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LIST OF SCIENTIFIC WORKS BY AUTHOR RELATED TO THE THESIS

[1] Phoeun, B. Nguyen, A. J., Dang, H. M., Tran, T. N., Weiss, B. (2019). Assessing the Effectiveness of Teachers' Mental Health Literaccy Training in Cambodia: A Randomized Controlled Trail. *VNU Journal of Science: Education Research,* Vol 35, No. 3 (2019) 1-15

[2] Nguyen, A. J., Dang, H. M., Bui, D., Phoeun, B., Weiss, B. (**under review**). Experimental evaluation of a school-based mental health literacy program in two Southeast Asian nations

[3] Phoeun, B. Nguyen, A. J., Dang, H. M., Weiss, B. (**under review**). Adaptation, Implementation, and Pilot Testing of a School-Based Mental Health Literacy Program in Cambodia

INTRODUCTION

1. Context and Background

Child and adolescent mental health problems create great burden throughout the world for individuals, their families and public health services. According to the World Health Organization (WHO), up to 20% of children suffer from mental health disorders worldwide, accounting for 15-30% of Disability-Adjusted Life Years (DALYs) lost during the first three decades of life [WHO, 2003]. About half of these mental health disorders begin before the age of 14 [WHO, 2014]. The prevalence of child mental health problems is similar in Low-and-Middle Income Countries (LMICs), with roughly 10–20% of children and young people experiencing mental health problems [Kieling, Baker-Henningham, et al., 2011]. Amongst adolescents, the most prevalent classes of mental disorders include common anxiety and mood disorders[Frauenholtz & Mendenhall, 2014; Merikangas, Nakamura, & Kessler, 2009]. According to the global mental health resources survey, the greatest gaps for mental health problems are found in low-middle-income-countries [Morris, Lora, McBain, & Saxena, 2012]. This increased burden of treatment gaps may occur as a consequence of the limited resources available in LMICs. Beyond the resource and policy challenges described above, there are also other, more social reasons that mental health disorders in LMICs remain unrecognized and untreated, among both adult and child populations. Key among these are a lack of knowledge about mental health and mental disorders, and the unwillingness of individuals to seek support given the stigma associated with mental disorders [D. Chisholm et al., 2007; Hossain, 2006; Saraceno et al., 2007; WHO, 2005a]. Stigma and discrimination continue to be great barriers even in settings with a stronger mental health service system [Kim, Thomas, Wilk, Castro, & Hoge, 2010], and are thought to be even more of a barrier in LMIC where there is often less awareness and understanding of mental health as a disorder [Ganasen et al., 2008; Mascayano, Armijo, & Yang, 2015]. Studies conducted in LMICs have also reported stigma reduced disclosure and help-seeking and increased harmful coping strategies; in these settings, even medical professionals may have limited mental health knowledge and negative attitudes toward mental illness [Mascayano et al., 2015]. Adolescents also report experiencing stigma, with parents, peers and school staff that had limited knowledge about mental health issues endorsing less positive attitudes toward students with mental illness than those with more knowledge of mental health [Moses, 2010]. Adolescents who had limited or inaccurate mental health information held more stigmatizing attitudes toward mental disorders and more negative attitudes to perceived mental health services. Those who do seek care may receive minimally adequate care or experience care that is culturally inappropriate and that is characterized by stigmatizing beliefs and attitudes toward their mental illness [Augsberger, Yeung, Dougher, & Hahm, 2015a; Benjamin Vicente et al., 2012]. Children with mental health problems are at increased risk of poor academic performance, truancy, school dropout, self-harm, risky behavior and premature deaths by suicide [Schulte-Korne, 2016]. Many of these adverse outcomes could be prevented if prevention, early identification, and intervention efforts were initiated in a timely and effectively manner [Hawton, Saunders, & O'Connor, 2012]. Particularly in LMIC such as Cambodia, where there is such a shortage of mental health treatment options, the potential impact of a comprehensive prevention, early intervention, and treatment system such as that promoted by the U.S. Institute of Medicine (IOM; 2009) is substantial. Critical to a comprehensive response strategy are efforts to reduce stigma and increase mental health help-seeking, through strategies such as promotion of mental health literacy among youth, families,

schools, and health services. Mental health literacy is conceptualized as having several components, including (1) t understanding how to maintain positive mental health, (2) understanding mental disorders and their treatments, (3) decreasing stigma related to mental disorders, (4) enhancing help-seeking efficacy [Stan Kutcher, Wei, & Coniglio, 2016].

2. Statement of the problem

In Cambodia, as is the situation among many LMIC as previously described, the shortage of financial aid to mental health, infrastructure, and human resources as well as the low mental health literacy in community have contributed to the poor quality of Cambodian mental health services and are barriers to mental health utilization. Only 2% of health centers (18 out of 967) and 59% referral hospitals (50 out of 84) offer mental health service to outpatients, resulting in very low mental health service utilization rate of 0.001 per capita (Leitner, 2012). Mental health services for children are even more inadequate than for the adult population. Several studies point to the potential magnitude of mental morbidity among young people in Cambodia and provide evidence of the imperative to respond to this developing need (Jegannathan & Kullgren, 2011; Tanja Schunert et al., 2012; Vostanis, 2006). Given the breadth of the current treatment gap, closing this gap in the near future is not feasible unless alternative delivery models are developed (Kieling et al., 2011). In the immediate future, there needs to be an alternative pathway for supporting young people, and the role of school teachers in the recognition and promotion of early mental health education and intervention has been promoted in a range of other LMICs, such as Vietnam (H. M. Dang, Weiss, Nguyen, Tran, & Pollack, 2017). Teachers are traditionally well-educated and respected professionals working in close contact with students and as a part of their role they are able to offer physical and emotional support to students. This existing relationship between teachers and students has therefore been identified as a potential avenue for bringing mental health services to adolescents in communities where there are limited existing mental health resources (Dang et al. 2017; Greenwood, 2008; Miller-Lewis et al., 2014).

The potential for educators to play such a critical role in the development of positive individual and community attitudes to mental health, and the possibility of early identification of mental health difficulties, provides the impetus for this study to focus on the school environment. Specifically, the school environment is a critical environment to explore mental health within Cambodia because this is (i) the life period where most mental health issues first develop (Merikangas et al., 2010) (ii), school provides access and support to a majority of children and therefore all young people are under a teachers' guidance and supervision (WHO, 2016; Kessler et al., 2007), and (iii) it is well documented that a failure to appropriately recognise and treat children experiencing mental health difficulties can result in poor educational performance, increased dropout rates from education and consequent lifelong disadvantage (Esch et al., 2014; Van Ameringen, Mancini, & Farvolden, 2003). Previous research found that professional development for teachers to support students with mental health problems was strongly correlated with teacher knowledge, belief and ability to identify problems as well as support and refer students with mental disorders for professional help; promoting mental health in schools has a positive impact on long-term interventions for mental health (Jorm, Kitchener, Sawyer, Scales, & Cvetkovski, 2010; Kirchner, Yoder, Kramer, Lindsey, & Thrush, 2000; Koller & Bertel, 2006; Wells, Barlow, & Stewart-brown, 2003).

3. Objectives of the Study

This is the first Cambodian study to explore the effectiveness of mental health literacy training in school in relation to knowledge, beliefs and attitudes toward mental illness. The goal of this current study is twofold. As a first aim, this study is to characterize the baseline mental health literacy of secondary and high school teachers and students. Descriptive

analysis provides an analysis of differences in mental health literacy as a function of respondent's education, grad, gender and experience. Second aim is evaluating the effectiveness of teacher's mental health literacy training and to examine moderators of intervention impact on students at intervention group, whether students improved knowledge and attitudes after receiving mental health literacy intervention.

4. Research Questions and Hypotheses

Research Questions

In this study, we aim to answer seven questions as identified as below:

1. What are the baseline measures of knowledge, attitudes and mental health beliefs across secondary and high school teachers? Are these baseline measures influenced by gender, educational background and teacher experience?
2. Does Mental Health Literacy (MHL) Training increase teachers' knowledge, beliefs, behaviors, and attitudes toward mental illness as measured post training?
3. Are changes in teachers' knowledge, beliefs, and attitudes influenced by the variables of level of education, gender and experience of teachers?
4. What is the baseline measure of mental health knowledge across students in in Don Bosco High school (grade 7, 8, 10, and 11)?
5. Does mental health literacy taught by teachers 1h/week and 6h for six weeks lead to an increase in students' knowledge of mental health?
6. Are changes in students' mental health knowledge influenced by level of education, age and gender?
7. Is the Guide culturally applicable to Cambodian classroom context?

Hypotheses

1. Hypothesis1: It is assumed that teachers are less likely to have better knowledge, positive beliefs and attitudes toward mental illness and these will vary by gender, level of education, and experience of teaching.
2. Hypothesis2: Mental health literacy training will increase teacher's mental health literacy (knowledge, beliefs and attitudes toward mental illness) amongst intervention group compare to control group.
3. Hypothesis3: Demographic characteristics such as level of education, experience of teachers and teacher gender will affect teachers' responses to mental health literacy training.
4. Hypothesis4: It is assumed that students are less likely to have mental health knowledge and their knowledge will vary by level of education, age, and gender.
5. Hypothesis5: Mental health literacy intervention for students will increase students' mental health knowledge toward mental illness.
6. Hypothesis6: Demographic data such as level of education (grade), age and gender will affect students' responses to mental health literacy intervention.
7. Hypothesis7: Is the Guide culturally feasible and acceptable to Cambodian classroom context?

5. Significance of the Study

The study provided primary data on the knowledge, attitudes and beliefs (mental health literacy) relating to mental health amongst secondary and high school teachers and students. It also explored the impact of training on these components of mental health literacy. It was anticipated that teachers who received mental health literacy training potentially improved their knowledge, beliefs and positive attitude toward mental illness. The impact of teacher's mental health literacy also benefit for students who received mental health literacy intervention by their usual classroom teachers, and mental health literacy

training could therefore provide a pathway solution to promote and prevent students' mental health problems in school setting.

CHAPTER 1
THEORETICAL FRAMEWORK

1.1. Literature Review

1.1.1. A Global Perspective of Child and Adolescent Mental Health

Mental disorders contribute substantial burden to society due to their widespread occurrence and devastating effects. Recent data suggests that mental illness accounts for 13% of global disability [Vigo, Thornicroft, & Atun, 2016a]. This burden is the most hard-hitting in low- and middle-income countries (LMIC), where there is often a lack of mental health infrastructure, resulting in massive treatment gaps. In the poorest of these countries, it is estimated that up to 85% people with severe mental illness receive no treatment for their mental health problems [Demyttenaere et al., 2004; Vigo, Thornicroft, & Atun, 2016b; WHO, 2009b]. Treatment gaps are often the highest for children and adolescents [Morris et al., 2011; Paula et al., 2014a; WHO, 2003, 2009c]. Recognition of the high prevalence and prolonged impact of these disorders provides an important foundation on which to plan services, allocate of resources, and develop additional research to broaden our understanding and focus on this global issue [Polanczyk, Salum, Sugaya, Caye, & Rohde, 2015]. Overall it appears that there is a lack of epidemiological studies of common mental disorders in children and adolescents in LMIC. Global reports have emphasised the need for research in LMICs into aspects of prevalence, and the efficacy of intervention for mental health disorders in children and adolescents [Belfer, 2008; Bronsard et al., 2016; Bhoomikumar Jegannathan & Kullgren, 2011; Kieling et al., 2011; Guilherme V. Polanczyk, Willcutt, et al., 2015; Ravens-Sieberer et al., 2008; Steel et al., 2014].

1.1.2. Lack of Mental Health Literacy as a Barrier to Treatment

Adversities, including deaths, have occurred due to the lack of mental health literacy in the community and this knowledge is differed from one to other countries. A cross-sectional study of 440 samples between British, Malaysia and Hong Kong populations showed British had better knowledge in identification mental disorders compare to Hong Kong Chinese and Malaysians. British reported more endorsed professional help compared with Hong Kong and Malaysian participants, whereas self-help and social support was endorsed more by Malaysian and Hong Kong participants. This study revealed that a population with lower mental health literacy are less likely to endorse professional help compare to population have better mental health knowledge [Loo, Wong, & Furnham, 2012]. Numerous studies have shown students lack of mental health literacy and hold negative beliefs and attitudes toward mental disorders. In Australia, a population-based health survey conducted among 1678 students in 2013 showed that only 16.4% participants had adequate mental health literacy in term of identification of depression and seeks help intention. Among this population, 23.4% correctly identified the vignette as depression and 14.8% were classified to have more moderate to severe depression. This study revealed that majority of participants who had better knowledge in recognition depression intended to seek help [Lam, 2014]. In Japan, a survey conducted with high school students, showed less than 20% of respondents rated suggesting professional help seeking are to be helpful for mental health problems which represents the lack of mental

health literacy amongst this population and it is an obstacle for treatment [Yoshioka, Reavley, Rossetto, & Jorm, 2015]. in Nigeria by Aluh et al., [2018] also revealed that Nigerian adolescents have limited knowledge of recognizing mental disorders. The results of this study showed less than 5% of the participants could correctly identify and label the depicting vignette as depression and only 1.5% recommended help from a psychiatrist or psychologist. This represents a huge gap of understanding mental health and the issues around mental health utilization with this population. Teachers also have challenges in identifying children with mental health problems. In Vietnam, findings by Dang and colleagues showed teachers have inadequate knowledge about mental health [Dang, Weiss, Lam, & Ho, 2018]. Therefore, it should be taken into account the need to study mental health literacy across countries which identify the problems.

1.1.3. The Role of Teachers in Management of Mental Health Issues

Teachers have an influential role in educating and supporting students' learning and development because they are able to observe them over an extended period of time [Herman, Reinke, Parkin, Traylor, & Agarwal, 2009; Meldrum, Venn, & Kutcher; Moor et al., 2000]. A review of previous studies shows that teachers need to be involved and take action to support students with mental health problems [Fazel et al.,2014; Jorm et al.,2010; Kelleher, 2014; Kutcher et al.,2015; Parikh et al., 2016; Woods, 2014]. Teachers see supporting students with mental health problems as part of their professional role [Herman et al., 2009; Reinke et al., 2011; Van Ameringen et al., 2003; Jessica Whitley et al., 2012]; but studies have shown that they believe they lack the knowledge and skills to adequately address such problems [A. Andrews, McCabe, & Wideman-Johnston, 2014; Mazzer & Rickwood, 2015b; Reinke et al., 2011]. A review of relevant literature indicates that although teachers have a desire to support students with mental health problems, they experience stress due to the fact that they feel they lack the experience to identify problems and the skills with which to respond [Curtis et al., 2006; Ibeziako et al., 2009; Jackson & King, 2004; Kurumatani et al., 2004; Kutcher et al., 2015 & 2016; Langeveld et al., 2011; Loades & Mastroyannopoulou, 2010; Lucas et al., 2009; Masillo et al., 2012; Meltzer et al., 2003; Reinke et al., 2011; Rothì et al., 2008]. Examining teachers' experiences of managing mental health problems, Rothì, Leavey, & Best [2008] found that teachers often feel unable to identify mental health problems, or that they have no specific training in relevant areas (as shown by their confusion related to the terminology used by the Child and Adolescent Mental Health Service). A study of teachers' recognition of mental health needs in Nigeria [Ibeziako et al., 2009], using focus group interviews, demonstrated that teachers were able to identify common mental health problems in children and their causal factors. A study by Bella, Omigbodun, & Atilola, [2011] investigating the knowledge and attitudes of teachers toward mental health problems found that teacher inability to recognize children with mental problems potentially resulted in emotional stress, intolerance and negative attitudes toward children with mental health problems. Although there has been a lack of research, evidence based on studies conducted to date suggests that teachers believe mental health literacy training will increase their knowledge, skills, and self-efficacy toward supporting and responding to the learning and development of students with mental health concerns [Graham, Phelps, Maddison, & Fitzgerald, 2011; Roeser & Midgley, 1997; Walter, Gouze, & Lim, 2006; Jessica Whitley et al., 2012]. A review of mental health literacy among educators by Whitley et al., [2013] acknowledged that research has been limited regarding teacher's values, beliefs and attitudes about mental health issues in the classroom. However, the previously mentioned study conducted in India by Parikh et al., [2016] revealed lower education has a significant impact on mental health literacy resulting in increased negative attitudes, increased beliefs in the dangerousness of people with mental

illness and therefore increased attempts to socially distance themselves from those with mental illness.

1.1.4. Mental Health Literacy Program

Scholarly literature often probes various components of MHL that could be targets for intervention, as well as assessing responses among different populations to programs targeting the development of mental health literacy. Most commonly, studies have tracked the effect of interventions on knowledge, stigma reduction and awareness. Findings generally indicating that these components of mental health literacy are subject to positive change [Wei, Kutcher, Hines, & Mackay, 2014a]. Investigations relating to mental health literacy have been undertaken in many contexts including communities [Anthony F. Jorm, 2012], populations of university students [Mazzer & Rickwood, 2015b] and school based environments [Yoshioka, Reavley, MacKinnon, & Jorm, 2014]. Within the school environment there is significant support for the efficacy of mental health interventions to increase the mental health literacy of the teacher cohort. Interventions related to MHL are generally shown to be an effective "evidence based practice" to improve knowledge and attitudes in educational settings [S. Kutcher et al., 2015; S. Kutcher, Wei, & Coniglio, 2016; Stan Kutcher, Wei, McLuckie, & Bullock, 2013; Wei & Kutcher, 2014; Wei, Kutcher, Hines, & Mackay, 2014b]. Evidence-based intervention showed school mental health intervention was a pathway solution to improve adolescent's mental health. A school-based educational intervention in Australia showed students increased their knowledge and attitudes toward mental illness. This study designed as cluster Randomized Control Trail. It was conducted with 380 students of 22 classes from ten private secondary schools. The study was aimed to assess mental health literacy, prejudiced beliefs and help-seeking toward mental illness among adolescents. Students were assessed before and after intervention, plus a 6-month follow up. Over a period of 5 to 8 weeks, students received 10 hours of intervention taught by personal development, health and physical education teachers. The results of this study showed student's improved their knowledge and reduce stigma [Perry et al., 2014]. Similar finding in Norway also highlighted the importance of mental health literacy program to improve adolescent's mental health. This study was conducted with 1070 adolescents from three schools in a Norwegian town. After a three day intervention, students were assessed. This was followed by a six month follow up. The results showed that the mental health literacy intervention program was helpful to improve student's mental health literacy. Students' increased their knowledge in recognition, positive attitudes (reduced prejudiced beliefs) and promoted appropriate help-seeking behaviors [Skre et al., 2013]. Another study based on mental health literacy intervention showed teachers increase their knowledge after receiving training. This study was accomplished with 218 teachers in Malawi, Africa. Teachers were assessed before and immediately after completing three days training based on the African Guide Malawi version. Teachers greatly improved their knowledge and attitudes toward mental illness after the training. The results showed that the program was effective in improving teacher's mental health [Kutcher et al., 2015]. Kutcher et al., [2015] identify the mental health literacy taught by usual classroom teachers was effective in improving student's attitudes toward mental illness. Teachers received mental health training based on AGMs format for one week before teaching in the classrooms. As a result of this study mental health literacy programs taught by classroom teacher was significant in developing positive attitudes toward mental illness. Ojio and colleagues identified the mental health literacy program led by usual teachers was effective to increase student's mental health literacy. This study was conducted with secondary school students in Tokyo using a two 50 minutes session on mental health literacy that taught by usual teachers. The intervention was effective increasing knowledge and positive attitudes toward mental illness among school-

age children. Due to the positive results the schools established mental health literacy programs in their system [Ojio et al., 2015]. Studies by Kutcher et al. [2013 & 2016] and Wei et al. [2014] showed that mental health literacy training significantly improved teachers' knowledge of and attitudes toward mental health issues. Kutcher et al. [2016] adapted a Canadian mental health curriculum for use in Africa, evaluating its impact on mental health literacy among Tanzanian secondary school teachers. Results revealed highly significant improvements in teachers' overall knowledge, including knowledge of mental health and curriculum specific knowledge. Teachers' negative beliefs about mental illness also decreased. Wei et al. [2014] used a guide developed by Kutcher [2013] to implement a one-day mental health literacy training session among 134 teachers. Results showed the training significantly improved teachers' knowledge and attitudes toward mental illness, and the training was highly successful in meeting the teachers' needs as well as enhancing the teachers' confidence in addressing students' mental health in school. Studies have also measured the effects of MHL interventions among students. In a 2015 study, Kutcher et al. [2015] evaluated students' knowledge and attitudes related to mental health after being taught using the Mental Health and High School Curriculum Guide. Results showed students' knowledge of and attitudes toward mental illness improved substantially compared with baseline and this improvement was maintained at 2-month follow-up ($P < 0.001$). The findings suggest embedding MHL resources in the classroom curriculum can effectively improve literacy among students. MHL training can also be used to combat stigma against mental health disorders among student populations [Mcluckie, Kutcher, Wei, & Weaver, 2014a; Milin et al., 2016; Wei, Kutcher, Hines, & Mackay, 2014a]. In a different study by Wei et al. [2014], students showed a significant decrease in stigmatizing beliefs related to mental illness after their teachers participated in a one-day training course [Wei, Kutcher, Hines, & Mackay, 2014b]. In a randomized control trail (RCT) showed MHL curriculum resource was effective in enhancing mental health literacy for students. In the study, some schools were randomly assigned to either the intervention or control group. Among 534 students from 24 high schools, about half of participants were taught mental health literacy by their teacher. The intervention program consisted of a six-module 4-8 week curriculum guide. The changes in MH knowledge and stigma/attitudes toward mental illness were evaluated overtime between intervention and control groups. As results showed students who received the mental health curriculum had more positive attitudes towards people with mental illness and better mental health knowledge than student in control group who received no intervention [Milin et al., 2016].

1.2. Conceptual Framework

Mental health literacy was a construct that has arisen from health literacy and it is generally described in terms of several major components that could be targets for intervention; specifically this includes the recognition of mental health issues, knowledge about mental health, and attitudes toward mental health conditions [Jorm, 1997 & 2000; O'Connor et al., 2014]. Originally MHL was conceptualized as "knowledge and beliefs about mental disorders which aid their recognition, management or prevention" [Jorm, Korten, & Jacomb, 1997]. Later refined by Jorm [2012], MHL includes (a) the ability to identify mental disorders or various forms of psychological distress; (b) knowledge and beliefs regarding risk factors and determinants of mental health problems or disorders; (c) knowledge and beliefs about self-help interventions, knowledge and beliefs about available professional help; (d) attitudes which aid in recognition of mental health disorders and appropriate help-seeking behavior; and (d) knowledge on how to access mental health information. More recently, a conceptualization of MHL put forward by Kutcher, Bagnell, & Wei [2015] includes understanding how to obtain and maintain positive mental health; understanding mental disorders and their treatments; decreasing stigma relating to mental

disorders; and enhancing help-seeking efficacy (knowing when and where to seek help and developing competencies designed to improve one's mental health care and self-management capabilities). Hence, the concept of mental health literacy identifies many critical elements that are important in recognition and intervention for mental health issues [Langeveld et al., 2011; Wei & Kutcher, 2014]. Overall, mental health literacy (MHL) has been widely recognized as the groundwork for the promotion and prevention of mental health particularly in school setting [Jorm, 2012; Jorm, Korten, Jacomb et al., 1997; Kutcher, Bagnell, & Wei, 2015; Kutcher , Wei, & Coniglio, 2016; Kutcher, Wei, & Weist, 2015; Reavley & Jorm, 2011; McLuckie, Kutcher, Wei, & Weaver, 2014]. Thus, this conceptual framework is accordance to the Theory of Change. It offered a better understanding how, why and to what extent change happens as a result of MHL program. We used the ToC map the intervention of multiple pathways across three components of mental health literacy. The MHL is indicator when the knowledge change lead to the change of stigma, beliefs, attitudes (help seeking behavior) toward mental illness. Therefore, the current intervention is assumed by increasing knowledge of mental health will lead to decrease stigma (negative attitudes) and increase help-seeking behavior toward mental illness.

CHAPTER 2

METHODOLOGY

2.1. Overview of Research Design

Teachers were randomized to either participate in the mental health literacy training program or a no-intervention control condition. Teachers' mental health literacy was evaluated before and after intervention. The impact of the mental health literacy training was further investigated at the student level. To avoid contamination, students were purposively assigned to intervention and control conditions by grade level. Four teachers who had received the teacher training in the intervention condition also received an additional day of train the trainer instruction, and then taught. Students in the intervention condition then participated in a 6-week classroom-based mental health training program delivered by these teachers. Mental health literacy of students was evaluated before and after the intervention. This study has four aims as below:

Aim 1: evaluate whether baseline MHL scores vary according to participant demographics for a) teachers; and b) students.

Aim 2: evaluate whether the MHL intervention significantly improved MHL scores relative to a control group for a) teachers; and b) students.

Aim 3: evaluate whether intervention impacts were moderated by demographic characteristics for a) teachers and b) students.

Aim 4: evaluate feasibility and acceptability of the Guide-VN as adapted to Cambodian context.

2.2. Study Methods

About half of teacher was randomly assigned to intervention group and other half teacher was randomly assigned to control group. Teachers at intervention group required to participate 2-day mental health literacy training and intervention teachers were assigned to implement the guide in classroom attended one-additional day "train the trainer". The intervention teachers were observed the change in knowledge, beliefs and attitudes compare to control group. Students were assigned by grade which grade 7 and 11 students were assigned to intervention group, receiving MHL classroom intervention, and grade 8 and 10 students were assigned to control group, no intervention or receiving only their standardize

classroom curriculum. The intervention students were observed the change of knowledge and attitudes compare to control group. Descriptive analysis provides differences in mental health literacy as a function of participant's demographic information, and Analysis of Covariance (UNCOVA) was used for both the teacher and student data.

2.2.1. Participants

A total of 100 staff were contacted for recruitment. N = 73 (intervention: n = 36; control: n = 37) consented and returned the baseline assessment. Of those, 67 provided complete data for analysis (intervention: n = 34, 94%; control: n = 33, 89%); reasons for staff loss to follow up were unrelated to the project (e.g., change of employment). Students from grade 7, 8, 10 and 11 were invited to participate in the study. Students at grade 7 and 11 were assigned into intervention group, receiving mental health literacy intervention by usual classroom teachers, and students at grade 8 and 10 were assigned into control group, waitlist or not received any intervention. At baseline, there were three hundred and two (N = 302) students completed the baseline assessment (intervention: n = 158; control: n = 144). Of those, 275 students (intervention: n = 145; control: n = 130) completed data for analysis. Twenty-seven students were excluded the data for analysis because of mismatch assessments between T1 and T2.

2.2.2. Sampling strategy

This study used a random assignment for teacher participants based on a number on the consent form; those with an even number were assigned to the intervention group, and odd numbers to the control condition. Intervention teachers received training in the mental health literacy curriculum. Four intervention teachers were also selected and trained to implement the guide in classroom; the limited selection was due to limited number of classrooms for implementation. Teacher selection for this role was non-random, in consultation with the school director, because they taught English, Library, and Khmer language (i.e., classes in which the MHL materials could be included without deviating from governmental curriculum requirements). Teacher in control group were waiting list, did not receive any intervention. For students, purpose sampling was used. Because of containment and to reduce spill-over, students were carefully assigned by grade. Students at seven and eleven grades were allocated to intervention group, and students at eight and ten grade were assigned to waiting list. Intervention students received six module sessions by their usual classroom teachers while control student did not receive any intervention.

2.3. *Measures*

Teacher Measures

Teacher pre-post outcomes were assessed using the Mental Health Knowledge Quiz (MHK-Q), Mental Health Literacy Scale (MHLS), and Beliefs toward Mental Illness (BMI). These assessments were translated, adapted and also piloted with 10 staff before beginning the study. The Guide Lesson Fidelity Rating and Teacher Survey were used to observe teacher implementing the guide in classroom.

The Mental Health Knowledge Quiz [Kutcher, 2016] is an assessment developed for use with the curriculum to assess knowledge of information presented in the guide. The quiz consists of 30 true/false items (e.g., "a phobia is an intense fear about something that might be harmful such as heights, snakes, etc.").Each item was scored as incorrect = 0 and correct = 1, missing data was treated as incorrect. Scores are reported as the proportion correct (range: 0-1), with higher scores indicate greater knowledge. Internal consistency was not calculated as these items are not intended to measure a single underlying construct.

The Mental Health Literacy Scale [O'Connor & Casey, 2015] was designed to assess an individual's level of mental health literacy, determine areas in which individuals may require further support, and evaluate the effectiveness of interventions intended to improve MHL. The original MHLS is a 35-item measure including six subscales that identified subjects' mental health literacy demonstrating good internal consistency (α = .87) and test-retest reliability (r = .80), and support for its validity for use in evaluating outcomes of mental health literacy training programs [O'Connor & Casey, 2015]. The MHLS was adjusted for this current study by removing those seven items due to low reliability and lack of evidence these occur in Cambodia. No epidemiology studies that addressed the severity of illness between genders are available.

Therefore, the new version of this instrument consists of 28 items which contains only four subscales four subscales, assessing (1) *ability to recognize mental disorders* (e.g., "If someone experienced excessive worry about a number of events or activities where this level of concern was not warranted, had difficulty controlling this worry and had physical symptoms such as having tense muscles and feeling fatigued then to what extend do you think it is likely they have General Anxiety Disorder?"; 8 items); (2) *Mental health help-seeking/self-efficacy (e.g.,* I am confident that I know where to seek information about mental illness"; 4 items); *(3) four subscales stigma/negative attitudes toward mental illness* (e.g., "If I had a mental illness I would not tell anyone"; 9 items); and (4) *willingness to interact with people with mental illness* (e.g., "How willing would you be to have someone with a mental illness marry into your family?" 7 items). The remaining item numbers 1 to 8 were adjusted to the 1-5 Likert scale instead of the 1-4 Likert scale. The five-point scale provided better quality in terms of missing data and higher levels of internal consistency compared to four-point. Items are evaluated using a 5-point Likert scale ranging from 0 ("very unlikely"/ "strongly disagree"/ "definitely unwilling") to 4 ("very likely"/ "strongly agree"/ "definitely willing"). Sub-scale scores were calculated as the mean of all answered items, retaining the 0-4 scale range to increase ease of interpretation. For the sub-scale of recognition, self-efficacy, and willing to interact, higher scores are more positive; for stigma toward mental illness, higher scores indicate a greater stigma toward mental illness. The total score is produced by summing all items, with a maximum score of 140 and a minimum score of 28. In the current study, internal consistency for the full scale was α = .61 (T1) and α = .72 (T2). For the subscales, internal consistency was: Recognition α = .60 (T1) and α = .66 (T2); Self-efficacy α = .63 (T1) and α = .74 (T2); Negative attitudes / stigma α = .60 (T1) and α = .66 (T2); and Willingness to interact α = .62 and α = .79 (T2)

The Beliefs toward Mental Illness Scale [Hirai & Clum, 2000], a 21-item scale is designed to assess negative stereotypical views of mental illness. Response options use a six-point Likert-scale: "completely disagree" (0), "mostly disagree" (1), "partially disagree" (2), "partially agree" (3), "mostly agree" (4) and "completely agree" (5). Scores were calculated as the mean of all included items, retaining the 0-5 scale range which lower scores indicate positive attitudes and high scores indicate negative attitudes toward mental illness. Scale consists of three subscale include (1) dangerousness of individuals with mental illness (e.g., a mental ill person is more likely to harm others than a normal person), 5 items; (2) perceptions that individuals with mental illness have poor interpersonal/ social skills (e.g., I am afraid of what my boss, friends would think if I were diagnosed as having a psychological disorder.); 10 items; and (3) perceptions of the Incurability of mental illness as a chronic, unpredictable condition (e.g., Individuals diagnosed as mental ill will suffer from the symptoms throughout their life); 6 items. Internal consistency for the full scale was α = 81 (T1) and α = .87 (T2). For the subscales, internal consistency was: Dangerousness α = .77 (T1) and α = .84 (T2); Poor social skills α = .53 (T1) and α = .54 (T2); and Incurability α = .54 (T1) and α = .54 (T2).

Student Measures

The Mental Health Knowledge and Attitude Test [Kutcher, 2016], a 36-item questionnaire developed to accompany the Mental Health & High School Curriculum Guide: Understanding Mental Health and Mental Illness, Washington State, USA edition. This measure assess **knowledge**, with 28 statements evaluated as true / false / I don't know answer (e.g., "People who have a mental illness are frequently violent"). To more accurately assess knowledge and avoid correct responses by chance, students encouraged to select "I don't know" rather than guess if they did not know. Knowledge scores are reported as the proportion correct (range: 0-1), with "I don't know" considered not correct. Total score is produced by summing all items, maximum score of 28. The remaining eight items in the test assess ***stigma*** (e.g., "A mentally ill person should not be able to vote in an election"), with response options on a 7-point Likert scale ranging from 0 "strongly disagree" to 6 "strongly agree". Internal consistency was $\alpha = .47$ (T1) and $\alpha = .56$ (T2).

2.4. Procedures

Study Recruitment. After receiving permission from school director researcher had a chance to participate in staff meeting to introduce himself and the research study to all teachers. The research Informed consent was also given to teachers, and they were asked to return the informed consent with their signature when they agreed to participate in the study. Researches also made contact with students in grades 7, 8, 10, and 11 to introduce the research study and ask for their participation. The consent for students was obtained through a passive consent process with a letter sent home to the parents, and with students given the option to opt out of data collection. All participants were aware of their right to participate or refuse and how the data is stored. Teachers were informed that their academic careers would not be affected as it was only an exercise for a research purpose. Students also were aware that their decision to participate or not participate would not affect their grade as it was only an exercise for research. Teachers and students knew that their response is kept strictly confidential. Hence, they should be free and honest in answering the questions.

Intervention Allocation. Teachers who returned the research informed consent with odd numbers were randomly assigned to control group and even numbers were allocated to intervention group. Purposive sampling was used to assign student's participation. Students were assigned by grade to avoid contamination while counterbalancing the two groups for developmental differences. Students in 7th and 11th grade classrooms were assigned to receive the intervention, while students in 8th and 10th grade classrooms were assigned to the control condition. Students in grades 9 and 12 were not included in this study as they were preparing for examinations.

Teacher Training. Teachers in the intervention group completed the two-day in-person mental health literacy training, with the additional 3rd day of training for the four implementing teachers. All training was led by the researcher and followed the training outline described in section (2.4.3.). Teachers in the control group received no MHL training. Each teacher participant received the translated curriculum guide with the accompanying self-study module. All participants received the equivalent of $5 USD for completing the baseline- and follow-up assessments, $20 for participating in the 2-day training, and $35 for delivering the classroom-based curriculum.

Classroom Implementation. Teachers were assigned to implement the classroom curriculum guide, in consultation with the school director, because their classes include English, Library, and Khmer language were classes most easily adjusted to allocate instructional time for the curriculum guide implementation while maintaining adherence the lesson plan of Ministry of Education Youth and Sport requirements. Students at intervention group, 7 and 11 grades received the Guide curriculum delivered by one of the

four trained teachers during regular instructional time. It was six sessions/modules over 8 weeks and approximately 1 hour per week. During implementation, trained research assistants observed the classroom instruction and provided feedback the process of classroom intervention to researchers. The assistants completed the fidelity rating checklist while observing teacher's implementation, collecting student's post assessment and teacher satisfaction survey. Students in 8 and 10 grades received their standard instruction, but completed baseline and follow-up assessments on the same time as the intervention group. Students in grades 9 and 12 were not included in this study as they were preparing for examinations.

Data collection

All instruments were administered at baseline (T1) and post-intervention (T2). Assessments were administered to both intervention and control groups on the same schedule. Assessment was administered by group format; all participants completed the assessment in the same classroom under supervision by researcher and research assistants. Exception, the guide lesson fidelity rating and teacher survey was used only with intervention teacher at post-test. T1 assessments were administered before the beginning of the teacher training workshop for teachers, and before the beginning of the classroom implementation for students. T2 data collection for both teachers and students took place the week after completion of the full classroom delivery of the MHL curriculum.

Data Analysis

Scale scores were calculated as the item mean. One-Way Analysis of Variance (ANOVA) was used to examine whether baseline mental health literacy scores varied by respondent demographics. For teachers, this included sex (male/female), education (high school education or less) and work experience (less than 5 years vs. 5 or more years). For students, we examined differences by sex and grade level.

Analysis of Covariance (ANCOVA) was used for both the teacher and student data using complete cases only. Models included T2 scores on the mental health literacy-related scales the dependent variables, baseline T1 scores as covariates, and Group (program, vs. no program) as the independent variable. In addition, paired (T1, T2) t-tests also were conducted to evaluate within-group change to determine whether between-group differences at T2 reflected improvements in the treatment group vs. worsening in the control group (or both).

4. Results

3. Results of Teacher Analyses

3.1. *Demographic Data of Teachers*

Seventy three (n=73) staff participants participated in this current study. Of the 73 participants, thirty six (n=36) participants were intervention group and thirty seven (n=37) participants were control group – that was time one (T1). By time two (T2) sixty seven (n=67) participants remained for this study, six participants missed following up. Out of 36, thirty four (n=34) remained for intervention group and thirty three (n=33) remained for control group. Two participants from intervention group (n=2) and four from control group (n=4) failed to provide follow-up data due to reasons unrelated to the study (e.g., no longer working at the school, family leave, etc.).

The majority of participants were female (79%), with a median age of 27 and over half were teaching staff (66%). Just over half had a bachelor (53%) or masters (3%) degree, while others had either a high school (24%) or junior high school (15%) education. Two thirds were teaching staff (66%), with others in administrative or other non-teaching roles.

3.2. Baseline Scale Scores

3.2.1. Baseline Scale Scores by Intervention Group

The mean scores, standard deviation of T1 were outlined in Table 2. There were no significant differences between groups on any of the baseline scores, all $p > .05$.

Table 2: ANCOVA – Difference Participant's T1, mean scores, standard deviation, and p-value by groups

		Intervention		Control		
Scale	**F test, for effect of Group**	**N**	**M (SD)**	**N**	**M (SD)**	***p-value***
MHKQ	F(1,64)=.448	34	52.6 (.078)	33	53.9 (.080)	.506
MHLS	F (1, 64) = 10.449	34	3.39 (.254)	33	3.19 (.236)	.168
MHLS subscale1 - Recognition	F (1, 64) = 3.205	34	3.76 (.498)	33	3.39 (.427)	.078
MHLS subscale2 - Self-efficacy	F (1, 64) = .010	34	3.61 (.712)	33	3.50 (.612)	.920
MHLS subscale3 - Stigma	F (1, 64) = 1.457	34	3.26 (.403)	33	3.12 (.444)	.232
MHLS subscale4 - Willingness to interact	F (1, 64) = .043	34	3.09 (.406)	33	2.83 (.492)	.837
BMI	F (1, 64) = .628	34	2.38 (.612)	33	2.63 (.592)	.431
BMI subscale1 - Dangerous	F (1, 64) = .287	34	2.75 (.677)	33	2.90 (.791)	.591
BMI subscale2 - Poor skills	F (1, 64) = .536	34	1.85 (.714)	33	2.36 (.707)	.467
BMI subscale3 - Incurable	F (1, 64) = 2.426	34	2.96 (.744)	33	2.87 (.719)	.124

3.2.2. Aim 1: Evaluate whether Baseline MHL Scores Vary according to Participant Demographics for Teacher

Mental Health Knowledge Quiz

At baseline, female teachers scored an average of 53.9% on the mental health knowledge quiz, compared to an average of 51.0% among male teachers. This difference was not statistically significant ([F (1, 65) = 1.508, p =.224]. Teachers with high school education or lower scored an average 53.9% on the mental health knowledge quiz, compare to an average of 52.7% among higher education teachers. This difference was not statistically significant [F (1, 61) = .290, p = .592]. Teachers with less experience (4 years or less) score an average of 54.2% on the mental health knowledge quiz, compare to an average of 52.6% among teachers with more experience (5 years or more). This difference was not statistically significant [F (1, 47) = .438, p = .511]. Results showed the demographic variables including sex, education and experience did not influence over the mental health knowledge quiz, indicating that the difference of sex (male vs. female), level of education (high vs. low) and experiences (more vs. less) of participants have no impact on teacher's mental health literacy.

Mental Health Literacy Scale

At baseline, female teachers scored an average of (M = 3.26, SD = .258), compare to an average score of (M = 3.43, SD = .241) among male teachers. This difference was not statistically significant [F (1, 65) = 4.970, p = .029]. Teachers with higher levels of education scored an average of (M = 3.31, SD = .233), compared to an average score of (M = 3.23, SD = .279) among teachers with lower education. This difference was not statistically significant [F (1, 61) = 1.553, p = .217]. Teachers with five years or more experience scored an average of (M = 3.35, SD = .237), compare to an average score of (M = 3.32, SD = .279) among teachers with less than five year experience. The mean difference (B=-.026) there was not statistically significant difference [F (1, 47) = .115, p = .736]. As a results of baseline showed there was not statistically significant difference between sex (male vs. female), education (lower vs. higher), experiences (less vs. more), indicating that the difference of sex, education and experience was not influenced over the teacher's mental health literacy.

Beliefs toward Mental Illness

At baseline, male teachers scored an average (M = 2.64, SD = .618), compared to an average score of (M = 2.47, SD = .610) among female teachers. The mean difference (B=.174) there was not statistically significant difference [F (1, 65) = .893, p = .348]. Teachers with higher levels of education scored an average of (M = 2.35, SD = .592), compare to an average score of (M = 2.67, SD = .629) among teachers with lower education. The mean difference (B=.315) there was statistically significant difference [F (1, 61) = 4.093, p = .047], indicating that level of education was influenced over the beliefs toward mental illness. Teachers with five years or more experience scored an average of (M = 2.53, SD = .713), compared to an average score of (M = 2.36, SD = .630) among teachers with less than five year experience. The mean difference (B= -.167) there was not statistically significant difference [F (1, 47) = .755, p = .389]. This finding indicated that the difference between sex (male vs. female) education (low vs. high) and experience (less vs. more) was not influenced over the beliefs toward mental illness.

3.2.3. Aim 2: Evaluate whether the MHL Intervention Significantly Improved MHL Scores Relative to a Control Group for Teachers

Mental Health Knowledge Quiz

After controlling for T1 score, the ANCOVA showed the intervention group score an average of 64.66% on the scale of mental health knowledge quiz, compare to an average score of 51.37% among control group. The mean difference (B = .13.3%) there was a statistically significant difference [F (1, 64) = 22.22, p < .001], indicating that the intervention was effective in increasing teacher's knowledge of mental health. We also run a second, fully adjusted-model to account for the potential influence of statistically significant baseline differences between the treatment and control groups on some demographic variables. This analysis showed that the treatment effect change after adjusting for sex, level of education, teacher status, and income [F (1, 37) = 8.450, p = .006], indicating that these variables has influence over teacher's mental health knowledge quiz.

Mental Health Literacy Scale

We examine whether there was a statistically significant difference between treatment and control groups on the mental health literacy score at follow-up, adjusting for baseline scores. After controlling for T1 score (MHLS), the ANCOVA showed intervention group score an average of (M = 3.62, SD = .33) on the scale of mental health literacy,

compare to an average scores of (M = 3.16, SD = .25) among control group. The mean difference (B=.40) there was statistically significant difference [F (1, 64) = 27.36, p < .001], indicating that the intervention was effective in increasing mental health literacy. We also ran a second, fully adjusted-model to account for the potential influence of statistically significant baseline differences between the treatment and control groups on some demographic variables. This analysis showed that the treatment effect remained after adjusting for sex, level of education, teacher status, experiences, and income [F (1, 37) = 18.10, p < .001], indicating that these variables has influence over teacher's mental health literacy.

Beliefs toward Mental Illness

We examine whether there was a statistically significant difference between treatment and control groups on the beliefs toward mental illness scores at follow-up, adjusting for baseline scores. After controlling for T1 score (BMI), the ANCOVA showed intervention group score an average (M = 1.88, SD = .69) on the beliefs toward mental illness, compare to an average score of (M = 2.57, SD = .70) among control group. The mean difference (B= -.55) there was statistically significant difference [F (1, 64) = 17.68, p < .001], indicating that the intervention was effective in reducing teacher's negative beliefs toward mental illness. We also ran a second, fully adjusted-model to account for the potential influence of statistically significant baseline differences between the treatment and control groups on some demographic variables. This analysis showed that the treatment effect remained after adjusting for sex, level of education, teacher status, experience, and income [F (1, 37) = 9.61, p = .004], indicating that these variables has influence teacher's beliefs toward mental illness.

3.2.4. Aim 3: Evaluate whether Intervention Impacts were moderated by Demographic Characteristics for Teachers

3.2.4.1. Mental Health Knowledge Quiz

We looked at the interaction between sex of teacher and groups whether the impact of the intervention was different by sex, while adjusting for the T1 score. ANCOVA showed the main effect of groups was statistically significant [F (1, 62) = 12.107, p = .001]. There was not statistically significant neither main effect of sex [F (1, 62) = 2.850, p = .096] nor a sex-by-group interaction effect [F (1, 62) = .159, p = .691].

We also looked at the interaction between teacher's education and groups whether the impact of the intervention was different by education, while adjusting T1 score. ANCOVA showed the main effect of groups was statistically significant [F (1, 58) = 12.556, p = .001]. There was not statistically significant neither main effect of education [F (1, 58) = .473, p = .494], nor education-by-group interaction effect [F (1, 58) = .568, p = .454].

Adjusted-model was also used to examine the interaction between teacher's experience and groups whether the impact of the intervention was different by experience, while adjusting for the T1 score. ANCOVA showed the main effect of group was statistically significant [F (1, 44) = 11.766, p = .001]. There was not statistically significant neither main effect of experience [F (1, 44) = 2.336, p = .134] nor experience-by-group interaction effect [F (1, 44) = .270, p = .606]. This finding revealed that sex, education and experience has no influenced over intervention on teacher's mental health knowledge quiz.

3.2.4.2. Mental Health Literacy Scale

We looked at the interaction between sex of teachers and groups whether the impact of the intervention was different by sex, while adjusting for the T1 score. ANCOVA showed the main effect of groups was statistically significant [F (1, 62) = 13.187, p = .001].

There was not statistically significant neither the main effect of sex [*F* (1, 62) = .068, *p* = .795] nor sex-by-group interaction effect [*F* (1, 62) = .005, *p* = .945].

The interaction effect between teacher's education and groups was also examined whether the impact of the intervention was different by education, while adjusting for the T1 score. ANCOVA showed the main effect of groups was statistically significant [*F* (1, 58) = 12.259, *p* = .001]. There was not statistically significant neither the main effect of education [*F* (1, 58) = .174, *p* = .678], or education-by-group interaction effect [*F* (1, 58) = 1.916, *p* = .172].

We also looked at the interaction between teacher's experience and groups whether the impact of the intervention was different by experience, while adjusting for the T1 score. ANCOVA showed the main effect of groups was significant [*F* (1, 44) = 27.790, *p* < .001]. There was not statistically significant neither the main effect of experience [*F* (1, 44) = .008, *p* = .928], nor experience-by-group interaction effect [*F* (1, 44) = .401, *p* = .530].This findings indicated that sex, education and experience has no influenced over intervention on scale of scale of mental health literacy.

3.2.4.3. Beliefs toward Mental Illness

We looked at the interaction between sex of teachers and groups whether the impact of intervention was different by sex, while adjusting for the T1 score. ANCOVA showed the main effect of groups was statistically significant [*F* (1, 62) = 5.915, *p* = .018]. There was not statistically significant neither the main effect of sex [*F* (1, 62) = .007, *p* = .933] nor sex-by-group interaction effect [*F* (1, 62) = 24.938, *p* = .742].

The interaction effect between teacher's education and groups was also examined whether the impact of the intervention was different by education, while controlling for the T1 score. ANCOVA showed the main effect of groups was significant [*F* (1, 58) = 13.124, *p* = .001]. There was not statistically significant neither the main effect of education [*F* (1, 58) = 1.083, *p* = .302], nor education-by-group interaction effect [*F* (1, 62) = .024, *p* = .877].

We also examined the interaction between teacher's experience and groups whether experience moderated the treatment effect, while adjusting the T1 score. ANCOVA showed the main effect of groups was significant [*F* (1, 44) = 10.424, *p* = .002]. There was not statistically significant neither the main effect of experience [*F* (1, 44) = .028, *p* = .868] nor the experience-by-group interaction effect [*F* (1, 44) = .257, *p* = .615]. This finding indicated that sex, education and experience has no influenced over intervention on scale of beliefs toward mental illness.

3.2.5. **Results of Student Analyses**

3.2.5.1. ***Demographic Data of Students***

Students (N = 275) who are studying at Don Bosco High School (grade 7, 8, 10, & 11) were invited to participate in the current study. Out of 275 which intervention group 52.7% (*n* = 145) and control group 47.3% (*n* = 130). The majority of participants were female 61. 5% (*n* = 169), male 37.8% (*n* = 104), correspondents did not indicate their sex 0.7% (*n* = 2). Age range from 13 to 22 (M = 15.48). Out of 275, grade 7 (25.8%, *n* = 71), grade 8 (24.7%, *n* = 68), grade 10 (22.5%, *n* = 62), and grade 11 (26.9%, *n* = 74) and

MHL - Knowledge

At baseline, treatment group score an average of (M=53.68, SD=.09) on the MHL knowledge, compare to an average score of (M=53.03, SD=.09) among control group. The difference was not statistically significant [F(1,272)=.005, p=.946].

MHL – Stigma

Treatment group score an average of (M=3.94, SD=.68) on the MHL-stigma scale, compare to an average score of (M=3.90, SD=.85) among control group. The difference was not statistically significant [F(1,272)=.579, p=.447].

3.2.6. ***Aim 1: Evaluate whether Baseline MHL Scores vary according to Participant Demographics for Students.***

Knowledge and Attitudes by Age

We looked at the baseline measures whether baseline score (T1) of mental health knowledge and attitudes toward mental illness is varied by age. Univariate analysis of variance showed that students age 15 and under had an average score of 52.4% and student over age 15 had an average score of 54.3%. The mean difference (B = -.020) there was not statistically significant difference [F (1, 273) = 3.324, p = .069], indicating that age of correspondent has no influence over the knowledge of mental health. Attitudes, ANCOVA showed that students age 15 and under had an average score of (M = 3.74, SD = .787) and student over age 15 had an average score of (M = 4.10, SD = .718). 54.3%. The mean difference (B = -.353) there was statistically significant difference [F (1, 273) = 15.099, p < .001], indicating that age of correspondent has influence over the attitudes toward mental illness.

Knowledge and Attitudes by Sex

We also looked at the baseline measures whether baseline score (T1) of mental health knowledge and attitudes toward mental illness is varied by sex. ANCOVA female students score an average of (54.07%), compare to an average score of (52.50%) among male students. The mean difference (B = -.016) there was not statistically significant difference [F (1, 271) = 1.938, p = .165], indicating that sex has no influence over the mental health knowledge. Attitudes scale was also examined, ANCOVA showed female students score an average of (M = 3.94, SD = .059), compare to an average score of (M = 3.89, SD = .076) among male students. The mean difference (B = -.051) there was not statistically significant difference [F (1, 271) = .280, p = .597], indicating that sex has no influence over the attitudes toward mental illness.

Knowledge and Attitudes by Grade

We looked at grade of students on mental health knowledge T1 scores whether the effect of mental health knowledge and attitudes scales were influenced by grade. Grade was computed into two groups [grade 7 and 8 as secondary school (n = 139), and grade 10 and 11 as high school (n = 136)]. ANCOVA showed a lower secondary school score an average of (M =.526, SD = .008), compare to an average score (M = .542, SD = .008). The mean difference (B = -.015). There was not statistically significant difference [F (1, 273) = 1.987, p = .160], indicating that grade has no influence over the mental health knowledge. The effect of attitudes scale was examined whether it was influenced by grade. A one-way ANCOVA showed higher secondary school student score an average of (M = 4.130, SD = .064), compare to an average score (M = 3.726, SD = .063) among lower secondary school students. The mean difference (B=-.404) there was statistically significant difference [F (1, 273) = 20.079, p < .001], indicating that grade have influence over attitudes toward mental illness.

3.2.7. ***Aim 2: Evaluate whether the MHL Intervention Significantly Improved MHL Scores Relative to a Control Group for Students.***

Knowledge and Attitudes

We looked at the effect of the mental health knowledge T2 score between groups whether the intervention was effective in increasing mental health knowledge while adjusting for the T1 score. A one-way analysis of covariance (ANCOVA) showed the intervention group scores an average of (56.98%), compare to an average score of (50.57%) among control group. Intervention group had higher mental health knowledge score than control group (B = .06). The difference was statistically significant [F (1, 272) = 32.570, p < .001], indicating that the intervention was effective in increasing the student's mental health knowledge.

We also looked at the attitudes T2 score between groups whether the intervention was effective in increasing positive attitudes toward mental illness. After adjusting T1 score, the analyses of ANCOVA showed that intervention group had higher score (M = 4.60, SD = .84) than control group (M = 3.98, SD = .76). The mean difference (B =.61) the difference was statistically significant [F (1, 272) = 41.528, p <.001], indicating that the intervention was effective to decrease student's negative attitudes toward mental illness.

We also run a second, fully adjusted-model to account for the potential influence of statistically significant baseline differences between the treatment and control groups on some demographic variables. This analysis showed that the intervention effect remained for the attitudes after adjusting for sex, age, and grade [F (1, 267) = 49.168, p <.001] and sex has significant difference (p =.001) but age and grade were not statistically significant (p >.005). Knowledge also remained after adjusting for sex, age, and grade [F (1, 267) =38.531, p <.001] and sex has significant difference (p =.001) but age and grade were not statistically significant (p >.005).

3.2.8. ***Aim 3: Evaluate whether Intervention Impacts were moderated by Demographic Characteristics for Students.***

Knowledge and Attitudes by Sex

We looked at the interaction between sex of correspond and groups whether the impact of intervention was different by sex, while adjusting for the T1 score. ANCOVA showed the main effect of groups was statistically significant [F (1, 268) = 30.051, p <.001]. There was statistically significant neither the main effect of sex [F (1, 268) = 11.259, p =.001] nor the main sex-by-group interaction effect [F (1, 268) = 7.316, p =.007]. Attitudes, ANCOVA showed the main effect of groups was statistically significant [F (1, 268) = 41.467, p <.001]. The main effect of sex was statistically significant [F (1, 268) = 12.348, p =.001] but sex-by-group interaction effect not statistically significant [F (1, 268) = .999, p =.319].

Knowledge and Attitudes by Age

We looked the interaction between grade of correspondent and groups whether the impact of intervention was different by grade, while controlling for the T1 score. ANCOVA showed the main effect of groups was statistically significant [F (1, 270) = 32.156, p <.001]. The main effect of grade was statistically significant [F (1, 270) = 4.850, p =.028] but age-by-group interaction effect not statistically significant [F (1, 270) = .023, p = .881], indicating that the intervention was not influenced by age. We also looked at the interaction between age of correspondent and groups whether the age moderated the T2 score. Univariate analysis of variance (ANCOVA) showed that the main effect of groups was

statistically significant [F (1, 270) = 41.774, p < .001]. There was not statistically significant neither the main effect of age [F (1, 270) = .761, p = .384] nor age-by-group interaction effect [F (1, 270) = .167, p = .433], indicating that the interaction was not influenced by age.

Knowledge and Attitudes by Grade

We looked at the interaction between grade of students and groups whether groups change depending on the grade while controlling for the mental health knowledge and attitudes T1 scores. ANCOVA showed that higher secondary school students score an average of (55%), compare to an average score of (52.6%) among lower secondary school students. Higher secondary school students score higher than lower secondary school students (B=.024). Intervention group had higher mental health knowledge T2 scores (M = .569) than control group (M = .507). The mean difference (B=.063) there was not statistically significant difference [*F* (1, 270) = .098, *p* =.755], indicating that intervention was not influenced by grade level. Attitudes, lower secondary school students score an average of (M = 4.36), compare to an average score of (4.22) among control group. Lower grade students score higher than higher grade students (B=.134). Intervention group had higher on attitudes T2 score (M = 4.60) than control group (M = 3.98). The mean difference (B=.622) there was not statistically significant difference [*F* (1, 270) = .305, *p* =.581], indicating that intervention was not influenced by grade level.

3.2.9. Exploratory Results of Aim 4: Evaluate Feasibility and Acceptability of the Guide-VN as Adapted

Implementation Outcomes

Instructional time. All teachers spent a similar amount of time, on average, delivering the lessons. Individual teacher averages ranged from 56 minutes to 62 minutes per lesson. However, whereas all other lessons took an average of 51 to 57 minutes to deliver, Lesson 3 (Information on Specific Mental Illnesses) took an average of 88 minutes. This was consistent with teacher reports that they needed more time to cover this module due to the extensive information presented.

Fidelity. Mean fidelity by session was generally high with a combined mean of 2.55 across sessions, ranging from a low of 2.45 in Lesson 5 (Seeking Help and Finding Support) to a high of 2.65 in Lesson 6 (Positive Mental Health). Notably, examining the 24 individual time-fidelity records, there appeared to be no correlation between time spent and fidelity (r = -.03). Table 12 similarly displays no relationship when looking at classroom averages. We did observe variation in fidelity between teachers, with average fidelity scores ranging from a low of 2.11 to a high of 2.86. Given this variation, we also examined whether there was classroom variation in student outcomes. Post-hoc analyses did show that Classroom D had significantly higher Knowledge scores than all other classrooms (all p<.01), the rest of which did not significantly differ from each other. Classroom B had significantly higher (i.e. worse) Attitude scores (all p<.01) than all other classrooms, while Classroom D also had significantly (p<.01) higher Attitude scores than Classrooms A and C (which did not differ from each other). Comparing these scores with classroom average instructional time and fidelity score, we see no clear pattern of association (Table 12). We also examined fidelity sub-domain, including content (M = 2.67, range: low-high), process (M = 2.60, range: low-high), materials (M = 2.56, range: low-high), students' acceptance (M = 2.35, range: low-high), and quality (M = 2.58, range: low-high).

Teacher Satisfaction. Implementing teachers reported generally high satisfaction with the program, with an average satisfaction score of M = 2.60 (range: 2.45 - 2.75). Teachers reported higher satisfaction related to enthusiasm (M=2.83, range: 2.5-3) and self-

efficacy (M= 2.60, range: 2.43-2.6), with lower satisfaction regarding beliefs about classroom implementation (M= 2.39, range: 2.29-2.43)

3.3. Discussion

To our knowledge, this is the first study assessing teacher and student mental health literacy in Cambodia. Baseline results demonstrated that both teachers and students have limited knowledge, prejudiced perceptions and negative attitudes about mental illness.Baseline result showed consistent finding between teachers and students, higher education teachers and student's grade had less negative beliefs and attitudes toward mental illness. Knowledge might be one of important factors to decrease stigma. As the previous report showed the public has very limited knowledge about mental health[TPO Cambodia, 2015]. Culture might also be another main contributing factor to stigma around mental illness. Living in a culture that was mixed with various religious beliefs might bring more stigmatizing beliefs and attitudes. Khmer believe in Buddhist-Hindu beliefs, beliefs in spirits, luck and astrology, and emphasis on the connection between physical and mental health; help-seeking through the medical system often only occurs when traditional methods are unsuccessful in addressing the problem [Schunert et al., 2012].

Our findings are consistent with prior research in Vietnam using the same instruments, which showed Vietnamese teachers had poor knowledge of mental health problems [H.-M. Dang et al., 2018]. Previous studies have also showed teachers had difficulty to identify and distinguish the severity of mental disorders, which reflects poor mental health literacy among teachers [Deborah Oyine Aluh, Dim, & Anene-Okeke, 2018b; Mendonsa Rohan Dilip, 2013]. Further, research across multiple settings such as United States, Canada, Malaysia and Nigeria have all demonstrated a need to improve students' knowledge, awareness, recognition, and stigma as well [Jack-ide, Azebri, Ongutubor, & Amiegheme, 2016; Mcluckie et al., 2014b; Mustafa, Habil, Ibrahim, & Hassan, 2015; Wahl, Susin, Lax, Kaplan, & Zatina, 2012]. These current findings provide critical information about mental health literacy challenges in a context that receives little attention on the mental health care system, and where the low mental health literacy creates substaintial barries to mental health care [McLaughlin & Wickeri, 2012; Schunert et al., 2012; TPO Cambodia, 2015].

Our second finding of this current study confirms the mental health literacy program -The Guide was effective at increasing teachers and student's mental health literacy (knowledge, beliefs, and attitudes). The finding was supported by previous literature that underpinned the effectiveness of mental health literacy programs for training teachers [Stan Kutcher, Wei, & Morgan, 2015a; Stan Kutcher, Wei, et al., 2015b; Ojio et al., 2016]. The largest effects for teachers were reported on the scales measuring willingness to interact with people with mental illness and perceptions of dangerousness. We posit two explanations for this. First, greater understanding about mental illness (i.e., the cause and effect) might increase empathy toward people experiencing mental disorder. Specifically, providing a bio-psycho-social framework that includes a medical explanation of mental illness as a brain or neurobiological disease may reduce perceptions of a spiritual cause of mental illness that implies something evil or something one brings upon oneself by bad action. Prior research has also shown that people who view mental illness as a medical condition tend to hold less stigmatizing attitudes than people who viewed mental illness through neurobiological explanation or brain condition [Lebowitz & Ahn, 2014; Loughman & Haslam, 2018]. Second, both willingness to interact and perceptions of dangerousness may be linked to fear: fear either of social or spiritual contamination, or fear of direct physical harm. Both increased understanding of the cause of mental illness and increased awareness that most mentally ill people are not dangerous should decrease fear and increase

willingness to interact. To the best of our knowledge, most generally the public have more stigmatizing attitude because they perceived inaccurate information about mental illness, and promoting accurate information about mental illess could reduce stigma, prejudice, and increase their positive interaction with people with mental illness. These findings of smaller effects in other domains do, however, highlight areas to focus on in further refinement of The Guide.

Likewise, although we observed statistically significant effects at the student level, their low scores – particularly in knowledge – indicate room for additional improvement. These findings are not atypical; a previous study of The Guide reported about 14% improvement among students receiving the intervention [Mcluckie et al., 2014], compared to about 12% in the current study. Although literature supports teacher MHL training as a good strategy to promote children mental health care in school system [Mcluckie et al., 2014b; Jessica Whitley et al., 2013] its effectiveness may vary based on the methodology and actual context [Kutcher, Wei, McLuckie, & Bullock, 2013; Kutcher, Bagnell, & Wei, 2015; Mcluckie, Kutcher, Wei, & Weaver, 2014; Wei, Kutcher, Hines, & MacKay, 2014]. Potential factors affecting student outcomes in the current study may include both implementation factors and cultural/contextual fit. Below we discuss a number of these potential factors.

Cascading Training Model.

This program was implemented by general education teachers who received a 3-day training, which included only one day of implementation (train-the-trainers) training. This level of training, although a direct carry-over from the North American curriculum, may be insufficient to prepare relatively inexperienced Cambodian teachers to deliver the mental health lesson to students. We observed during the teacher training a gap in knowledge of mental health literacy in general (manifested also in their pre-post Quiz scores) and skills to deliver classroom curriculum. Teachers had difficulty understanding the conceptual framework to deliver the classroom curriculum. Even in Canada, previous research has found that teachers needed more preparation when working with mental issue [A. L. Andrews, 2012]. Other studies in Canada and Haiti also emphasized the necessity to extending the duration and number of training sessions to get better outcome of the training [Eustache et al., 2017b; S. Kutcher et al., 2015]. Teachers also reported feeling stressed and lacking confidence, in need extra support from the trainer besides the training for their preparation and delivery classroom curriculum. This concern has been observed elsewhere as well [Daniszewski, 2013; Udoba, 2014]. We believe providing additional supports like continuing professional development, supervision or consultation would improve both teacher and student outcomes. This is consistent with literature that suggests supervision is necessary to lead to behavioral change for learning and teaching processes [Evans et al., 2017; Kikegbusi, Gloria & Eziamaka, 2016]. Similar findings among Canadian teachers have also showed that supervision was important during delivering curriculum in classroom [Daniszewski, 2013].

Dose. Beyond the dosage issues described for the teachers above, one hour per week may be insufficient to deliver the content of the six modules in Cambodia, even though prior study had showed the curriculum guide need six hours of classroom time or 4-8 weeks intervention [Milin et al., 2016]. Since this curriculum was developed for Western students, additional implementation changes may be needed. For example, Cambodian students may have lower baseline mental health literacy, requiring more intervention exposure. Additionally, Cambodian classrooms may have a larger number of students than Canada or the US, requiring adjustment to the classroom environment to allow time for teacher-student interaction. For instance, each module should require two sessions (two hours), and given this extension may provide more interaction between teachers and students.

Lack of motivation (intrinsic motivation) may also be a factor. Teachers play an important role to created friendly learning environment that allow students to seek knowledge as worthwhile and take ownership over their learning [Bieg, Backes, & Mittag, 2011; Blazar & Matthew A. Kraft, 2017; Valerio, 2012]. However, as observed, teachers not only had difficulty understanding the concepts and teaching process but also face stressors related to managing large classrooms. Students may have also paid less attention than their usual study because there were no performance requirements, like taking an exam or receiving a grade.

Cultural fit. Although the Guide required minimal adaptations and was further reviewed by a team of highly trained Cambodian psychologists, it is also possible that some of this decreased impact was due to the lack of specific cultural and contextual adaptations. For example, previous research in Cambodia has documented culturally distinct mental health syndrome presentations [D. E. Hinton, Pollack, Pich, Fama, & Barlow, 2005; D. Hinton, Um, & Ba, 2001] that were not incorporated into The Guide. It is possible that expanding The Guide content to address these types of syndromes as well may improve outcomes by addressing a more comprehensive cultural understanding of what constitutes mental illness.

3.4. Strength and Limitations

Strengths of this study include incorporating a randomized experimental design into a real-world implementation context, inclusion of both teaching and non-teaching staff, as well as the low dropout rate of participants. There are, however, some important limitations. First, we conducted this study only in one private school; it is unclear whether these findings would generalize to other schools in Cambodia. Second, because not all staff were subsequently engaged in curriculum delivery they received less training and may have been less motivated to fully learn the material and implement The Guide. The single-school design also presented barriers to randomization; the control group students who did not receive the intervention may have had interactions with teachers, non-teaching staff, and students who have received the training. Additionally, although the assessment tools had been previously validated in Vietnam and were piloted before use, they were not separately validated in Cambodia. Finally, due to resource constraints we were unable to conduct a longer-term follow-up to evaluate sustained programmatic impacts on knowledge and attitudes, and ultimately on behavior. Knowledge and attitudes are seen as intermediate outcomes conceptualized as leading to the ultimate goals, of increased identification of mental health need, connection to services, and ultimately improved functioning. Our current findings are promising and support more extensive evaluation of the MHL curriculum in Cambodia to include further adaptation and study of implementation features.

CONCLUSIONS AND RECOMMENDATIONS

1.1. CONCLUSIONS

The current study demonstrated consistently positive, although varying in magnitude, improvements in knowledge and attitudes among teachers and students following implementation of a classroom-based mental health literacy program in Cambodia. Integrating school-based mental health program in school setting can be a path-way solution to build the significant needs for children and adolescents in limited resource settings like Cambodia and is increasingly a focus in LMIC [Kieling, Baker-henningham, et al., 2011; Vikram Patel, Kieling, Maulik, & Divan, 2013]. The task-sharing approach that engage teachers to take responsible in promoting mental health rather than professional to implement the schoolwide mental health programming in accessibility of service and

reducing stigma associated with seeking mental health care through health facilities [Hoang Minh Dang et al., 2017; Milin et al., 2016]. However, low levels of mental health literacy in many LMIC, including among professionals such as teachers, indicate a basic need to strengthen staff and student understanding of mental health, mental health disorders, and their treatments, to decrease stigma, and increase help-seeking.

1.2. **RECOMMENDATIONS**

1. Findings from this pilot RCT support the potential benefits of school-based MHL training in Cambodia, where there is substantial stigma, prejudice and discrimination toward mental illness.
2. The next practical steps: revise curriculum, large multi-school RCT, hybrid implementation-effectiveness research (that looks at both different approaches to implementation support and also impact on outcomes).