

SYSTEMATIC REVIEW

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Mental health first aid training and assessment for healthcare professionals and medical nursing students: a systematic review

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Abstract

Purpose To summarize the effect of mental health first aid (MHFA) on paramedics and medical nursing students and provide direction to future training and research.

Methods Seven databases, including Web of Science, PubMed, Embase, Cochrane, China Knowledge, Wanfang, and China Biomedical Literature Database, were searched for relevant studies from database establishment up to January 31, 2023. The Cochrane risk of bias tool was used to assess the quality of randomized controlled trials, qualitative studies, and single-armed trials on the basis of the literature evaluation criteria developed by the JBI Center for Evidence-Based Healthcare in Australia. Mixed-sex studies were assessed by using the mixed-methods assessment tool (MMAT 2018).

Results The review identified 11 studies that met the criteria, most of which reported on the effects of MHFA training in terms of mental health literacy (referred to as MHL), MHFA intentions and confidence, stigma, and changes in social distance. A few studies analyzed the strengths and weaknesses of MHFA training courses, motivation to complete MHFA, barriers and facilitators to MHFA training, and participants' perceptions of implementing MHFA training.

Conclusions The MHFA curriculum is practical for healthcare workers and medical nursing students. In the future, a standardized training program based on the population characteristics of healthcare workers and medical nursing students must be developed to standardize the measurement of outcome indicators to reflect the effectiveness of implementing the MHFA training curriculum. Our study has been registered to PROSPERO under registration number CRD42024519793.

Keywords Mental health first aid, Healthcare professionals, Medical students, Nursing students, Systematic review

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Introduction

Mental illness has become an important contributor to the global burden of disease, accounting for 32.4% of life years lived with disability and affecting the daily lives of more than 1 billion people worldwide [1, 2], which are characterized by high rates of disability, relapse, and suicide. Given that the majority of people with mental illness lack a proper understanding of the early signs and symptoms of mental illness and have low mental health literacy (MHL) or else have a solid stigma against mental health, only a few seek medical or professional help at the onset of symptoms and miss the best time for treatment [3]. This situation results in potentially adverse consequences, such as death, suicide, or suspension of schooling due to distressing mental health issues [3, 4]. The attitudes of healthcare professionals, as well as medical and nursing students, who are key members of the healthcare professions, towards patients with mental disorders are one of the most important factors influencing the appropriate care received by patients [5]. One study showed that approximately 25% of personal stigma was associated with healthcare professionals [6]. However, some studies have shown that medical and nursing students, like the general public, also have a strong sense of mental health stigma and social distance towards patients with mental disorders [7, 8], and healthcare professionals also have a large negative attitude towards patients with mental disorders [9]. A systematic evaluation showed [10] that nursing students who shared the same experiences, mental health education and hands-on training (including case studies, lectures, role-playing, and videos) during their school years, and anti-stigma programs (such as peer education) were the promoting factors affecting the stigma and stigma of nursing students towards people with mental disorders [5]. Network meta-analysis showed [11], that direct contact with patients with mental disorders combined with lectures or PBL teaching can more effectively reduce the stigma and stigmatizing attitude of healthcare professionals and medical students towards patients with mental disorders than simple lectures and videos.

Mental health first aid (MHFA) is a program designed to train participants in recognizing mental health disorders and provide support to people experiencing issues of mental health illnesses [12, 13]. The program not only includes the aforementioned facilitators, but has been applied in 25 countries and with diverse populations [14, 15]. The program is efficacious in improving participants' ability to recognize mental health problems and MHL, thus increasing participants' confidence in treating mental health problems and decreasing the stigma attached to individuals with mental health problems or their peers [16–18].

MHFA has also been applied by scholars to medical students, nursing students, and healthcare professionals [17–20] and achieved similar results. However, no scholar has analyzed and summarized the effects of MHFA on the training of healthcare workers and medical nursing students. Therefore, this study conducted a systematic review of the existing literature related to MHFA training for healthcare workers and medical nursing students to summarize the effects of MHFA on MHL, willingness and confidence to provide MHFA help, disease identification, stigma, and social distance. It also identified the types of different indicator measurement tools used, the pros and cons of the implementation of MHFA, and considerations for the future development of MHFA. This review was conducted to increase the confidence of medical practitioners in caring for people with mental health problems, improve their competence in dealing with mental health problems, and benefit from enriching their mental health-related knowledge and ability to recognize mental health disorders to enable them to serve others better or take appropriate measures to solve their problems and reduce the occurrence of adverse events when they themselves are facing mental health problems. This review also aims to provide a basis for the development of localized healthcare-specific MHFA curricular training programs in the future.

Materials and methods

Clarifying the research question

The research team discussed and identified the research question: What is the effectiveness of MHFA training among health care workers and medical nursing students?

Research design

This study is based on the methodology of systematic reviews. It applied descriptive analysis to organize, analyze, and compare the results of the included studies [21] and followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement [22]. Qualitative studies were synthesized through the thematic analyses of the reported narratives and citations. Our study was registered to the PROSPERO Platform (International Prospective Register of Systematic Reviews) on March 13, 2024 (registration number CRD42024519793).

Literature sources and search strategy

Two researchers (LL and ZYW) independently searched the literature by using the search formula. LL and ZYW discussed and resolved any disagreement about the included studies with a another researcher (YCX). Web of Science, PubMed, Embase, Cochrane, China

Knowledge Network, Wanfang, and China Biomedical Literature Database were searched. The search period was from database establishment to January 31, 2023. The search was conducted using a combination of subject (MeSH) and free-text searches, and the search formula was adjusted according to the type of database. In addition to this we manually searched the gray literature and the references included in the study to ensure the completeness of the search. Boolean operator were used to combine the search terms and the searches used as an example for Web of Science are as follows:

PubMed #1 (((((((Nurse[MeSH Terms]) OR (Nurse [Title/Abstract]) OR (Personnel, Nursing[Title/Abstract]) OR (Nursing Personnel[Title/Abstract]) OR (Registered Nurses[Title/Abstract]) OR (Nurse, Registered[Title/Abstract]) OR (Nurses, Registered[Title/Abstract]) OR (Registered Nurse[Title/Abstract])

#2 (((((((((((Paramedics[MeSH Terms]) OR (Paramedical Personnel[Title/Abstract]) OR (Personnel, Paramedical[Title/Abstract]) OR (Paramedic[Title/Abstract]) OR (Community Paramedics[Title/Abstract]) OR (Community Paramedic[Title/Abstract]) OR (Paramedic, Community[Title/Abstract]) OR (Paramedics, Community[Title/Abstract]) OR (Paramedics, Emergency[Title/Abstract]) OR (Paramedic, Emergency[Title/Abstract]) OR (EMT-Paramedic[Title/Abstract]) OR (EMT Paramedic[Title/Abstract]) OR (EMT-Paramedics[Title/Abstract]) OR (Emergency Paramedic[Title/Abstract]) OR (Emergency Paramedics[Title/Abstract])

#3 (surgeons[MeSH Terms]) OR(surgeon [Title/Abstract])

#4 (((((((Students, Nursing [MeSH]) OR (Nursing students[Title/Abstract]) OR (Pupil Nurses[Title/Abstract]) OR (Student, Nursing[Title/Abstract]) OR (Nurses, Pupil[Title/Abstract]) OR (Nurse, Pupil[Title/Abstract]) OR (Pupil Nurse[Title/Abstract]) OR (Nursing Student[Title/Abstract]) OR (Nursing Students[Title/Abstract])

#5 (((Students, Medical[MeSH]) OR (Students, Medical[Title/Abstract]) OR (Medical Students[Title/Abstract]) OR (Student, Medical[Title/Abstract]) OR (Medical Student[Title/Abstract])

#6 #1 OR #2 OR #3 OR #4 OR #5

#7 (((Mental Health[MeSH]) OR (Health, Mental[Title/Abstract]) OR (Mental Hygiene[Title/Abstract]) OR (Hygiene, Mental[Title/Abstract])

#8 (((((((((((Mental Disorders[MeSH]) OR (Mental Disorder[Title/Abstract]) OR (Psychiatric Illness[Title/Abstract]) OR (Psychiatric Illnesses[Title/Abstract]) OR (Psychiatric Diseases[Title/Abstract]) OR (Psychiatric Disease[Title/Abstract]) OR (Mental Illness[Title/Abstract]) OR (Illness, Mental[Title/Abstract]) OR (Mental Illnesses[Title/Abstract]) OR (Psychiatric Disorders[Title/Abstract]) OR (Psychiatric Disorder[Title/Abstract]) OR (Behavior Disorders[Title/Abstract]) OR (Diagnosis, Psychiatric[Title/Abstract]) OR (Psychiatric Diagnosis[Title/Abstract]) OR (Mental Disorders, Severe[Title/Abstract]) OR (Mental Disorder, Severe[Title/Abstract]) OR (Severe Mental Disorder[Title/Abstract]) OR (Severe Mental Disorders[Title/Abstract])

#9 (((((((First Aid[MeSH]) OR (Aid, First[Title/Abstract]) OR (Aids, First[Title/Abstract]) OR (First Aids[Title/Abstract]) OR (mental health training[Title/Abstract]) OR (mental health education[Title/Abstract]) OR (mental health first aid[Title/Abstract]) OR (MHFA[Title/Abstract])

#10 (((((((education[MeSH]) OR (Training programs[Title/Abstract]) OR (Curriculum[Title/Abstract]) OR (Teaching[Title/Abstract]) OR (Training[Title/Abstract]) OR (education[Title/Abstract])

#11 #7 OR #8 OR #9 OR #10

#12 #6 AND #11

Inclusion and exclusion criteria

Inclusion criteria

(1) Healthcare workers and nursing students. (2) Inclusion of original research involving quantitative/qualitative evaluations of MHFA curricula, assessments of the

effectiveness of MHFA, and factors affecting the implementation of MHFA, as well as studies of interventions for the use of MHFA by healthcare professionals and nursing students.

Exclusion criteria

Literature meeting the following conditions were excluded: (1) review literature; (2) literature inconsistent with the content of the current study; (4) literature for which the full text is unavailable; and (5) literature not in Chinese or English.

Literature screening and data extraction

Literature screening

Two researchers (LL and MXL) used Endnote 20 to screen the literature independently in accordance with the NER criteria, eliminating duplicates, systematic evaluations, reviews, and conferences. The researchers then read the titles and abstracts to exclude literature that did not correspond to the content of the review and then read the full text to determine whether the article will be included in the review or not. The researchers discussed inconsistencies with each other. If disagreement persisted, the decision of inclusion was discussed with another researcher (XCY).

Data extraction

Excel 2021 was used to organize data, and the data extracted included (1) the essential characteristics of the included studies, such as the first author, year of publication, and country; (2) length of the course training, mode of delivery, and duration of follow-up; and (3) corresponding outcome indicators of the included studies. Any disagreements during data extraction were resolved with the support of another researcher (XCY).

Literature quality assessment

The quality of included randomized controlled trials was independently assessed in accordance with the Cochrane Collaboration's criteria for randomized controlled trials [23]. Disagreements were resolved by discussion or involving other review authors. The studies were evaluated on the basis of the following elements: (1) method of randomized allocation; (2) method of allocation concealment; (3) blinding of subjects and investigators; (4) blinding of outcome assessment; (5) completeness of endpoint data; (6) selective outcome reporting; and (7) other biases. Assessment results were expressed as "low risk," "high risk," or "unclear." The quality of qualitative studies and single-armed trials was assessed by using the criteria for evaluating the literature developed by the Australian

JBICentreforEvidence-BasedHealthcare[24].Resultswereassessedintermsof"yes", "no", "unclear", and "not applicable." Mixed-sex studies were assessed by using the mixed-methods assessment tool (MMAT 2018) [25]. Their assessments were summarized as "yes", "no", and "unclear". Any inconsistencies encountered during evaluation were resolved and discussed with a third researcher (XCY).

Results

Results of the literature search

In this study, 6406 documents were initially searched, 360 duplicates were excluded, 6013 documents with irrelevant titles and abstracts were excluded, and the full texts of the remaining 34 documents were viewed. A total of 12 documents met the inclusion criteria. However, after a careful reading of the complete text, the type of study of Baker et al. [26] could not be accurately identified. Therefore, this study was not included in this review for analysis. A total of 11 papers were ultimately included. Figure 1 shows the specific screening process.

Basic characteristics of the included literature

A total of 11 papers were included in this study. They included five randomized controlled trials [18, 19, 27–29], one qualitative study [30], three single-armed trials [12, 17, 20], and two mixed-method studies [31, 32]. The detailed results are shown in Table 1.

Literature quality assessment

The results of the literature quality assessment are shown in Tables 2, 3, 4, and 5.

Results related to MHFA training

Effectiveness of MHFA training

Recognition of disease

Five studies [12, 17–19, 28] reported on the identification of depression. Four studies [12, 17, 18, 28] investigated the identified depression on the basis of a case of a depressed patient that was written to meet the diagnostic criteria of the Diagnostic and Statistical Manual and International Classification of Diseases for depression or schizophrenia [33]. After the case presentation, the participants were asked to respond to an open-ended question. Their response was correct if it involved depression or schizophrenia. In one study [19], the MHL Scale (Chinese version) was used to assess the participants' ability to identify depression. In Bond's study [17], there was no significant change in recognition of depression before and after the implementation of the MHFA course intervention. Consistent with Dzemaili et al. [28], Burns [18] reported that the motivation for mental illness identification in the intervention group had increased relative to that in the control group without a statistically significant

difference ($P=0.750$). However, in Hung's study [19], the ability of the students in the intervention group to identify depression was significantly different from that in the students in the control group ($P<0.01$). Kitchener et al. [12] reported an increased and statistically significant difference in the recognition of schizophrenia among caregivers and health providers after the implementation of the MHFA intervention ($P<0.001$). In both of these 3 studies with non-significant results, which showed that the majority of participants had received mental health training or that mental health subjects were part of the medical curriculum of their care living, there were no large differences in participants' ability to recognize illness at baseline versus after MHFA training.

Willingness and confidence to provide MHFA

Several studies [12, 17–19, 28] involved willingness and confidence in providing MHFA. However, only Kitchener et al. [12] reported confidence in providing MHFA in their study. Dzemaili et al. [28] used a five-point Likert scale and the subjects' first aid actions to help people with mental illness to measure the willingness and confidence to offer MHFA. Three studies [17–19] adopted scoring on the basis of the quality scoring system used by Yap and Jorm to assess willingness to provide MHFA [34] on the basis of the ALGEE action plan. Each section of the ALGEE can be scored from 0 to 2 for a total score of 0–12, with high scores indicating great willingness to perform MHFA. Four studies assessed participants' confidence in providing MHFA on the basis of the question "How confident are they in their ability to help recipients?" In the study by Bond et al. [17], the answer to this question was assigned by using a four-point Likert scale that ranged from "very confident" to "not at all confident." Bruns et al. [18], Hung et al. [19], and Kitchener et al. [12] adopted a five-point Likert scale that ranged from "do not know" to "very confident," with sequential scores ranging from 0 to 5. High scores indicated high confidence in providing MHFA. Bond et al. showed that after the implementation of the MHFA intervention [17], online and face-to-face MHFA course training significantly increased medical and nursing students' willingness to administer MHFA to depressed patients and confidence in providing first aid ($P<0.05$). In line with Hung et al. [19], Burns et al. [18] reported a significant increase in the willingness and confidence to implement MHFA in the intervention group ($P<0.01$). Kitchener et al. [12] found that the confidence of caregivers and health providers increased months after the end of the training. However, the increase in the tendency to provide help was not prominent, and the participants showed low likelihood to engage with patients with psychiatric disorders. In the study of Dzemaili et al. [28], the intervention group

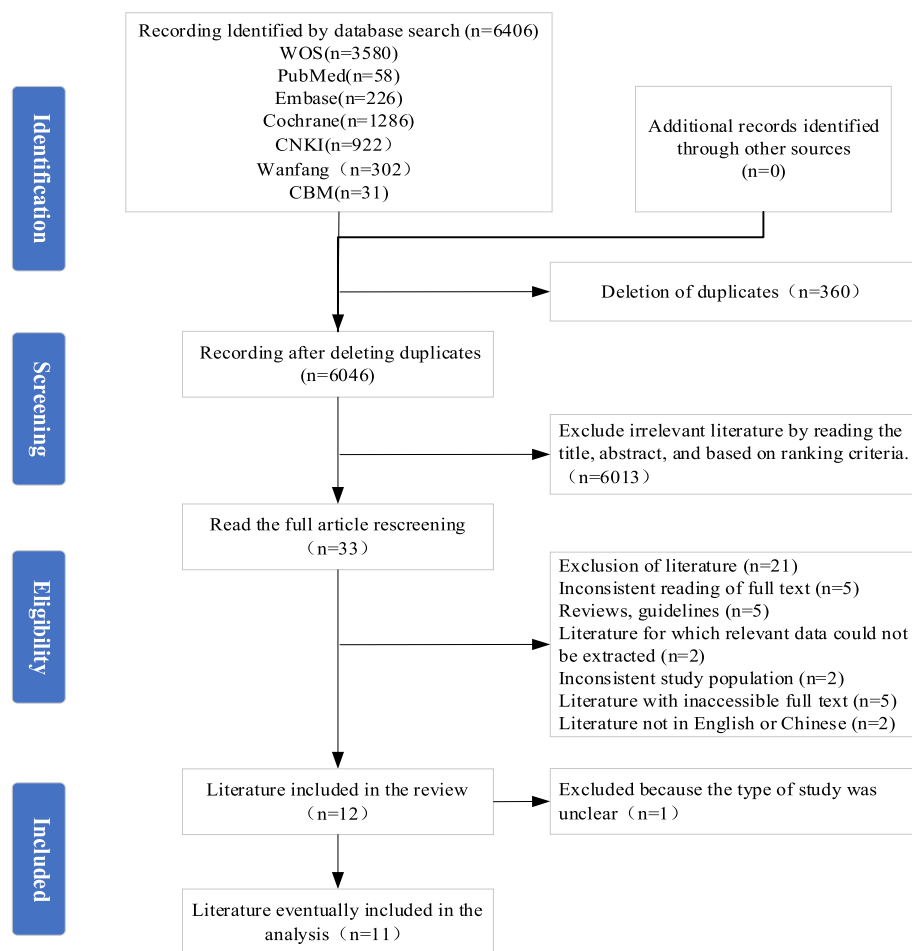


Fig. 1 Flow diagram for the search strategy

showed a significant increase in confidence in providing MHFA but showed no significant change in their willingness to provide MHFA. Among the 2 studies that did not differ significantly, possible reasons include: in Dze-maili et al. [28] found a time interaction effect for willingness and confidence to provide MHFA help, so it may be related to the duration of the MHFA intervention; and After the Kitchener et al. [12] training course, some participants had significantly less contact with people with mental health problems and therefore fewer referrals for professional help.

Social distance

Five studies [12, 17–19, 28] reported changes in participants' social communicative distance. All of these studies used the Social Communicative Distance Scale to measure the changes in participants' social communicative distance. Bond et al. [17] found a statistically significant change in the social distance scores of nursing and medical students in the online mode of

delivery ($P < 0.05$). In the face-to-face mode of delivery, only nursing students had a significant change in social distance ($P < 0.05$). No statistically significant change was observed in the social distance scores of medical students ($P = 0.19$). In the remaining studies, social distance showed a significant change ($P < 0.05$) and reduced in patients with mental disorders. It is unclear why there was no significant change in social distance scores for face-to-face medical students, but this may be due to the small size of the group and lack of statistical power [17].

Stigmatization

Four studies [17, 18, 27, 28] analyzed stigma. Most studies based on healthcare providers used scales to assess stigma, such as the Depression Stigma Scale [18, 28] and the 15-item Open Thought Scale. Stigmatization was assessed by using individuals' statements about different issues, including perceived and personal stigmas

Table 1 Basic characteristics of the included studies

First author	Year of publication	Country	Type of study	Study population	Sample size	Duration of training	Teaching methods	Course format	Follow-up time	Ending variables
Bond [17]	2015	Australia	single-armed trials	Medical and nursing students	434	13 h	Online/face-to-face	Lectures	—	Depression identification, MHFA willingness, and confidence, MHL, social distance, stigmatization
Kirchener [12]	2002	Australia	single-armed trials	Nurses or health care providers	190	9 h	Face-to-face	Lectures	6 months	Schizophrenia recognition, confidence in treating illness (depression and schizophrenia), social distance, MHFA confidence
Nakagami [20]	2018	Japan	single-armed trials	Nurses and physicians	74	2 h	Face-to-face	Lectures, videos, role-playing	1 month	Knowledge of depression and suicide prevention, changes in perceptual skills, and confidence
Dzenali [28]	2023	Switzerland	RCT	Nursing students	107 (Intervention group: 53; control group: 54)	12 h	Face-to-face	—	12 months	Disease recognition, MHL, social distance, stigma, MHFA willingness, and confidence
Crawford [29]	2020	Australia	RCT	Nursing students	181 (Intervention group: 92; control group: 89)	—	—	—	—	Motivation for the completion of the MHFA
Burns [18]	2017	Australia	RCT	Nursing students	140 (Intervention group: 59; control group: 81)	13 h	Face-to-face	Lectures	2 months	Depression identification, MHFA willingness, confidence, MHL, stigma, and social distance
Hung [19]	2021	Hong Kong, China	RCT	Nursing students	332 (Intervention group: 167; control group: 165)	12 h	Face-to-face	Lectures	6 months	Recognition of depression and schizophrenia, confidence in treating illness, social distance, willingness and confidence in MHFA, MHL, stigmatization
Moll [27]	2018	Canadian	RCT	Hospital staff	192 (Intervention group: 97; control group: 95)	12 h	Face-to-face	Lectures	3 months	MHL, stigmatization
Wadsworth [31]	2022	Australia	Mixed Studies	Nursing students	102	—	Blended learning	Online learning, instructor-led classes	—	MHL
Kelly [32]	2017	Australia	Mixed Studies	Nursing and midwifery students	66	—	—	—	—	Student perceptions of the MHFA, program and review of the value of the program
Pham [30]	2022	Australia	Qualitative research	Medicine, nursing, and pharmacy students	15	—	—	—	—	Barriers and facilitators to MHFA implementation Lectures and role-plays

[17]. Bond et al. [17] found no significant change in the perceived stigma scores of either group of medical and online nursing students with P values of 0.92 and 0.14, respectively, which were greater than 0.05 and consistent with the findings of other scholars [35, 36], and in personal stigma in face-to-face and online delivery modes ($P < 0.05$). In the study by Burns et al. [18], the intervention effect of MHFA on participants' personal stigma became significant over time, with scores in both groups indicating low levels of stigma at baseline. However, Moll et al. [27] and Dzemaili et al. [28] found no significant intervention effect on overall perceived stigma. MHFA intervention significantly reduced the stigmatization of the participants ($P < 0.05$). Of the studies with no significant differences in outcomes, the authors stated that there is currently no clear reason to explain the lack of significant changes in perceived stigma scores for both the medical student and online nursing student groups, but perhaps it could be explained by the purpose of the MHFA program—the goal of the MHFA training is to change participants' attitudes, not how they view others' attitudes [17].

MHL

Six studies [17–19, 27, 28, 31] reported MHL. Three studies assessed MHL [17, 18, 28] by using questions related to mental health knowledge. One used a subjective score of literacy based on a standardized instrument to assess MHL [27]. One study [31] applied thematic analysis to extract mental health themes from responses to 18 questions and hence assessed changes in MHL in participants who completed MHFA training. One study [19] utilized the MHL Scale (Chinese version) to assess participants. The results of six studies showed that MHFA training improved participants' MHL.

Confidence in treating disease

Two studies [12, 19] assessed confidence in treating diseases. Hung et al. [19] used the MHL Scale (Chinese version), whereas Kitchener et al. [12] asked participants open-ended questions about their confidence in treating illnesses.

Strengths and weaknesses of the MHFA training program and motivation to complete the MHFA

Kelly et al. [32] reported the following strengths of implementing the MHFA program: The content of the MHFA program is highly intellectual and emphasizes the hands-on nature of the skills learned. The MHFA program increases people's understanding of mental illnesses. Such an understanding is valuable for dispelling misconceptions and reducing stigma. Furthermore, the

posttraining feedback from the MHFA course was positive, with the majority of participants stating that after completing the course, they would use the skills and knowledge that they gained to help others (e.g., friends, family, and neighbors) and direct them to seek professional help. The program's shortcomings centered on the lack of administration, such as course scheduling; limitations on the number of slots in the course; and lack of catering. Other shortcomings included the course length and content that is or is not covered. However, most participants felt that MHFA training is valuable. Crawford [29] primarily emphasized motivations for completing MHFA, including MHL, the willingness to help others, and the presence or absence of experience helping others. These motivations play an essential role in the MHFA training curriculum, and institutions of higher education should embed MHFA training in nursing curricula to supplement existing course material.

Results of the qualitative study

One qualitative study included in this study described the reasons for receiving MHFA training, the group of medical students receiving MHFA training, and the barriers and driving factors for the implementation of MHFA training. Among them, there were two reasons for providing MHFA training, most of them set MHFA as a compulsory course for students, and only a few of them volunteered MHFA training. The main reasons are lack of funding, differing views on professional practice and lack of time for training and MHFA trainers. Most of the training methods used blended teaching methods, but some also used online teaching. The group of students receiving training is mostly in the first and second years, but there is no uniform standard. The study also pointed out that most MHFA first aid programs did not provide students with the opportunity to practice MHFA skills after the training, which may have an impact on students' confidence in applying MHFA in practice. Therefore, in the follow-up study, we should focus on clarifying the population of students receiving MHFA training, the best form of MHFA training, and the necessity of post-training activities and assessments, and further explore the application of MHFA in the real world.

Discussion

This review is the first to analyze the effect of MHFA on healthcare workers and medical nursing students. It summarized differences in the measurement of each outcome indicator and the effects of MHFA when applied to different participants and integrated the main themes of one qualitative study. In this study, even though there are some differences in statistical methods and outcome

Table 2 Quality evaluation results of randomized controlled trials

First author (year)	Random allocation methodology	Distribution scheme hidden	Blinding of subjects and researchers	Blinding of outcome assessments	The integrity of results data	Selective reporting of findings	Other sources of offset
Burns 2017 [18]	Low risk	High risk	High risk	Currently unknown	Low risk	Low risk	Low risk
Hung 2021 [19]	Low risk	Currently unknown	Currently unknown	Currently unknown	Low risk	Low risk	Low risk
Moll 2018 [27]	Low risk	Low risk	Currently unknown	Currently unknown	Low risk	Low risk	Low risk
Dzemaili 2023 [28]	Low risk	Currently unknown	Low risk	Currently unknown	Low risk	Low risk	Low risk
Crawford 2020 [29]	Currently unknown	Currently unknown	Currently unknown	Currently unknown	Low risk	Low risk	Low risk

Table 3 Results of the quality assessment of qualitative studies

First author (year)	1	2	3	4	5	6	7	8	9	10
Pham 2022 [30]	Currently unknown	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Consistency indicates whether the methodology is consistent with the way the results are presented; indicates whether the researcher's situation is described in terms of cultural background and values; indicates whether the researcher's influence on the study or the study's influence on the researcher is elaborated upon; 8 indicates whether the research subject is typical and whether it adequately represents/reflects the research subjects and their views; 9 indicates whether the ethics committee approved the research; 10 indicates whether the conclusions were drawn from the analysis and interpretation of the data

Table 4 Quality evaluation results of single-armed tests

First author (year)	1	2	3	4	5	6	7	8	9
Bond 2015 [17]	Yes	Yes	Nonapplicable	Yes	Currently unknown	Currently unknown	Yes	Yes	Yes
Nakagami 2018 [20]	Yes	Yes	Nonapplicable	Yes	Currently unknown	Currently unknown	Yes	Yes	Yes
Kitchener 2002 [12]	Yes	Yes	Nonapplicable	Yes	Currently unknown	Currently unknown	Yes	Yes	Yes

Indicates whether causality in the study was clearly stated; indicates whether the baseline was comparable between groups; indicates whether other measures received by each group, except for the interventions to be validated, were the same; indicates whether control was established; indicates whether diversified measures of outcome indicators were implemented before and after the intervention; 6 indicates whether the follow-up was complete. If incomplete, whether lost visits were reported and measures were taken to address lost visits; indicates whether outcome indicators were measured in the same way for each group of study participants; indicates whether the method of measuring outcome indicators was credible; indicates the appropriateness of the method used to analyze data

measures among the studies. Firstly, there were different types of studies. This study included single-arm trials, randomized controlled trials and qualitative studies. The single arm test is helpful for us to understand the preliminary effect and promotion of MHFA in medical staff and medical nursing students; However, due to the lack of a control group, it is not possible to directly compare the effect of MHFA with other interventions. It is difficult to distinguish whether the observed results are caused by MHFA itself, or by other factors such as the patient's own psychological recovery ability and external environmental support, which may overestimate the effect of MHFA. However, a meta-analysis [37] found that uncontrolled trials produced effect sizes similar to controlled trials regarding the effects of MHFA courses, suggesting that controlled trials produced effects that may not be much

biased in effect sizes compared to uncontrolled trials. Randomized controlled trials can reduce the influence of confounding factors on the trial results to some extent, so that the experimental group and the control group are as balanced as possible in terms of known and unknown factors, so as to more accurately evaluate the effect of the intervention (MHFA). However, in practice, patients may receive multiple treatments or interventions at the same time. However, randomized controlled trials usually only study a single intervention, which cannot reflect the real clinical situation. Qualitative research is helpful to understand the complexity of MHFA training in medical students and the barriers and driving factors faced by MHFA implementation, so as to take appropriate solutions in future research. However, it has strong subjectivity and certain subjective bias. Secondly, there were

Table 5 Results of the quality evaluation of mixed studies

First author (year)	1	2	3	4	5	6	7	8	89	10	11	12	13	14	15
Wadsworth (2022) [31]	Yes	Yes	Yes	Yes	Currently unknown	Yes	Yes	Yes	Currently unknown	Yes	Yes	Yes	Yes	Yes	No
Kelly (2017) [32]	Yes	Yes	Currently unknown	Yes	Currently unknown	Currently unknown	Yes	Yes	Currently unknown	Yes	Yes	Currently unknown	Currently unknown	Yes	No

The evaluation indicators for the qualitative research section are numbered 1–5: 1 indicates whether the qualitative methodology is appropriate to answer the research question. 2 indicates whether qualitative data collection methods are adequate to answer the research question. 3 indicates whether the information collected was sufficient to distill the research findings. 4 indicates whether the interpretation of the results is supported by sufficient information. 5 indicates consistency among the sources, collection, analysis, and interpretation of qualitative information. The evaluation indicators for the quantitative research section indicate whether the sampling method was appropriate for answering the research question. 7 indicates whether the sample is representative of the target population and whether the measurements are appropriate and if the risk of nonresponse bias is low. 10 indicates if the statistical analysis methods are appropriate. The components of mixed-methods studies are numbered 11–15. 11–15 indicate whether a sufficient rationale exists for the use of a mixed methods design to answer the research question. 12 indicates if the different components of the study are effectively integrated to answer the research question. 13 questions if the representation adequately explains the results of the qualitative and quantitative components. 14 indicates whether the divergence and heterogeneity between the quantitative and qualitative results have been adequately addressed. 15 indicates whether the different components of the study meet the quality criteria addressed in each previous routine method (Note: Criteria 1–5 are used for qualitative components. Criteria 6–10 are used for quantitative components. The overall quality of mixed-methods studies, which can only be considered high quality if both study components are of high quality, depends on the quality of the weakest component)

only 5 randomized controlled trials in this review and the quality was low, so it is difficult to evaluate the reliability of the improvement of relevant outcome indicators, but they all showed the benefits of MHFA in identifying mental illness, stigma, willingness to provide MHFA, confidence and so on. In addition, grey literature and relevant references were included in this study, which made the included studies relatively comprehensive. The narrative synthesis of this study was strictly in accordance with the PRISMA 2020 guidelines. Therefore, even with all the limitations mentioned earlier, the authors feel that this review contains a representative number of relevant studies and that the findings may be of interest.

Standardizing MHFA training programs for healthcare workers and medical nursing students is urgently needed

Mental health training is important for paramedics, medical nursing students, and other healthcare providers, and most nursing students and medical professions have psychiatric or mental health issues [38]. For nursing students, the source of stress is mainly the fear of the heavy workload that they need to face in the future in the clinic, problems related to training and learning in the clinic, handling of nurse-patient disputes, and fear of unknown situations [39, 40]. Most medical students are also prone to mental health problems, such as mild or moderate anxiety and depression due to academic, financial, and employment problems [41, 42], with some studies [43] reporting that nurses with mental health problems also often lack recognition from their colleagues and many nurses avoid disclosing their mental health problems due to stigmatization by their colleagues [44, 45]. Studies have found that teaching healthcare students about mental health or providing courses on mental health has a positive effect on their mental health, increases social support and health literacy, and reduces stigma [40, 46]. In addition, suicide prevention training for nurses can increase their understanding of suicide, improve their awareness of self-prevention, enhance their ability to recognize patients with mental health problems, and reduce the incidence of suicide among patients [47]. MHFA training courses can improve people's MHL, ameliorate prejudices inherent in mental health disorders (such as stigma or stigmatization), and increase people's skills and confidence in providing help to people with mental health problems [12]. Currently, MHFA courses have been standardized for different populations. Such courses include standard (for any form of adult), senior, youth, and aboriginal and Torres Strait Islander MHFA courses with specific training lengths, course formats, and aims [48]. No standard MHFA training program for healthcare workers and medical nursing students exists.

Therefore, healthcare workers and medical nursing students must be targeted. A standardized MHFA training program must be developed to improve the effectiveness of MHFA training, increase the awareness of mental health issues among healthcare workers and medical nursing students, reduce stigma, and assist patients with mental health issues.

Clarifying the effect of MHFA on participants and recipients

This review found that MHFA significantly increased participants' MHL and willingness and confidence to provide MHFA as well as enabled participants to provide helping behaviors to people with mental health problems. This finding is consistent with the results of Hadlaczky et al. [37] and Ng et al. [49]. However, the systematic evaluation by Sánchez et al. could not provide a conclusion on whether or not MHFA would improve participants' helping behaviors [50]. Maslowski et al. [51] provided support for the effect of MHFA on participants' helping behaviors but reported that the effects on recipients are inconclusive. A recent systematic evaluation reported that the evidence showing that MHFA improves participants' helping behaviors or recipients' mental health problems is insufficient [52]. Therefore, future studies assessing recipient effects are warranted, and further research is needed to explore the efficacy of MHFAs in improving behavior and assess the efficacy of MHFAs in improving behavioral healthcare competence and its effects on patients' prognoses.

Differences in the effectiveness of MHFA interventions

This review found that the effects of the MHFA intervention on disease identification, stigmatization, and social distance were not uniform. The likely reason for the lack of a significant difference in disease recognition before and after training is that most of the participants in this study had a medical background and may have received relevant training or knowledge during their school years. The likely reason for the results for stigmatization is that MHFA course training aims to change the participants' MHL rather than their perceptions of others' attitudes [18]. The likely reason for the case of social distance is that differences in research methodology, timing of the intervention, and measurement instrument changed the results obtained. As was also shown in a study by the Australian scholars Jorm et al. [53], social distance varied by time.

Negative effects of MHFA implementation

Although the literature included in this study reported the continuous benefits of MHFA in some areas, MHFA may also bring the following negative effects during the

training process, which are mainly summarized as the following themes:

Participants' perception bias of daily life problems from mental disorders. Participants may equate problems of daily living with psychiatric disorders, which, as reported by Andrews et al. [54], are slightly increasing in terms of trend and magnitude. This phenomenon is normal because most mental disorders are not identified or professionally treated.

Participants' tendency to offer advice on professional help in first aid. Participants were less likely to recommend that someone seek professional help when providing them with first aid possibly because they had recently come into contact with someone with a mental health problem and thus attended a course to provide the patient with professional help. However, after the course, their contact with people with mental health problems decreased and, therefore, referrals for professional help decreased [12].

Potential pain of MHFA training and deficiencies in adverse event investigation and data collection. MHFA training may cause some distress to participants after training [55]. However, other than stating that participants were provided with free 24-h telephone crisis or counseling support (e.g., Lifeline) if they were distressed during the training or telephone interview, Morgan et al. did not report any adverse events as a result of MHFA training, and that the MHFA course trainers [56, 57]. This finding is consistent with the result reported by Reavley et al. [58, 59], who indicated that they would provide lifelines and suicide hotlines if participants became distressed while completing the survey or undergoing training. Furthermore, they encouraged subjects to contact the appropriate person in charge and report any adverse events. However, neither study went on to investigate and systematically collect data on adverse events during training. Therefore, whether discomfort is experienced during MHFA training is unknown.

In view of the above negative effects, we need to do the following measures in the implementation of MHFA training: first, in order to avoid the cognitive bias of patients equating daily life problems with mental disorders, we can carry out comprehensive popularization of mental disorders according to different educational levels of participants; Identifying key differences between stress, distress and mental disorders in daily life in training and education; Case analysis can be introduced into MHFA training, so that participants can distinguish between normal emotional responses and possible signs of mental disorders in specific situations and improve the accuracy of judgment. Secondly, in order to encourage participants to actively provide MHFA first aid to people

in need of help, after the implementation of MHFA training, we can provide participants with regular opportunities to practice MHFA skills, which may increase their confidence in applying MHFA in actual cases. Finally, after reviewing the relevant literature, we found that there were limited studies on the adverse events and negative effects of MHFA. In the future, we can further explore the negative effects and countermeasures.

Factors still to be considered for future MHFA implementation

Although MHFA has been used in a wide variety of populations and settings, the following factors still need to be considered during its implementation [32, 60, 61]: the scheduling of the course, number of slots in the course, need for catering, adequacy of the course curriculum, appropriateness of the training methodology and duration, availability of funding for implementation, implementation in an appropriate setting, appropriateness of the methods used to evaluate the program, and ability to help participants in a meaningful way when they are facing mental health problems. Some studies have shown that MHFA can help improve help-seeking behaviors and MHL regardless of the literacy level of the participants. However, the risk and protective factors that are exposed in the implementation of MHFA must be considered when implementing MHFA training in various workplaces and populations. These factors include MHFA participant and recipient workplace relationships, workplace discrimination based on mental health status, and concerns [62, 63]. Therefore, the above issues must be considered in the development of future MHFA training courses to optimize the implementation of the MHFA curriculum.

Strengths and limitations

This study summarized and evaluated the literature of different research types and analyzed the problems of the current MHFA training curriculum. It also analyzed the areas that need to be improved and potential negative effects and causes that may exist after training with the MHFA curriculum. Moreover, it provided a solid basis and strong rationale for the future development of standardized MHFA training programs for healthcare workers and medical nursing students. Of course, this study has some limitations. Given that it is a scoping review, it did not provide a quantitative synthetic analysis of the data from the included studies, only a descriptive summary of the results. Moreover, the included studies originated from different countries. Therefore, the subjects and research methods varied, and a certain degree of bias may exist. Of the original studies included in this review, only a few were randomized controlled trials and

of low quality. Therefore, the ability of MHFA courses to improve competence in the recognition of mental health disorders, willingness to provide MHFA, and confidence of medical nursing students and healthcare professionals still needs to be proven by trials with rigorous controlled designs, high quality, and large scales to demonstrate the effectiveness of MHFA interventions. Similar works include the studies by Davies et al. and Moll et al. [27, 64], providing new directions for future exploration of the design of MHFA programs.

Implications for future research

No consensus exists on the type of training, modality, duration, course evaluation tools, and need for follow-up on the effectiveness of MHFA training in different populations. Most of the studies lacked follow-up, and only a small number of studies, such as the works of Mohatt [65] and Moffitt [66], had follow-ups longer than 6 months. As a result, determining the long-term effects of MHFA training has not been possible, and the refinement of the implementation guidelines of MHFA programs is necessary to improve the quality of future interventions and validity of follow-up visits [67]. Furthermore, consistent with the findings of Minas et al. [68], the results of this study showed that MHFA had mixed effects on perceived and personal stigmas. Therefore, future MHFA research should include questions assessing personal and perceived stigmas to understand how this training affects these beliefs.

Conclusion

Similar to studies by other scholars [3, 69–72], this work demonstrated the benefits of MHFA training courses. It showed that MHFA was effective in increasing participants' MHL, willingness to provide MHFA, and confidence. Moreover, it had a positive effect on disease recognition, stigmatization, and social distance. Its inclusion in the nursing curriculum may be necessary for improving the treatment of mental health issues [73]. However, MHFA training courses must be refined for different professional populations to make them flexible, lively, and engaging and increase their efficiency.

Abbreviations

MHFA Mental Health First Aid
MHL Mental Health Literacy

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s40359-025-02519-0>.

Supplementary Material 1.

Acknowledgements

None.

Authors' contributions

Yamin Li conceptualized and supervised the study. Li Li and Zhiying Wu independently searched the literature by using the search formula. Li Li and Xiaolan Ma independently screened the literature, extracted data, and appraised bias. Moreover, disagreements during literature screening and data extraction were resolved with Chunyan Xie. All authors interpreted the findings, and Li Li drafted the manuscript. All authors contributed to editing the manuscript and approved the final version.

Funding

This study was funded by the Major Scientific and Technological Projects in Hunan Province (grant number: 2020SK2085, director: Professor Yamin Li).

Data availability

Data is provided within the manuscript or supplementary information files.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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Received: 13 May 2024 Accepted: 20 February 2025

Published: 3 March 2025

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