

Review



The effectiveness of interventions to improve mental health literacy, helping behaviours and stigmatizing attitudes in schoolteachers and staff in Asian countries: A systematic review and meta-analysis

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Abstract

Introduction: Mental health literacy (MHL) has been defined as the knowledge and beliefs about mental disorders which aid their recognition, management or prevention.

Objectives: To assess the effectiveness of interventions to improve MHL, helping behaviours and stigmatizing attitudes in schoolteachers and staff in Asian countries

Methods: This review was registered in the PROSPERO and followed PRISMA Guidelines. Medline, ERIC, PsycINFO, CINHAL and Web of Science databases were searched using predefined search strategies. Studies with randomized controlled trial (RCT), quasi experimental or cluster randomized experimental designs, published as a peer reviewed journal article and or as a report in English from 2000 till February 2022 were selected. Risk of bias (ROB) assessments were conducted with Cochrane ROB V2 tool and ROBINS-I criteria for randomized and non-randomized interventions, respectively. Meta-analyses were performed with Review Manager 5.4 .

Results: At the initial search, 11547 articles were identified and eight were subsequently selected for synthesis of findings. There were four RCTs (n=496) and four, before and after studies without a comparator group (n=251). Most RCTs studies were of low ROB while other studies with ROB of some concern/critical. The findings of the meta-analysis using four RCTs indicated that there was a large improvement in knowledge (SMD=1.3; 95% CI: 0.95, 1.7), a moderate improvement in stigma (SMD=-0.6; 95% CI: -0.8, -0.3) and a large improvement in helping behaviour (SMD=0.8; 95% CI: 0.5, 1.2).

Conclusions & Recommendations: Our review indicates that interventions targeting schoolteachers and staff had large effects upon knowledge of mental illnesses and helping behaviour and moderate effects upon stigma.

Keywords: Systematic review, meta-analysis, mental health literacy, helping behaviour, stigma, interventions

Introduction

Mental health (MH) is an issue of major concern in both developed and developing countries (1). Half of MH problems start to emerge during adolescence (2). As children and adolescents spend a large amount of their time in schools, teachers have the opportunity to provide help to identify MH problems and support help-seeking behaviour (3). They can also liaise with school counsellors, mental health professionals and parents about providing necessary guidance and support for students with MH problems (4). This support may help to reduce the effects of poor MH, preventing absenteeism and school dropout (5). However, many teachers do not possess the adequate knowledge and skills to provide such support (6).

Mental health literacy (MHL) is defined as 'knowledge and beliefs about mental disorders which aid their recognition, management or prevention' (7). MHL has several components, including the ability to recognize specific disorders, knowledge of treatment of mental illnesses, attitudes that promote recognition and appropriate help-seeking, and first aid skills to support others with MH problems (8). Teachers' helping behaviour is conceptualized as either self-reported confidence or intention to provide help, or actual occurrences of teachers providing help to students in the area of MH. Teachers' ability to care for the young people with MH problems could be improved by providing them with necessary knowledge, increasing confidence and lowering stigma. The term 'stigma' encompasses people's knowledge, negative attitudes and behaviours toward a certain group or individual deemed 'unacceptably different' (9). MH stigma, which may be defined as one's attitudes and beliefs about mental disorders, emotional responses, and behavioural intentions, towards people with mental disorders. Teachers with high MHL and low stigma might be able to identify the MH problems in students and to refer them to early for proper care or treatment and have confidence in managing MH problems.

According to Steel & colleagues (2009), cultural factors influence the expression and reporting of mental disorders across countries (10). For instance, countries in North-East and South-East Asia show a lower rate of common mental disorder compared to other regions (10-11). A policy brief reported by the ASEAN (Association of South-East Asia Nation) Task Force on MH (2013) proposed four solutions to address MH issues in the 10 ASEAN countries (12). One of the strategies addressed the promotion of MHL and depression awareness as well as combatting stigma using public education campaigns.

The model of help seeking is a dynamic four step process which involves awareness of the problem, expression of the problem to others, recognizing the help sources and seeking professional help (13). In this framework, MHL plays a critical role. Thus, MHL interventions have been implemented in multiple countries and settings (13). However, MHL interventions need to be context specific (applicable to day-to-day life events in key settings), developmentally appropriate (tailored to match life span), effectively integrated to the existing organizational structures (e.g. schools) and ideally subject evaluation, with all components of MHL measured (mental health knowledge and attitudes, stigma, and help-seeking intentions and behaviours) (14).

To date, a number of programs to improve teachers' MHL have been developed in Asia. The effectiveness of these programs has, however, not been well-established, and none of the reviews have included a meta-analysis, which can offer greater certainty than the results of individual studies with small sample sizes. Two systematic reviews have examined the efficacy of MHL interventions in teacher population in the world but have limitations in addressing our understanding of the effectiveness of such interventions in Asia (15-16).

Yamaguchi & Colleagues conducted a systematic review and narrative synthesis on MHL programs for schoolteachers in September 2018 (15). This review included studies from regions other than Asia, did not include a meta-analysis and included studies which evaluated MHL training programs targeting community members. While teachers were included, programs targeting school nurses, school psychologists and school counsellors were excluded. Anderson & Colleagues conducted a systematic review on MH training programs for secondary school teachers in July 2017 (16). This review included 12 case series but did not include a meta-analysis or publication bias assessments. Thus, to addresses these limitations, the current review aimed to systematically review the effectiveness of interventions to improve the MHL, helping behaviours and stigmatizing attitudes of schoolteachers and staff in Asian countries.

Methods

This review was registered in the International Prospective Register of Systematic Reviews (PROSPERO: CRD42022311421). The systematic review was performed according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) guidelines which are used for reporting systematic reviews (17). This aimed to assess the effectiveness of interventions to improve MHL, helping behaviours and reduce their stigmatizing attitudes in schoolteachers and other school staff in Asian countries.

The following sub questions were investigated:

1. What type of MHL interventions, interventions to improve helping behaviours and stigma reduction interventions have been implemented for schoolteachers and staff in Asia?
2. To what extent have these interventions been

shown to be effective for schoolteachers and staff in terms of:

- a) knowledge of mental illness and the treatment
- b) stigma related to people with mental illnesses
- c) helping behaviours towards people with mental illness

The research problem was formulated based on following PICO (Population, Intervention, Comparison, Outcome) terms. Eligible populations were 'teachers', 'special education teachers' 'refugee teachers' 'school staff such as nurses, office secretaries, IT staff'. Eligible interventions were psycho-educational/MHL interventions/interventions to improve helping behaviours/ stigma reduction interventions delivered in Asian countries with a primary focus on general MH disorders or specifically focused on depression/anxiety/psychosis/schizophrenia and bipolar disorder; comparisons were when control groups to have either 'no intervention' or any type of intervention. Eligible outcomes were knowledge of mental illness, and the treatment or/and stigma related to people with mental illnesses or/and helping behaviour related to people with mental illness.

Eligible study designs included randomized controlled/ quasi experimental (uncontrolled trial or controlled trial without randomization) /cluster randomized experimental designs. Articles were included if they were published as a peer reviewed journal article and or as a report (dissertations, thesis and proceedings of conferences) from January 2000 till February 2022 and in English. The cut-off date of 2000 was based on the decision to include adequate recent evidence and the fact that MHL research was rare before late 1990s, and much early research was conducted in high income countries. We excluded studies with interventions targeting individuals with pre-diagnosed mental illness.

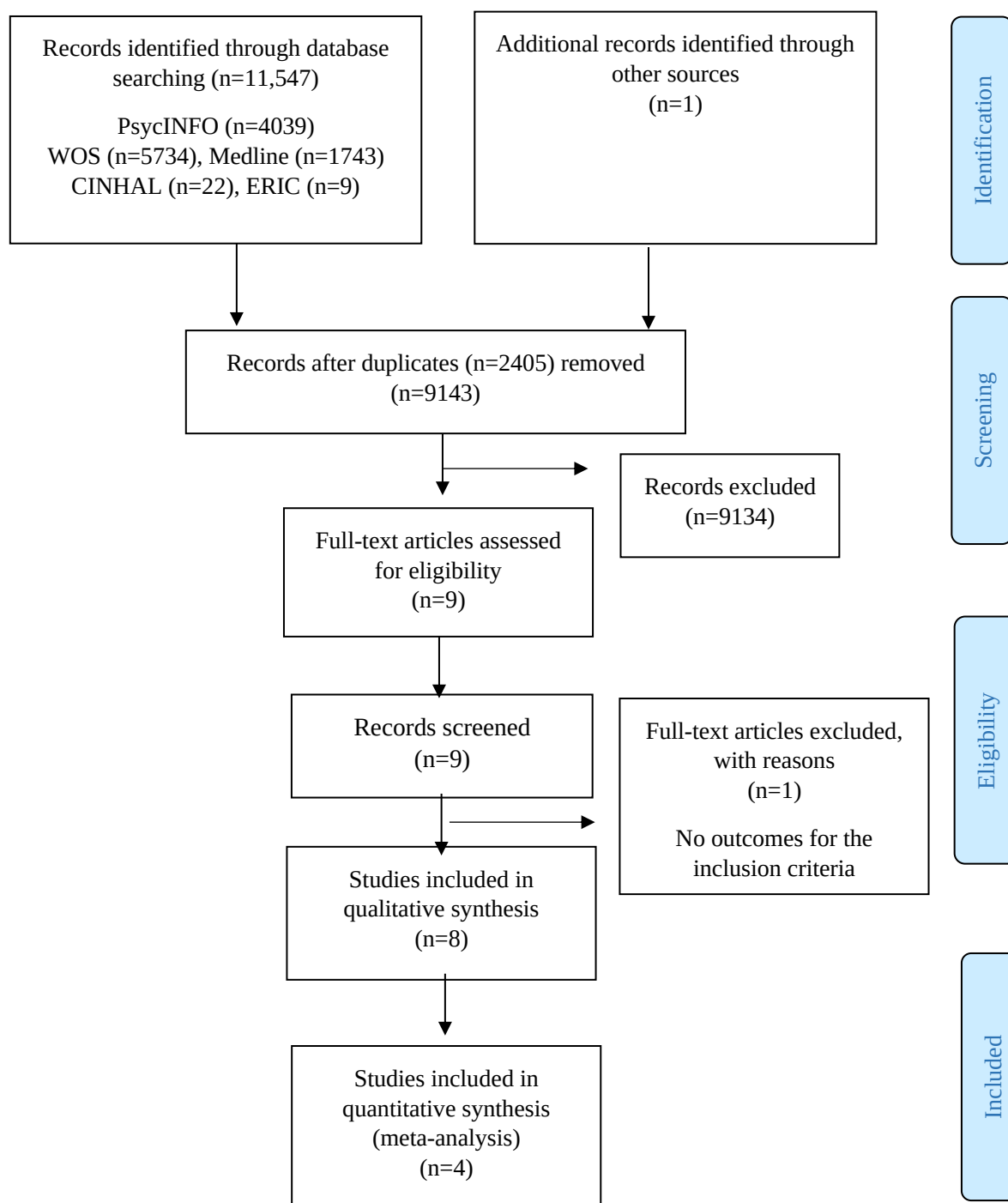


Figure 1: Flow diagram on the selection of studies for the systematic review

To search for eligible primary studies, search strategies were designed with the input of an expert in library sciences (search strategy is given in the appendix). Five major online general databases Medline, ERIC, PsycINFO, CINAHL and Web of Science were searched for primary studies and reviews. Reference lists of included studies were also searched. A manual search was done for reports in the form of dissertations, thesis and proceedings of conferences and for journal articles which were not available through web searches. Unpublished articles were searched by contacting expert colleagues in related fields.

The selection of the studies was conducted in two rounds. In the first round, full database search results were entered into a review manager. EndNote (version X9.3.3), was used to collate the results of the database searches and for de-duplication. In the first round, records were identified through database searching and one was identified by other means (searching the web). None were identified through manual search. Next, the duplicate publications were removed. In the first round, records were screened by titles and abstracts by BD and ineligible records were removed.

After title and abstract screening, the nine included studies were imported into covidence. Full text articles were reviewed in the second round independently by BD and AC and one ineligible publication was removed as there were no outcomes for targeted contents. Conflicts were resolved by NR. The process followed to apply eligibility criteria and PICO terms with the relevant numbers of articles are shown in Figure 1.

Two authors independently extracted the data from the selected studies. When the outcome of the intervention was measured using both quantitative and qualitative methods, we presented the quantitative study findings as the results. Selected

studies were categorized under 'randomized' and 'non-randomized'. Risk of bias (ROB) was assessed by two reviewers (BD & JW) with disputes resolved by the third reviewer (NR). Randomized trials were assessed using the five domains and overall, ROB of the Cochrane ROB V2 tool (18). Non-randomized studies were assessed using the seven domains of ROBINS-I criteria (19).

Data analysis

Narrative synthesis was done based on the outcomes evaluated and the study design (RCT vs non-RCT). A vote counting based on direction of effect approach was used (20). Firstly, each effect estimate was categorized as effective or not, based on the observed direction of effect alone, thereby creating a standardized binary metric. A count of the number of effects showing 'yes' was then compared with the number showing 'no'. All RCTs were included in the meta-analysis.

In anticipation of substantial methodological heterogeneity, the meta-analysis was planned for RCT only. Data analysis was carried out using Review Manager software (Rev Man) version 5.3. Statistical heterogeneity between the studies was assessed using the I^2 statistic. Publication bias was tested by visual inspection of funnel plots. Standardised Mean Difference (SMD) with confidence interval (CI) was used as the effect measure for continuous measurements. When multiple measures were eligible, commonly used measures in the studies were selected for the meta-analysis.

Meta-analysis was performed using random effect assumptions. Sensitivity analyses were done by levels of ROB (Some concern vs. low). Sub-group analysis was conducted to investigate heterogeneity. We investigated publication bias with funnel plots (with publication bias indicated by a deviation from the funnel shaped distribution).

Results

Searches generated 11,548 records of which nine were assessed for full-text eligibility (Figure 1). One study was excluded at the full-text screening stage as there were no outcomes for the inclusion criteria. Finally, eight studies were included in the review with four studies included in the meta-analysis. Study characteristics are detailed in Table 1. The studies were published between 2009 and 2022. Mean/median age was reported from 21 years to 41.2 (SD=13.04) years.

All eight studies involved interventions that targeted teachers, while one intervention was also aimed at other school staff (21). In most studies (7) the delivery method was group except in one study (22) which used printed material. The duration of the intervention varied from one session in one study (23) to a series of sessions delivered for 15 days (1 session) (22).

Several studies involved manualised interventions (21, 24-25) (Table 2). The group interventions applied educational approaches, involving interactions and exchange with peers and/or MH professionals. All the studies emphasised knowledge of MH and mental illness. Only two studies focused on stigmatising attitudes towards people with mental illness (21-24). Seven studies had information on how to support or behave towards people with a person with mental illness (21, 23-28).

Studies also varied in terms of the outcomes they assessed, and how they assessed them. Some of the tools were previously validated (21, 24-25) and some were developed by study authors (22-23, 26-28). Only one of the RCTs (25) collected 3 months follow-up data for the outcome MH knowledge and helping behaviour related to mental illness. This study found a significant increase from baseline to follow-up ($F1=38.6$; $p \leq 0.001$; $\eta^2p=0.3$ & $F2=15.9$; $p \leq 0.001$; $\eta^2p=0.2$).

In this study, helping behaviour was assessed by asking how confident you feel in helping a student with a MH problem. Teacher's intentions to help students with depressive symptoms was evaluated by asking "When you encounter students, you consult with and presented with 10 targets to consult, e.g. boss, colleague (23). All the studies evaluated helping behaviour related to mental illness by the perceived confidence rather than the actual behavioural outcome.

ROB in RCTs and non-RCTs is summarised in Figs 2 and Table 3 respectively. In the RCTs, most of the studies were rated as low ROB due to deviations from intended intervention, missing outcome data and measurement of the outcome. Two studies were judged as low ROB in the selection of reported results, with two studies prospectively registering trial protocols. For the knowledge outcome, two studies were rated as low ROB overall. Similarly, for the helping behaviour outcome, two studies were rated as low ROB overall. For the stigma outcome, only one study was rated as low ROB overall.

For the knowledge outcome in non-RCTs, all didn't have control groups, all four studies were rated as critical ROB overall. Similarly, for the stigma two studies were rated as critical ROB overall. For the helping behaviour outcomes, one study was rated as critical ROB overall.

Effect of interventions on knowledge of mental illness and treatments was evaluated in eight studies and all studies were effective in improving teacher knowledge (21-28). Effect of interventions to reduce stigma related to people with mental illnesses was evaluated in five studies (three RCTs (21, 23-24) and two non-RCTs (26, 28)) and four (80%) studies (two RCTs (66.7%) and two non-RCTs (100%)) were effective in reducing teacher stigma (21, 24, 26, 28) while one RCT showed no effect (23).

Table 1: Study characteristics of educational interventions

Author (year)/ Location	Study design	Study population (%)	How were they selected into the study	Sample size N (I,C)	Age (M, SD, range)	% Female	Years of teaching experience	Education qualification	Received previous training experience mainly related to teaching	Received any training related to child psychology or behaviour management	Has been involved with people with a mental illness	Delivery method	Duration/ Frequency of contact	Comparison
Imran, 2022, Pakistan (25)	RCT	School teachers-100%	Universal	231 (118, 113)	32.5 (pooled)/ 9.7 (pooled)	98.0 (pooled)	8.5 (pooled)/ 6.8 (pooled)	Bachelor's degree-20.4% (pooled) Master's degree-68.6% (pooled) Matric-4.4% (pooled) Intermediate-14% (pooled) Higher qualification-8.1% (pooled)	NR	NR	NR	Group (lectures, discussion, role-plays)	3 days with daily 6hr sessions over 2-week period	Waitlist
Ueda, 2021, Japan (23)	RCT	School teachers-100%	Universal	112 (56,56)	41.2 (pooled) 13.04 (pooled)	46.3 (pooled)	16.2 (pooled)/ 12.3 (pooled)	NR	NR	46 % (pooled)	46.05 % (pooled)	Group	50 min	Waitlist
Nguyen 2020, Vietnam (24)	RCT	Secondary school teachers-100%	Universal	80 (40, 40)	36 (Median)	90	12 (Median)	Bachelor's degree-84% Master's degree-15% Community college degree- 1%	NR	NR	NR	Group (didactic lectures, case studies, group discussion role play)	3-days, followed by 45 mins twice per week for 5 weeks.	No intervention

Phoeun 2019, Cambodia (21)	RCT	School teachers- 66% & Staff (nurses, office secretaries, information technology staff)	Universal	73 (36, 37)	27 (Median)	79	4 (Median)	Bachelor's degree- 53% Master's degree- 3% High school education-24% Junior high school education-15% No response -5%	NR	NR	NR	Group	2 days	No interven tion
Tay, 2019, Malaysia (26)	One group before- after design	School teachers- 100%	Universal	68 (68,0)	30.26 10.61	63.2	3.11/ 2.07	NR	NR	NR	NR	Group	8 hours	NR
Daniel, 2013, India (22)	One group before- after design	Primary School teachers- 100%	Universal	35 (35,0)	36.37/ 9.4	97	11.43/7.4	Bachelor's degree- 57%	74%	63%	51%	Printed material	15 days	NR
Hussein, 2013, Pakistan (27)	Mixed- methods design	Primary School teachers- 100%	Universal	114 (114,0)	21-25 years- 35% >40 years-5%	100	5-10 yr- 38.50% 1-2 yr- 23.10% <1yr- 21.50%	Bachelor's degree- 36.10% Higher qualification-6.7%	53.6%	NR	NR	Group, (video clips, roleplay, practical activities and small- group exercises, handouts, suppleme ntary case vignettes)	two-day (10-12 hours) /6 sessions of 2 hours each	NR

Kumar, 2009, India (28)	Mixed-methods design	School teachers- 100%	Universal	34 (34,0)	NR	70.6	NR	NR	NR	NR	NR	Group	3 days	NR
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*NR- Not Reported

Table 2: Effectiveness of the interventions: Summary of studies

Author (year)/ Location	Type of intervention / Setting	Characteristics of intervention	Is there an emphasis on mental health and mental illness?	Is there a focus on stigma of mental illness?	Is there information on how to support or behave towards ppl with a person with mental illness?	Outcome 1- (Knowledge of mental illness and the treatment)/ Instrument/ Timepoints/ Higher scores indicate...	Outcome 2- (Stigma related to mental illnesses)/ Instrument/ Timepoints/ Higher scores indicate...	Outcome 3- (Helping behaviour related to mental illness)/ Instrument/ Timepoints/ Higher scores indicate...	Main results
Imran, 2022, Pakistan (25)	Education, Secondary schools	WHO-EMRO School Mental Health Manual based Intervention helps teachers to recognize mental health in school settings, fosters awareness of child development phases, provides information about evidence-based behaviour management strategies and focuses on mental health promotion activities via a whole of school approach. Topics covered in the manual include: (1) Social-emotional childhood development, (2) Mental Health Promoting Schools	Yes	No	Yes	1. Teacher's mental health literacy. Culturally adapted (by Pakistani mental health experts) questionnaire developed by WHO/T1, T2 & T3(three-month follow up)/ higher MHL	NR	1. "How confident do you feel in helping a student with a mental health problem?" (Likert scale; Not at all, A little bit, Moderately, quite a lot, Extremely)/ T1, T2 & T3(three-month follow up)/ higher confidence in providing help	Effective Compared with waitlist group, teachers in intervention group presented a significant increase in mental health literacy (F2,181=8.92; <0.001). Increase confidence in helping students with mental health problems was also noted in the intervention arm

		(Promotion and Prevention), (3) Addressing Student Mental Health Problems in Your Classroom (and when to refer for additional help) and (4) Case studies to aid understanding of commonly occurring problems.							(F2,181=15.96;p≤0.001).
Ueda, 2021, Japan (23)	Education, School	The short educational video (film on DVD) provided information regarding the epidemiology of mental disorders, the most prevalent psychiatric problems among children and adolescents, general descriptions and examples of the clinical symptoms of mental disorders (depression, panic disorder, schizophrenia, eating disorders, alcohol use, etc.), the importance and necessity of seeking help, means of responding to students' attempts to obtain help, and means of securing cooperation between schools and medical institutions.	Yes	No	Yes	1.General Knowledge About Mental Health/Illnesses/ T1 & T2/higher knowledge 2.Ability to Recognize Specific Mental Disorders (Depression/ Panic Disorder/ Schizophrenia)/ T1 & T2/higher knowledge	1.Depression Stigma Scale (DSS; Items 1-3 only)/T1 & T2/ Lower stigma 2.Behavior regarding mental health-related stigma (Japanese adaptation)/T1 & T2/greater stigma	1.Intentions to help students with depressive symptoms (self-developed; Asked, "When you encounter students, you consult with" and presented with 10 targets to consult, e.g., boss, colleague)/T1 & T2/ Willingness to interact	Effective in 2/3 outcomes. The educational group showed a greater improvement in knowledge regarding mental health than did the control group. The program was not effective for decreasing stigma toward mental illness. However, the educational group showed an increased intention to assist students with depression.
Nguyen 2020, Vietnam (24)	Education, Secondary schools	Culturally adapted Vietnamese version of the Mental Health & High School curriculum Guide; which was initially developed and tested in	Yes	Yes	Yes	1.Mental Health Literacy Scale (MHLS) (Vietnamese	1.MHLS Stigma/Willingness to interact/ T1 & T2/	1.MHLS Self efficacy/MH help-seeking/ T1 & T2/ higher self-efficacy/MH help-seeking	Effective Six of 7 program effects for teachers

		Canada; an evidence-based mental health literacy training program that includes a teacher preparation component and classroom curriculum. The teacher component involves a 2-day course on mental health literacy in which concepts such as adolescent development, brain function, and mental health, classification and concepts of mental disorders, and stigma are reviewed, and the third day focuses on practical use of the Guide in the classroom (e.g., lesson planning and teaching strategies). Teachers participated in three-day teacher training workshop then taught The Guide modules to their students during their life skills classes (45mins) twice per week for 5 weeks. (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				adaption)- Recognition / T1 & T2 Higher/ knowledge	greater stigma/ higher willingness to interact 2.BMI (Translated and reviewed for necessary adaptation)- Dangerous; Poor skills; Incurable/ T1 & T2/ more stigma	MHLS	were significant with some large effects (e.g., teacher Recognition of Mental Health Disorders, R2=0.36).
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Phoeun 2019, Cambodia (21)	Education, High school	Adaptation (by lead author and bilingual Cambodian psychologists) of the Mental Health & High School Curriculum Guide which was developed in Canada. 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.	Yes	Yes	Yes	1. Mental Health Literacy Scale (MHLS)- Recognition T1 & T2/ higher knowledge 2. Mental Health Knowledge Quiz (MHL-Q)/ T1 & T2/greater knowledge	1. MHLS Stigma/ Willingness to interact/T1 & T2/greater stigma/ higher willingness to interact 2. BMI (Beliefs toward Mental Illness)- Dangerous/ Poor skills/ Incurable T1 & T2/more stigma	1. MHLS Self efficacy/MH help-seeking T1 & T2/ higher self-efficacy/MH help-seeking	Effective Results showed significant improvements in all indicators of teacher knowledge and attitudes about mental illness; largest improvements were in teachers' perceptions of dangerousness and willingness to interact.
Tay, 2019, Malaysia (26)	Education, Refugee learning centres	Trauma-informed mental health literacy program for refugee teachers; developed by researchers and clinical psychologists. Content covers signs and symptoms of mental health issues in children and adolescents (post-trauma, anxiety and depression), early intervention (complementary approaches (e.g., active listening, progressive muscle relaxation) and professional help-seeking), and information	Yes	No	Yes	1. Mental Health Knowledge Schedule (MHKS)/ T1 & T2/ greater mental health knowledge 2. Attitudes and knowledge about mental health conditions/ T1 & T2/ a more positive attitudes and/or accurate knowledge	1. MHL- Stereotypes/ T1 & T2/ more positive beliefs about mental disorders 2. Reported Intended Behaviour Scale (RIBS)/ T1 & T2/ Willingness to interact	1. MHL- Help seeking/T1 & T2/ higher help seeking	Effective The paired sample t-test showed that participants reported higher willingness to contact with people having mental health problems ($t=2.79$; $p<0.01$; Cohen's $d=0.39$), less stereotypes toward mental illness ($t=4.6$;

		on risk/protective factors, evidence-based treatment and ways refugees in Malaysia access professional help. And five-step action plan (CARE2) for supporting individuals with mental health concerns. CARE2 comprises: (i) C – care and concerns, (ii) A – attentive listening, (iii) R – risk review and management, (iv) E – empowerment with information, and finally (v) E – ensure professional help.				3.MHL-Knowledge/ T1 & T2/ higher knowledge 4.Mental Health Literacy Questionnaire for Young Adult Form/T1 & T2/a better knowledge and more positive beliefs about mental disorders 5.Self-help (8-item)/T1 & T2/ higher knowledge			p<0.01; d=0.65) and a better understanding of self-help strategies (t=2.16; p=0.04; d=0.32) than baseline.
Daniel, 2013, India (22)	Education, Primary schools	Self-instructional module on early symptoms of childhood psychiatric disorders (SIM on ESCD) distributed to teachers followed by introductory session (30mins) on the SIM. Participants were asked to study the SIM for a period of 15 days and were reminded at day 7 and 14 to read and review the SIM.	Yes	No	No	1.Knowledge on ADHD/Conduct disorder/Autism/ Scholastic skills disorders/Speech and language disorders-Assessed via structured knowledge questionnaire developed by researcher/T1 & T2/higher knowledge	NR	NR	Effective There was significant difference in mean knowledge score of primary school teachers before (9.71) and after (15.60) the administration of SIM on ESCD. Younger teachers and those who had less years of teaching experience had more knowledge gain score than those who were older and had more teaching experience.

Hussein, 2013, Pakistan (27)	Education, Primary School	Program on child mental health problems tailored for Pakistani school context that covered (1) an understanding of child development and learning age-appropriate behaviours, including a description of common child mental health problems, how these present at school and the risk and protective factors for their onset and maintenance, (2) emphasis being placed on building positive relationships with children and parents, which was the foundation of the training programme, and being proactive in managing children's behaviours	Yes	No	Yes	1.Knowledge About Mental Health/Illnesses- 7 questions related to the presentation, causes, and prevalence of child mental health problems. (Developed in English, translated into Urdu)/T1 & T2/higher knowledge	NR	NR	Effective The training was associated with an improvement in teachers' knowledge and awareness of various signs and symptoms of common child mental health problems.
Kumar, 2009, India (28)	Education, Primary School	Three-day workshop involving lectures and group/panel discussion. Content covers psychological problems in childhood/adolescents (contributing factors to psychological problems and positive mental health, role and effect of stress), identification and management of cognitive and academic problems, and emotional problems.	Yes	No	Yes	1.Ramesh has a psychiatric problem (Case vignette of a child with ADHD with 5 follow-up questions developed from Attitudes to Mental Illness Questionnaire)/T1 & T2/higher knowledge 2.Strict discipline can reduce his problem behaviours/T1 &	1.It is likely that his parents have not taught him discipline and that is why he is such a problem/T1 & T2/greater stigma 2.Children like Ramesh are a bad influence on other children and should	NR	Effective The training sessions were associated with an improvement in teachers' knowledge and awareness of various signs and symptoms of common child mental health problems. The greatest improvement was noted in

						T2/higher knowledge	therefore not be kept in class/T1 & T2/greater stigma 3.I would be comfortable having Ramesh in my class/T1 & T2/greater stigma		response to strategies of managing difficult behaviours, as 61% of respondents were able to formulate appropriate behavioural management techniques after the training.
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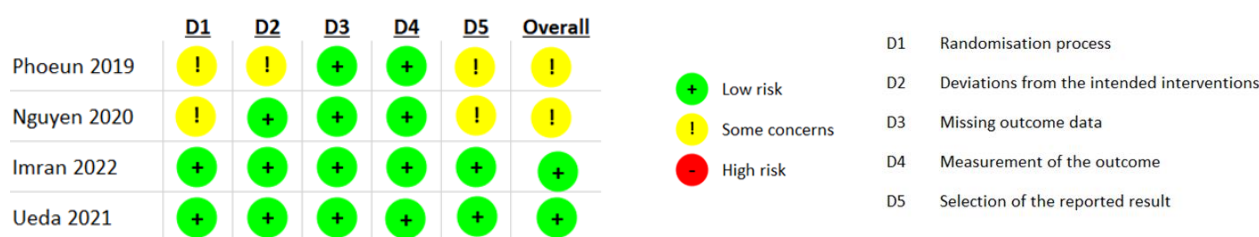


Figure 2.1: Risk of bias summary of the randomized studies for the knowledge outcome

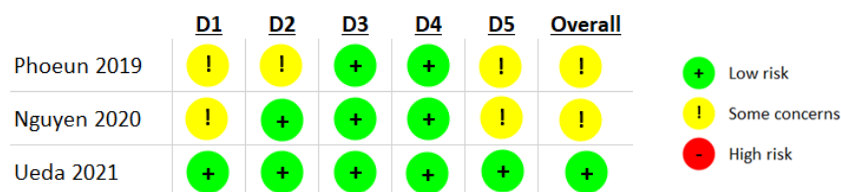


Figure 2.2: Risk of bias summary of the randomized studies for the stigma outcome

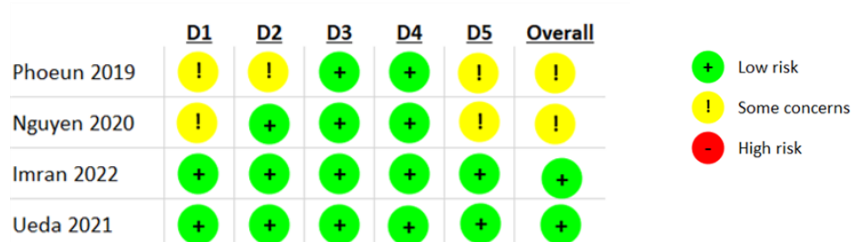


Figure 2.3: Risk of bias summary of the randomized studies for the helping behaviour outcome

Effect of interventions to improve helping behaviour related to mental illness was evaluated in five studies (four RCTs (21, 23-26) and one non-RCT (26)) and all studies (all four RCTs (100%) and the non-RCT (100%)) were effective in improving helping behaviour related to people with mental illness (19-21, 22-25). Details of the intervention activities of each study is given in Table 2. Meta-analysis was conducted for three outcomes: knowledge, stigma and helping behaviour. The forest plots of the outcomes of those interventions included in the meta-analyses are shown in Figure 3.1-3.3. Four RCTs were included in the meta-analysis. Two studies had overall low ROB and two studies had overall ROB ratings of 'some concerns'.

The forest plot of the knowledge outcome is shown in Figure 3.1. With meta-analysis, the total effect size of four intervention studies, was 1.3 (95% CI: 0.95, 1.7). There were high levels of heterogeneity, possibly due to the different study population (schoolteachers and staff) observed in Phoeun, 2019. However, the effect was robust in sensitivity analyses that removed Phoeun, 2019, with a pooled effect of 1.54 (95% CI: 1.3, 1.8) and zero heterogeneity. All the studies were conducted after 2019, which highlights the emergence of this area of research. The effect was robust in sensitivity analyses that removed studies with some concern ROB, with a pooled effect of 1.6 (95% CI: 1.3, 1.8) from two low ROB studies.

Table 3.1: Risk of bias summary of the non-RCT studies for the knowledge outcome

	1. Confounding Bias	2. Selection bias	3. Bias in measurement classification of intervention	4. Bias due to deviations from intended interventions	5. Bias due to missing data	6. Bias in measurement of outcomes	7. Bias in selection of the reported results	8. Overall ROB
Kumar, 2009								
Daniel, 2013								
Hussein, 2013								
Tay, 2019								

Table 3.2: Risk of bias summary of the non-RCT studies for the stigma outcome

	1. Confounding Bias	2. Selection bias	3. Bias in measurement classification of intervention	4. Bias due to deviations from intended interventions	5. Bias due to missing data	6. Bias in measurement of outcomes	7. Bias in selection of the reported results	8. Overall ROB
Kumar, 2009								
Tay, 2019								

Table 3.3: Risk of bias summary of the non-RCT studies for the helping behaviour outcome

	1. Confounding Bias	2. Selection bias	3. Bias in measurement classification of intervention	4. Bias due to deviations from intended interventions	5. Bias due to missing data	6. Bias in measurement of outcomes	7. Bias in selection of the reported results	8. Overall ROB
Tay, 2019								
Low	Moderate	Severe	Critical	No information				

The forest plot of the stigma outcome is shown in Figure 3.2. With meta-analysis, the total effect size of three intervention studies was -0.6 (95% CI: -0.8, -0.3). There was zero heterogeneity. In sensitivity analysis, removing some concern ROB studies left only one study (22). The effect size was similar after sensitivity analysis (-0.5; 95% CI: -0.9, -0.2). The studies (23, 25). The effect size was similar after

forest plot of the helping behaviour outcome is shown in Figure 3.3. With meta-analysis, the total effect size of four intervention studies, was 0.8 (95% CI: 0.5, 1.2). There were high levels of heterogeneity, but all studies showed an improvement in helping behaviour. In the sensitivity analysis, removing some concern ROB studies from the interventions left only two sensitivity analysis (0.8; 95% CI: 0.2,1.5).

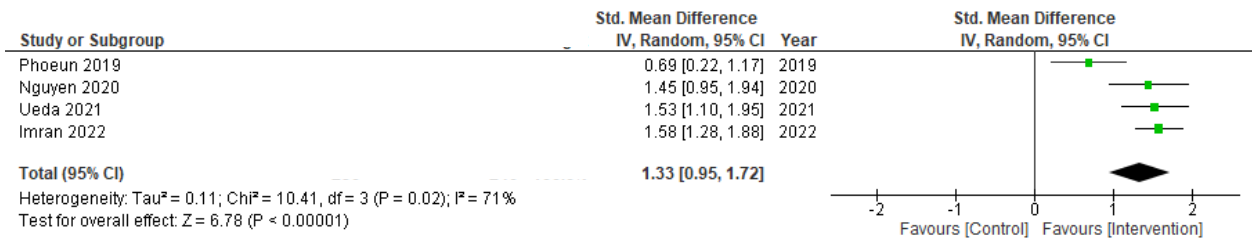


Figure 3.1: Forest plot of knowledge outcome

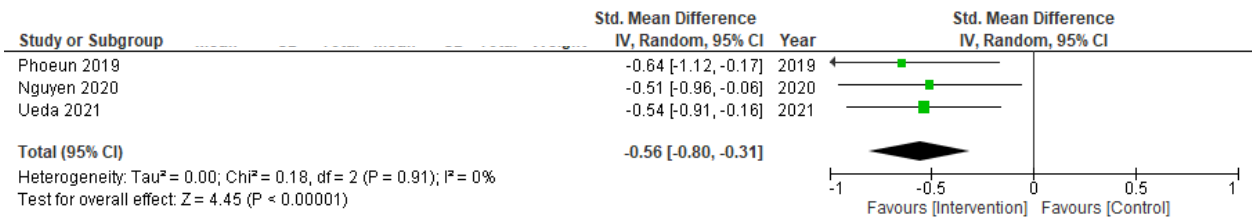


Figure 3.2: Forest plot of stigma outcome

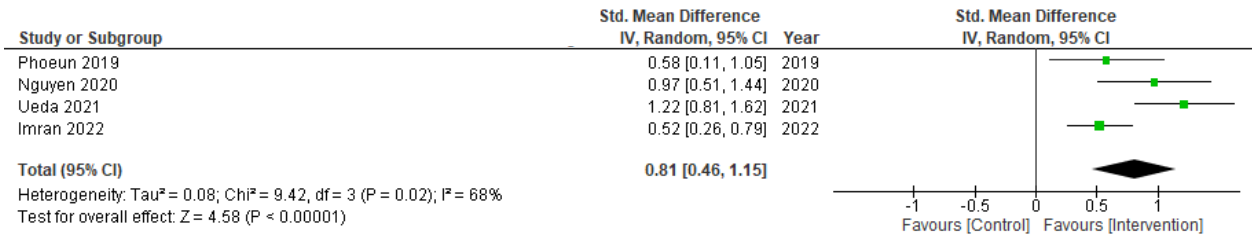


Figure 3.3: Forest plot of helping behaviour outcome

Helping behaviour is conceptualized as either self-reported confidence or intention to provide help to a person with a MH problem. With sub-group-analysis, the total effect size of three intervention studies with measures of self-reported confidence (21, 24-25) and one with a measure of intention to provide help (23) were 0.6 (95% CI: 0.4, 0.9) and 1.22 (95% CI: 0.8, 1.6) respectively and the test for subgroup differences was significant ($p=0.02$). There was 0.02 and not applicable heterogeneity in sub-groups, respectively.

With sub-group-analysis, the total effect sizes of two intervention studies with lowest age of teacher and teaching experience (21, 25) and highest age of teacher and teaching experience (23-24) were 0.5

(95% CI: 0.3, 0.8) and 1.11 (95% CI: 0.8, 1.4), respectively. The test for subgroup differences was significant ($p=0.003$) and there was zero heterogeneity in both sub-groups.

The funnel plots exploring potential publication bias are shown in appendices 2, 3 and 4. The funnel plots of the knowledge and helping behaviour outcomes were not symmetrical indicating the existence of publication bias and the funnel plot of the stigma outcome was fairly symmetrical indicating no publication bias. However, the limitation of the small number of studies (only four/four/three studies respectively) should be noted.

Discussion

This paper reports on the first systematic review and meta-analysis of studies of interventions to improve MHL, helping behaviours and stigmatizing attitudes in schoolteachers and staff in Asian countries. This review identified four RCTs and there was a significant large effect size for knowledge outcome (1.3), medium effect size for stigma outcome (-0.6) and a large effect size for helping behaviour outcome (0.8).

Although there is a large effect size that training improved helping behaviour, all the studies evaluated the perceived confidence rather than the actual behavioural outcomes. ROB of the RCTs were rated as low or some concern ROB, supporting confidence in the findings. For the stigma outcomes, heterogeneity was zero, also giving confidence in the findings, although study numbers were small. However, the non-RCTs did not have control groups, strongly suggesting unmeasured confounding, with all being rated as critical risk of bias. Further studies should aim to include control groups. Further research is required to investigate how to sustain benefits in the longer-term.

Two studies were conducted in Pakistan and India. The other four studies were conducted in Cambodia, Vietnam, Malaysia, and Japan. In RCTs, all the studies were conducted after 2019, which highlights the emergence of this area of research in Asia. Results were generally consistent with those reported in earlier reviews of MHL programs for teachers, that included 16 trials and one overlapping study (15) and 8 trials and zero overlapping studies (16). For knowledge outcomes, Yamaguchi and colleagues (15) found a large improvement ($n=11$; median=1.5) and Anderson and colleagues (16) also found similar results (0.57–3.1) in acquiring knowledge about MH/illness similar to our results (1.3). Improvements in stigma were also similar ($n=7$; median=0.6) (9); 0.36–1.18 (11) to those reported here (-0.6). Effects on helping behaviour was higher (0.8) than those

reported in another review in one study (0.2), but they have not reported a summary of effects (15). In contrast, Anderson and colleagues reported that less evidence was found for the effectiveness of training programs for improving teachers' helping behaviour regarding student MH needs (16).

Since effects were generally moderate to large, interventions could potentially have a large public health effect. In any nation, teachers are responsible for producing the future workforce and thus have a major effect indirectly on the economy and health of a nation. There is evidence to suggest that most of the public in Asian countries, including teachers are not well informed on how to recognize MH problems in others, how to respond to these MH problems, and have poor knowledge of available services and effective treatments (6, 29). Stigmatising attitudes about people with MH problems may effect on help seeking and treatment adherence and increase social exclusion (30-31). These interventions need to offer facts about MH problems and myth-busting, steps and advice on how to approach and support a person with a MH problem. This is important as avoidance and lack of understanding are key experiences of discrimination reported by those with common mental disorders (30, 32). Given low rates of treatment-seeking (33), and evidence that people are more likely to seek help if someone close to them suggests it (34-35), the support that young people receive from their teachers may help to improve MH outcomes in this population. However, teacher's lack of time and opportunity to support student MH due to resource constraints in the school environment is a key barrier to both implementation of MHL initiatives and use of skills learned during such interventions (36-37). There are huge pressures on teachers to deliver demanding curricula with high expectations for pupil test results, leading to little available time for teachers to focus on anything other than the curriculum delivery (37). Likewise, resource constraints and budget cuts may affect the availability of MH educational materials (37). In Asia, lower middle-income countries such as India, Pakistan,

Indonesia, Philippines need to fight the challenges such as inadequate funds, lack of resources and trained MH professionals and lack of medical care (38).

In Asia, MH issues is the second largest contributor to years lost because of disability (38). When considering the aetiology of MH problems in Asia, economic and other factors such as poverty and family disputes have been recognized (39-40). Thus, when designing interventions to improve help seeking and increasing MHL in Asia, it is essential to consider financial, cultural, ethnic and religious factors (41). A systematic review on perceived barriers and facilitators to MH help-seeking in young people revealed perceived stigma and embarrassment and poor MHL (problems recognising symptoms, lack of knowledge about MH services) as the most important barriers to help-seeking (38). Young people perceived positive past experiences, and social support and encouragement from others as aids to the help-seeking process. Thus, MHL interventions targeting schoolteachers need to be developed to improve help seeking as context specific, developmentally appropriate, effectively integrated to the existing school structures and with ideally subject evaluation, with all components of MHL measured (MH knowledge and attitudes, stigma, and help-seeking intentions and behaviours (14).

Strengths and limitations

This review's strength was the intention to include other school staff such as school nurses who play a

valuable role in supporting students with MH problems. Limitations included the small number of studies in meta-analyses, which affected the precision of pooled estimates. Investigating heterogeneity in subgroup and meta-regression analyses was not possible as there weren't enough studies. Another limitation is that since only English language databases were searched, some studies in Asian languages could have been missed. Other limitations include single author screening at title and abstract stage and only 10% were reviewed by a second author and the inclusion of English-language articles only. Further, no studies examined behavioural outcomes.

Conclusions & Recommendations

Our review indicates that interventions targeting teachers and staff had large immediate effects upon knowledge about MH problems and helping behaviour and moderate effects on stigmatising attitudes. MHL interventions could be developed to improve help seeking as Asian context specific, developmentally appropriate, effectively integrated to the existing school structures and with ideally subject evaluation, with all components of MHL measured. Further research into the effectiveness of these interventions would benefit from the use of higher quality designs such as RCTs, validated measures of MHL (41) and longer-term follow-up. Further research is needed to include other school staff such as school nurses who play a valuable role in supporting students with MH problems.

Public Health Implications

- Review indicates that interventions targeting schoolteachers and staff had large effects upon knowledge of mental illnesses and helping behaviour and moderate effects upon stigma. There is a clear need for additional methodologically sound studies in this area in Asia.

Author Declarations

Competing interests: The authors declare that they have no competing interests.

Ethics approval and consent to participate: Not applicable. There is no involvement of any participants or teachers.

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Authors' contributions: BD and NR proposed the topic of the study. BD and AC designed the study in consultation with NR and AM. BD searched the literature and assessed titles, abstracts. BD and AC assessed full texts. BD and JW extracted the data. Conflicts were resolved by NR. BD and JW conducted the ROB assessment. Conflicts were resolved by NR. BD drafted the manuscript. All authors contributed to revisions of the draft and approved the final version of the manuscript.

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Appendices:

Appendix 1 - Search strategies

Ovid MEDLINE

1. mental illness*.mp.
2. mental [health.mp.](#)
3. 1 or 2
4. [stigma.mp.](#)
5. stigmatizing [attitudes.mp.](#)
6. [discrimination.mp.](#)
7. 4 or 5 or 6
8. 3 and 7
9. [knowledge.mp.](#)
10. attitude*.mp.
11. literacy*.mp.

12. awareness*.mp.
13. 9 or 10 or 11 or 12
14. 2 and 13
15. 8 or 14
16. helping behaviour*.mp.
17. help seeking behaviour*.mp.
18. help seeking efficacy*.mp.
19. 16 or 17 or 18
20. 3 and 19
21. 15 or 20
22. teacher*.mp.
23. educator*.mp.
24. school*.mp.
25. 22 or 23 or 24
26. intervention*.mp.
27. program*.mp.
28. psychoeducation*.mp.
29. 26 or 27 or 28
30. 21 and 25 and 29

Search strategy – Key1

<term>.mp. The fields searched by a .mp. include Title, Original Title, Abstract, Subject Heading, Name of Substance, and Registry Word fields.

<term>* Unlimited truncation retrieves all possible suffix variations of the root word indicated.

Last searched on 24/02/2022.

The example and search terminology were used as a framework for subsequent PsycINFO, CINAHL, Web of Science and ERIC database searches. Examples are given below.

Search strategy – APA PsycInfo

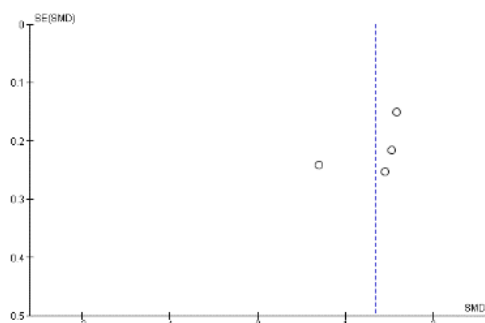
1. mental illness*.mp.
2. mental health.mp.
3. 1 or 2
4. stigma.mp.
5. stigmatizing attitudes.mp.
6. discrimination.mp.
7. 4 or 5 or 6
8. 3 and 7
9. knowledge.mp.
10. attitude*.mp.
11. literacy*.mp.
12. awareness*.mp.
13. 9 or 10 or 11 or 12
14. 3 and 13
15. 8 or 14
16. helping behaviour*.mp.
17. help seeking behaviour*.mp.
18. help seeking efficacy*.mp.
19. 16 or 17 or 18
20. 3 and 19
21. 15 or 20

22. teacher*.mp.
23. educator*.mp.
24. school*.mp.
25. 22 or 23 or 24
26. intervention*.mp.
27. program*.mp.
28. psychoeducation*.mp.
29. 26 or 27 or 28
30. 21 and 25 and 29

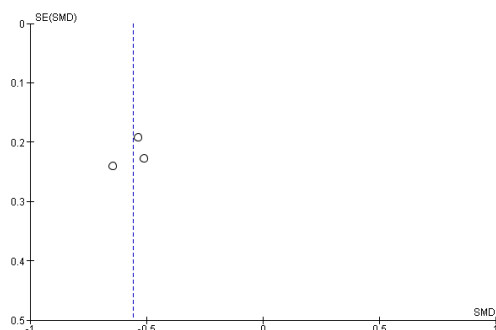
Search strategy – WOS/ERIC/ CINHAL

1. ALL= (mental illness or mental health)
2. ALL= (stigma or stigmatizing attitudes or discrimination)
3. 3 #1 AND #2
4. ALL= (knowledge or attitude or literacy or awareness)
5. #1 AND #4
6. #3 OR #5
7. ALL= (helping behaviour* or help seeking behaviour* or help seeking efficacy*)
8. #1 AND #7
9. #6 OR #8
10. ALL= (teacher* or educator* or school*)
11. ALL= (intervention* or program* or psychoeducation*)
12. #9 AND #10 AND #11

Appendix 2 - Funnel plot of the pooled estimates of the knowledge outcome



Appendix 3 - Funnel plot of the pooled estimates of the stigma outcome



Appendix 4 - Funnel plot of the pooled estimates of the helping behaviour outcome

