold of AVE values > 0.5. Divergent validity was determined by Pearson's correlation coefficient between MHLq-12 scores and HLS-SF12 scores. Test-retest reliability was examined by calculating the intraclass correlation coefficient (ICC) using SPSS statistical package version 26, based on a single rater/measurement, absolute-agreement, 2-way mixed-effects model. Predictive validity was tested by conducting multiple linear regressions to see whether the scores of subscales in the MHLq-12 could predict three outcome variables in Time 2, which are (a) help-seeking intention, as measured by the GHSQ scores; (b) help-seeking behaviour, as measured by the AHSQ scores; and (c) positive mental health, as measured by the PMHS scores.

4.2 Results

4.2.1 Confirmatory Factor Analysis

      In Study 2, CFA was conducted on the sample collected during Time 1. The purpose was to clarify the controversies shown by the best-fit model (12-item four-factor model with one error covariance) identified in Study 1, which achieved all fit indices but indicated insignificant factor loadings in two items. The additional fit indices of each competing model were reported in Table 4.1.

Table 4.1

Model Fit Indices for CFA Models

Model	χ^2	df	p	χ^2/df	CFI	TLI	RMSEA [90% CI]	SRMR
1. One-factor model	246.64	54	< .001	4.57	0.625	0.541	.129 [.114, .145]	0.136
2. Second-order model	96.26	50	< .001	1.93	0.910	0.881	.066 [.046, .085]	0.096
3. Second-order model (two error covariances)	91.98	48	< .001	1.92	0.914	0.882	.065 [.045, .086]	0.097
4. Four-factor model	67.02	48	.036	1.40	0.963	0.949	.043 [.012, .066]	0.053
5. Four-factor model (one error covariance)	62.19	47	.044	1.38	0.970	0.958	.039 [.009, .053]	0.052

Note. CFI = comparative fit index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation; SRMR = standardized root mean square residual.

The CFA results of other competing models in Study 2 replicated the findings in Study 1: all the fit indices did not achieve the cut-off for the 12-item one-factor model, the 12-item second-order model, and the 12-item second-order model with two error covariances. Meanwhile, the 12-item four-factor model showed a good fit except for the TLI value, whereas the 12-item four-factor model with one error covariance achieved an excellent fit for all fitness indices. The factor loadings for all items in this model were significant, including items 3 and 22 (refer to Figure 4.1).

Figure 4.1

CFA of the 4-factor model (one error covariance)
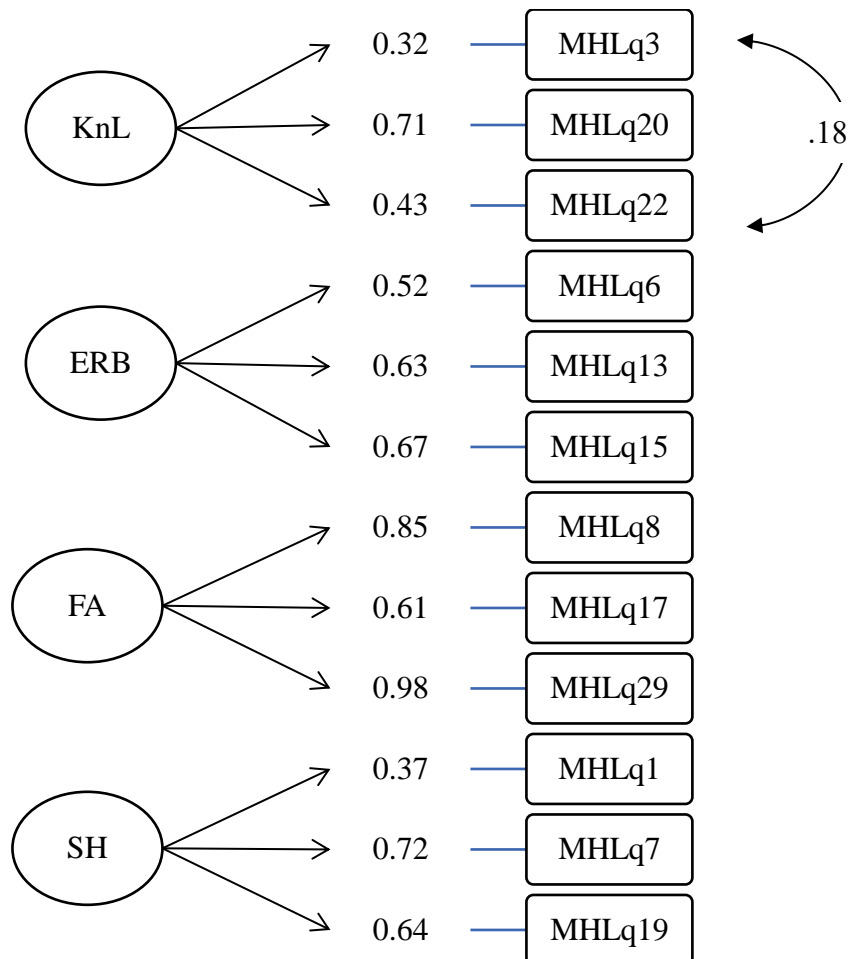
In this CFA, the controversies on insignificant factor loadings were resolved. The current result confirmed the robustness of the 12-item four-factor model with one error covariance. Therefore, it was identified as the best-fit model in our study.

As the results did not suggest the existence of a latent factor, the computation of the total score for the MHLq-12 was not recommended. Therefore, the subsequent analyses for the psychometric properties were conducted separately by each factor in the MHLq-12.

4.2.2 Reliability

Table 4.2 shows Cronbach's alpha values for the overall MHL-12 and its subscales in Time 1 and Time 2. In general, the MHLq-12 and its subscales did not demonstrate acceptable internal consistencies as the values of Cronbach's alpha were below 0.7, except for the FA subscale.

Table 4.2

Cronbach's alpha values of MHLq-12 Subscales

Variable	Cronbach's α	
	Time 1	Time 2
MHLq-12	0.707	0.689
KnL	0.535	0.501
ERB	0.628	0.674
FA	0.843	0.763
SH	0.592	0.622

Note. KnL = Knowledge of Mental Health Problems subscale, ERB = Erroneous Beliefs/Stereotypes subscale, FA = First Aid Skills and Help-Seeking Behaviour subscale, SH = Self-Help Strategies.

Test-retest reliability was examined by computing ICC estimates using the scores of the MHLq-12 subscales in Time 1 and Time 2 (refer to Table 4.3). In general, the MHLq-12 subscales obtained ICC estimates ranging between 0.5 and 0.75 are indicative of moderate reliability (Koo & Li, 2016).

Table 4.3

ICC Estimates of MHLq-12 Subscales

Subscales	Intraclass correlation [95% CI]
KnL	0.522** [.373, .644]
ERB	0.625** [.498, .726]
FA	0.618** [.489, .720]
SH	0.568** [.429, .680]

Note. ** indicates $p < .001$.

4.2.3 Convergent Validity

The AVE values of the MHLq-12 subscales were as follows: 0.254 for KnL subscale, 0.352 for ERB subscale, 0.723 for FA subscale, and 0.365 for SH subscale. Current findings indicated limited convergent validity for the MHLq-12 subscales, as three subscales did not exceed the cutoff of 0.5 for AVE values.

4.2.4 Divergent validity

The correlations between the MHLq-12 subscales scores and the HLS-SF12 scores were low (refer to Table 4.4). The divergent validity of the MHLq-12 was established by the weak association between MHL and health literacy, indicating that it measures a distinct construct from general health literacy.

Table 4.4

Correlations between MHLq-12 subscales and HLS-SF12

Variable	1	2	3	4
1. KnL				
2. ERB	.379**			
3. FA	.167	.039		
4. SH	.383**	.137	.382**	
5. HLS-SF12	.351**	.295*	.242**	.286*

Note. * indicates $p < .05$, ** indicates $p < .001$. KnL = Knowledge of Mental Health Problems subscale, ERB = Erroneous Beliefs/Stereotypes subscale, FA = First Aid Skills and Help-Seeking Behaviour subscale, SH = Self-Help Strategies.

4.2.5 Predictive validity

The results of the multiple linear regressions revealed that among the four subscales of the MHLq-12, only the FA scores in Time 1 showed significant predictive effects on the GHSQ and PMHS scores in Time 2. However, other subscales in Time 1 did not have significant predictive effects on the GHSQ and PMHS scores in Time 2. None of the four subscales in Time 1 significantly predicted the AHSQ scores in Time 2. The regression results are shown below in Table 4.5. The findings indicated that the FA subscale

demonstrated some predictive validity on participants' future outcomes in help-seeking intention and positive mental health.

Table 4.5

Predictive Effects of MHLq-12 Factors by Outcome Variables

Outcome Variable	Predictor	t	p	β	F	df	p	Adj. R^2
GHSQ_T2								
	Overall model				8.10	4, 108	< .001	.23
	KnL_T1	-1.98	.050	-.18				
	ERB_T1	-1.94	.055	-.18				
	FA_T1	4.68	< .001	.44				
	SH_T1	-0.79	.430	-.08				
AHSQ_T2								
	Overall model				0.95	4, 108	.439	-.002
	KnL_T1	0.22	.824	.02				
	ERB_T1	0.31	.759	.03				
	FA_T1	1.74	.084	.19				
	SH_T1	-0.26	.795	-.03				
PMHS_T2								
	Overall model				3.83	4, 108	.006	.09
	KnL_T1	-1.35	.181	-.130				
	ERB_T1	-0.87	.386	-.084				
	FA_T1	2.17	.032	.219				
	SH_T1	1.57	.119	.159				

Note. GHSQ_T2 = GHSQ scores in Time 2, AHSQ_T2 = AHSQ scores in Time 2, PMHS_T2 = PMHS scores in Time 2, KnL_T1= KnL subscale scores in Time 1, ERB_T1 = ERB subscale scores in Time 1, FA_T1 = FA subscale scores in Time 1, SH_T1 = SH subscale scores in Time 1.

In summary, the results of Study 2 regarding the psychometric properties of the MHLq-12 were mixed. The internal consistencies of the MHLq-12 subscales, as measured by Cronbach's alpha, were slightly below the

satisfactory level of 0.7. On the other hand, the test-retest reliability of the MHLq-12 subscales was supported, as indicated by the ICC values.

Regarding construct validity, the findings provided mixed results. The convergent validity of the MHLq-12 subscales was not supported, as the AVE values were below the recommended threshold of 0.5. However, the MHLq-12 demonstrated discriminant validity, as it exhibited a low correlation with the health literacy construct, indicating that it measures a distinct construct from general health literacy. The MHLq-12 showed limited evidence for predictive validity except for the FA subscale. Overall, while the MHLq-12 displayed satisfactory divergent validity and test-retest reliability, there were limitations in its internal consistency and convergent validity.

CHAPTER 5

DISCUSSION

Despite increasing mental health awareness, the availability of validated MHL remains scarce in Malaysia. To the best of our knowledge, this research is the first to provide a comprehensive investigation into the psychometric properties of an instrument for MHL in the local context, including its factorial structure, reliability, and validity. The results of this research revealed a four-factor structure that is consistent with the original study. Meanwhile, the removal of items with dissatisfactory factor loadings resulted in a 12-item MHLq which is briefer and more tailored to the Malaysian context. This chapter discusses the applicability of this brief MHL instrument (MHLq-12) based on the empirical evidence from current study findings.

5.1 General Discussion

5.1.1 Factorial Structure

In Study 1, both EFA and CFA were conducted to study the factorial structure of the MHLq. The initial result of EFA revealed a four-factor structure that corresponds to the subscales in the original MHLq, which are knowledge of mental health problems (KnL), erroneous beliefs/stereotypes (ERB), first-aid skills and help-seeking behaviour (FA), and self-help strategies (SH).

This finding from our Malaysian undergraduate student sample is consistent with the MHLq's factor structure revealed in the original cultural context and other countries such as the United States and China (Campos et al., 2022; Dias et al., 2018). While the MHLq retains its factor structure in different countries, it suggests that the MHL dimensions measured by the MHLq are meaningful and relevant across cultures. The consistency of factor structure provides preliminary support for the MHLq's ability to measure MHL in Malaysia.

In EFA, items with low factor loadings are subjected to removal due to their limited contribution to measuring the target factor. Cultural variation is one of the common reasons that often contributes to weak factor loadings, in which certain items may not resonate or be relevant to individuals from different cultural backgrounds (Borsa et al., 2012). Notably, Item 4 ("If I had a mental disorder, I would seek my relatives' help.") and Item 18 ("If I had a mental disorder, I would seek my friends' help.") on the FA subscale exemplify this trend. The weak factor loadings suggest these items may not align with Malaysians' help-seeking preferences. Living in a collectivistic society like Malaysia, individuals may be more prone to feelings of shame concerning how others might view themselves if they have a mental health problem (Kotera & Ting, 2021). A cross-national study found that Malaysian university students held stronger beliefs than their Western counterparts that their mental health problems would be stigmatised by family and community (Kotera et al., 2021). This cultural context may elucidate why the two specific items pertaining to

Following the items suggested in EFA, CFAs were conducted in Study 1 with few competing models. Among the competing models, the first-order four-factor model with an error covariance demonstrated an excellent fit, and all items loaded on their target factors accordingly. However, non-significant factor loadings were observed for two items within the KnL subscale, despite their high loadings in the initial structure suggested by EFA. This inconsistency sparked controversy, which could be the issues with the model's validity in capturing item relationships or the quality of responses in this sample. To address these concerns, another CFA was conducted on a new sample in Study 2 to clarify the controversies and verify the model. The significant factor loadings of Items 3 and 22 in this CFA gave evidence of the model's robustness and supported the decision to retain these two items.

In the finalised model, an error covariance was added between items 3 and 22 of the KnL subscale. The two items ask about diagnostic criteria of mental disorder, which are the symptoms of schizophrenia and time length of manifestation of the symptoms respectively. These two items are conceptually relevant as both symptoms and duration are important to inform the decision for diagnosis of a mental disorder (APA, 2022). Therefore, they might seem alike to respondents. Adding error covariances between the two items can assist future researchers in recognising the questionable nature of these items and emphasise the need for potential revisions in subsequent studies.

In the MHLq-12, one of the identified factors corresponds to the First Aid Skills and Help Seeking Behaviour subscale in the original MHLq. This factor retains three items from the original questionnaire: Item 17 assesses the respondents' intention to refer someone close to them to a psychologist or psychiatrist for a mental disorder, while Item 8 and 29 assess the respondents' intention to seek help from a psychologist and psychiatrist for themselves. Upon closer examination, it has been determined that Item 17 does not fully capture the concept of first-aid skills as it encompasses a more comprehensive set of skills and strategies involved in mental health first aid. First-aid skills in the context of mental health often involve listening nonjudgmentally, offering support and information, and utilising various related skills to provide initial assistance and facilitate the recognition of mental health issues.

To ensure clarity and accurately represent the underlying construct, the factor has been appropriately renamed 'help-seeking behaviours' instead of first-aid skills. This renaming aligns with the content of the three items, which assess attitudes that facilitate appropriate help-seeking. Future studies are recommended to include additional items that specifically assess the skills and strategies involved in providing initial assistance and support to others in need of mental health help. This will contribute to a more accurate assessment of individuals' mental health first aid as part of MHL.

The results of CFAs identified the first-order four-factor model as the best-fit model in our studies rather than a second-order model. This finding

seems to conflict with the common theoretical assumption, which interprets MHL as a higher-order construct that consists of several dimensions (Jorm, 2012; Kutcher et al., 2016). The lack of fit in the second-order model might be attributed to the low intercorrelations between the MHLq-12 subscales, particularly between ERB and FA. Weak relationships among the lower-level factors may affect the ability of the second-order factor to explain the shared variance among the lower-level factors adequately (Kline, 2016). This result implies that some subscales in the MHLq-12 are not much related to the other subscales to form a system of interdependence that is meaningful in reflecting the participants' level of MHL.

One possible explanation for the low intercorrelations between the MHLq-12 subscales could be potential variations in the understanding of MHL among participants from different cultural contexts. To date, most studies on MHL have focused on Western populations, who generally place greater value on maintaining good mental health than in developing countries like Malaysia (Loo et al., 2012). In contrast, Malaysian participants might not adequately recognise the importance of some components in the MHLq-12 (e.g., self-help strategies) to mental health due to a less comprehensive understanding of MHL (IPH, 2019). Given the great discrepancies, exploring MHL perceptions using a grounded theory approach in Malaysia is crucial to identify the crucial components required for measuring MHL in Malaysia rather than being imposed from existing theories (Chun Tie et al., 2019). Guided by the grounded theory approach, future researchers are recommended to conduct in-depth

interviews or focus group discussions to gather comprehensive qualitative data for MHL.

The original definition and existing theories have generally posited the concept of MHL as a multidimensional construct. However, the findings from our studies did not support a second-order model. It is worth noting that the original MHLq was developed based on Jorm's conceptualisation of MHL, which is often considered the golden standard for MHL (Campos et al., 2016; Kutcher et al., 2016). This discrepancy could suggest there may be limitations in the MHLq's ability to encompass the complexity and breadth of MHL dimensions fully. Particularly, the four subscales in the MHLq were not fully aligned with the six dimensions proposed in Jorm's definition. Therefore, the lack of fit to the second-order model may raise questions about the adequacy of the MHLq in capturing the comprehensive nature of MHL.

On the other hand, it is also important to note that Jorm's theoretical framework of MHL has not been validated empirically, despite its widespread acceptance. For instance, the Mental Health Literacy Scale (MHLS), which consists of all MHL dimensions in Jorm's definition, have obtained a single-factor structure as the best-fit model in its original study (O'Connor et al., 2015). However, subsequent validation studies of the MHLS have yielded different factor structures, including a four-factor model (Krohne et al., 2022), a six-factor model (Montagni & González Caballero, 2022) and a four first-order and two second-order structure (Wang et al., 2022). These inconsistent findings suggest a lack of consensus regarding the underlying structure of MHL as

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defined by Jorm. As no evidence was to establish the relationship of Jorm's proposed dimensions to one higher-order MHL construct, it may justify the lack of fit to the second-order model for MHLq-12 that was observed in our studies.

To address these concerns, further research is recommended to thoroughly examine and validate Jorm's definition of MHL before applying it as a guiding framework for scale development. Establishing the empirical basis for Jorm's definition of MHL is essential as many researchers in the field of MHL lay their groundwork on the basis of the "golden standard". Once the validity of Jorm's definition of MHL is established, future researchers are encouraged to focus on refining and improving the MHLq items to enhance its ability to measure MHL effectively.

5.1.2 Reliability

The three subscales in MHLq-12, which are KnL, ERB, and SH, demonstrated inadequate internal consistencies across the current research, as indicated by Cronbach's alpha values below 0.7. This could imply that the items in the subscales seem not to measure the same thing to participants in our studies, or some items are perceived as irrelevant to each other. Future studies may consider working on the modifications of items to enhance their relatedness in measuring the target factor.

On the other hand, the poor Cronbach's alpha values might be explained by the number of items. In MHLq-12, there are only three items in each subscale.

Cronbach's alpha could underestimate the reliability of scales with a smaller number of items (Sijtsma, 2009). Future researchers may reconsider the cutoff value of Cronbach's alpha which is more optimal for a scale with fewer items when establishing the internal consistencies of the MHLq-12.

Current research also examined the test-retest reliability of the MHLq-12 subscales. The moderate reliability shown by those subscales was consistent with past studies that established the stability of MHL instruments over time (e.g., Bjørnsen et al., 2017). Notably, the test-retest of the MHLq-12 subscales corresponded to their internal consistencies. ERB and FA have higher estimates for both types of reliability compared to KnL and SH. One possible explanation for this was quality of items could affect both types of reliability estimates concurrently (McCrae et al., 2011). Ambiguous items could affect the participants' patterns of response to items within the same subscale, resulting in unsatisfactory internal consistency. Meanwhile, ambiguous items could lead to higher variability in the interpretation of items, causing participants to respond differently over separate occasions although the items were the same.

In conclusion, the findings suggest that the MHLq-12 may require further refinement to improve its internal consistency. Researchers should consider revising the items to enhance their coherence and relevance. Despite these limitations, the moderate test-retest reliability of the MHLq-12 subscales supports the stability of MHL measurements over time. It is advisable to exercise caution when using the MHLq-12 in its current form, as its reliability may not be optimal. However, the MHLq-12 holds the potential to become a

reliable tool in the future with further refinement and validation on the identified issues.

5.1.3 Validity

Convergent validity. In Study 2, the findings suggested that the MHLq-12 may not demonstrate satisfactory convergent validity. Except for the FA subscale, all other subscales in the MHLq-12 had an AVE value lower than the recommended cutoff of 0.5, which is generally used to establish convergent validity (Chen et al., 2015; Gu et al., 2019; J. Hair et al., 2010). The low AVE values could be attributed to low factor loadings displayed by some items (e.g., Item 1 in the SH subscale). When an item might not effectively capture the underlying essence of the MHL construct they were intended to measure, it may result in a weak association with the other items within the subscale, contributing to the low AVE values (Hair et al., 2021).

To enhance the psychometric properties of the MHLq-12, further investigations are needed to resolve the issues related to low AVE values. By carefully scrutinising the items with low factor loadings, it can ensure that this instrument accurately measures the intended dimensions of MHL.

Divergent validity. The findings from Study 2 support the divergent validity of the MHLq-12, indicating that it measures a distinct construct separate from general health literacy. The weak correlation between the MHLq-12 subscales and the HLS-SF12 ($r < .3$) could imply that MHL encompasses

knowledge and skills beyond general health literacy. This finding corroborates previous studies that reported a weak positive relationship between MHL and health literacy (Akgün et al., 2022; Lee et al., 2020). These results emphasise the need for a domain-specific approach when measuring mental health literacy to better understand individuals' mental health (Jorm, 2015). In summary, the MHLq-12 subscales demonstrate their validity by effectively capturing the unique construct of MHL.

Predictive validity. Guided by the past findings that MHL plays a role in help-seeking and mental well-being (Bonabi et al., 2016; Gorczynski et al., 2017), it is hypothesised that MHL could predict respondents' subsequent help-seeking intention, help-seeking behaviours, and positive mental health measured three weeks later. However, findings in Study 2 did not lend weight to the predictive validity of the MHLq-12.

This result might be related to the complex nature of the relationship between MHL and help-seeking. Some studies have discovered the indirect pathways between MHL and help-seeking through mediators, such as stigma and attitudes toward mental health issues (DeBate et al., 2018; Kim et al., 2020). This implies that help-seeking may not be predicted directly by MHL. Indeed, few studies reported that MHL was not a significant predictor of help-seeking intention and behaviours health (Aldalaykeh et al., 2019; Gulliver et al., 2012). Therefore, it seems possible that help-seeking and mental might not be the most suitable candidates for testing the predictive validity of the MHLq-12.

5.2 Limitations and Recommendations

Several limitations could be addressed in this current research. First, the criterion variables selected to test the predictive validity of the MHLq-12 in Study 2 might not be the most suitable ones. As mentioned earlier in the discussion, the level of MHL is more likely to have an indirect effect on help-seeking intention and help-seeking behaviour. This could explain the poor performances of the MHLq-12 in predicting these variables. Future studies are recommended to validate the MHLq-12 against criterion variables that have direct impacts from MHL, such as the stigma and attitudes toward mental health issues.

The sample of the present study is not representative of the ethnic groups in our country, with most respondents consisting of Chinese (92.9%). This has made the findings derived from this study less generalisable to the Malaysian population. Future studies are recommended to replicate the study on a sample that is more equal in the distribution in terms of the ethnic groups of the respondents. For instance, a stratified sampling method can be employed to obtain representative samples by dividing the population into strata (i.e., Malay, Chinese, Indian, Bumiputera) and randomly sampling from the strata based on the predefined proportion for each stratum.

Another limitation is some of the instruments that were used to examine the validity of the MHLq-12 had not been validated in local context. This could be a source of threat to the validity of the results. Future researchers are

recommended to validate the MHLq-12 against those instruments that have been validated in Malaysia.

5.3 Implications/ Contribution

5.3.1 Theoretical Implication

Our studies found the discrepancy between the idea of a single MHL construct encompassing multiple domains proposed by Jorm and the lack of support for a second-order model from current findings. This raises important theoretical implications for the definition of MHL.

Firstly, it raises doubts about the adequacy of Jorm's proposed MHL framework as a multidimensional construct despite its widespread acceptance. While this idea has not been empirically examined, the existing conceptualisation of MHL as a single construct encompassing multiple dimensions may not accurately capture the complexity and multidimensionality of the construct. Future works may focus on thoroughly examining and validating the structure of MHL by empirical research, such as structural equation modelling.

Along with this line, current findings found low correlations between MHLq subscales, particularly between erroneous beliefs/ stereotypes (ERB) subscales and those that measure help-seeking behaviours. For a multidimensional construct like MHL, it is crucial to establish strong and

meaningful relationships between the lower-order factors. The lack of such relationships in our study might suggest that not all attributes included in Jorm's definition truly represent the construct of interest. This raises concerns about potentially misclassifying factors that may be the antecedents or consequences of MHL as part of the MHL construct. This misclassification can lead to a distorted understanding of the MHL construct and its associations with other variables. While there have been debates over the inclusion of stigma/ stereotypes as a dimension of MHL, current findings further indicate the need for further investigation and refinement of this dimension to ensure its relevance and coherence within the broader construct of MHL.

5.3.2 Practical Implication

The current study has several practical implications for researchers and practitioners. First, results from this research support the potential use of an abbreviated version of MHL instruments in survey research and interventions. In such conditions, abbreviated versions are often favoured to reduce cognitive strain for respondents. This helps to minimise missing data and mitigate high attrition rates during data collection (Basarkod et al., 2018; Linardon et al., 2019). Researchers and practitioners can consider the use of abbreviated MHL instruments as a more efficient option, particularly in large-scale survey studies.

While findings have implied a rudimental use of MHLq-12 in Malaysia, current research identified the MHLq-12's structure that is comparable to other validation studies of MHLq in various cultural contexts. This comparability

allows researchers to compare findings directly and facilitate the synthesis of research findings across multiple studies. Consistency in measurement allows for meaningful comparisons and increases the validity of conclusions drawn from research studies.

Besides, the current research provides a foundation for future research to develop a culturally tailored MHL instrument for the Malaysian context. In the current study, a total of 12 items with better factor loadings remained after the item reduction procedure. By identifying a subset of 12 items with better factor loadings, the study highlights items that may align more closely with the understanding of mental health literacy in the local context. Further efforts can focus on modifying and refining these items to create a measurement tool that accurately reflects the nuances of MHL in Malaysia.

CHAPTER 6

CONCLUSION

Our studies identified a first-order four-factor structure for the MHLq-12, which does not support the existence of an underlying higher construct of MHL. As a result, the study recommends using the MHLq-12 in separate subscales and obtaining individual scores for each subscale with caution, as the questionnaire may not yet possess strong evidence of reliability and validity. Researchers and practitioners should consider this limitation when utilising the MHLq-12 and carefully evaluate whether the MHLq-12's subscales align with their research objectives and the specific aspects of MHL they aim to measure.

The 12-item MHLq remains the factor structure similar to its original one. MHLq-12 assesses knowledge of mental health problems such as depression and schizophrenia, as well as some common misunderstandings about mental health problems. This instrument also assesses their help-seeking in terms of getting professional help, and knowledge on maintaining good mental health among undergraduates in Malaysia. The dimensions in MHLq-12 correspond to Jorm's definition of MHL.

This instrument covers the typical approach of MHL, including the knowledge and beliefs about mental disorders. At the same time, it consists of items that tap into the understanding of behaviours that can be taken to improve

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mental health, such as getting professional help and self-help strategies. The latter aligns with the call from Jorm (2020) to direct more attention to the knowledge that can link people to take action that aids the nurturance of their mental health.

While future researchers might use this instrument as a potential tool to assess and empower undergraduates' MHL, researchers can evaluate the domains in MHL that students need to enhance to ensure they have sufficient knowledge to deal with their daily challenges and alleviate those impacts on their mental health.

It is important to note that Campos et al. (2022) obtained the same structure in their studies and employed a total sum scoring for all subscales. However, based on current findings, researchers who want to employ a total MHL score for the MHLq-12 should use and interpret it cautiously to best suit their study's needs.

Current findings suggest that there is room for improvement in the psychometric soundness of the MHLq-12 in a Malaysian context. However, the discovery of a shortened version provides a valuable direction for enhancing the instrument. Cultural differences should be considered when modifying items of MHLq-12 to develop an instrument tailored to the local context. This ensures that the instrument captures the specific aspects of MHL that are relevant and meaningful within the Malaysian cultural setting.

The findings in this study also provide insights into the need to examine and validate the prevailing definition of MHL. A clear and validated definition of MHL is crucial to provide a solid foundation for research and practice in the field. Nevertheless, a greater focus on consolidating the conceptualisation of MHL would be needed to develop MHL instruments with good construct and content validity.

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Appendix A

Letter of Ethical Approval

UTAR **UNIVERSITI TUNKU ABDUL RAHMAN**
Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

Re: U/SERC/176/2020

4 November 2020

Mr Pheh Kai Shuen
Department of Psychology and Counselling
Faculty of Arts and Social Science
Universiti Tunku Abdul Rahman
Jalan Universiti, Bandar Baru Barat
31900 Kampar, Perak

Dear Mr Pheh,

Ethical Approval For Research Project/Protocol

We refer to your application for ethical approval for your research project (Master student's project) and are pleased to inform you that your application has been approved under expedited review.

The details of your research project are as follows:

Research Title	Validation of Mental Health Literacy (MHL) Questionnaire for University Students in Malaysia
Investigator(s)	Mr Pheh Kai Shuen Dr Tan Chee Seng Low Kah Yue (UTAR Postgraduate Student)
Research Area	Social Sciences
Research Location	UTAR (Kampar Campus)
No of Participants	2,000 students (Age: 18 - 65)
Research Costs	Self-funded
Approval Validity	4 November 2020 - 3 November 2021

The conduct of this research is subject to the following:

(1) The participants' informed consent be obtained prior to the commencement of the research,

(2) Confidentiality of participants' personal data must be maintained; and

(3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.

Should you collect personal data of participants in your study, please have the participants sign the attached Personal Data Protection Statement for your records.

The University wishes you all the best in your research.

Thank you.

Yours sincerely,

Professor Ts Dr Faidz bin Abd Rahman
Chairman
UTAR Scientific and Ethical Review Committee

c.c   Dean, Faculty of Arts and Social Science
        Director, Institute of Postgraduate Studies and Research

Kampar Campus: Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia
Tel: (605) 468 8888 **Fax**: (605) 466 1313
Sungai Long Campus: Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia
Tel: (603) 9086 0288 **Fax**: (603) 9019 8868
Website: www.utar.edu.my

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Appendix B

Permission from Author of the MHLq

Request for permission to use MHLq-Young Adult form
4 messages

kayuss hang <hastaforg@gmail.com>   Thu, Dec 3, 2020 at 1:56 PM
To: pdias@porto.ucp.pt
Cc: Chee Seng Tan <tcseng@utar.edu.my>, Kai Shuen Pheh <phehks@utar.edu.my>

Good day,

My name is Kah-Yue Low, a graduate student of Psychology at the University Tunku Abdul Rahman, Malaysia.

I have an opportunity to read your work entitled "Mental Health Literacy in Young Adults: Adaptation and Psychometric Properties of the Mental Health
Literacy Questionnaire", which was published in the International Journal of Environmental Research and Public Health in 2018. I was very impressed with your study for validating a mental health literacy (MHL) measure among young adults.

I am writing to request for the full scale of the MHLq-Young Adult form and to gain permission of using and validating this scale in Malaysian context. I am intending to adopt and validate the scale as my Master's dissertation.

I would like to determine the psychometric properties of the MHLq among Malaysian university students aged 18 years old and above. My study will be supervised by Mr. Kai-Shuen Pheh and Dr. Chee-Seng Tan at the Department of Psychology and Counselling, University Tunku Abdul Rahman.

Thank you for your kind consideration of my request. I look forward to hearing from you soon.

Yours sincerely,
Kah-Yue Low

Luísa Campos <mcampos@porto.ucp.pt>   Wed, Dec 23, 2020 at 7:47 PM
To: "hastaforg@gmail.com" <hastaforg@gmail.com>

Dear Kah-Yue Low,

Sorry for the late response.

We thank you for your interest in our work on the assessment of Mental Health Literacy.

Please find attached the Mental Health Literacy questionnaire – young adult form - and its procedures document.

Looking forward to hearing from you.

Best,

Luísa Campos

[Quoted text hidden]

....

2 attachments

Appendix C

Informed Consent

UNIVERSITI TUNKU ABDUL RAHMAN (UTAR)
FACULTY OF ART AND SOCIAL SCIENCE (FAS)
DEPARTMENT OF PSYCHOLOGY AND COUNSELLING

PARTICIPANT INFORMATION SHEET

Validation of Mental Health Literacy Questionnaire (MHLq) among undergraduate students

You are invited to take part in a research study. Before you decide whether or not to take part, it is important for you to understand why the research is being conducted and what it will involve. Please take the time to read the following information carefully and decide if you want to take part in this study. Please feel free to ask questions if there is anything that is not clear or if you would like more information.

Purpose of the Research:
This study is done in order to validate the Mental Health Literacy Questionnaire (MHLq) among undergraduate students in Malaysia. In order to collect the required information, your participation in this research study is highly appreciated.

Participants:
*All students who have enrolled in **any bachelor's programmes (undergraduate students)** in universities in Malaysia are welcomed to participate in this study.*

Procedure:
*This study is a longitudinal study. **After you filled in the first survey, your email will be requested in order for researchers to send you an follow-up email to***

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complete another survey. Both surveys includes questions on your knowledge about general and mental health, as well as some or your feelings and behaviours in past few weeks. Your will be requested for providing your demographic information at the last part of this research. This survey could take 10-15 minutes to be completed.

Benefits:
As a token of appreciation, RM10 Touch 'n Go eWallet credit will be given to those participants who have participated in this study. However, there are certain criteria that must be fulfilled so that participants are entitled to claim the token of appreciation:
(a) Participants are required to **complete the whole study,** *which are the first survey three weeks ago and the current survey.*
(b) Participants are required to **pass the attention check questions** *inserted throughout this survey. It is important that you pay attention to this study.*

Kindly note that failures to fulfill the aforementioned criteria will result in disqualification for the token of appreciation.

Ethical Clearance:
Current research has been reviewed and approved by UTAR Scientific and Ethical Review Committee (Ref. no: U/SERC/176/2020). The chairperson of UTAR SERC is Prof Ts Dr Faidz bin Abd Rahman (contact number: +603-90860288, Extension: 395 ; email: faidzar@utar.edu.my).

Voluntary Participation:
Participation in this study is totally voluntary, you are under no obligation to take part in this study. If you decide to take part you will be given this information sheet to keep and will be asked to sign a consent form. You have the right to withdraw from the study at any time and without giving a reason, there will be no penalty and it will not affect the relationship with the researchers in the future.

Risks/Discomfort:
No risks or minimal risks will be anticipated in this study, which means that the probability and magnitude of harm or discomfort anticipated in the research are not greater in and of themselves than those ordinarily encountered in daily life or during the performance of routine physical or psychological examinations or tests.

However, you may decide to pull out anytime as you will not be held responsible for opting out. If you experience any discomfort in participating the study, you may terminate your participation. If you have encountered issues such as distress after your participation in this study, feel free to contact the researchers through the email provided at the last section.

Confidentiality:
All information and responses given by you will be kept confidential and will not made available to the public unless disclosure is required by law. The data of the research will neither be revealed to the third party nor used for any other purposes other than the study.
Thank you for taking the time to read this Participant Information Sheet and considering taking part in the study. If you do wish to take part in the study, please indicate at the consent form below.

If you have any further questions concerning this study please feel free to contact us through email: Low Kah Yue at hastaforg@gmail.com or Mr Pheh Kai Shuen at phehks@utar.edu.my (supervisor).

Appendix D

Demographic Information

Age

```
┌─────────────────────────────────────────────────────────┐
│                                                         │
│                                                         │
└─────────────────────────────────────────────────────────┘
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Gender

○ Male
○ Female

Ethnicity

○ Malay
○ Chinese
○ Indian
○ ┌─────────────────────┐ Others (Please specify)
  │   │
  └─────────────────────┘

Name of university/ college

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┌─────────────────────────────────────────────────────────┐
│                                                         │
└─────────────────────────────────────────────────────────┘
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Appendix E

Questionnaire

Mental Health Literacy Questionnaire MHLq Part 1

Section A

Please indicate how much you agree with each statement.

	1 = Strongly disagree	2 = Disagree	3= Neither agree nor disagree	4= Agree	5= Strongly Agree
1. Physical exercise contributes to good mental health.	O	O	O	O	O
2. A person with depression feels very miserable.	O	O	O	O	O
3.People with schizophrenia usually have delusions (e.g., they may believe they are constantly being followed and observed).	O	O	O	O	O
4. If I had a mental disorder I would seek my relatives' help.	O	O	O	O	O
5. If someone close to me had a mental disorder, I would encourage her/him to look for a psychologist.	O	O	O	O	O
6. Mental disorders don't affect people's behaviours.	O	O	O	O	O
	1 = Strongly disagree	2 = Disagree	3= Neither agree nor disagree	4= Agree	5= Strongly Agree
7. Sleeping well contributes to good mental health.	O	O	O	O	O
8. If I had a mental disorder I would seek a psychologist's help.	O	O	O	O	O
i. Please select "Strongly Disagree" for this statement.	O	O	O	O	O
9. A person with anxiety disorder may panic in situations that she/he fears.	O	O	O	O	O

	1 = Strongly disagree	2 = Disagree	3= Neither agree nor disagree	4= Agree	5= Strongly Agree
10. People with mental disorders belong to low-income families.	O	O	O	O	O
11. If someone close to me had a mental disorder, I would listen to her/him without judging or criticising.	O	O	O	O	O

	1 = Strongly disagree	2 = Disagree	3= Neither agree nor disagree	4= Agree	5= Strongly Agree
12. Alcohol use may cause mental disorders.	O	O	O	O	O
13. Mental disorders don't affect people's feelings.	O	O	O	O	O
14. The sooner the mental disorders are identified and treated, the better.	O	O	O	O	O
15. Only adults have mental disorders.	O	O	O	O	O

Mental Health Literacy Questionnaire MHLq Section A cont

Section A (con't)

Please indicate how much you agree with for each statement.

	1 = Strongly disagree	2 = Disagree	3= Neither agree nor disagree	4= Agree	5= Strongly Agree
16. Changes in brain function may lead to the onset of mental disorders.	O	O	O	O	O
17. If someone close to me had a mental disorder, I would encourage her/him to see a psychiatrist.	O	O	O	O	O
18. If I had a mental disorder I would seek friends' help.	O	O	O	O	O
19. A balanced diet contributes to good mental health.	O	O	O	O	O

	1 = Strongly disagree	2 = Disagree	3= Neither agree nor disagree	4= Agree	5= Strongly Agree
ii. Kindly select "Disagree for this statement.	O	O	O	O	O

	1 = Strongly disagree	2 = Disagree	3= Neither agree nor disagree	4= Agree	5= Strongly Agree
20. One of the symptoms of depression is the loss of interest or pleasure in most things.	O	O	O	O	O
21. If someone close to me had a mental disorder, I could not be of any assistance.	O	O	O	O	O
22. The symptom's length is one of the important criteria for the diagnosis of a mental disorder.	O	O	O	O	O
23. Depression is not a true mental disorder.	O	O	O	O	O
24. Drug addiction may cause mental disorders.	O	O	O	O	O

	1 = Strongly disagree	2 = Disagree	3= Neither agree nor disagree	4= Agree	5= Strongly Agree
25. Mental disorders affect people's thoughts.	O	O	O	O	O
26. Doing something enjoyable contributes to a good mental health.	O	O	O	O	O
27. A person with schizophrenia may see and hear things that nobody else sees and hears.	O	O	O	O	O
28. Highly stressful situations may cause mental disorders.	O	O	O	O	O
29. If I had a mental disorder I would seek a psychiatrist's help.	O	O	O	O	O

Short-Form Health Literacy Instrument (HLS-SF12)

Section B

On a scale from very easy to very difficult, how easy would you say it is to:

	1= Very difficult	2= Difficult	3= Easy	4= Very easy
1. find information on treatments of illnesses that concern you?	○	○	○	○
2. understand the leaflets that come with your medicine?	○	○	○	○
3. judge the advantages and disadvantages of different treatment options?	○	○	○	○
4. call an ambulance in an emergency?	○	○	○	○
5. find information on how to manage mental health problems like stress or depression?	○	○	○	○

	1= Very difficult	2= Difficult	3= Easy	4= Very easy
6. understand why you need health screenings (such as breast exam, blood sugar test, blood pressure)?	○	○	○	○
iii. Please select "Easy" for this statement.	○	○	○	○
7. judge which vaccinations you may need?	○	○	○	○
8. decide how you can protect yourself from illness based on advice from family and friends?	○	○	○	○
9. find out about activities (such as meditation, exercise, walking, Pilates etc.) that are good for your mental well-being?	○	○	○	○

	1= Very difficult	2= Difficult	3= Easy	4= Very easy
10. understand information in the media (such as Internet, newspaper, magazines) on how to get healthier?	○	○	○	○
11. judge which everyday behavior (such as drinking and eating habits, exercise etc.) is related to your health?	○	○	○	○
12. join a sports club or exercise class if you want to?	○	○	○	○

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Positive Mental Health Scale (PMH-Scale

Please indicate how much you agree with for each statement. Please do not leave out a statement.

	0= Do not agree	1= Disagree	2= Tend to agree	3= Agree
1. I am often carefree and in good spirits	◯	◯	◯	◯
2. I enjoy my life.	◯	◯	◯	◯
3. All in all, I am satisfied with my life.	◯	◯	◯	◯
iv. Please select "Agree" for this statement.	◯	◯	◯	◯
4. In general, I am confident	◯	◯	◯	◯
5. I manage well to fulfill my needs.	◯	◯	◯	◯
6. I am in good physical and emotional condition.	◯	◯	◯	◯
7. I feel that I am actually well equipped to deal with life and its difficulties.	◯	◯	◯	◯
8. Much of what I do brings me joy.	◯	◯	◯	◯
9. I am a calm, balanced human being.	◯	◯	◯	◯

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General Help-Seeking Questionnaire (GHSQ)

Section D

Below is a list of people who you might seek help or advice from if you were experiencing a personal or emotional problem.
Please indicate the number that shows *how likely is it* that you would seek help from each of these people for a personal or emotional problem during the **next 4 weeks**?

	Extremely unlikely	Moderately unlikely	Slightly unlikely	Neither likely nor unlikely	Slightly likely	Moderately likely	E:
Partner (e.g., significant boyfriend or girlfriend)	O	O	O	O	O	O	
Friend (not related to you)	O	O	O	O	O	O	
Parent	O	O	O	O	O	O	
Other relative/ family member	O	O	O	O	O	O	
Please select "Moderately likely"	O	O	O	O	O	O	
Mental health professional (e.g., school counsellor, psychologist, psychiatrist)	O	O	O	O	O	O	
Phone help line (e.g., Lifeline, Kids Help Line)	O	O	O	O	O	O	
Family doctor / GP	O	O	O	O	O	O	
Teacher (year advisor, classroom teacher)	O	O	O	O	O	O	
Someone else not listed above (please describe who this was)	O	O	O	O	O	O	
I would not seek help from anyone	O	O	O	O	O	O	

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AHSQ

Section E

Below is a list of people who you might seek help or advice from if you were experiencing a personal or emotional problem.

Tick any of these who you have gone to for advice or help in the **past 2 weeks** for a personal or emotional problem.

	Yes	No
Partner (e.g., significant boyfriend or girlfriend)	O	O
Friend (not related to you)	O	O
Parent	O	O
Other relative/ family member	O	O
Mental health professional (e.g., school counsellor, psychologist, psychiatrist)	O	O
Please select "No"	O	O
Phone help line (e.g., Lifeline, Kids Help Line)	O	O
Family doctor / GP	O	O
Teacher (year advisor, classroom teacher)	O	O
Someone else not listed above (please describe who this was)	O	O
I would not seek help from anyone	O	O

Appendix F

Interitem Correlations between Original MHLq Items

Items 1-10

Variable	MHLq_1	MHLq_2	MHLq_3	MHLq_4	MHLq_5	MHLq_6	MHLq_7	MHLq_8	MHLq_9	MHLq_10
1. MHLq_1	—									
2. MHLq_2	0.118*	—								
3. MHLq_3	0.095	0.270***	—							
4. MHLq_4	0.122*	-0.105	-0.065	—						
5. MHLq_5	0.115*	0.111	0.154**	0.162**	—					
6. MHLq_6	0.210***	0.186***	0.107	-0.230***	0.052	—				
7. MHLq_7	0.400***	0.027	0.110	0.120*	0.160**	0.142*	—			
8. MHLq_8	0.263***	0.050	0.042	0.260***	0.435***	-0.013	0.287***	—		
9. MHLq_9	0.108	0.269***	0.283***	0.067	0.246***	0.152**	0.231***	0.120*	—	
10. MHLq_10	0.057	0.013	0.032	-0.222***	0.097	0.397***	0.099	0.028	0.113*	—
11. MHLq_11	0.138*	0.104	0.114*	0.032	0.222***	0.080	0.117*	0.208***	0.250***	0.186***
12. MHLq_12	0.059	0.103	0.156**	0.150**	0.019	9.085×10^{-4}	0.145*	0.091	0.073	-0.167**
13. MHLq_13	0.182**	0.236***	0.168**	-0.214***	0.071	0.645***	0.131*	-0.046	0.261***	0.425***

Variable	MHLq_1	MHLq_2	MHLq_3	MHLq_4	MHLq_5	MHLq_6	MHLq_7	MHLq_8	MHLq_9	MHLq_10
14. MHLq_14	0.179 **	0.212 ***	0.212 ***	0.001	0.217 ***	0.179 **	0.199 ***	0.311 ***	0.215 ***	0.192 ***
15. MHLq_15	0.215 ***	0.166 **	0.165 **	-0.226 ***	0.177 **	0.528 ***	0.214 ***	0.122 *	0.252 ***	0.528 ***
16. MHLq_16	0.004	0.152 **	0.176 **	-0.001	0.151 **	0.177 **	0.018	0.081	0.234 ***	-0.023
17. MHLq_17	0.155 **	0.201 ***	0.192 ***	0.075	0.652 ***	0.049	0.119 *	0.479 ***	0.249 ***	0.068
18. MHLq_18	0.064	-0.035	0.057	0.326 ***	0.040	-0.071	0.126 *	0.089	0.124 *	-0.102
19. MHLq_19	0.346 ***	0.165 **	0.163 **	0.211 ***	0.064	-0.018	0.449 ***	0.223 ***	0.137 *	-0.023
20. MHLq_20	0.056	0.286 ***	0.298 ***	-0.065	0.212 ***	0.199 ***	0.029	0.093	0.351 ***	0.176 **
21. MHLq_21	0.175 **	0.116 *	0.175 **	-0.104	0.055	0.324 ***	0.137 *	0.187 ***	0.147 **	0.276 ***
22. MHLq_22	0.111	0.197 ***	0.236 ***	0.117 *	0.122 *	0.081	0.027	0.109	0.229 ***	0.002
23. MHLq_23	0.121 *	0.281 ***	0.175 **	-0.157 **	0.111	0.439 ***	0.068	0.082	0.251 ***	0.379 ***
24. MHLq_24	0.057	0.159 **	0.106	0.118 *	0.048	0.046	0.085	0.001	0.140 *	-0.090
25. MHLq_25	0.101	0.322 ***	0.196 ***	-0.090	0.072	0.339 ***	0.072	0.007	0.344 ***	0.191 ***
26. MHLq_26	0.280 ***	0.200 ***	0.227 ***	0.122 *	0.164 **	0.162 **	0.412 ***	0.186 ***	0.354 ***	0.054

Variable	MHLq_1	MHLq_2	MHLq_3	MHLq_4	MHLq_5	MHLq_6	MHLq_7	MHLq_8	MHLq_9	MHLq_10
27. MHLq_27	0.120*	0.269***	0.391***	-0.031	0.200***	0.140*	0.128*	0.127*	0.232***	0.106
28. MHLq_28	0.106	0.210***	0.220***	0.034	0.188***	0.203***	0.186**	0.103	0.367***	0.042
29. MHLq_29	0.169**	0.101	0.105	0.257***	0.435***	-0.047	0.194***	0.784***	0.105	-0.072

*p < .05, **p < .01, *** p < .001

Items 11-20

Variable	MHLq_11	MHLq_12	MHLq_13	MHLq_14	MHLq_15	MHLq_16	MHLq_17	MHLq_18	MHLq_19	MHLq_20
12. MHLq_12	0.015	—								
13. MHLq_13	0.138*	-0.041	—							
14. MHLq_14	0.266***	0.136*	0.096	—						
15. MHLq_15	0.249***	-0.094	0.592***	0.181**	—					
16. MHLq_16	0.194***	0.160**	0.138*	0.219***	0.064	—				
17. MHLq_17	0.335***	0.008	0.088	0.363***	0.194***	0.212***	—			
18. MHLq_18	0.112*	0.131*	-0.140*	0.093	-0.128*	0.047	0.061	—		

Variable	MHLq_11	MHLq_12	MHLq_13	MHLq_14	MHLq_15	MHLq_16	MHLq_17	MHLq_18	MHLq_19	MHLq_20
19. MHLq_19	0.169 **	0.211 ***	-0.014	0.214 ***	-0.015	0.031	0.150 **	0.154 **	—	
20. MHLq_20	0.276 ***	0.001	0.209 ***	0.290 ***	0.147 **	0.318 ***	0.254 ***	-0.018	0.183 **	—
21. MHLq_21	0.335 ***	0.047	0.312 ***	0.281 ***	0.358 ***	0.141 *	0.218 ***	0.062	0.106	0.165 **
22. MHLq_22	0.223 ***	0.084	0.128 *	0.269 ***	0.063	0.252 ***	0.196 ***	0.140 *	0.216 ***	0.378 ***
23. MHLq_23	0.225 ***	0.011	0.420 ***	0.228 ***	0.555 ***	0.145 *	0.164 **	-0.032	-0.004	0.283 ***
24. MHLq_24	-0.015	0.496 ***	0.058	0.066	-0.065	0.152 **	-0.046	0.107	0.169 **	0.079
25. MHLq_25	0.155 **	0.047	0.389 ***	0.141 *	0.304 ***	0.227 ***	0.130 *	-0.046	0.069	0.303 ***
26. MHLq_26	0.094	0.065	0.182 **	0.287 ***	0.128 *	0.132 *	0.247 ***	0.110	0.358 ***	0.240 ***
27. MHLq_27	0.143 *	0.003	0.211 ***	0.278 ***	0.186 ***	0.267 ***	0.214 ***	0.033	0.098	0.256 ***
28. MHLq_28	0.124 *	0.169 **	0.211 ***	0.230 ***	0.176 **	0.227 ***	0.188 ***	0.079	0.114 *	0.328 ***
29. MHLq_29	0.207 ***	0.137 *	-0.061	0.296 ***	0.062	0.126 *	0.577 ***	0.148 **	0.213 ***	0.134 *

*p < .05, **p < .01, *** p < .001

Items 21-29

Variable	MHLq_21	MHLq_22	MHLq_23	MHLq_24	MHLq_25	MHLq_26	MHLq_27	MHLq_28	MHLq_29
22. MHLq_22	0.119 *	—							
23. MHLq_23	0.298 ***	0.131 *	—						
24. MHLq_24	0.042	0.186 **	0.005	—					
25. MHLq_25	0.096	0.162 **	0.254 ***	0.206 ***	—				
26. MHLq_26	0.228 ***	0.193 ***	0.083	0.072	0.254 ***	—			
27. MHLq_27	0.049	0.279 ***	0.268 ***	0.121 *	0.217 ***	0.165 **	—		
28. MHLq_28	0.072	0.239 ***	0.227 ***	0.132 *	0.296 ***	0.317 ***	0.237 ***	—	
29. MHLq_29	0.164 **	0.174 **	0.072	-0.015	0.015	0.203 ***	0.178 **	0.180 **	—

*p < .05, **p < .01, *** p < .001

Appendix G

Factor Loadings of Six-Factor Solution

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Uniqueness
MHLq_15	0.804						0.314
MHLq_6	0.729						0.448
MHLq_13	0.728						0.379
MHLq_10	0.602						0.594
MHLq_23	0.554						0.570
MHLq_20		0.664					0.536
MHLq_9		0.547					0.639
MHLq_28		0.490					0.691
MHLq_22		0.485					0.703
MHLq_27		0.473					0.747
MHLq_3		0.471					0.759
MHLq_25		0.468					0.650
MHLq_2		0.451					0.761
MHLq_16		0.428					0.760
MHLq_29			0.826				0.280
MHLq_8			0.784				0.316
MHLq_17			0.674				0.377
MHLq_5			0.636				0.545
MHLq_7				0.742			0.434
MHLq_19				0.640			0.493
MHLq_26				0.514			0.573
MHLq_1				0.499			0.695
MHLq_12					0.773		0.400
MHLq_24					0.593		0.577
MHLq_11						0.465	0.656
MHLq_21						0.418	0.639

Note. Applied rotation method is promax.

Appendix H

Factor Loadings of Five-Factor Solution

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Uniqueness
MHLq_15	0.836					0.311
MHLq_6	0.751					0.455
MHLq_13	0.735					0.403
MHLq_10	0.613					0.604
MHLq_23	0.558					0.581
MHLq_21	0.419					0.762
MHLq_4	-0.328			0.222		0.739
MHLq_25	0.247	0.436				0.685
MHLq_1	0.206			0.542		0.690
MHLq_20		0.719				0.565
MHLq_9		0.534				0.656
MHLq_22		0.533				0.732
MHLq_3		0.503				0.756
MHLq_27		0.485				0.746
MHLq_16		0.463				0.760
MHLq_28		0.462				0.728
MHLq_2		0.462				0.761
MHLq_26		0.331		0.562		0.578
MHLq_8		-0.272	0.853			0.303
MHLq_14		0.271	0.260			0.713
MHLq_17		0.226	0.733			0.380
MHLq_11		0.207	0.259			0.799
MHLq_29			0.887			0.283
MHLq_5			0.611			0.605
MHLq_7				0.780		0.465
MHLq_19				0.633		0.574
MHLq_12					0.758	0.455
MHLq_24					0.654	0.544
MHLq_18						0.885

Note. Applied rotation method is promax.

Appendix I

Factor Loadings of Four-Factor Solution

	Factor 1	Factor 2	Factor 3	Factor 4	Uniqueness
MHLq_15	0.824				0.315
MHLq_13	0.724				0.414
MHLq_6	0.698				0.488
MHLq_10	0.654				0.595
MHLq_23	0.522	0.236			0.593
MHLq_21	0.390				0.768
MHLq_4	-0.362			0.296	0.733
MHLq_25	0.262	0.464			0.682
MHLq_1	0.259			0.565	0.688
MHLq_7	0.251	-0.234		0.775	0.491
MHLq_12	-0.208	0.236		0.276	0.803
MHLq_18	-0.206			0.230	0.881
MHLq_20		0.624			0.612
MHLq_16		0.528			0.763
MHLq_22		0.511			0.735
MHLq_2		0.482			0.758
MHLq_3		0.481			0.759
MHLq_9		0.470			0.676
MHLq_27		0.466			0.749
MHLq_28		0.461			0.725
MHLq_24		0.361	-0.234	0.212	0.775
MHLq_14		0.269	0.276		0.712
MHLq_17		0.212	0.763		0.365
MHLq_29			0.799		0.328
MHLq_8			0.759	0.243	0.346
MHLq_5			0.613		0.596
MHLq_11			0.285		0.801
MHLq_19				0.622	0.596
MHLq_26				0.448	0.661

Note. Applied rotation method is promax.