Original Article

Assessing the Effectiveness of Teachers' Mental Health Literacy Training in Cambodia: A Randomized Controlled Trial

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Abstract: School-based mental health literacy (MHL) programs are used to reduce stigma and promote help-seeking among students and teachers. This study aimed to adapt and evaluate a teacher-delivered MHL program in Cambodia, where the impact of MHL programs has not previously been evaluated. 67 teachers and 275 students from a high school in Phnom Penh voluntarily completed the study. School staff were randomly assigned, and classrooms purposively assigned, to either a 2-day MHL training program or a control condition. Four teachers in the intervention condition were also pragmatically selected to deliver a 6-week classroom MHL curriculum to students; these teachers receive extra day of implementation training. Teacher and student MHL were assessed before and after the intervention. Results showed significant improvements in all indicators of teacher and student knowledge and attitudes about mental illness; largest improvements were in teachers' perceptions of dangerousness and willingness to interact. This pilot RCT supports the potential benefits of school-based MHL training in Cambodia, where there is substantial mental health stigma and discrimination. However, small to moderate effect sizes, particularly for students outcomes, suggest a need for further refinement and testing of the curriculum to optimize impact, including further consideration of implementation strategies and supports.

Keywords: Adolescents, program effectiveness, mental health literacy, stigma, school-based.

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1. Introduction

Child mental health problems are common worldwide, with up to 20% of children being affected each year [1]. Untreated child mental health conditions severely influence children's development, educational attainments, and their potential to live fulfilling and productive lives [2, 3]. Given the high burden of these common conditions, promoting positive mental health and wellbeing throughout development has been recognized as a grand challenge [4] and integrated into the UN sustainable development goals [5].

Supporting child mental health is particularly challenging in many low - and middle-income countries (LMIC), where mental health service systems struggle due to lack of human, financial, political, and infrastructure resources and supports [6-12]. People living in LMIC also tend to have lower levels of knowledge and understanding of mental health problems as medical issues and higher levels of mental health-related stigma, which can become a barrier to seeking or offering help [13].

In Cambodia, a largely agricultural country in Southeast Asia, the situation is consistent with the general trends described above. Cambodia is home to largest youth and adolescent population in the South East Asia region, with approximately two third of population between age of 15-24 and nearly a quarter between 10-19 year old [14]. Previous studies suggested a high prevalence of mental health-related problems among both Cambodian children and adults [15-17]. In a nationally representative study, 8.2% of households with children reported one or more children were having school problems, 11.5% reported child aggressive behavior, and 4.9% reported children were experiencing other mental health-related problems [15]. With a focus on school problems and externalizing behaviors, these caregiver-reported statistics likely underestimate the full burden of disorder. And yet there remain multiple barriers to child mental health care, including shortages of human resources, mental health budget, and infrastructure, as well as low mental health awareness within the community [18, 19].

Increasing school capacity to identify and respond to child mental health needs is a logical approach to addressing the mental health treatment gap in LMIC, given that most children spend a significant portion of their day in schools [20-24]. Teachers can promote student mental health by providing psychologically supportive classrooms; are often the first adult to identify children's mental health needs and make referrals for services; and are a key mechanism for implementation of classroom mental health programs [25]. The role of educators in the recognition and promotion of early mental health education and intervention has been promoted in a range of other LMICs, such as neighboring Vietnam [26]. This is a natural fit in Cambodia, where participation in the educational system is high; 87.3 % of children attend primary school (grades 1-6), 43.5% attend lower secondary (grades 7-9) and 21.6% attend upper secondary (grades 10-12) [27, 28].

To harness their potential to provide mental health support to students, teachers' *mental health literacy* is crucial. Jorm [29] defines mental health literacy as "knowledge and beliefs about mental disorders and their treatment, which aid their recognition, management or prevention" (p.396). Mental health literacy has several components, including (1) understanding how to maintain positive mental health, (2) understanding mental disorders and their treatments, (3) low levels of stigma related to mental disorders, and (4) high levels of mental health-related help-seeking efficacy [30].

As is the case in many LMIC [31, 32], low mental health literacy has been identified as a challenge in Cambodia [33]. Khmer cultural explanations for mental illness originate from 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 [34]. Therefore, efforts to leverage school-based mental supports must include effective, school-based resources to increase mental health literacy. However, two recent reviews of school-based mental health literacy studies found relatively few studies in LMIC and none in Cambodia [34, 35]. Country-specific research is necessary to account for factors, such as cultural beliefs and education system structures, that could potentially influence the acceptability and effectiveness of programs [36, 37].

Current Study

The goal of this study was to evaluate a culturally adapted version of a school-based mental health literacy program, initially developed in Canada, for use in Cambodian high schools. Specifically, we aimed to adapt the program, evaluate baseline mental health literacy of both teachers and students, and compare post-intervention mental health literacy scores between teachers and students who were randomized to the intervention vs. control condition. We hypothesized that intervention participation would result in higher mental health literacy among both teachers and students.

2. Methods

2.1. Setting

Our study was carried out in one private school in Phnom Penh capital city of Cambodia. The selection of a private school was due to the nature of the educational system in Cambodia that would have required permission from the Minister of Education to conduct a study in the public school system. This school offers a general education program from preschool to high school, with a total population of approximately 1300 students (approximately 500 at the high school level) and 108 staff.

2.2. Study Design

We used a pre-post, randomized controlled trial design. School staff were individually randomized to either the MHL intervention group or a no-intervention control group. To avoid contamination, 7th and 11th grade classrooms were purposively assigned to receive the classroom MHL curriculum while students in 8th and 10th grades received standard (non-intervention) coursework. The study was approved by the Cambodian National Ethics Committee for Health Research, Ministry of Health (No. 055NECHR).

2.3. Intervention

The Mental Health & High School Curriculum Guide[38] is an evidence-based mental health literacy training program originally developed in Canada (www.teenmentalhealth.org). The Guide includes a teacher preparation component as well as a classroom curriculum. It includes six modules: (1) The Stigma of Mental Illness; (2) Understanding Mental Health and Mental Illness; (3) Information on Specific Mental Illnesses; (4) Experiences of Mental Illness; (5) Seeking Help and Finding Support; and (6) The Importance of Positive Mental Health. Prior research in Canada as well as other LMIC suggests positive program impacts, but typically has not included a control condition for comparison [39-43].

The USA Edition: Washington State, 2nd Edition version of the Guide [38] was adapted and translated into Khmer language by the lead author (BP). The adapted materials were then reviewed by a team of bilingual Cambodian psychologists. Suggested adaptations included replacement with more appropriate Khmer words and expressions (e.g., for "mental illness" and "mental health problems"). As this study was aligned with a similar study being undertaken in Vietnam, adaptations made for that context were also incorporated into the Cambodian study. This included a structural

change to present depression first rather than schizophrenia. The rationale for this change was that teachers would more frequently encounter students with depression than schizophrenia, and common perceptions of mental illness as "madness" or "craziness" would be reinforced if the first mental illness presented was schizophrenia.

In the standard implementation of this program, all teachers receive a 3-day teacher preparation training that includes two days of training focused on improving teacher MHL, and a third day of "train the trainer" training focused on preparing teachers to deliver the classroom curriculum. In the current study, this approach was modified to include both teaching and non-teaching staff and to accommodate a within-school study design that included a control comparison group at both the staff and student level. All staff randomly assigned to the intervention condition received the 2-day training program focused on building MHL. Four teachers in the intervention condition were also pragmatically selected to subsequently deliver the classroom-based curriculum, and therefore also received the 3rd day of training in methods for teaching the curriculum in their classroom. 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).

After completing the training program, implementing teachers were given two weeks to review and prepare to deliver the classroom curriculum. Before beginning to implement the classroom curriculum, these four teachers participated in a consultation meeting with the researcher and two research assistants to review the classroom implementation plan and address any outstanding questions. These four teachers then implemented the MHL classroom curriculum in six weekly, 1-hour lessons in which each lesson focused on one of the six Guide modules. Control classrooms completed

their standard, non-MHL coursework during this time.

2.4. Sample

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). Of $N = 307$ students (98% of those contacted) who provided consent, 302 students provided T1 data (intervention: $n = 158$; control: $n = 144$), and 301 students provided T2 data (intervention: $n = 157$; control: $n = 144$). However, in some cases students provided inconsistent identifier data that precluded matching their records, resulting in a final sample size of 275 students (intervention: $n = 145$, 92%; control: $n = 130$, 90%) who provided complete data for analysis.

2.5. Teacher Measures

Teacher outcomes were assessed using the Mental Health Knowledge Quiz (MHL-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 Mental Health Knowledge Quiz [38] 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."). 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 by O'Connor & Casey** [44] was used to assess teachers' knowledge and attitudes regarding mental health and related constructs. The

original MHLS is a 35-item measure 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 [45]. Seven items were removed as not applicable to Cambodia, leaving a total of 28 items organized into four subscales: (1) *ability to recognize mental disorders* (e.g., "If someone experienced [symptom description], to what extent do you think it is likely they have [name of disorder]?"; eight items); (2) *Mental health help-seeking/self-efficacy (e.g.,* I am confident that I know where to seek information about mental illness"; four items); *(3) 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). Items were evaluated using a 5-point Likert scale ranging from 0 to 4. Scores were calculated as the mean of all answered items to account for missingness. Higher scores may be interpreted as more positive for all sub-scales except for stigma, in which higher scores indicate greater stigma. 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).

Stigma was also measured using the Beliefs towards Mental Illness [46], a 21-item scale designed to assess negative stereotypical views of mental illness. Response options use a six-point Likert-scale ranging from 0 to 5. Scores were calculated as the mean of all included items to account for missingness; high scores indicate more stigma negative attitudes toward mental illness. The items are organized into three subscales: (1) dangerousness (e.g., "a mental ill person is more likely to harm others than a normal person"; five items); (2) 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) Incurability (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).

2.6. Student measures

Students completed the Mental Health Knowledge and Attitude Test [38], a 36-item questionnaire developed for use with the Guide. This measure includes a 28-item knowledge assessment (e.g., "People who have a mental illness are frequently violent"). Response options were true/false/I don't know; to avoid correct answers due to guessing, students were encouraged to select "I don't know" rather than guess if they did not know the answer. Knowledge scores are reported as the proportion correct (range : 0-1). 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 α = .47 (T1) and α = .56 (T2).

3. Study procedures

Study Recruitment. After receiving approval to conduct the study, the lead researcher approached teachers and school staff to introduce the study and obtain informed consent from participants. Informed consent at the student level 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.

Intervention Allocation. Teachers were randomly assigned to the MHL program or control condition based on a number included on their consent form. As previously described,

classroom-level allocation was purposive 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. The in-person staff training, including the 2-day training for all intervention staff and the additional 3rd day of training for the four implementing teachers, was led by the lead researcher. Staff in the control condition received no MHL training. Staff 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. The four implementing teachers taught The Guide MHL curriculum to 7th and 11th grade classrooms during regular instructional time (i.e., when students would normally be studying Khmer, Library, or English). The six weekly, one-hour lessons were delivered over an 8-week period due to school holidays. Instruction was observed by two research assistants who also attended the teacher training workshop and received additional training in classroom observation to monitor teacher fidelity to the intervention materials. These research assistants were present for monitoring only; they were instructed not to provide any support to teachers or intervene the session. Their main role were only to observing the teacher delivering The Guide in the classroom by using the teacher fidelity rating checklist and to provide feedback their classroom observation to researcher.

3.1. 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. 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.

3.2. 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

Staff participants were predominantly women (79%), with a median age of 27 and a median of four years of teaching experience. 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, and 5% did not disclose their education background. Two thirds were teaching staff (66%), with others in administrative or other non-teaching roles.

Students were 62% female with a median age of 16, roughly equally distributed across grade 7 (25.8%), grade 8 (24.7%), grade 10 (22.5%) and grade 11 (26.9%).

4.1. School staff results

Scale scores by intervention group and time point are reported in Table 1. At baseline, most notable were relatively poor mental health knowledge, low levels of willingness to interact with people with mental illness, and relatively high levels of beliefs about mental illness as more negative perceptions of the dangerousness and incurability of mental disorders. Examining associations between baseline scale scores and demographics (sex, work experience, and level of education), the only positive association observed was between education and the total BMI score; relative to those with lower education, those with higher education had a more positive attitude toward mental illness [$F (1, 61) = 4.093$, $p = .047$].

T-tests show significant within-group improvements in the intervention group for all variables except MHLS Recognition and MHLS Self-efficacy, for which observed improvements did not reach statistical significance. No significant within-group changes were observed among the control group. In the ANCOVA models, all four dependent variables from the Mental Health Literacy Scale were significantly different between the two groups at follow-up, with Recognition $F(1,64)=5.17$, $p<.05$, Self-efficacy in help-seeking $F(1,64)=5.09$, $p<.05$, Stigma $F(1,64)=6.24$, $p<.05$, and Willingness to Interact $F(1,64)=30.00$, $p<.0001$. In all instances, results favored the experimental group, with higher levels of recognition, self-efficacy, and willingness to interact, and lower levels of stigma (see Table 2). For the Beliefs about Mental Illness (BMI) scale, all three subscales showed significant Group effects, with BMI Dangerousness $F(1,64)=17.47$, $p<.0001$, BMI Poor skills $F(1,64)=8.99$, $p<0.005$, and BMI Incurable $F(1,64)=7.91$, $p<0.01$. All effects favored the experimental

group, which showed lower levels of all variables at follow-up (Table 2). For the Mental Health Knowledge Quiz (MHK-Q) scale showed significant Group effects $F (1, 64) = 22.22$, $p<0.07$. Results favored the experiment group, with higher levels of mental knowledge (see Table 2).

4.2. Student results

Students reported low mental health knowledge and high levels of stigma at baseline (Table 1). At baseline, result showed no significant association between student sex and either knowledge or attitudes (both $p > .05$). Grade level was also not associated with knowledge ($p = .160$), but upper secondary students did have a significantly higher attitude score than lower secondary students (4.13 vs. 3.73, $p < .001$).

For the students who received the MHL curriculum, significantly higher levels of mental health literacy knowledge at follow-up were found as compared to the control group, $F(1,272)=23.09$, $p<.0001$. The students who received the MHL curriculum also showed significantly lower levels of stigma than the control group at follow-up, with $F (1,272) =41.53$, $p<0.0001$ (see Table 2). No within-group changes were observed among control students, whereas intervention students showed small but significant improvements in both Knowledge and Stigma (Table 1).

5. Discussion

Knowledge, attitudes and beliefs about mental illness plays an important role in early identification and referral of children in need of support. In this regard, this preliminary study was conducted to investigate the knowledge, attitudes and beliefs and to assess the feasibility of a mental health literacy program, The Guide [38], on knowledge, beliefs and attitudes among teachers and students in Cambodia. Findings suggest that with limited adaptations to the original curriculum guide, a 2-day teacher

mental health literacy training followed by teacher-led classroom implementation can improve teacher and student mental health literacy (i.e. knowledge, beliefs, and attitudes). This demonstrates the potential of sustainable approach aimed at training educators on the low-cost application and teacher-optimized resource and embedding the mental health literacy program into existing standard curriculum in classroom.

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, teacher with high education background 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 [33]. 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 [15] .

Our findings are consistent with prior research in Vietnam using the same instruments, which showed Vietnamese teachers had poor knowledge of mental health problems[48]. 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 [49, 50]. 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 [51-54]. 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 [33, 34, 52].

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 [56-58]. 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 [59, 60]. 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 [51], 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 [51, 61] its effectiveness may vary based on the methodology and actual context [62-65]. 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 [66]. 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 [67, 68]. 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 [69, 70]. 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 [71, 72]. Similar findings among Canadian teachers have also showed that supervision was important during delivering curriculum in classroom [70].

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 [43]. 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 and extrinsic) 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 [73-75]. 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 [76, 77] 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.

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.

6. 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 [12, 78]. 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 [43, 79]. 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.

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Table 1
T1 and T2 mean (SD) scale scores by intervention group for Cambodian sample

Scale	Timepoint	Treatment	Control
Teacher - MHLS Recognition	T1	2.67 (.50)	2.41 (.43)
	T2	2.74 (.51)	2.42 (.40)
Teacher – MHLS Self-efficacy	T1	2.61 (.71)	2.50 (.61)
	T2	2.74 (.77)	2.32 (.67)
Teacher – MHLS Stigma	T1	1.72 (.38)	1.84 (.48)
	T2	1.45 (.64)*	1.86 (.62)
Teacher – MHLS Willingness to interact	T1	2.09 (.46)	1.84 (.49)
	T2	2.51 (.46)****	1.81 (.48)
Teacher – BMI Dangerous	T1	2.75 (.68)	2.90 (.79)
	T2	1.99 (1.04)****	2.93 (.73)
Teacher – BMI Poor skills	T1	1.85 (.71)	2.36 (.71)
	T2	1.44 (.77)**	2.20 (.68)
Teacher – BMI Incurable	T1	2.96 (.74)	2.87 (.72)
	T2	2.55 (.66)**	2.91 (.60)
Teacher – MHK-Q	T1	.526 (.078)	.539 (.080)
	T2	.646 (.144)	.513 (.070)
Student – MHL Knowledge	T1	0.57 (.13)	0.56 (.13)
	T2	0.61 (.14)**	0.54 (.12)
Student – Stigma	T1	4.05 (.69)	4.10 (.86)
	T2	3.39 (.84)****	4.02 (.77)

Notes. [1]=Range of the MHLS scales is 0 ("strongly disagree") to 4 ("strongly agree"); range of BMI scales is 0 ("completely disagree") to 4 ("completely agree"). Student – MHL Knowledge is proportion correct. Range of the Student – Stigma scale is 0 ("strongly disagree") to 6 ("strongly agree"); Means are adjusted for T1 scores.
* = $p<.05$, ** = $p<.01$, *** = $p<.001$, **** = $p<.0001$ for within-group T1 to T2 comparisons

Table 2. Results of inferential analyses for Cambodian sample

Dependent variable	F test, for effect of Group	ES[1]	Adjusted[2] Mean (SD) Tx	Adjusted[2] Mean (SD) Cntl
Teachers - MHLS Recognition	$F(1,64)=5.17$*	$R^2=.07$	2.71 (.51)	2.45 (.38)
Teacher – MHLS Self-efficacy	$F(1,64)=5.09$*	$R^2=.07$	2.71 (.72)	2.33 (.64)
Teacher – MHLS Stigma	$F(1,64)=6.24$*	$R^2=.09$	1.46 (.64)	1.85 (.62)
Teacher – MHLS Willingness to interact	$F(1,64)=30.00$****	$R^2=.27$	2.47 (.39)	1.85 (.49)
Teacher – BMI Dangerous	$F(1,64)=17.47$****	$R^2=.19$	2.01 (.97)	2.89 (.71)
Teacher – BMI Poor skills	$F(1,64)=8.99$**	$R^2=.08$	1.57 (.67)	2.06 (.56)
Teacher – BMI Incurable	$F(1,64)=7.91$**	$R^2=.09$	2.53 (.58)	2.93 (.56)
Teacher-MHK-Q	$F(1, 64) = 22.22$	*.258*	.646 (.14)	.513 (.07)
Student – MHL Knowledge	$F(1,272)=23.09$****	$R^2=.07$	0.62 (.13)	0.54 (.12)
Student – Stigma	$F(1,272)=41.53$****	$R^2=.13$	2.40 (.82)	3.01 (.77)

Notes: [1]=effect size is semi-partial eta-squared, controlling for T1 dependent variable.
*=$p<.05$, **=$p<.01$, ***=$p<.001$, ****=$p<.0001$