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Interventions to Promote Mental Health Literacy in University Students and Their Clinical Educators. A Systematic Review of Randomised Control Trials ☆

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Abstract

Purpose: The effects of interventions for improving mental health literacy of health professional students and their clinical educators have not been established. This review analysed interventions to: support mental health literacy, deal with stigma, encourage help-seeking behaviour and improve attitudes towards providing help to those experiencing mental health issues.
Method: The full holdings of Medline, PsycINFO, EBM Reviews, Cinahl Plus, ERIC and EMBASE were searched until 16th November 2016. Inclusion criteria were randomised controlled trials of interventions to support mental health delivered to groups or using face to face and / or online delivery methods compared to alternative education, usual curriculum or no intervention; and post-intervention measurements for intervention and control. Studies were appraised using the PEDro scale.
Results: Mental health educational interventions were associated with statistically significant improvements in attitudes toward providing help. In one study, Mental Health First Aid (MHFA) resulted in improvements in social associations with a person with a mental health condition. A mental health literacy program improved anxiety literacy. One study of MHFA improved MHFA knowledge. No significant effects were found for attitudes to seeking professional help or mental health stigma. Studies were limited to English and only short term effects were analysed. Method quality was generally poor.
Discussion: Preliminary evidence suggests that interventions such as MHFA may potentially help clinical educators and health professional students develop positive attitudes to providing help and increase MHFA knowledge. MHFA may reduce social distance from a person with a mental health condition but the content needs to be refined if they are to change attitudes toward seeking professional help or stigma. High quality research that includes long term follow up is warranted given the importance of the attitudes of health professionals towards those with mental health issues and the mental health challenges of working as health professionals.
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Keywords: Mental health; Health professional student; Clinical educator; Mental health first aid; Systematic review

☆We acknowledge the Traditional Custodians of our land and pay our respects to their Elders, past and present.

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1. Introduction

Health professional students experience challenges to mental health and wellbeing including psychological distress[1,2]. Distress has been defined as a general term describing unpleasant emotions that impact on a person's level of functioning[3]. This may include depression, anxiety and burnout. Depression is defined as prolonged low mood (from weeks to years). It is a serious condition that affects physical and mental health[4]. Anxiety involves a prolonged feeling of stress and worry that may happen without any particular cause. Anxiety makes it hard to cope with daily life[5]. Burnout has been characterised by emotional exhaustion and cynicism[6].

Health professional courses are demanding in terms of competition for specific career pathways, long contact hours and course length, knowledge retention requirements and the frequently confronting circumstances associated with service provision. These conditions challenge the mental health of students[1,2]. A systematic review reported that American and Canadian medical students have a high prevalence of overall distress, depression and anxiety compared to age-matched peers[7]. Hope and Henderson[8] later conducted a systematic review into medical student distress outside Northern America and reported the prevalence of psychological distress (12.2–96.7%), depression (6–66.5%) and anxiety (7.7–65.5%). In a systematic review, the prevalence of medical student burnout has been reported to be between 45–71% and may increase across professional life[9]. High rates of burnout have also been reported for nurses, physiotherapists and occupational therapists[2,10].

Mental health issues can have serious consequences including sleeplessness, drug and alcohol use, family conflict, sickness and suicidal ideation[11–14]. Despite these statistics, only a small percentage of health professional students seek professional support or guidance for mental health issues[15]. This may reflect a lack of awareness of mental health conditions or how to access relevant treatment or support[15]. The most common source of support is from peers[16]. However peers may not be equipped to identify mental health issues or refer on for appropriate support.

People may not seek professional help due to negative attitudes towards mental illness otherwise termed 'stigma'. Stigma may also lead to limited social interaction with people with mental health conditions. The questions in the social distance scale ask respondents how willing they would be to (1) move next door to the person described, (2) make friends with the person, (3) work closely with the person or (4) have the person marry into the family. This is assessed on a scale of 1 = definitely, 2= rather not, 3= definitely not. Clinicians supervising health professional students in the clinical environment may be in a position to identify potential mental health issues however they lack confidence and comfort in providing support[17]. Health professionals may also have a role in recognising and supporting clients with mental health issues.

There has been a call for culture change, for health professional curricula to incorporate strategies to support mental health and wellbeing[18]. Strategies that could be delivered to groups of students would have the greatest potential for educating cohorts of learners. A strategy that has been used to successfully address stigma associated with poor mental health and create awareness of appropriate supports is mental health first aid (MHFA)[37].

MHFA is designed to educate members of the public on the initial help to give people with developing mental health issues. It also educates about the assistance to give in mental health crises and with ongoing mental health issues. The course presents the major forms of mental health illness and provides a simple five-step plan of management for supporting people with mental health issues. This consists of (1) Assess risk of suicide or harm, (2) Listen non-judgementally, (3) Give reassurance and information, (4) Encourage person to get appropriate professional help and (5) Encourage self-help strategies[19]. This is summarised by the acronym A.L.G.E.E. Participants learn about symptoms, risk factors, effective types of help and knowledge of where and how to obtain help.

The aim of this review was to identify the evidence that supports group interventions suitable for improving mental health literacy. This includes the characteristics of increasing knowledge of mental health conditions, general knowledge about the management and type of support that could be delivered to those with mental health conditions. A meta-analysis of MHFA programs for the public[15] found that MHFA was an effective strategy for improving knowledge, attitudes and helping behaviour as reported in nine single-group pre/post studies and six waitlist controlled trials. The review did not include quality assessment of included studies.

In a recent systematic review, the most common barriers for seeking help in health professionals were disclosure/confidentiality concerns followed by negative social judgement, stigma and employment related discrimination[20]. This was a systematic review of quantitative and qualitative studies and did not include meta-analysis.

The review question was: "What is known about the effects of group interventions for university students or their clinical educators on knowledge, attitudes or behaviours relevant to mental health compared to alternative, usual or no curriculum?" We adapted the WHO definition of mental health as a state of well-being in which an individual "*can cope with the normal stresses of life, and is able to made a contribution to his or her community*"[21]. We also investigated cost efficiencies associated with group interventions given the budget restraints in university programs. A secondary review aim was to describe the program elements in included studies.

2. Methods

2.1. Protocol

This systematic review followed PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) standards[22].

2.2. Eligibility criteria

To be included in the review, studies had to adhere to all of the following criteria:

2.2.1. Population

Undergraduate or post-graduate university students, educators or the public.

2.2.2. Intervention

Any group education intervention designed to enhance mental health literacy.

2.2.3. Comparison

Any alternative approach, usual curriculum content or no intervention control conditions.

2.2.4. Outcomes

Must report at least post intervention measurements for intervention and control groups of knowledge, attitudes or behaviours relevant to mental health.

2.2.5. Study design

Must be randomised controlled trials (RCT) delivered to groups or using face to face and / or online delivery methods.

2.2.6. Report characteristics

The report had to be published in English in peer-reviewed journals. They needed to describe interventions in enough detail to enable replication. Data needed to be presented in a manner that enabled analysis of the effect of the intervention (point estimates and measures of variability for intervention and control groups after the intervention) or data that enabled estimates of these values.

2.3. Search strategy

The full holdings of OVID Medline (1946 to present), PsycINFO (Ovid 1987–2016), EBM Reviews (Ovid 3rd quarter 2016), ERIC (ProQuest 1945- 2016), EMBASE (Elsevier 1957–2016) and Cochrane library were searched until the 16th November 2016. A combination of MeSH and keywords were used. The full search strategy for each database is available on request. As per Hadlaczky and colleagues[15] the search terms included 'mental health first aid', 'MHFA', 'mental health training', 'mental health gatekeeper training', 'mental health gatekeeper' and 'mental health education'. Additional search terms were added including 'mental health literacy' and 'psychological first aid'. The reference lists from relevant reviews were also searched.

The search yield was imported into bibliographic management software. Duplicates were removed and two researchers independently identified articles of potential relevance based on title and abstract. Full-text articles were retrieved and assessed against inclusion and exclusion criteria. Consensus on article inclusion was reached via discussion. Where disagreement occurred a third reviewer was consulted.

2.4. Data extraction

Two researchers piloted the data extraction tables and independently extracted the following data: author/s, year and location of the study, participants' demographic details (age, gender), study details (number of participants). Data was also extracted regarding intervention (content, duration, frequency, details of comparison / control conditions, intervention delivery mode and learning outcomes (method of assessment, pre and post-intervention measurements of relevant outcomes and p-values for tests of differences between groups). If data extraction discrepancies occurred, these were resolved through discussion. The accuracy of independent data extraction was calculated by comparing individual data extraction to data achieved by consensus.

2.5. Risk of bias within studies

Each eligible study was assessed independently by two researchers for potential bias using the PEDro scale. This scale is a validated approach to systematic evaluation of the method quality of clinical trials[23]. The PEDro scale assesses 10 sources of bias including bias associated with random allocation of participants (selection bias), blinding (performance and detection bias), incomplete outcome data (attrition bias) and bias associated with intention to treat. Higher scores indicate fewer potential sources of bias. As per protocol, items 2–11 on the 11 item scale were used to assess study validity and bias. If a study fulfils a criterion it is given a score of 1, with a maximum score of 10. PEDro item decision rules were applied with the exception of item 2; 'Randomisation' was considered achieved if randomisation was reported, regardless of the methods used for randomisation. The review team considered that item 3 assessed concealment. Item 8 'Attrition' was calculated utilising the immediate post intervention scores.

2.6. Summary measures

The principle summary measures were point measures and measures of variability (e.g. means and standard deviations) for each outcome assessed and the number of participants. These were extracted or calculated separately for intervention and control groups.

2.7. Synthesis of results

Analysis of statistical data will be performed using Cochrane Collaboration guidelines[24]. Where authors do not report between group differences required to estimate the intervention effect we will calculate the Hedges g effect size using the formula

$$Hedges' g = \frac{M1-M2}{SDpooled}$$

where M1 – M2 is the difference in means and SD pooled

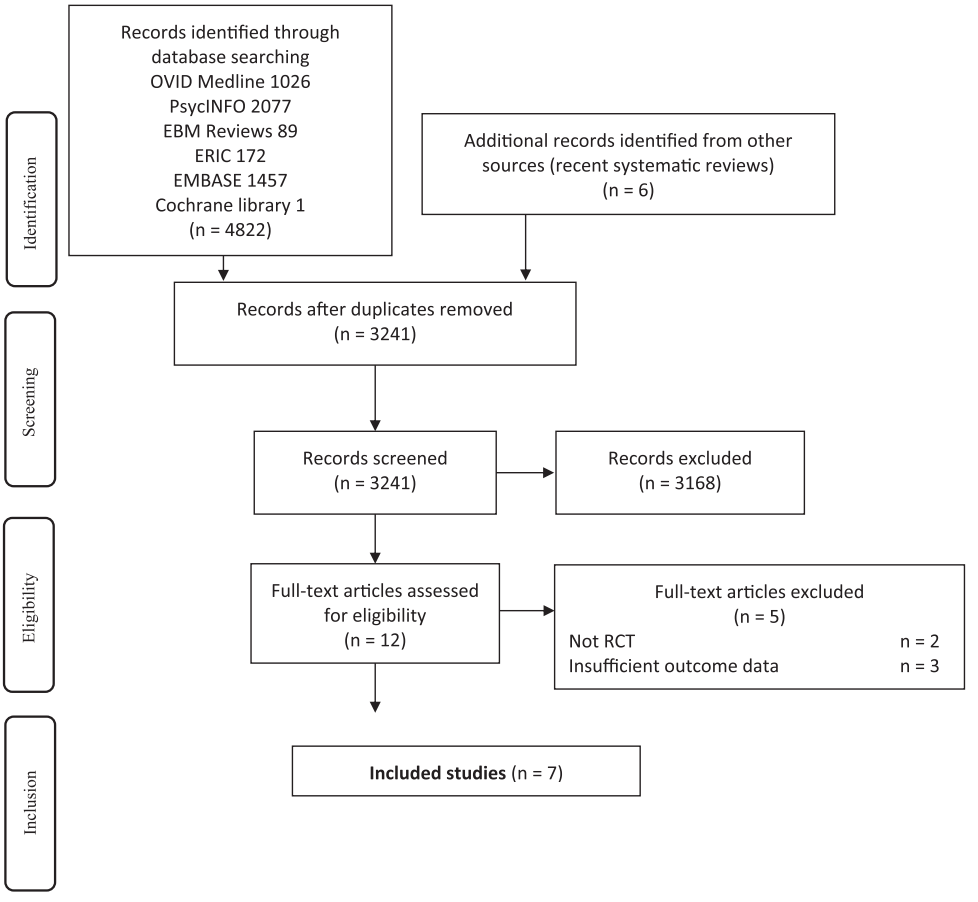

Fig. 1. PRISMA 2009 Flow Diagram describing the pathway of reports into the review.

is the pooled and weighted standard deviation. We will also calculate the associated 95% confidence interval for each outcome. Where possible the outcome data for similar interventions and outcomes will be pooled in meta-analysis using Review Manager Version 5.3®. Where required, conversion of standard errors (SE) of means to standard deviations (SD) will be completed using the formula SE = SD/(√n). If indicated, Forest plots will be generated. Hedges standardised mean difference (SMD)[25] and associated 95% confidence intervals will be used to standardise data assessed on different scales. The alpha level for the test of differences between groups will be set at 0.05.

2.8. Risk of bias across studies

Potential risk of bias across studies due to selective reporting of results will be addressed where possible by comparing reported outcomes to those described in previously published protocols.

3. Results

3.1. Study selection

From the initial search yield of 4822 papers, 11 papers were retrieved for full text evaluation. Of these, four papers did not meet all inclusion criteria. Fig. 1 summarises the process that resulted in the final yield of seven articles.

3.2. Data extraction

Based on 1130 extracted data items, there was 97% agreement between independent reviewers. The common sources of disagreement were related to extraction of outcomes. All disagreements were resolved with collaboration and discussion.

3.3. Characteristics of included studies

3.3.1. Population

Publication demographics are summarised in Table 1. All of the studies were published after 2004 with five out of seven studies conducted in Australia. Included studies involved 2908 commencing participants who were primarily public sector employees. In one study gender was not reported; 63% of participants in the remaining studies were female.

3.3.2. Intervention

3.3.2.1. Delivery. Interventions were primarily face to face or online or a combination. Duration of interventions varied from 3×3 h 26, 27 to a two year program 28.

3.3.2.2. Design. The design of the educational interventions varied (Table 1). Most studies compared interventions to no-intervention controls. One study[29] compared three interventions to control and one study compared two interventions to each other[30].

3.3.2.3. Intervention. The interventions varied (Table 1) but for five studies these were based on Mental Health First Aid (MHFA).

3.4. Attitudes toward seeking professional help

Two studies with a total of 815 participants investigated attitudes towards seeking professional help[28,29]. Gulliver and colleagues[29] compared outcomes for a control group to three interventions for three independent groups of participants: stigma group, feedback group and help-seeking group (see Table 1 for description of interventions). There were three sets of data for Gulliver et al. (2012) for attitudes toward seeking professional help: (1) refers to help-seeking attitudes, (2) refers to help-seeking intentions (formal sources) and (3) refers to help-seeking intentions (informal sources). These three related outcomes were measured on all subjects and the results were therefore not pooled in meta-analysis.

Table 2 presents the comparison of education to control groups on the outcome of seeking professional help. There were non-significant differences for all groups compared to control conditions.

3.5. Attitudes toward providing help

Two studies with a total of 1159 participants investigated attitudes towards providing help[26,34]. Jorm and colleagues measured confidence in providing help. Svensson and Hansson measured attitudes towards providing help: help offered and confidence in providing help. The results are collated in Table 2. Given the heterogeneous outcomes measures, meta-analysis was not performed. Significant differences between groups favouring the experimental group were observed for all comparisons.

Table 1
Summary of mental health interventions in included studies.

First Author (Year) Country Sample size and participants, age mean (SD) female %	Intervention and control conditions Duration	Delivery mode
Gulliver (2012)[29] Australia 120 athletes age 24.83 (N/A) female 83%	• Stigma group: Online education about anxiety and depression • Feedback group: Interactive quiz about participants' anxiety and depression • Help-seeking group: Online education about mental health conditions, sources of help and resources • Control: No treatment control Conducted over a period of two weeks.	Online
Jorm (2010)[38] Australia 327 secondary school teachers age N/A female 65%	• e-learning CD with video clips and interactive case studies • Mental Health First aid manual, with the same content as e-learning CD but without the video clips and interactive case studies • Control: Waitlist control Duration N/A	Face to face
Kitchener and Jorm (2004)[26] Australia 301 employees in two large Government departments age 49.2% 18–39 years, 50.2% 40–59, 0.7% 60+ years (N/A) female 78.1%	• Mental Health First Aid • Control: Waitlist control Three weekly sessions of 180 min (9 h)	Face to face
Jorm (2004)[26] Australia 753 members of the public from a rural community age 47.14 (N/A) female N/A	• Mental Health First Aid • Control: Waitlist control 12 h duration	Face to face

Levin (2016)[30] USA 234 undergraduate university students age 21.61 (5.48) female 76.9%	• Mental Health Education: two online sessions focussing on basic education about the symptoms and causes of depression and anxiety and brief information on coping strategies • Control: A brief orientation followed by a 3-week program called ACT-CL an online course involving two sessions focussing on the values and acceptance components of Acceptance and Commitment Therapy (ACT). ACT focuses on reducing inflexibility in psychological behaviours where these are rigidly governed by thoughts and feelings at the expense of actions that may be more effective. The course included content on defining values and goals, fostering mindfulness (the characteristic of being in the present moment) and dealing with barriers. There were also links to relevant resources Three weeks duration	Online
Reavley (2014)[28] Australia 767 university students age Intervention 24.89 (8.02), age Control 23.96 (8.89) female Intervention 69.3% female Control 52.5%	• Mental health program called MindWise. The intervention incorporated a number of key messages: "*(1) depression and related disorders are common in young people; (2) there are recognizable signs of depression and related disorders in young people; (3) early help-seeking leads to better outcomes; (4) there are several sources of professional help available; (5) there are useful types of self-help available; and (6) there are helpful first aid actions that staff and peers can take*. There was also information about safe consumption of alcohol. The intervention also included Mental Health First Aid training • Control: non specified control condition Conducted over 2 academic years.	Face to face and online
Svensson and Hansson (2014)[34] Sweden 406 public sector employees in Sweden age Intervention 45.6 (10.7), age Control 45.6 (10.3) female 77%	• Mental Health First Aid • Waitlist control 12 h duration	Face to face

Table 2
Study outcomes grouped by outcome measures.

Author (Year) PEDro score	Intervention versus control	Outcome measure	Intervention			Control			Mean Difference (95% confidence interval)
			Mean	SD	*n*	Mean	SD	*n*	
Attitudes towards seeking professional help									
Gulliver (2012)[29] 5	Mental health literacy versus control	Help-seeking attitudes (ATSPPH-SF)Higher scores = more positive toward seeking help	22.40	3.34	10	21.14	5.26	14	1.26 (−2.19, 4.71)
	Feedback versus control		20.67	4.19	12				−0.47 (−4.10, 3.16)
	Help-seeking versus control		20.92	3.23	12				−0.22 (−3.53, 3.09)
	Mental health literacy versus control	Help-seeking intentions (GHSQ) – formal sourcesHigher scores = more positive toward seeking help	4.10	1.29	10	3.79	1.81	14	0.31 (−0.93, 1.55)
	Feedback versus control		3.92	1.22	12				0.13 (−1.04, 1.30)
	Help-seeking versus control		4.04	0.92	12				0.25 (−0.83, 1.33)
	Mental health literacy versus control	Help-seeking intentions (GHSQ) – informal sourcesHigher scores = more positive toward seeking help	5.12	0.81	10	5.17	1.21	14	−0.05 (−0.86, 0.76)
	Feedback versus control		4.27	1.49	12				−0.90 (−1.95, 0.15)
	Help-seeking versus control		5.05	1.29	12				−0.12 (−1.09, 0.85)
Reavley (2014)[28] 4	Mind-wise versus control	Help-seeking actions for respondents' own mental health problemsHigher scores = more help-seeking	4.26	2.87	426	4.14	2.77	341	0.12 (−0.28, 0.52)

Attitudes to providing help									
Jorm (2004)[26] 6	MHFA versus control	Confidence in providing helpHigher scores = increased confidence	1.83	0.03	416	1.85	0.07	337	**−0.02 (−0.03, −0.01)**
Svensson and Hansson (2014)[34] 6	MHFA versus control	Help offeredHigher scores = more help offered	3.1	0.9	199	2.8	0.9	207	**0.30 (0.12, 0.48)**
		Confidence in providing helpHigher scores = more confidence in providing help	2.7	0.6	199	2.4	0.7	207	**0.30 (0.17, 0.43)**
Stigma									
Gulliver (2012)[29] 5	Mental health literacy versus control	Depression stigma (DSS) Higher scores = more stigma	7.50	4.95	10	8.93	6.39	14	−1.43 (−5.97, 3.11)
	Feedback versus control		9.82	5.90	11				0.89 (−3.94, 5.72)
	Help-seeking versus control		7.58	3.32	12				−1.35 (−5.19, 2.49)
	Mental health literacy versus control	Anxiety stigma (GASS) Higher scores = more stigma	5.40	4.77	10	5.57	4.36	14	−0.17 (−3.91, 3.57)
	Feedback versus control		8.18	5.38	11				2.61 (−1.30, 6.52)
	Help-seeking versus control		6.00	4.22	12				0.43 (−3.68, 4.54)
Svensson and Hansson (2014)[34] 6	Mental health first aid versus control	Personal stigma depressionHigher scores = less stigma	24.4	6.8	199	24.8	6.7	207	−0.40 (−1.71, 0.91)
		Perceived stigma depressionHigher scores = less stigma	36.3	4.8	199	35.4	5.3	207	0.90 (−0.08, 1.88)
		Personal stigma psychosisHigher scores = less stigma	22.3	6.1	199	22.4	5.8	207	−0.10 (−1.26, 1.06)
		Perceived stigma psychosisHigher scores = less stigma	33.5	5.2	199	33.6	4.7	207	−0.10 (−1.07, 0.87)

Table 2 (*continued*)

Author (Year) PEDro score	Intervention versus control	Outcome measure	Intervention			Control			Mean Difference (95% confidence interval)
			Mean	SD	*n*	Mean	SD	*n*	
Social distance from a person with a mental health condition									
Kitchener and Jorm (2004)[26] 6	MHFA versus control	Social distance from a person with depressionHigher scores = closer distance	11.27	3.5	107	11.62	3.35	133	−0.35 (−1.22, 0.52)
		Social distance from a person with schizophreniaHigher scores = closer distance	7.86	2.5	107	8.46	2.54	133	−0.60 (−1.24, 0.04)
Jorm (2004)[26] 6	MHFA versus control	Social distanceHigher scores = closer distance	7.59	1.202	355	7.9	0.2	315	**−0.31 (−0.44, −0.18)**
Mental health literacy									
Gulliver et al (2012)[29] 5	Mental health literacy versus control	Depression literacy (D-Lit) Higher scores = higher literacy	16.00	3.50	10	12.21	4.73	14	3.79 (0.50, 7.08)
	Feedback versus control		12.73	2.94	11				0.52 (−2.51, 3.55)
	Help-seeking versus control		10.92	2.54	12				−1.29 (−4.25, 1.67)
	Mental health literacy versus control	Anxiety literacy (A-Lit) Higher scores = higher literacy	13.70	4.88	10	9.57	4.48	14	**4.13 (0.30, 7.96)**
	Feedback versus control		8.27	3.23	11				−1.3 (−4.32, 1.72)
	Help-seeking versus control		9.17	3.19	12				−0.4 (−3.36, 2.56)

Kitchener and Jorm (2004)[26] 6	MHFA versus control	Beliefs re: treatment depressionHigher scores = more aware of interventions that can assist	86.29	18.3	146	83.42	18.48	155	2.87 (−1.29, 7.03)
		Beliefs re: treatment schizophreniaHigher scores = more aware of interventions that can assist	87.41	18.26	146	88.41	16.11	155	−1.00 (−4.90, 2.90)
Svensson and Hansson (2014)[34] 6	MHFA versus control	MHFA knowledgeHigher scores = more knowledge	8.7	2.1	199	7.3	2.4	207	**1.40 (0.96, 1.84)**
		Beliefs about treatment for depressionHigher scores = more aware of interventions that can assist	5.3	1	199	5.3	1.1	207	0.00 (−0.20, 0.20)
		Beliefs about treatment for psychosisHigher scores = more aware of interventions that can assist	3.8	1.1	199	3.7	1.1	207	0.10 (−0.11, 0.31)

A-Lit: Anxiety Literacy Questionnaire[29]
ATSPPH – SF: Attitudes Toward Seeking Professional Psychological Help (Short Form)[31]
D-Lit: Depression Literacy Questionnaire[29]
DSS: Depression Stigma Scale[32,33]
GASS: Generalised Anxiety Stigma Scale[33]
GHSQ: General Help-Seeking Questionnaire[34]
MHFA: Mental Health First Aid

3.6. Stigma

Two studies with a total of 354 participants investigated the effect of education on mental health stigma[29,34]. Table 2 presents the comparisons of education to control conditions on the outcomes of stigma. Gulliver and colleagues reported two measures of stigma: (1) depression stigma and (2) anxiety stigma. Svensson and Hansson also reported two measures of stigma: (1) personal stigma and (2) perceived stigma for each of depression and psychosis. No meta-analysis could be performed due to the heterogeneous nature of the outcome measures. No significant effects were found for any stigma outcomes.

3.7. Social distance from a person with a mental health condition

Two studies with a total of 910 participants investigated the effects of education compared to control conditions on the outcome of social distance from a person with a mental health condition[26,27]. Kitchener and Jorm separated this into social distance from a person with depression and social distance from someone with schizophrenia. Table 2 presents the outcomes. No meta-analysis was performed due to the heterogeneity of the outcomes. Only the social distance outcome measured by Jorm and colleagues[26] was statistically significant in comparison to controls.

3.8. Mental health literacy

Three studies with a total of 1507 participants investigated the effects of education compared to control conditions on mental health literacy[27,29,34]. The results could not be pooled in meta-analysis as the outcome measures were heterogeneous. The results are presented in Table 2. For each of the three interventions Gulliver and colleagues reported two measures of literacy – depression literacy and anxiety literacy. Kitchener reported two measures of literacy – beliefs about treatment of depression and beliefs about treatment of schizophrenia. Svensson and Hansson reported three measures of literacy – MHFA knowledge, beliefs about treatment for depression and beliefs about treatment for psychosis. There were only two statistically significant results favouring intervention for anxiety literacy versus no education[29] and for MHFA knowledge versus no education[34]. Study quality evaluations assessed using PEDro are presented in Table 3.

PEDro scores ranged from 4/10 – 7/10 (mean 5.57, S. D. 0.94). Given the inclusion criteria, all studies were

Table 3
Quality Assessment.

Author	Randomisation	Concealment	Baseline similarity	Subject blinding	Therapist blinding	Assessor blinding	Attrition	Intention to treat	Between groupcomparison	Point estimates / measures of variation	TOTAL Score
Gulliver (2012)[29]	1	1	1	0	0	1	0	0	0	1	5
Jorm (2010)[38]	1	1	1	0	0	1	0	0	0	1	5
Kitchener and Jorm (2004)[29]	1	1	1	0	0	1	0	1	0	1	6
Jorm (2004)[26]	1	1	1	0	0	1	0	1	0	1	6
Levin (2016)[30]	1	1	1	0	0	1	1	1	0	1	7
Reavley (2014)[28]	1	0	1	0	0	1	0	0	0	1	4
Svensson and Hansson (2014)[34]	1	1	1	0	0	1	0	1	0	1	6

randomised. All but the Reavley and colleagues[28] study concealed participants when determining group allocation. All studies demonstrated baseline similarity. For all studies, rigour was lacking in respect to subject and therapist blinding, a limitation that may not be amenable to improvement in educational interventions. All studies blinded the assessor. Only one study[30] met our criteria for attrition (at least one key outcome must be measured in more than 85% of participants who were initially allocated to groups). Four studies used intention to treat analysis or explicitly reported that participants received interventions as allocated[26,27,30,34]. No studies reported between group comparisons so we calculated these differences from reported data. All studies reported point estimates or measures of variation.

3.9. Data abstraction

3.9.1. Risk of bias across studies

Studies were also heterogeneous in terms of intervention and outcomes measures. Consequently no studies could be included in meta-analysis.

4. Discussion

4.1. Summary of evidence

Across the seven papers included in this review, data were collected from 2908 participants relating to the impact of interventions to promote help-seeking, providing help, mental health stigma and mental health literacy. Mental health interventions appear to have no significant effect on attitudes to seeking professional help or stigma.

Interventions appeared to have no significant effects on depression literacy or beliefs about treatment of mental health conditions. MHFA improved participants' attitudes to providing help to those with mental health conditions. This is supported by the systematic review and meta-analysis by Hadlaczky and colleagues[15] who found a change in attitudes (0.28, 95% CI = 0.22 – 0.35; $p < 0.001$) and helping behaviours (0.25, 95% CI = 0.12–0.38; $p < 0.001$) as a result of MHFA.

In one study, MHFA showed statistically significant reductions in social distance from a person with a mental health condition[35].

A mental health literacy intervention showed statistically significant changes in anxiety literacy in comparison to controls[29].

MHFA demonstrated improvements in MHFA knowledge in comparison to control. This is supported by the systematic review by Hadlaczky and colleagues[15] who found a significant increase in knowledge (mean effect size of Glass's $\Delta = 0.56$ 95% CI = 0.38–0.74; $p < 0.001$) associated with MHFA. This occurred whether participants were students, workers or the public.

There is preliminary evidence that MHFA might improve confidence in providing help and might improve knowledge of mental health conditions and their management. This may be a beneficial inclusion in health professional courses however further robust research is needed. Clinical supervisors who are considered both workers and the general public may be more likely to offer help to students with mental health issues as a result of completing a MHFA course. Brunero and colleagues[36] conducted an integrative review on mental health education programs for generalist health professionals and found improvements in knowledge, skill and attitude in most studies. The more effective components of the mental health education programs included supervised clinical experience, role play and case scenarios.

4.2. Limitations

This review was limited to peer-reviewed articles that were published in English which could result in bias. While an extensive search was conducted, it is possible that relevant articles were not identified. The literature is limited by the number of relevant RCT. Despite using the gold standard of RCT, the quality of the included studies varied considerably. Studies generally had low quality assessment scores indicating numerous potential sources of bias, which may compromise internal validity. We are therefore unable to draw robust conclusions from these articles. Many papers were from Australia and investigated primarily female participants, thus findings may not be generalisable to other contexts, to males or to other populations. Studies primarily measured before and after effects of interventions so we were not able to examine longer term effects. Each of the seven papers included in this review were heterogeneous in terms of study design and outcome measures and thus meta-analysis could not be performed. The majority of studies recorded the effects of interventions with self-rating assessment and this may have limitations. The studies with high attrition rates may indicate that interventions are not attractive to participants, thereby highlighting the importance of designing programs that engage participants. Although we intended to study cost-effectiveness, studies did not report information about intervention cost and this is a target for consideration in future work.

Despite the flaws, the included studies contain valuable information about the types of interventions that have been trialled. The study with the highest quality assessment score of 7/10 supports positive effects of acceptance and commitment therapy and mental health training on mental health literacy.

Despite the fact that mental health underpins the work of all health professionals, the strategies for improving mental health are poorly understood and inadequately studied. Future recommendations include conducting high quality RCTs to determine long-term effects of interventions. Well conducted trials could be performed in usual university settings. Agreement on consistent outcome measures would be beneficial to enable pooling of data in meta-analysis. Exploring strategies to support male students is an area that also requires further development.

5. Conclusions

Strategies are required to enhance university health professional student mental health. The findings of this systematic review suggests that interventions incorporating Mental Health First Aid may be valuable to health professional curricula both for students and their clinical educators. This review advances the understanding of strategies that might be useful to include in health professional courses to support student mental health. This review emphasises the need for further robust studies in the area given the importance of the mental health of health professionals. High quality trial design and long term outcome assessment are important in future studies. Collaboration is required to agree on a set of outcome measures as comparison of interventions with diverse outcome measures is challenging.

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