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Review article

A Systematic Review of Youth and Teen Mental Health First Aid: Improving Adolescent Mental Health

Sok Hui Ng, M.B.B.S. [a], Norman Jun Hao Tan, M.B.B.S. [a], Yang Luo, M.B.B.S. [a], Wei Sheng Goh, M.B.B.S. [a], Roger Ho, M.D. [a,b,*], and Cyrus Su Hui Ho, M.B.B.S., M.Sc. [a,c]

[a] *Department of Psychological Medicine, Yong Loo Lin School of Medicine, National University of Singapore, Singapore, Singapore*
[b] *Institute for Health Innovation and Technology (iHealthtech), National University of Singapore, Singapore, Singapore*
[c] *Department of Psychological Medicine, National University Health System, Singapore, Singapore*

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A B S T R A C T

Purpose: Adolescent mental illness often goes undetected. Youth and teen Mental Health First Aid (MHFA) are variations of adult MHFA that aims to help adults and adolescents recognize the signs and provide help where appropriate. We conducted a systematic review to summarize the current evidence for youth and teen MHFA, providing direction for future training and research.
Methods: A systematic search was performed on September 12, 2020 on PubMed, Embase, PsycINFO, ERIC, and Cochrane using keywords related to teen or youth MHFA, adolescents, and mental health. A narrative synthesis was then carried out.
Results: Of the 695 articles identified, 14 studies were included. All studies were from the U.S. and Australia. All studies demonstrated significant improvements in knowledge, recognition, stigmatizing attitudes, confidence, helping intentions, and helping behavior in both adult and youth participants. Improvement in knowledge and confidence was most reported, and improvement in helping behavior was the least reported. There is encouraging evidence of long-term benefits after the training.
Conclusions: More studies need to be conducted in non-Western countries, high-risk populations, and different professional settings. Future interventions could also consider different modes of learning, longer-term follow-up, and the measurement of outcomes that evaluate the quality of helping behavior.

IMPLICATIONS AND CONTRIBUTION

This review summarizes the literature surrounding Mental Health First Aid in the adolescent population. Both adults and adolescents were able to benefit from these adapted versions of Mental Health First Aid, with encouraging evidence for sustained outcomes. This training has a role in professional training, school curriculums, and improving adolescent mental health.

Approximately half of mental disorders begin before 14 years of age [1]. According to the World Health Organization, mental disorders account for 16% of the global burden of disease in adolescence [2]. However, adolescent mental illness often goes undiagnosed and untreated because of low levels of help-seeking behavior [3]. Commonly cited reasons for this include low mental health literacy and lack of recognition of mental illness [4–6]. Untreated adolescent mental disorders can lead to adverse outcomes later on in life [7,8], which reinforces the importance of early detection and prompt treatment. Hence, many researchers and clinicians have attempted to tailor early intervention programs in adolescent populations. As adolescents do not frequently seek help from mental health professionals, their peers, parents and teachers are key to detect the signs. As such, many of such interventions target these populations. One of such interventions is Youth and teen Mental Health First Aid (MHFA).

Conflicts of interest: The authors have no conflicts of interest to disclose.

* Address correspondence to: Roger Ho, M.D., Department of Psychological Medicine, Yong Loo Lin School of Medicine, National University of Singapore, Level 9, NUHS Tower Block, 1E Kent Ridge Road, Singapore 119228.
E-mail address: pcmrhcm@nus.edu.sg (R. Ho).

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MHFA is a course created in 2001 by Betty Kitchener, a nurse, and Anthony Jorm, a professor in mental health literacy. It aims to teach participants to identify signs of mental illness and provide support [9]. The standard version of MHFA has been shown to be effective particularly in improving mental health literacy and provider confidence and reducing stigmatizing attitudes [10]. In addition, these studies showed that despite the short duration of MHFA training, these effects are sustained over some time after the training [10,11]. Since the advent of MHFA, several versions of MHFA have been created to train specific populations. In this review, we have chosen to focus on youth and teen MHFA. Youth MHFA (YMHFA) is delivered to adults who look after adolescents [12]. Like the standard (adult) MHFA course, YMHFA provides an overview of mental health conditions, available treatments and a MHFA Action Plan. The contents of the course include specific information relevant to adolescent mental health, for example, information about eating disorders [12]. The Action Plan follows the ALGEE framework, which stands for assess for risk of suicide or harm, listen nonjudgmentally, give reassurance and information, encourage appropriate professional help, and encourage self-help [13]. Teen MHFA (tMHFA) is delivered to adolescents using age-appropriate learning materials [14]. The ALGEE framework in tMHFA is reframed into the mantra of "Look, Ask, Listen, Help your Friend." The action plan emphasizes finding a responsible, trained adult to provide assistance [15]. tMHFA focuses on detecting general signs of a mental health problem instead of focusing on specific mental illness [16].

Although studies have tested youth and teen MHFA, no review has been performed specifically for MHFA targeted at adolescents to our knowledge. Current reviews on adult MHFA have found that while MHFA generally increases mental health knowledge and helpful intentions and behavior and reduces stigmatizing attitudes [11,17,18], the impact of MHFA on the intended recipients of the aid has not been adequately studied [18]. This is understandable given that MHFA study populations do not include recipients of aid. However, teen and youth MHFA studies have the potential to measure outcomes on the adolescent recipients of aid because the parent-child or teacher-student relationship is established. Therefore, this review seeks to provide an overview of the studies on youth and teen MHFA and the outcomes of this course in the domains of participants' knowledge, recognition of mental illness, stigmatizing attitudes, confidence, and helping intentions and behaviors. Second, this review seeks to provide insight into the impact of MHFA on the adolescent recipients of aid provided by their caregivers. From this review, we hope to provide recommendations in youth and teen MHFA training and directions for future research to develop effective early intervention programs for adolescents.

Methods

Search strategy and selection criteria

This review was guided by the PRISMA recommendations for systematic reviews. A systematic search of the literature was conducted on 12 September 2020 on PubMed, EMBASE, PsycINFO, ERIC, and the Cochrane Central Register of Controlled Trials. A specific search strategy was created for each unique database combining the following concepts and related keywords: (1) mental health or mental disorders; (2) mental health first aid, MHFA or first aid; and (3) adolescents, youth or teens. The full search strategy for each database can be found in the Appendix.

To ensure sufficient data were collected, all studies that measured the outcomes of an intervention were eligible regardless of study design. Studies were included if they described "youth" or "teen" MHFA training as an intervention and where outcomes of this training were assessed. Only articles in English were included. Studies were excluded if they described other types of mental health training, if MHFA was not the primary intervention but part of a combined intervention, or if outcomes of MHFA were not measured. We also excluded conference abstracts, commentaries, letters, and dissertations.

One author (SHN) conducted the search in all databases and exported the search results into Endnote X9. Duplicates were removed first by Endnote, then manually by one author (SHN). Two authors (NTJH, YL) screened the articles by titles and abstracts independently and disputes were resolved with another author (WSG). Full-text inclusion based on aforementioned criteria were carried out independently again by two authors (NTJH, YL), with disagreements resolved by consensus of another author (WSG).

Data analysis

A data extraction sheet was developed by the authors to extract study characteristics, including study design, participant characteristics, details of the training, and outcomes measured. The outcomes of interest were extracted by four authors (SHN, NTJH, YL, WSG) into the following groups: mental health knowledge, recognition of mental illness, stigmatization, confidence, helping intentions, and helping behaviors. Other outcomes were recorded separately. A narrative synthesis was then carried out.

Results

Study selection and characteristics

Our search strategy generated 695 eligible articles. After removing duplicates, screening by titles, abstracts, and full texts, 14 studies were included for qualitative synthesis (Figure 1). Study characteristics and a summary of the results obtained from each study are presented in Tables 1 and 2. Nine studies were carried out in Australia and five were carried out in the U.S. Our search strategy did not generate any studies originating from outside Australia or the U.S. Five articles described and collected outcome data on tMHFA and 10 articles described and collected outcome data on YMHFA. Nine studies used a pre-post design with no comparison group. The remaining five studies had a comparison group, including one randomized controlled trial, three cluster randomized trials, and 1 nonrandomized quasi-experimental comparison group study. The comparison groups either received physical first aid training [16,19,20], were placed on a waitlist, [21] or received other mental health training after study completion [13], All interventions were carried out as face-to-face sessions. Outcomes in youth and teen MHFA were evaluated through the administration of a self-reported questionnaire before training, shortly after the training and occasionally, a follow-up some time after training. Knowledge outcomes included mental health literacy and identification of appropriate sources of help. Ability to recognize a mental health problem, stigmatizing attitudes, and helping intentions were evaluated

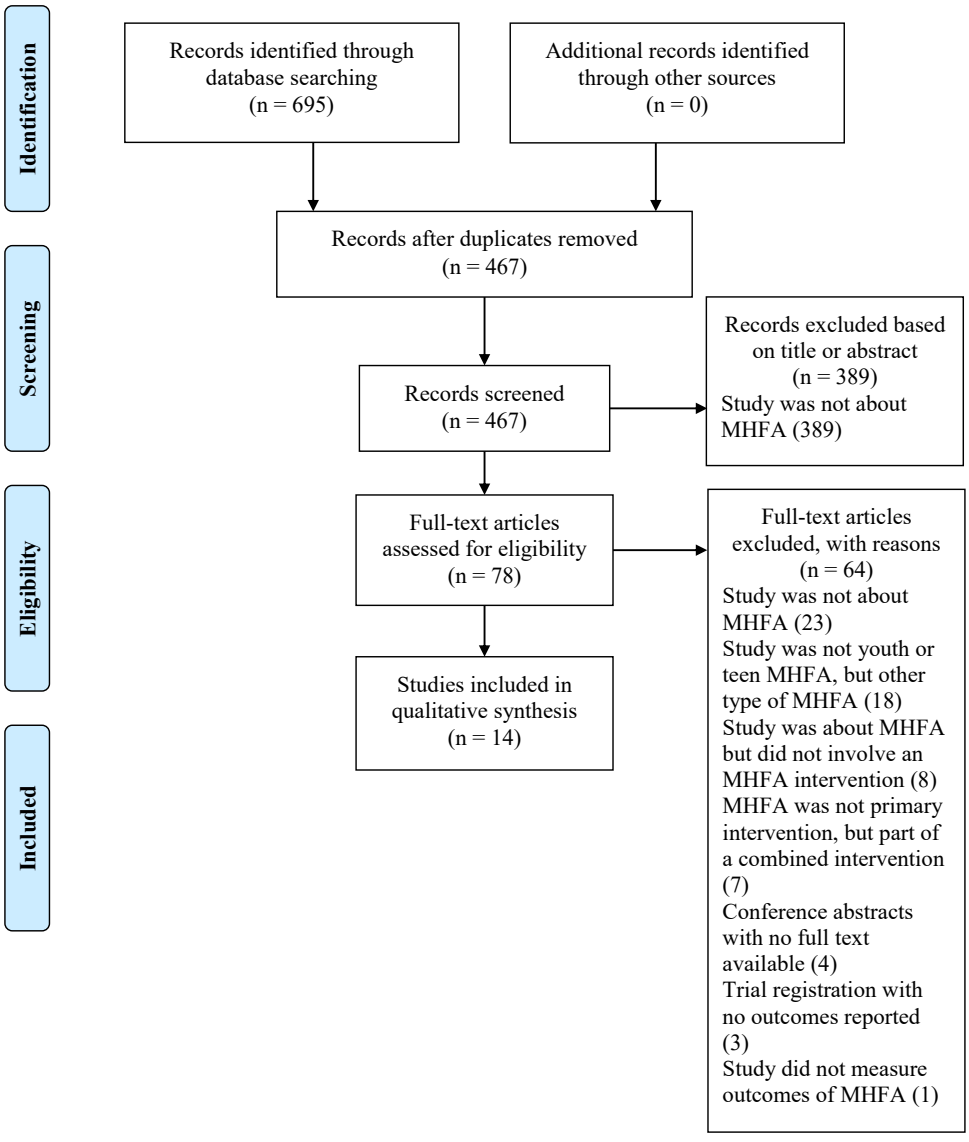

Figure 1. Study selection.

using a clinical vignette asking participants to identify the presentation and how they would help. Helping behaviors involved asking participants about their experiences with helping a peer facing a mental health problem. Confidence was self-reported. Finally, some studies evaluated additional outcomes such as participant satisfaction and psychological distress [14].

Quality of studies was mostly low, with high risk of bias. Five of 14 studies had lower risk of bias from having a comparison group. However, blinding of participants in comparison group studies was not possible. Therefore, participants may expect benefits from MHFA training, which may have influenced outcomes, especially self-reported ones. Four of 14 studies had lower risk of bias from randomization. There was overall low risk of bias from deviation from intervention as all MHFA training were conducted by certified instructors except for 1 study where the number of hours and profile of instructor were not reported [22]. In terms of reporting outcomes, stigmatizing attitudes and confidence were always self-rated and at high risk of bias, especially social desirability for stigmatizing attitudes. Knowledge and recognition of mental illness had low risk of bias as these were always assessed using objective measurements such as quizzes and vignettes. Helping intentions and behaviors had low risk of bias as participants were asked to select appropriate actions to handle the problem in the vignette, frequency of aid rendered, and the nature of the aid. However, quality of first aid received, if measured, was self-rated by the recipient and high risk of bias.

Teen mental health first aid

Five articles reported outcomes for tMHFA, including two cluster-randomized trials and three uncontrolled pre-post studies.

Three of the five articles reported significant improvements in mental health knowledge. One cluster-randomized trial found that participants who received tMHFA training were more likely to identify adults as a valid source of help 1 week after training

Table 1
Youth MHFA study characteristics and summary of results

	Country	Study design	Participants	Intervention	Outcomes measured	Results
Morgan et al. (2019)	Australia	RCT	Parents and children from general public	YMHFA: 14-hour FTF Comparison group received physical first aid training	Both parents and adolescents: Stigmatizing attitudes Participants' mental health Parents only: Knowledge Recognition of mental illness Confidence Helping intentions Helping behavior Adolescents' help-seeking behavior Adolescents only: Parents' helping intentions Helping behavior (as recipient) Adolescents' help-seeking behavior Self-reported at pretest, 1-year follow-up and 2-year follow-up	Knowledge: compared with the comparison group, there was improvement in trained parents' knowledge at 1 year (Mdiff = 1.25, 95% CI .62−1.97, $p < .001$) and 2 years (Mdiff = .84, 95% CI .17−1.51, $p < .05$) after training. Confidence: compared with the comparison group, there was improvement in trained parents' confidence, sustained until 1 year after training (Mdiff = −.17, 95% CI −.34 to −.00, $p < .05$). Helping intentions: compared to the comparison group, there was improvement in the quality of helping intentions in trained parents at 1 year after training (Mdiff = .23, 95% CI −.01 to .47, $p < .001$).
Jorm et al. (2010)	Australia	Cluster-randomized trial	Teachers and students from secondary schools	YMHFA: 14-hour FTF Comparison group was placed on a waitlist	Teachers: Knowledge Recognition of mental illness Stigmatizing attitudes Confidence Helping intentions Helping behavior School practices and policies Participants' mental health Students: Knowledge Recognition of mental illness Stigmatizing attitudes Helping behavior (as recipient) Information received from teachers Participants' mental health Self-reported at pretest, post-test and 6-month follow-up	Teachers: Knowledge: Teachers who received training had greater gains in knowledge from pretest to post-training (Mdiff = 2.08, 95% CI 1.38−2.78, $p < .001$) and 6 months after training (Mdiff = 1.79, 95% CI 1.06−2.52, $p < .001$). Beliefs about the effectiveness of different approaches became more consistent with that of mental health professionals at post-test (Mdiff = .79, 95% CI .23−1.34, $p = .006$), maintained at 6 months after training (Mdiff = .73, 95% CI .15−1.31, $p = .013$). Stigmatizing attitudes: Trained teachers were less likely than untrained ones to see depression as a personal weakness at post-test (OR = 3.07, 95% CI 1.16−8.14, $p = .024$). They were also less likely to be reluctant to disclose depression to others (OR = 3.79, 95% CI 1.34−10.71, $p = .012$ at post-test and OR = 3.42, 95% CI 1.13−10.32, $p = .029$ at 6 months). Confidence: Confidence in helping a student with a mental health problem increased (OR = 8.09, 95% CI 1.89−34.63, $p = .005$ at post-test, OR = 7.02, 95% CI 1.65−29.79, $p = .008$ at follow-up). Helping intentions: Compared with untrained teachers, trained teachers were more likely to have these helpful intentions: discussion with another teacher (OR = 3.73, 95% CI 1.31−10.62, $p = .013$ at post-test), discussion with a counselor (OR = 3.87, 95% CI 1.21−12.41, $p = .023$ at post-test) and having a conversation with the student (OR = 3.16, 95% CI 1.10−9.06, $p = .032$ at 6 months). Others: Teachers who were trained were more likely to agree with the following strategies to support a student with a mental health problem: review curriculum options/classroom practices (OR = 3.76, 95% CI 1.51−9.34, $p = .004$ at 6 months), review/change school policy (OR = 3.20, 95% CI 1.12−9.14, $p = .029$ at post-test), and improve relationships within the school (OR = 3.09, 95% CI 1.12−8.52, $p = .029$ at post-test, OR = 3.26, 95% CI 1.14−9.27, $p = .027$ at 6 months). Trained teachers were more likely to report that the school had a written policy to deal with students with mental health problems (OR = 4.57, 95% CI 1.28−16.26, $p = .019$ at post-test, OR = 7.28, 95% CI 1.92−27.54, $p = .003$ at 6 months) and that the policy had been implemented in the previous month (OR = 13.30, 95% CI 1.32−133.44, $p = .028$ at 6 months). Students: Stigmatizing attitudes: There was an increase in perceived stigma of others of 1 of 7 items ("unpredictable") among students of the trained teachers compared with students of untrained teachers (OR = 1.64, 95% CI 1.15−2.33, $p = .006$ at 6 months). Information received from teachers: Students of the trained teachers were more likely to report that they received information about mental health problems in the form of a class lesson, poster, pamphlet, brochure, book, or website (OR = 2.60−2.78, $p < .05$ at 6 months).

Table 1
Continued

	Country	Study design	Participants	Intervention	Outcomes measured	Results
Rose et al. (2019)	USA	Nonrandomized, quasi-experimental comparison group design	Social work students from one university	YMHFA: 8-hour FTF Comparison group did not receive any intervention during the study period but received other mental health training after the study was completed	Knowledge Confidence Social norms Attitudes and beliefs about performing ALGEE Self-reported at pretest, 2-week follow-up and 5-month follow-up	Knowledge: the trained group had increased knowledge compared with the comparison group 5 months after training ($F(1, 44) = 17.41$, $p < 0$ .001). Confidence: the trained group had increased confidence compared with the comparison group 5 months after training ($F(1, 42) = 10.54$, $p = .002$). Others: In terms of attitudes and beliefs, the trained group reported lower perceived difficulty ($F(1, 48) = 4.80$, $p = .03$) and greater belief in beneficial outcomes of YMHFA ($F(1, 49) = 27.89$, $p < 0$ .001) compared with the comparison group 5 months after training.
Aakre et al. (2016)	USA	Uncontrolled pre-post study	Employees from one social service department working in child welfare	YMHFA: 8-hour FTF	Knowledge Confidence Helping intentions Self-reported at pretest and post-test	Knowledge: significant improvement in percentage of participants choosing correct actions for these ALGEE components from pretest to post-test: Assess for risk of suicide or harm (9%−23%, $p < .001$), Listen nonjudgementally (66%−79%, $p = .003$), Encourage professional help (38%−47%, $p = .032$) and Encourage self-help and other support (19% −31%, $p = .002$). Confidence: improved confidence levels immediately after the course (t test = 5.25, $p <$ .001). Helping intentions: Significantly more likely to try to help (t test = 4.44, $p < .001$), and more comfortable in helping someone in distress (t test = 3.36, $p = .001$) at post-test.
Childs et al. (2020)	USA	Uncontrolled pre-post study	Child-sector professionals from: welfare, justice, support service, and education recruited from the general public	YMHFA: 8-hour FTF	Knowledge Confidence Helping intentions Self-reported at pretest and post-test	Knowledge: significant improvement in mental health literacy immediately after the course (paired t-test, $p < .001$ for all occupational groups). Confidence: significant improvement at post-test (paired t-test, $p < .001$ for all occupational groups). Helping intention: significant improvement in helping intentions at post-test (paired t-test, $p < .001$ for all occupational groups).
Haggerty et al. (2019)	USA	Uncontrolled pre-post study	Mental health workers and nonmental health workers as part of Project AWARE	YMHFA: 8-hour FTF	Knowledge Stigmatizing attitudes Confidence Self-reported at pretest and post-test	Knowledge: only nonmental health workforce participants had increased levels of mental health literacy at post-test ($p < .000$, Cohen's d = 1.09). Confidence: only nonmental health workforce participants had increased confidence at post-test ($p < .000$, Cohen's d = 1.56).

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Table 1
Continued

	Country	Study design	Participants	Intervention	Outcomes measured	Results
Kelly et al. (2011)	Australia	Uncontrolled pre-post study	Adults from general public	YMHFA: 14-hour FTF	Knowledge Recognition of mental illness Stigmatizing attitudes Confidence Helping behavior Self-reported at pretest, post-test and 6-month follow-up	Knowledge: Significant increase in mean knowledge score at post-test (Mdiff = 4.42, 95% CI 4.0–4.8, $p < .001$) and 6-month follow-up (Mdiff = 3.19, 95% CI 2.63–3.75, $p < .001$). Significant increase in knowledge of appropriate actions (increase in mean total ALGEE score) for both depression (3.13–5.57, $p < .001$ from pretest to post-test, 3.25–3.95, $p = .043$ from pretest to 6 months) and schizophrenia (2.26–4.76, $p < .001$ from pretest to posttest, 2.27–3.39, $p < .001$ from pretest to 6 months). Recognition of mental illness: Significant improvement of recognition of depression at 6-month follow-up (89.1%–97.1%, $p = .019$) and significant improvement in recognition of schizophrenia from pretest to post-test (67.4%–91.8%, $p < .001$) and pretest to 6-month follow-up (68.8%–83.3%, $p = .005$). Stigmatizing attitudes: significant increase in participants disagreeing with 4 of 7 stigmatizing attitudes toward depression at post-test (88.1%–94.5%, $p = .007$ for "could snap out of it," 94.1%–98.2%, $p = .026$ for "personal weakness," 65.1%–75.7%, $p = .004$ for "dangerous," 35.2%–52.1%, $p < .001$ for "unpredictable"). Improvement in these items except "dangerous" was still maintained at 6-month follow-up ($p < .05$). There was also a significant increase in participants disagreeing with 4 of 7 stigmatizing attitudes toward schizophrenia at post-test (95.0%–98.6%, $p = .022$ for "personal weakness," 37.6%–49.8%, $p = .005$ for "dangerous," 20.4%–33.0%, $p < .001$ for "unpredictable," 58.4%–68.8%, $p = .0052$ for "would not tell anyone") but improvement in only "dangerous" was maintained at 6 months (33.1%–48.5%, $p = .008$). Confidence: from pretest to post-test, there was significant improvement in confidence in helping (31.8%–84.1%, $p < .001$ for depression, 12.4%–60.8%, $p < .001$ for schizophrenia). From pretest to 6-month follow-up, there was still improvement (30.8%–72.2%, $p < .001$ for depression, 11.8%–40.4%, $p < .001$ for schizophrenia). Helping behavior: significant increase in reported frequency of talking to a young person about their mental health from 75.2% at pretest to 88.4% at 6-month follow-up ($p = .003$).
Martin (2017)	Australia	Uncontrolled pre-post study	Social work students from one university	YMHFA: no. of hours not specified, FTF	Recognition of mental illness Self-reported at pretest and 1-month follow-up	Recognition of mental illness: increase in recognition of depression (45.26%–54.71%, p value not reported).
Noltemeyer et al. (2020)	USA	Uncontrolled pre-post study	Adults from general public who took YMHFA training under Project AWARE	YMHFA: 8-hour FTF	Knowledge Stigmatizing attitudes Confidence Helping intentions Self-reported at pretest and 3-month follow-up	Knowledge: significant increase in knowledge of mental health support resources at 3 months after training (t[289] = 11.69, $p < 0$ .001). Stigmatizing attitudes: participants had a significantly more positive attitude toward individuals with mental health problems 3 months after training (t[290] = 4.72, $p < .001$). Confidence: participants had significant gain in confidence at 3 months post-training (t[320] = 11.98, $p < .001$). Helping intentions: significant increase in helping attitudes at 3 months after training (t[288] = 3.39, $p < .001$).
Uribe Guajardo et al. (2019)	Australia	Uncontrolled pre-post study	Secondary school students (tMHFA) and teachers and adults (YMHFA) from a culturally and linguistically diverse region	YMHFA: 14-hour FTF tMHFA: three 75-minute FTF sessions	Knowledge Recognition of mental illness Stigmatizing attitudes Confidence Helping intentions Helping behavior Self-reported a pretest, post-test and 3-month follow-up	YMHFA group: Knowledge: after training, teachers had greater mental health knowledge (Mdiff = 2.41, $p < .001$ at post-test, Mdiff = 2.03, $p < .01$ at 3 months) and were more likely to endorse a valid source of help (Mdiff = .73, $p < .05$ at post-test). Confidence: higher confidence levels in teachers after training (Mdiff = .44, $p < .001$ at post-test, Mdiff = .32, $p < .01$ at 3 months).

B = unstandardized regression coefficient; CI = confidence interval; F = ANCOVA or ANOVA F-tests; FTF = face-to-face; Mdiff = difference in means; OR = odds ratio; t = paired t-tests; tMHFA = teen Mental Health First Aid; YMHFA = Youth Mental Health First Aid.

Table 2
Teen MHFA study characteristics and summary of results

	Country	Study design	Participants	Intervention	Outcomes measured	Results
Hart et al. (2018)	Australia	Cluster-randomised crossover trial	Students from secondary schools	tMHFA: three 75-minute FTF sessions Comparison group received physical first aid training	Knowledge Recognition of mental illness Stigmatizing attitudes Confidence Helping intentions Self-reported at pretest and 1-week follow-up	Knowledge: significantly improved beliefs of adults as the appropriate source of help in the intervention group compared with the comparison group 1 week post-training for both the depression vignette (Mdiff = .78, 95% CI .58−.96, $p < .001$) and the anxiety vignette (Mdiff = .93, 95% CI .71−1.14, $p < .001$). Recognition of mental illness: Recognition of anxiety was more likely in the intervention group at 1 week post-training (OR = 3.34, 95% CI 1.88−5.94, $p < .001$). Stigmatizing attitudes: significantly decreased after 1 week in the intervention group compared with the comparison group for both the depression vignette (Mdiff = −.20, 95% CI −.28 to −.11, $p < .001$ for "weak not sick," Mdiff = −.26, 95% CI −.38 to .14, $p < .001$ for "would not tell anyone," Mdiff = −.19, 95% CI −.28 to −.11, $p < .001$ for "dangerous/unpredictable") and the anxiety vignette (Mdiff = −.20, 95% CI −.28 to −.12, $p < .001$ for "weak not sick," Mdiff = −.30, 95% CI .42−.17, $p < .001$ for "would not tell anyone"). Helping intentions: significant increase in helpful intentions for tMHFA group at 1 week post training for both the depression (Mdiff = .95, 95% CI .78−1.13) and anxiety vignettes (M diff = .75, 95% CI .57−.93, $p < .001$). Harmful intentions significantly decreased for both the depression (Mdiff = −.33, 95% CI −.44 to −.21, $p < .001$) and anxiety vignettes (Mdiff = −.11, 95% CI −.23 to .01, $p < .001$). Confidence: compared with the comparison group, tMHFA participants had significantly higher levels of confidence in helping the person in the depression (Mdiff = .34, 95% CI .23 −.45, $p < .001$) and anxiety vignettes (Mdiff = .26, 95% CI .14−.37, $p < .001$) after 1 week.
Hart et al. (2020)	Australia	Cluster-randomized crossover trial	Students from secondary schools	tMHFA: three 75-minute FTF sessions Comparison group received physical first aid training	Knowledge Recognition of mental illness Helping intentions Participants' mental health Self-reported at pretest, post-test and 12-month follow-up	Recognition of mental illness: Increased recognition of suicidality more likely in intervention than comparison group post-training (OR = 1.97, 95% CI 1.14−3.39, $p = .02$). Helping intentions: the tMHFA group was more likely to report adequate first aid intentions at post-training (OR = 35.40, 95% CI 19.86−63.14, $p < .001$) and 12-month follow-up (OR = 9.70, 95% CI 5.21−17.89, $p < .001$) compared with baseline. They were also less likely to provide harmful intentions at post-test (OR = .13, 95% CI .09−.21, $p < .001$) and 12 months after training (OR = .50, 95% CI .30−.72, $p < .001$). Participants' mental health: significantly higher proportion of students receiving tMHFA were affected than those receiving PFA (9.6% in tMHFA, 3.9% in comparison group, $p < .001$). However, the distress was short-lived.
Hart et al. (2016)	Australia	Uncontrolled pre-post study	Students from secondary schools	tMHFA: three 75-minute FTF sessions	Knowledge Recognition of mental illness Stigmatizing attitudes Confidence Helping intentions Helping behavior Participant satisfaction Participants' mental health Adolescents' help-seeking behavior Self-reported at pretest, post-test and 3-month follow-up	Knowledge: increased identification of appropriate sources of help after training for the depression/suicidal vignette (B = .70, $p < .001$ at post-test, B = .48, $p < .001$ at 3 months) and the social phobia vignette (B = .85, $p < .001$ at post-test, B = .84, $p < .001$ at 3 months). Recognition of mental illness: compared with pretest, participants were more likely to identify social phobia after training (OR = 3.99, 95% CI 2.33−6.82, $p < .001$ at post-test, OR = 3.11, 95% CI 1.78−5.43, $p < .001$ at 3 months). Stigmatizing attitudes: there was significant improvement at post-test for depression/suicide (B = −.12 for "weak not sick," B = −.34 for "dangerous/unpredictable," B = 2.49 for "would not tell anyone," B = −.64 for "social distance," all $p < .001$) and social phobia (B = −.19, $p < .001$ for "weak not sick," B = −.03, $p < .001$ for "dangerous/unpredictable," B = 1.72, $p < .01$ for "would not tell anyone"). At 3 months, some stigmatizing attitudes still had significant improvement for depression/suicide (B = −.44, $p < .001$ for "dangerous/unpredictable," B = 1.51, $p < .05$ for "would not tell anyone", B = −.64, $p < .001$ for "social distance") and social phobia (B = −.17, $p < .001$ for "weak not sick," B = −.35, $p < .05$ for "social distance"). Confidence: after the training, students were more likely to feel "quite a bit" confident to handle depression/suicidal (OR = 4.41, 95% CI 2.95−6.62, $p < .001$ at post-test, OR = 3.09, 95% CI 2.02−4.74, $p < .001$) and to handle social phobia (OR = 3.70, 95% CI 2.46−5.56, $p < .001$ at post-test, OR = 1.76, 95% CI 1.07−2.88, $p < .05$ at 3 months). Participants' mental health: students reported less psychological distress at 3-month follow-up (B = −1.50, $p < .001$) Participant satisfaction: majority thought the program was easy to understand, very well presented, and enjoyable.

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Table 2
Continued

	Country	Study design	Participants	Intervention	Outcomes measured	Results
Hart et al. (2019)	Australia	Uncontrolled pre-post study	Students from secondary schools	tMHFA: three 75-minute FTF sessions	Knowledge Recognition of mental illness Stigmatizing attitudes Confidence Helping intentions Helping behaviors Participants' mental health Participant satisfaction Self-reported at pretest, post-test and 3-month follow-up	Stigmatizing attitudes: improvement in some items from pretest to post-test (Mdiff = −.28, 95% CI −.34 to −.21, $p < .001$ for "weak not sick") and at 3-month follow-up (Mdiff = −.14, 95% CI −.20 to −.07, $p < .001$ for "weak not sick," Mdiff = −.08, 95% CI −.15 to −.01, $p = .031$ for "dangerous/unpredictable"). Confidence: improved from pretest to post-test (Mdiff = .16, 95% CI .07−.26, $p = .001$). Helping behavior: significant improvement in self-reported quality of help delivered from pretest to 3-month follow-up (Mdiff = .47, 95% CI .23−.70, $p < .001$). Participant satisfaction: participants generally found the information in the course to be not very new (45.0%), easy to understand (81.0%), well presented (60.8%), very useful in the present (37.5%) and future (56.0%).
Uribe Guajardo et al. (2019)	Australia	Uncontrolled pre-post study	Secondary school students (tMHFA) Teachers and adults (YMHFA) Participants were from a culturally and linguistically diverse region	YMHFA: 14-hour FTF tMHFA: three 75-minute FTF sessions	Knowledge Recognition of mental illness Stigmatizing attitudes Confidence Helping intentions Helping behavior Self-reported a pretest, post-test and 3-month follow-up	tMHFA group: Knowledge: participants were more likely to endorse a valid source of help (Mdiff = .72, $p < .001$ at post-test, Mdiff = .41, $p < .01$ at 3 months). Stigmatizing attitudes: decrease in "weak not sick" personal stigmatizing attitude (Mdiff = .13, $p < .05$ at 3 months). Helping intentions: higher levels of helpful intentions (Mdiff = −.41, $p < .01$ at post-test, Mdiff = .27, $p < .05$ at 3 months) and lower levels of harmful intentions (Mdiff = .34, $p < .001$ at post-test, Mdiff = .25, $p < .01$ at 3 months) after training.

B = unstandardized regression coefficient; CI = confidence interval; F = ANCOVA or ANOVA F-tests; FTF = face-to-face; Mdiff = difference in means; OR = odds ratio; t = paired t-tests; tMHFA = teen Mental Health First Aid; YMHFA = Youth Mental Health First Aid.

than the group receiving physical first aid training with medium effect sizes [16], Two uncontrolled pre-post studies also reported significant improvement in this domain up to 3 months after the training [14,23].

Five articles reported outcomes in recognition of mental illness, and three articles including both cluster-randomized trials reported significant results. The cluster-randomized trials found that 1 week after training, the intervention group was more likely to correctly recognize social phobia/anxiety disorder [16] and suicidality [20]. However, this improvement was not significant at 12-month follow-up for both studies. Finally, 1 uncontrolled pre-post study showed an improvement in recognition of social phobia at 3 months [14].

Four of the five articles measured stigmatizing attitudes, and among them, three reported a statistically significant reduction in the stigmatizing attitudes of participants after training. However, it is worth noting that this was not consistent between studies and even within studies. One cluster-randomized trial found improvements in all stigmatizing attitudes in the intervention group sustained at 1 week after the training [23], while the other found inconsistent changes in stigmatizing attitudes across the items used in outcome measure [24], While the desire to keep a distance from a person with a mental health problem reduced only in the immediate post-test but not sustained, the perception of persons with mental health problems as dangerous only showed improvement at the 3-month follow-up [24].

Of the five articles, three of them reported outcomes on confidence that were significant. One cluster-randomized study reported that at 1 week after training, the intervention group had significantly higher levels of confidence compared with baseline levels, whereas the control group had a decrease in confidence [16]. From the two uncontrolled studies with significant improvement in confidence, one reported that more than half of the participants described feeling “quite a bit” or “extremely” confident immediately after and 3 months after tMHFA training [14], whereas the other found significant improvement in confidence after test, but not sustained at 3 months later [24].

Four of five studies reported significant improvement in helping intentions after tMHFA training at various intervals. Both cluster-randomized trials and the RCT reported that the intervention group had significant improvement in helpful intentions at 1 week after training [16] and 12 months after training [19,24]. The latter study also reported lower levels of harmful intentions at the 12-month follow-up. One uncontrolled study also found higher levels of helpful intentions and lower levels of harmful intentions up to 3 months after training [23].

Three studies reported outcomes on helping behaviors [14,23,24]. Only 1 of the three, an uncontrolled pre-post study, reported significant improvements in quality of MHFA provided to a peer with a small-to-medium effect size [24].

Three studies also reported participants’ psychological distress to see if tMHFA training was associated with iatrogenic effects. One cluster-randomized trial noted that 10% of participants receiving tMHFA training reported experiencing psychological distress immediately after the training [20]. However, this was transient, lasting moments to hours only, and the majority of the participants who experienced distress felt that the training was still worth receiving. Reassuringly, the same study found no prolonged psychological distress at the 12-month follow-up, and 1 uncontrolled pre-post study actually reported lower levels of psychological distress 3 months after receiving the training [14].

Two articles, both uncontrolled pre-post studies, measured participant satisfaction, and both reported positive feedback from trainees. In one study, participants felt that the program was “easy to understand, very well presented, and enjoyable,” [14] whereas in the other study, participants felt that information was “new, well presented, easy to understand, and useful in both the present and future” [24].

Youth mental health first aid

Ten articles reported outcomes for YMHFA, including 1 randomized controlled trial, 1 cluster-randomized trial, 1 nonrandomized quasi-experimental comparison group study, and seven uncontrolled pre-post studies.

All nine studies that measured knowledge as an outcome reported significant improvement after training, including all controlled studies. Of the controlled studies, the RCT demonstrated sustainable increases in mental health knowledge in the intervention group compared with the control group up to 2 years after training [19], the cluster-randomized trial up to 6 months [21], and the nonrandomized quasi-experimental study up to 5 months after training [13]. Within the uncontrolled studies, two studies demonstrated improvement in participant knowledge immediately after training [25,26], whereas 1 study showed improvement in mental health literacy only in participants that were not in the mental health workforce [27]. In terms of knowledge of appropriate sources of help, one study showed improvement in knowledge of the recommended action plan for depression and schizophrenia vignettes at the post-test and 6 months after training [28]. Another showed an increased likelihood to endorse a valid source of help up to 3 months after training [22], and the last demonstrated a significant increase in knowledge of mental health support resources 3 months after training [28].

Of five studies that measured recognition of mental health issues, 1 uncontrolled pre-post study reported improved recognition of depression and schizophrenia immediately after the training and at 6-month follow-up [12]. While another study reported increased recognition in depression 1 month after training, the results of this study were of unclear statistical significance owing to lack of description of statistical methods [29]. Notably, 1 study also showed that ability of recognition of depression was already high at pretest and was not affected by the training [21].

Of the six studies that measured stigmatizing attitudes, four studies reported significant improvement, and results were not consistent within studies. The cluster-randomized trial found that teachers who received YMHFA training were less likely to have two of seven stigmatizing attitudes compared to untrained teachers. [21] One uncontrolled pre-post study reported improvement in four out of the seven stigmatizing attitudes toward depression measured at post-test, but this decreased to three items at the 6-month follow-up. For stigmatizing attitudes toward schizophrenia, four of seven items had improvement after test, but only 1 item still had improvement at 6 months [12]. Another found that participants had a significantly more positive attitude toward individuals with mental health problems 3 months after training [28]. The last found improvement in only 1 of three stigmatizing attitudes only at the 3-month follow-up [23].

Of the nine studies that measured confidence levels of participants, all reported a significant improvement in

confidence in helping youths after attending the training [12,13,19,21,23,25–28]. The longest duration of this improvement reported was 1 year, from the RCT [11].

Four of six studies that measured helping intentions reported significant improvement [21,25,26,28]. One cluster-randomized study reported sustained improvement in helping intentions in students in the trained group compared with the comparison group 6 months after training [21]. Three uncontrolled pre-post studies also reported improvement at post-test [25,26] and 3-month follow-up [28]. In 1 study, a higher satisfactory score was shown to have more helping intentions in education sector participants [25].

While four studies measured helping behaviors as an outcome [12,19,21,23], only 1 uncontrolled pre-post study reported that aiders reported a significant increase in frequency in rendering help to an adolescent at the 6-month follow-up [12]. There were other findings of note within the remaining studies, despite insignificant improvements in helping behavior. Two studies collected data on helping behavior received from teachers and parents in the same study [19,21]. In the cluster-randomized study, even though teachers who received YMHFA training did not report an increase in helping behavior, students under trained teachers reported a higher likelihood of receiving mental health information (in the form of poster, pamphlet, brochure, or book) than students under untrained teachers [21]. However, the students reported no significant change in further help received and overall mental health score [21]. The RCT collected data from parents and their adolescent children and found that although parent participants reported a significant improvement of knowledge at the 2-year follow-up, adolescent participants reported no change in quality and perceived support received from parents who had attended the training [11]. In addition, 1 uncontrolled study did not directly explore changes in helping behavior before and after training but instead recorded the frequency of helping behaviors reported by respondents at 3 month intervals after training for 12 months total. It was found that only a small percentage of respondents who came into contact with a person facing a mental health problem did not use what was taught in YMHFA (the ALGEE protocol): 1% of respondents at 3-month and 6-month follow-ups, 4% at 9-month follow-up and 2% at 12-month follow-up [28].

One of the uncontrolled pre-post studies also found that teachers who were trained in YMHFA were more likely to agree with strategies such as review of curriculum options, classroom practices, and school policy to support students with mental health problems and improve relationships within the school [21]. The article also found that YMHFA trained teachers were more likely to mention that the school had recently implemented policies to reduce mental health problems at 6-month follow-up. Another study cited that the YMHFA-trained group reported lower perceived difficulty and higher perceived reward and beliefs that YMHFA was beneficial 5 months after the training [29].

YMHFA was created for adults who were potential sources of help for adolescents [12]. The source of participants recruited for the studies in this review varied from adults in the mental health workforce [27,28], adults used in other occupations that worked with adolescents including social services [25,26,28], justice [25], welfare [25], and education [6,23,25,28]; social work students [13,22]; parents [19]; and adults with an unspecified relationship to adolescents [12]. It is worth noting that 1 uncontrolled pre-post study went on to compare the effectiveness of YMHFA training between mental health workforce participants and nonmental health workforce participants [27]. This study found that while the nonmental health workforce participants were able to benefit from the training, as evidenced by improved mental health literacy and confidence in the immediate post-training survey, the mental health workforce participants did not reap such benefits. In addition, the mental health workforce participants reported significantly higher levels of mental health literacy and confidence at the baseline (before training) compared with the nonmental health workforce participants. However, three other uncontrolled pre-post studies with participants with a background in mental health still reported significant gains from YMHFA training [25,26,28].

Discussion

In general, all studies showed that both tMHFA and YMHFA were generally effective in the domains of knowledge, recognition of mental illness, stigmatizing attitudes, confidence, helping intentions, and helping behavior. Evidence for improved knowledge and confidence was strongest, with 12 of 13 studies that measured these reporting significant results, including most of the higher quality randomized or controlled studies. Evidence for improved helping behavior was weakest, with two of six studies reporting significant results, both uncontrolled studies.

From this review, it is difficult to comment on the sustainability of these improvements, as only four of 14 studies included had a follow-up period of 6 months or longer. It is reassuring that these articles generally reported sustained benefits of tMHFA and YMHFA training in some domains, despite the short duration of training. In addition, there is no evidence of adverse effects of training, such as sustained psychological distress. It is also interesting that adolescents are able to benefit from tMHFA training as much as adults are able to benefit from YMHFA training, despite lower levels of maturity, which suggests the course material is adapted to be sufficiently easy to understand. This is in line with the mission of tMHFA, which capitalizes on the tendency of adolescents to refer to their friends rather than an adult for help [30]. However, 1 study piloted the intervention on an age group younger than the recommended age group for tMHFA and found a lower sustained effect in the younger age group [24].

One of the most commonly cited limitations of MHFA studies is the lack of data collected about outcomes beyond knowledge, stigma, and helping intentions [11]. Few studies report on experiences in delivering MHFA and even fewer reach out to recipients of MHFA. In this review, only two studies measured outcomes from the recipients' perspective [11,21]. These articles had both trainees and adolescents (the target recipient of mental health first aid) complete questions on helping behaviors. The results suggest that intentions to help do not always translate to helping behavior that is beneficial to the adolescent [11,21]. This suggests that there are likely other factors that bridge the gap between intentions and helping behavior beyond just knowledge, stigma, and confidence. Examples of such factors include the provider's attitude and beliefs, the recipient's willingness to accept help and the relationship between the recipient and provider [31]. Such factors remain to be investigated.

In terms of training of MHFA providers, the participants from the YMHFA studies came from different professional backgrounds. We found studies that presented different outcomes in participants with prior experience in the mental health

workforce. While more research is needed to investigate training outcomes in experienced professionals, it is conceivable that the higher baseline level of knowledge and confidence in experienced adults compared with their peers outside the field may minimize their gains from YMHFA training, which was originally conceived to train nonmental health professionals such as parents and teachers. It is possible that this subgroup may require yet another tailored form of YMHFA training to elevate their skills to an even higher level.

To our knowledge, this is the first systematic review to summarize the data surrounding teen and YMHFA. We presented a comprehensive overview of teen and YMHFA training and summarized the general outcomes that have been reported thus far. This review is also unique in that it presents the outcomes of teen and youth MHFA training, to evaluate if both peers and parents stand to benefit from this training. A more rigorous analysis, such as meta-analysis, could not be undertaken at this time given the variability in study designs, outcome measures, and follow-up intervals.

We have identified some gaps in current research that should be addressed in subsequent studies. First, more randomized controlled studies need to be conducted to improve the quality of evidence. Although standard MHFA training has been adapted to more than 25 countries internationally [32], this review only identified teen and youth MHFA studies from the U.S. and Australia, the latter being its country of origin [9]. It is possible that teen and youth MHFA have been delivered and evaluated in other countries, but the results are not published in the open domain and in the English language. As such, from this review, we are unable to generalize our findings to other countries owing to differences in cultural context, which in turn influences knowledge, attitudes, and beliefs about mental health. Moreover, the prevalence and symptomatology of mental illness varies. As such, future research may consider testing this intervention in other cultural contexts. Future research should also use longer follow-up intervals and measure a wider range of outcomes especially with regard to MHFA experiences and quality of MHFA provided. Longer follow-up intervals will help future reviews to comment on whether tMHFA and YMHFA could provide long-term benefits. Being able to identify a time point at which the effects of MHFA training starts to diminish can also give way to measures such as refresher courses. As per previous reviews on standard MHFA, more research needs to be performed to evaluate outcomes surrounding helping behavior, for instance, collecting data from recipients of mental health first aid to assess both quantity and quality of helping behaviors, and direct observation by course instructors of skill application through role play. Factors that influence the link between helping intentions and helping behaviors as aforementioned may be studied as well.

In our review, only 1 article by Uribe Guajardo et al. [23] tested YMHFA in a population particularly vulnerable to mental health problems—culturally linguistically diverse adolescents. Future studies could consider testing the intervention in other higher-risk adolescent subgroups. While adolescents spend most of their time under the care of members of the general public, that is, their parents or teachers, they do occasionally come into contact with other professionals, such as healthcare professionals. Our literature search yielded two studies on social work students, an allied healthcare profession, but there was a lack of studies on other healthcare professionals that also work with children—general practitioners, pediatricians, nurses, and students of these disciplines. It may be worth introducing YMHFA training to these professionals to increase the number of opportunities to detect adolescent mental health problems. We note that one study in this review found that mental health workforce participants were unable to benefit from training compared with nonmental health workforce participants [27]. Before recommending YMHFA to healthcare professionals, we recommend that studies be performed to compare the intervention between two groups—one with prior mental health training and another without—which will provide more insight into how the course may be refined for individuals with higher baseline competencies, such as healthcare professionals. While tMHFA is only available in face-to-face, online and blended versions of the YMHFA course is available in the U.S. that allows participants to review the curriculum online before participating in a video conference (or live session for blended learning) with a YMHFA instructor [9,33]. However, none of the included YMHFA studies conducted in the U.S. in this review used an online or blended learning platform. The online version of standard MHFA training has been shown to have similar outcomes as face-to-face MHFA and blended learning in previous studies [34]. In addition, blended learning may be associated with more participant satisfaction [34]. Moving the course online may help to increase class sizes and allow more people to benefit from training.

In conclusion, this review supports the effectiveness of teen and youth MHFA training in improving mental health knowledge and support for young people with mental health problems. While more research needs to be performed to elucidate the short- and long-term benefits and the possible differences in effectiveness across cultural contexts and populations given the short duration of the course, this intervention has the potential to benefit mental well-being greatly while being feasible to incorporate into professional training and school curriculums.

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Supplementary Data

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