ATHLETIC TRAINING EDUCATION JOURNAL

www.natajournals.org
ISSN: 1947-380X
DOI: 10.4085/1947-380X-23-001

ORIGINAL RESEARCH

Athletic Training Students' Mental Health Recognition and Referral Skills, Part 1: A Randomized Controlled Trial

Alyssa S. Anderson, PhD, ATC*†; William A. Pitney III, EdD, ATC, FNATA‡; Kirk J. Armstrong, EdD, ATC§; Beth Kinslow, DSc, ATC‖
*Rocky Mountain University of Health Professions, Provo, UT; †North Park University, Chicago, IL; ‡Professor of Athletic Training, Northern Illinois University, DeKalb; §James Madison University, Harrisonburg, VA; ‖University of Wisconsin, Stevens Point

Context: The increased prevalence of mental health conditions and athletic training education's heightened focus on behavioral and mental health necessitate an examination of teaching techniques for this material. This study explores the impact of virtual pedagogical strategies on athletic training students' knowledge and confidence with mental health recognition and referral to help educators determine best practices for content delivery.

Objective: This study examined the effect of Mental Health First Aid (MHFA) training on students' knowledge and confidence in mental health recognition and referral. The impact of group allocation (standardized patient [SP] encounters, case-based learning [CBL], and control) on these outcomes was also assessed.

Design: Randomized controllled trial portion from a sequential, explanatory mixed-methods design.

Setting: Online learning environment.

Patients or Other Participants: Convenience sample of 70 students (25 men, 44 women, 1 nonbinary; aged 23.38 ± 2.27 years) from Commission on Accreditation of Athletic Training Education-accredited graduate-level professional athletic training programs.

Intervention(s): All participants completed MHFA training followed by either no intervention, an SP encounter, or CBL activity.

Main Outcome Measure(s): Mental health recognition and referral skills as measured by an electronic knowledge assessment and self-reported confidence scale whose content validity were established by an expert panel.

Results: A mixed-model analysis of variance showed significant improvement from pretest to posttest for both knowledge and confidence [knowledge: $F_{(1,67)} = 70.31$, $P < .001$; confidence: $F_{(1,67)} = 206.41$, $P < .001$]. This relationship was similar among all 3 groups. No significant difference in knowledge or confidence was found between the control, SP, and CBL groups.

Conclusions: With the increased need to care for patients' behavioral and mental health, professional athletic training programs and continuing education should consider incorporating MHFA training to improve content knowledge and confidence in skills. While no numerical difference between the groups was shown by this study, supplementation with simulation through CBL or SP encounters provides an opportunity for application specific to athletic training practice, which may help reinforce concepts and enhance clinical readiness.

Key Words: standardized patients, case-based learning, mental health first aid training

Alyssa S. Anderson is currently the Athletic Training Clinical Education Coordinator at North Park University. Please address correspondence to Alyssa S. Anderson, PhD, ATC, Athletic Training Program, School of Nursing and Health Sciences, North Park University, 3225 W Foster Ave, Box 25, Chicago, IL 60625. aanderson1@northpark.edu.

Full Citation:
Anderson AS, Pitney WA III, Armstrong KJ, Kinslow B. Athletic training students' mental health recognition and referral skills, part 1: a randomized controlled trial. *Athl Train Educ J*. 18(4):213–222.

Athletic Training Students' Mental Health Recognition and Referral Skills, Part 1: A Randomized Controlled Trial

Alyssa S. Anderson, PhD, ATC; William A. Pitney III, EdD, ATC, FNATA; Kirk J. Armstrong, EdD, ATC; Beth Kinslow, DSc, ATC

KEY POINTS

- Mental Health First Aid (MHFA) training improved athletic training students' knowledge and confidence with mental health recognition and referral.
- The use of standardized patient encounters and case-based learning interventions following the MHFA standardized curriculum did not further enhance knowledge or self-reported confidence with mental health recognition and referral.
- The use of simulation offered participants the opportunity for continued practice and feedback in a safe environment that mimics clinical practice.

INTRODUCTION

The growing prevalence of mental health conditions in the United States[1–3] underscores the importance of early recognition, support, and referral for those in need. Athletic trainers (ATs) are in a unique position to address this need. Despite the importance of ATs recognizing the signs and symptoms of mental health challenges and appropriately referring patients, professional confidence and competence in this area need improvement.[4–6] Previous literature reported that during educational preparation, ATs lack experience interacting with patients undergoing mental health challenges.[4] Additionally, credentialed clinicians' confidence in this area has been identified as being deficient by their supervisors[5] and through self-reports.[6] Expanding mental health research within athletic training practice aligns with and supports the priorities of the Strategic Alliance's research agenda,[7] the Board of Certification (BOC) practice analysis,[8] and the Commission on Accreditation of Athletic Training Education (CAATE) standards.[9]

To adequately equip athletic training students with the skills needed to assist patients with mental health concerns, educators need to evaluate approaches for content delivery and application. Mental Health First Aid (MHFA), a standardized curriculum offered by the National Council for Behavioral Health,[10] is an interactive option that has been incorporated into professional and continuing education by a variety of health care professions.[11–13] As a public education tool, MHFA training introduces signs and symptoms associated with mental health challenges and provides referral resources, which can increase literacy and reduce stigma.[10] While MHFA does not go into depth about all mental health disorders, it does highlight some conditions, provides participants with opportunities to identify warning signs, and allows them to practice determining the appropriate next steps using the ALGEE action plan (Figure 1). Thus far, ATs have investigated MHFA as a continuing education offering[14] and as part of an institution's comprehensive mental health curriculum.[13]

While MHFA provides a solid foundation with mental health content, athletic training-specific application is also vital for developing students' skills. One approach to skill development is simulation, an experiential learning technique that involves the representation or replication of real-world scenarios.[15] The risk-free environment created by simulation allows for practice along with reflection and debriefing, with a focus on skill correction and self-awareness.[16]

Standardized patients (SPs) and case-based learning (CBL) are types of simulation that can provide athletic training-specific application of content. Standardized patients are trained individuals portraying a specific case. The benefits of SPs include assessment of clinical skills in a controlled environment[17] and improved confidence in transition to practice.[18] Unlike SPs, CBL examines a realistic case of patient care through a written narrative rather than live patient interaction. Students have reported that CBL is enjoyable and has a positive impact on their learning.[19] An interrupted case format progressively presents information, with pauses for student reflection, and has been shown to increase critical thinking, learning, and retention.[20]

Previous studies within athletic training education have compared CBL and SPs; however, these examinations have lacked a control group.[21,22] A study examining lower-extremity evaluation skills compared group SP encounters and individual CBL with 1 cohort of students. While both techniques increased student confidence and reflection on specific actions, the CBL improved internal organization, and the SP encounter highlighted the benefit of peer learning.[21] An exertional heat stroke study found that hybrid simulation and CBL led to similar results on a knowledge assessment.[22] Both of these explorations incorporated some small-group simulation techniques but did not include a control group.

Figure 1. ALGEE acronym. The ALGEE action plan is part of the National Council for Mental Wellbeing's Mental Health First Aid training program.

Previous explorations of mental and behavioral health learning strategies have included only single institutions. A recent study reported positive student reflections on incorporating exploratory counseling, MHFA, and SP encounters as a way to meet accreditation standards for mental health recognition and referral. Another institution implemented a scaffolded suicide prevention curriculum that incorporated didactic training, experiential exercises, and the creation of a mental health emergency action plan.[23] For greater generalizability, an examination of educational interventions focused on behavioral and mental health with students from multiple institutions is needed.

The purpose of this study was 2-fold: (1) to investigate the effect of MHFA training on student knowledge and confidence in mental health recognition and referral and (2) to compare the impacts of small-group CBL and SP encounters after MHFA training on these same measures.

METHODS

A sequential, explanatory mixed-methods design was used.[24] The study was divided into 2 phases. This paper focuses on phase I, a randomized controlled trial involving pretest and posttest assessments of knowledge and confidence. We used the Consolidated Standards of Reporting Trials (CONSORT) checklist to guide the study's rigor and reporting. Phase II involved follow-up interviews with participants and is presented as a separate work.

Participants and Recruitment

A convenience sample of students from CAATE-accredited, graduate-level professional athletic training programs was recruited between October 2021 and May 2022. Program personnel were invited to incorporate the educational interventions into their curriculum. For a program to be invited, its students needed to have some experience with simulation (eg, task trainers, SPs, mock patients). Students from 14 cohorts (students from the same program at equivalent academic progression) representing 11 institutions completed the educational interventions. While recruitment and allocation occurred programmatically, individual students volunteered to participate in the study by completing electronic informed consent before accessing the baseline assessment. Participants were excluded if they had previously completed MHFA training. Participants' previous experience with other behavioral health instruction or virtual interventions did not influence their eligibility.

Using an online randomization tool, the primary investigator (ASA) assigned institutional cohorts to the intervention groups (MHFA only, MHFA + SP, and MHFA + CBL). To achieve sufficient responses, each intervention group had 4 or 5 cohorts assigned, totaling 54, 52, and 47 potential students, respectively.

The target sample size was 48 as determined by G*Power based on a power of 0.95, an alpha value of 0.05, and an effect size of 0.3. While 121 students were enrolled in the study, only 70 also completed the posttest. The overall attrition rate was 42.14%.

Procedures

Institutional review board approval was obtained from Rocky Mountain University of Health Professions. All students in participating cohorts completed the MHFA training and subsequent interventions as a programmatic requirement. The MHFA training was provided free of charge and resulted in a national certification upon individual completion. However, students volunteered to complete the study's knowledge and confidence assessments.

To maintain separation between assessment data and participant identity while also allowing for comparison of pre- and posttest results, each participant provided an identification code for both assessments. This code included their institutional cohort abbreviation followed by the last 4 digits of their phone number. Since group allocation was done via cohorts, the institutional cohort abbreviation allowed for appropriate coding and comparison.

Shortly after the completion of the baseline assessment, all participants took part in the MHFA training. The National Council for Mental Wellbeing's nationally standardized MHFA curriculum involved online individual prework followed by live, synchronous training. The primary investigator facilitated two 3-hour training sessions within 1 week via Zoom for each cohort.

Three to four weeks after their MHFA training, participants engaged in SP or CBL encounters. After their assigned encounter, participants were immediately sent the posttests. Since the MHFA-only group had no follow-up encounter, they were emailed the posttest link 3–4 weeks after their initial MHFA training to maintain consistency with the other groups. The CONSORT flow diagram (Figure 2) details how many individuals were involved in each phase of the study.

Instrumentation

Qualtrics XM (Qualtrics) was used to distribute the data collection instruments, including a demographic survey, knowledge assessment, and confidence scale. The demographic survey screened for the exclusion criteria of previous MHFA training and then collected basic categorical information about participants, including semesters completed in the program, age, NATA district, and gender.

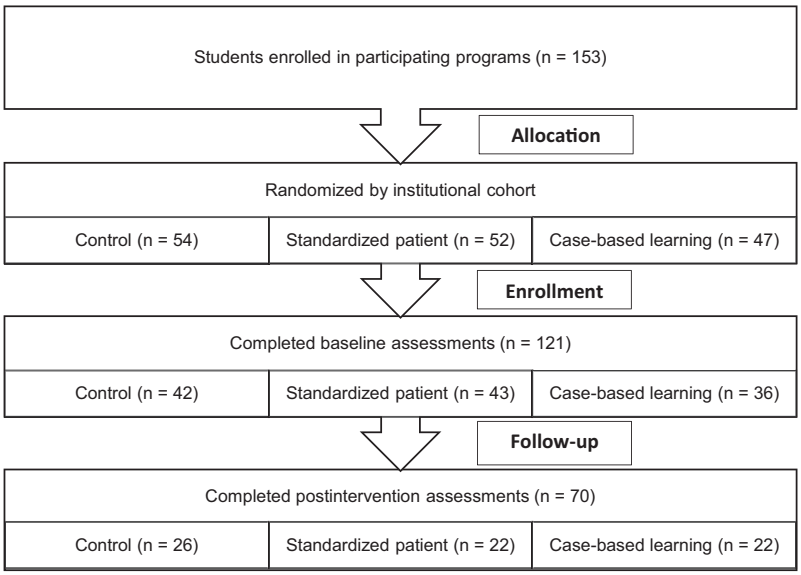
Main Outcomes Measures

Knowledge Assessment. The baseline knowledge assessment incorporated MHFA content using multiple-choice, multiselect, and true/false questions. The assessment was validated with a content validity index (CVI) whereby a panel of 3 individuals rated item relevance and clarity on a 4-point scale.[25] The individual ratings were averaged to create a CVI score; the minimally acceptable threshold for CVI scores was set at 0.75.[25] The grand mean for relevance was 3.75; the grand mean for clarity was 3.42 (Table 1).

The CVI panel consisted of 2 athletic training educators with MHFA instructor certification and 1 MHFA instructor trainer. Of the 15 items on the initial draft, all items met the minimally acceptable threshold for relevance and clarity. However, based on some of the reviewers' comments, 3 items were eliminated due to possible incongruence with the MHFA training.

The final knowledge assessment had 4 true/false items, 4 multiple-choice items, and 4 multiselect items. Multiselect items had 2 correct responses; each was scored as half a point. As part of the study's outcomes, each item on the assessment was scored as 1 point for a possible total of 12 points. Since the knowledge

Figure 2. Overview of procedures.



assessment included multiselect questions, it was not compatible with performing Cronbach's alpha analysis to measure reliability.

Confidence Scale. A previously published and validated clinical performance confidence scale[26] was adapted to include mental health-specific items (Figure 3). The confidence scale was assessed for relevance and clarity using the above-mentioned CVI procedures. Of the 13 initial items, 9 met the minimally acceptable threshold for relevance. Of these 9 items, 2 did not meet the acceptable level for clarity. These 2 items along with 1 other were revised based on reviewer comments and returned to the panel for evaluation of clarity. The panel confirmed that all 3 revised items met the acceptable threshold for clarity (Table 2). The grand means for relevance and clarity were 3.77.

The finalized instrument consisted of 9 items using a Likert scale, with a score of 1 representing *strongly disagree* and 5 representing *strongly agree*. Therefore, confidence scores had the potential to total 45 points. Cronbach's alpha analysis was performed, with a resulting coefficient of 0.88, which indicates that the confidence scale had good reliability.

Table 1. Content Validity Index for Knowledge Assessment Item Rating

Item No.	Relevance (Average)	Clarity (Average)
1	4.00	4.00
2	3.67	3.33
3	4.00	4.00
4	3.33	3.00
5	4.00	3.33
6	3.33	3.00
7	3.33	3.33
8	3.33	3.00
9	4.00	3.00
10	4.00	3.00
11	4.00	4.00
12	4.00	4.00
Grand mean	3.75	3.42

Interventions

The SP and CBL encounters involved the same "case" of a patient who was experiencing grief, stress, and related psychosomatic symptoms. The primary investigator created the case using an existing SP template that was adapted with permission (Table 3). The SP case was then converted to an interrupted CBL format (Table 4). Both documents were peer reviewed by a panel of 3 athletic training educators familiar with CBL and/or SPs to ensure overall quality and uniform presentation between the formats. The panel confirmed that the CBL and SP cases were similar and clear. Specific feedback from reviewers was integrated into the final draft to improve consistency and clarity. To allow for similarity between allocations, both SP and CBL encounters occurred in small groups (2–5 participants from the institutional cohort).

Standardized Patient Encounter. Individuals assigned to the SP encounter interacted with a trained individual during a 15–30-minute video conference with peers from their institutional cohort (2–5 participants), followed by debriefing with the primary investigator. Due to cohort size variability, 18 small-group sessions occurred with 52 students.

The SP's training consisted of 3 parts: a written case guide, a recorded orientation, and a meeting with the primary investigator. Initially, the SP received a written case guide that provided background about the scenario, their opening statement for the encounter, and pertinent patient history information. The SP

Figure 3. Confidence scale.

1. I am confident in my abilities to identify key signs & symptoms of mental health conditions.
2. I am confident in my abilities to ask a patient if they have thought about engaging in self-injurious behaviors.
3. I am confident in my abilities to ask a patient if they have thought about suicide or killing themselves.
4. I am confident providing care to patients with mental health concerns.
5. I am confident in my abilities to recognize a mental health emergency.
6. I am confident in knowing my abilities and limitations and referring patients to qualified providers as needed.
7. I am confident in facilitating difficult conversations with patients.
8. I am confident using appropriate verbal communication.
9. I am confident using appropriate nonverbal communication.

Table 2. Content Validity Index for Confidence Scale Item Rating

Item No.	Relevance (Average)	Clarity (Average)
1	3.00	3.67
2	4.00	4.00
3	4.00	4.00
4	4.00	4.00
5	4.00	4.00
6	4.00	4.00
7	3.67	3.00
8	3.33	3.33
9	4.00	4.00
Grand mean	3.77	3.77

then reviewed a prerecorded introduction to the case before meeting with the primary investigator. This recording provided guidance on how to prepare for the encounter in terms of tone, interpersonal skills, and the case context. During the meeting with the primary investigator, the SP asked questions about the case and honed their portrayal through role-play.[13]

Case-Based Learning Activity. Individuals assigned to the CBL activity cooperatively examined the same case through an interrupted format, meaning that the case was introduced in stages. The primary investigator facilitated the participants' discussion of pertinent details and brainstorming of appropriate decision-making. In addition, each participant had the opportunity to role-play appropriate responses. The CBL sessions were 30–45 minutes via Zoom. Participants were in small groups with members of their institutional cohort (2–5 people); based on cohort size, there were 47 students across 11 group sessions.

Data Analysis

Statistical analyses were run with Intellectus Statistics (version 1.01). Participant demographic information produced descriptive statistics. The influence of the pedagogical strategies on knowledge and confidence was analyzed via a mixed-model

Table 3. Standardized Patient Encounter Overview

Case Name	Jackie Jones
Setting	You are the athletic trainer for the college softball team. You are about to have a telehealth encounter during the last week of winter break.
Gender and age	Female (she/her/hers) Identifies as bisexual 19 years old
Presenting complaints	Nausea and vomiting Difficulty focusing Telehealth encounter
Key objectives	• Engage in telehealth encounter • Obtain patient history • Emphasize person-first language • Provide mental health first aid (including appropriate referral)
Brief summary	First-year college softball athlete home for the first time for winter break. Experiencing loss/change: grandfather died, grandmother moved in with her parents, away from her college friends/support system, and somatic effects—nausea, vomiting, decreased exercise capacity/intensity, and difficulty concentrating. Telehealth encounter 1 week before reporting back to campus for the softball season.
Setup for encounter	First-year softball player emails AT over winter break to schedule a telehealth appointment. *Dear AT,* *I was wondering if we can have a conversation before I get back to campus. I've been having some issues concentrating lately. I'm struggling to get ready for season. I've been vomiting before workouts which makes it really challenging to finish them.* *Thanks,* *Jackie Jones*
Instructions to student	You will have 20–25 min to complete a focused history and examination of the patient in your small group. (Keep in mind your certification as a Mental Health First Aider.) You will need to discuss your findings with the patient and outline a treatment plan (which may or may not include a referral).
Differential diagnoses	Anxiety Depression
Tasks for students	• Obtain patient history • Provide mental health first aid ○ Ask about self-harm ○ Ask about threat to others ○ Ask about suicide • Appropriate referral
Designed for	Students who recently completed Mental Health First Aid training

Abbreviation: AT, athletic trainer.

Table 4. Case-Based Learning Activity Overview

Section	Case Information	Facilitator Prompts
1	You are having a telehealth consult with Jackie, a first-year collegiate softball player, during the last week of winter break. She reached out to you via email to schedule a virtual appointment. Based on her electronic medical record profile, you know that Jackie identifies as female and is 19 years old. *Dear Athletic Trainer,* *I was wondering if we can have a conversation before I get back to campus. I've been having some issues concentrating lately. I'm struggling to get ready for season. I've been vomiting before workouts which makes it really challenging to finish them.* *Thanks,* *Jackie Jones*	• Remember that this is the actual telehealth encounter. • How would you establish rapport? • What history questions would you ask? • Role-play this interaction.
2	As part of the telehealth conversation, Jackie mentions that she's been struggling with being at home and trying to get ready to come back for the season. She states that her nausea started during finals week—she chalked it up to nerves about her exams, but it never really went away. It takes her a bit to open up. She fidgets a bit as she describes the changes that she's experienced this year: starting college, coming back home for break, her grandfather's death, and her grandmother moving in with her parents. She says that she feels isolated from the friends that she's made at school and distant from her family. She feels that her inability to focus began after she returned home from the semester. She admits that she increased her caffeine intake as finals approached, and her diet changed when she returned home. Jackie denies any previous significant medical or behavioral health issues and is not currently taking any medications.	• Remember that this is the actual telehealth encounter. • What are your concerns? • What is an appropriate follow-up response? • What reassurance could you provide to the patient? • Role-play these interactions.
3	Upon more probing during your telehealth conversation, you learn that she's been sleeping a lot more than usual. Jackie also mentions that her mom has a diagnosis of anxiety and mild obsessive-compulsive disorder tendencies that her mom is usually able to cope with. Jackie states that she herself has not been evaluated by a mental health professional. She says that she is nervous about the transition back to campus and preparing for the season and just does not know how to handle everything. She mentions feeling overwhelmed and states, "I just don't know what else to do."	• At this moment, what pertinent questions do you need to ask to determine patient safety? • Role-play this conversation. • (Need to ask about suicide and self-harm.)
4	Jackie says that she has no intention of harming herself and no suicidal ideation. She expresses, "I just want to feel like myself again."	• What referral or interventions would be appropriate? • How will you facilitate the next steps and wrap up the conversation? • Role-play how to communicate this to the patient.

analysis of variance (ANOVA) with the a priori value set at a P value of $< .05$. Before running a mixed-model ANOVA, it was determined that the assumption of normality was met using a Q-Q scatterplot.[27]

RESULTS

Students were recruited from institutions located in 6 NATA districts. The participants were aged 23.3 ± 2.27 years old with a gender breakdown of 62.86% women, 35.71% men, and 1.43% nonbinary. Participants had completed an average of 2.87 ± 1.76 didactic semesters and 2.3 ± 2.27 semesters of clinical education. Full participant demographics can be found in Table 5.

Improvement Between Pretest and Posttest

Participants showed improvement in their knowledge assessment scores (max score = 12, pretest average = 8.65, posttest average = 10.28). Using a mixed-method ANOVA, the main effect for the within-subjects factor was significant [$F_{(1,67)} = 70.31$, $P < .001$], indicating that there were significant differences between the pretest and posttest values for knowledge. The reported effect size ($\eta^2 = 0.51$) was large.

A similar result was found for confidence. Participant scores increased from 29.65 on the pretest to 39.21 on the posttest. The main effect for the within-subjects factor revealed a significant difference [$F_{(1,67)} = 206.41$, $P < .001$] between the

Table 5. Participant Demographic Information

Group Allocation	Age, y, Mean ± SD	Gender, %	No. of Semesters Completed, Mean ± SD	No. of Semesters of Clinical Experience, Mean ± SD
Control	22.68 ± 2.12	63.64 F 31.82 M 4.5 NB	1.32 ± 0.99	1.00 ± 0.99
CBL	23.92 ± 2.83	57.69 F 42.31 M	3.44 ± 1.55	2.92 ± 2.83
SP	23.45 ± 1.47	68.18 F 31.82 M	3.77 ± 1.6	2.86 ± 0.83
Overall	23.38 ± 2.27	62.86 F 35.71 M 1.43 NB	2.87 ± 1.76	2.3 ± 2.27

Abbreviations: CBL, case-based learning; F, female; M, male; NB, nonbinary; SD, standard deviation.

values of pretest and posttest confidence scores. In addition, the η^2 value of 0.75 is considered a large effect size.

The knowledge and confidence score averages are presented in Table 6. Full mixed-method ANOVA results are shown in Table 7.

Comparison of Intervention Groups

Pretest and posttest scores were similar among intervention groups as indicated by an examination of the main effect for allocation [knowledge: $F_{(2,67)} = 0.21$, $P = .807$; confidence: $F_{(2,67)} = 1.29$, $P = .281$].

The mixed-model ANOVA showed no significant difference between the control, SP, and CBL groups in terms of knowledge or confidence improvement. For knowledge, the interaction effect of the within-subjects factor and allocation was not significant [$F_{(2,67)} = 0.26$, $P = .771$], indicating a similar relationship between pretest and posttest. The relationships between pretest and posttest confidence scores were similar between levels of allocation, with an interaction effect of an $F_{(2,67)}$ value of 0.08 and a P value of .919.

DISCUSSION

As athletic training students and professionals increasingly encounter patients with mental and behavioral health concerns, MHFA provides an opportunity to deliver updated information about signs and symptoms, distinguish crisis from noncrisis situations, and provide basic intervention and referral strategies.[10] Our results showed a significant improvement in participants' knowledge and confidence related to managing mental and behavioral health issues after their MHFA training. While all participants' knowledge and confidence improved, there were no differences in improvement between the 3 intervention groups.

MHFA is evidence based, standardized, and developed by individuals with content expertise in mental and behavioral health. While MHFA does not cover each component of the CAATE standards for behavioral health pertaining to policy creation, action planning, examination, diagnosis, and intervention, it does addresses core content related to anxiety disorders, depression, mood disorders, psychosis, trauma, and substance use disorders. Thus, incorporating MHFA into athletic training programs adheres to high standards of content delivery and may reduce the preparation burden on athletic training educators.

Impact of MHFA Training

Our study's increased scores for knowledge and confidence align with the findings of other examinations of MHFA training within health care education. Incorporating MHFA training into pharmacy education improved the identification of mental illness, decreased stigmatizing attitudes, and increased confidence in providing pharmaceutical support.[12] A study of nursing students indicated significant improvements in knowledge, confidence in helping, destigmatization, and mental health first aid intentions both immediately after MHFA training and at follow-up.[28] Within athletic training education, Ostrowski et al[13] found that MHFA followed by an SP encounter boosted student confidence and the ability to recognize, intervene, and refer patients experiencing mental health challenges. MHFA training seems to be an appropriate way to improve health care students' knowledge and confidence with mental health recognition and referral.

Table 6. Knowledge and Confidence Scores

Group Allocation	Pretest Knowledge	Posttest Knowledge	Difference	Pretest Confidence	Posttest Confidence	Difference
Control	8.59	10.14	1.55	29.64	39.6	9.95
CBL	8.56	10.36	1.81	30.5	39.92	9.42
SP	8.8	10.32	1.5	28.68	38	9.32
Overall	8.65	10.28	1.63[a]	29.65	39.21	9.56[a]

Abbreviations: CBL, case-based learning; SP, standardized patient encounter.

[a] Significant difference, $P < .05$.

Table 7. Mixed-Model Analysis-of-Variance Results

Factor	Source	Degree of Freedom	Sum of Squares	Mean Square	F Ratio	*P* Value	Effect Size (η^2)
Knowledge							
Between subjects	Allocation	2	0.92	0.46	0.21	.807	0.006
	Residuals	67	143.65	2.14			
Within subjects	Within factor	1	91.03	91.03	70.31	<.001	0.51
	Allocation	2	0.67	0.34	0.26	.771	0.008
	Residuals	67	86.75	1.29			
Confidence							
Between subjects	Allocation	2	85.43	42.72	1.29	.281	0.04
	Residuals	67	2212.49	33.02			
Within subjects	Within factor	1	3182.52	3182.52	206.41	<.001	0.75
	Allocation	2	2.60	1.30	0.08	.919	0.003
	Residuals	67	1033.04	15.42			

The increased confidence reported by our study's athletic training students mirrors the findings of an exploration of certified ATs in which self-efficacy scores were significantly higher after MHFA training than pretest.[14] Self-efficacy and confidence are closely related as descriptors of participants' perceptions of their abilities. Given that ATs have been reported to lack confidence in providing care and referral to patients with mental health concerns,[4–6] MHFA training incorporated into professional education or provided as a continuing education offering may help bridge this gap.

Use of SPs and CBL

We found no difference in knowledge and confidence between CBL and SP encounters following a didactic learning experience. In examining the literature, we found a range of results in similar studies. Schwartz and colleagues, for example, found no difference between CBL and human patient simulation (HPS) on students' clinical examination performance.[29] In their study, medical students completed required didactic sessions on the emergency management of acute chest pain and were then randomly assigned to either the CBL or HPS group; their end-of-clerkship objective structured clinical examinations (OSCEs) revealed similar overall and subscale scores between the intervention groups.[29]

While Schwartz and colleagues studied clinical performance, others have found differences between intervention modes when assessing knowledge acquisition. For example, Aluisio et al conducted a randomized controlled trial examining the effectiveness of CBL or SPs in addition to didactic instruction in disaster triage preparedness among nursing students.[30] They found that CBL outperformed SP experiences in terms of knowledge acquisition.[30] In contrast, an evaluation by Lee Chin et al[31] of HPS and CBL in pharmacy students found that students in the HPS group had greater changes from pre- to posttest than the CBL group. Given the variability between these studies and our results, there does not seem to be an intervention that consistently performs better.

The use of simulation for high-risk, low-repetition skills has shown benefits for student knowledge and confidence in athletic training education. Kinslow et al[22] compared hybrid simulation to CBL for the assessment and treatment of exertional heat stroke and found that both strategies similarly improved student scores on the Knowledge, Preferences, and Practices of Certified Athletic Trainers Regarding Recognition and Treatment of Exertional Heat Stroke (KPP-EHS) survey. Similarly, a study focused on high-fidelity simulations for cardiopulmonary resuscitation (CPR) found an increase in student knowledge acquisition and confidence from pretest to posttest,[32] and a study of facemask removal using an SP found increased performance and confidence.[33] While the types of simulation used in each of these studies varied slightly from the CBL activity and SP encounters that we incorporated, similar impacts on knowledge and confidence were observed. Unlike those previous studies, our examination also incorporated a control group receiving only the MHFA training.

Our control group showed improvement similar to that of the simulation groups. This differs from other findings in the literature. Therefore, variables surrounding the simulation strategies and the standardized education used for original content delivery should be investigated further. A medical laboratory technology program compared the incorporation of SPs and CBL into a cell biology course to a control group that experienced traditional methods of lecture and experiments; the final scores in the course were significantly higher for the students who engaged in SP and CBL experiences.[34] For our study, the didactic exposure was quite comprehensive as the MHFA training involved both self-paced and synchronous work totaling 8 hours. Perhaps this intensive exposure may surpass typical didactic instruction before CBL or SP intervention, thereby leading to less of an impact of the simulated experiences. The CBL and SP interventions in our study were 30–45 minutes. It is also possible that the difference in contact times between the didactic instruction and intervention strategies also contributed to the lack of a difference in scores between the allocation groups. Perhaps multiple follow-up simulations would have revealed significant gains in knowledge and confidence compared to a control group.

Implications for Athletic Training Education

As ATs evaluate professional and continuing education offerings, it is helpful to know how adding types of simulation compares to just completing an interactive training curriculum. MHFA training has demonstrated the ability to improve knowledge and confidence with recognition and referral for mental and behavioral health concerns. Incorporating MHFA training into professional athletic training programs as well as continuing education has the potential to improve clinicians' skills and abilities in caring for patients experiencing mental health challenges.

Educators who look to engage participants in simulated sessions to enhance skill development following didactic-based lessons have many options. Given the required resources associated with SP encounters, the use of CBL offers an economical approach to reinforcing knowledge and skills while allowing for practice in a low-risk environment.

Since MHFA is geared toward a lay audience, providing students and professionals with opportunities to apply their knowledge and skills to athletic training scenarios may help transfer content to practice. While there was not a statistically significant difference between those participants who did only the MHFA training and those who performed the CBL activity or SP encounter, participant interviews (found in Part 2) support increased feelings of comfort, confidence, and capability from discipline-specific practice.

Limitations

Although didactic contact with MHFA was uniform, the students' previous and concurrent didactic and clinical experiences and exposure to the study's pedagogical techniques were not controlled. The convenience sample limits generalizability, and the randomization of cohorts rather than individuals leaves room for confounding.

In addition, our participant attrition rate was 42.14%. While 121 students took the pretest, only 70 posttests were recorded. Either the remaining 51 students failed to complete the posttest or their identification codes could not be linked to a pretest. Additionally, some individuals did not accurately provide their institutional abbreviation or unique 4-digit code. A few factors that may have influenced attrition include the timing of the posttest near the end of a term, time elapsed between training and the posttest, and failure to use the correct identification code.

This study focused on knowledge acquisition and self-perceived confidence and did not include skill-based assessments, such as a practical examination, of recognition and referral. Future research should examine the effects of mental health simulation experiences on skill performance.

Future Research

This study used only 1, short, small-group encounter with CBL or SPs. Future research could incorporate an encounter of greater length, multiple encounters, or an individual experience rather than a small-group encounter compared to a control group. Using an individual evaluative SP experience to assess students' clinical application of knowledge as an additional outcome measure may allow for better differentiation between the interventions' benefits. In addition, exploring differences in retention of knowledge and confidence between those in SP, CBL, or MHFA-only groups is another potential avenue.

Due to the increasing commonness of hybrid and online instruction in athletic training professional preparation and continuing education, virtual presentation of MHFA training, SP encounters, and CBL activities was used for this study. It would be interesting to compare modes of instruction, both virtual and face to face, to determine if the delivery method influences participant knowledge and confidence with mental health recognition and referral.

While this study focused on mental and behavioral health, future comparisons of CBL activities and SP encounters with a control group could be done with other content areas pertinent to athletic training. Mental and behavioral health topics may be considered a novel content area within athletic training; the lack of distinction between allocation groups may be tied to the steeper learning curve of this material. Future research using a less complex or more common topic may allow a better comparison of the intervention strategies.

CONCLUSIONS

As athletic training professionals seek continuing education to enhance knowledge and skills transferable to their clinical practice, MHFA training is a promising offering. Likewise, MHFA training provides professional athletic training programs with an effective instructional tool to present content relevant to the CAATE curricular standards for mental and behavioral health. This standardized curriculum and the virtual delivery option offer a comprehensive, practical, and flexible approach. While a difference in scores between the allocations (CBL, SP, and control) was not found, the use of simulation offered participants the opportunity for continued practice and feedback in a safe environment that mimics clinical practice.

ACKNOWLEDGMENTS

This study was made possible in part by the financial support of the Rocky Mountain University of Health Profession's Graduate Research Support Fund and the Illinois Athletic Trainers' Association Research Grant.

REFERENCES

1. Whitney DG, Peterson MD. US national and state-level prevalence of mental health disorders and disparities of mental health care use in children. *JAMA Pediatr*. 2019;173(4):389–391. doi:10.1001/jamapediatrics.2018.5399
2. Mental illness. National Institute of Mental Health. Accessed May 23, 2021. https://www.nimh.nih.gov/health/statistics/mental-illness
3. Lebrun-Harris LA, Ghandour RM, Kogan MD, Warren MD. Five-year trends in US children's health and well-being, 2016–2020. *JAMA Pediatr*. 2022;176(7):e220056. doi:10.1001/jamapediatrics.2022.0056
4. Clement D, Arvinen-Barrow M. Athletic trainers' views and experiences of discussing psychosocial and mental health issues with athletes: an exploratory study. *Athl Train Sports Health Care*. 2018;11(5):213–223. doi:10.3928/19425864-20181002-01
5. Thrasher AB, Walker SE, Hankemeier DA, Pitney WA. Supervising athletic trainers' perceptions of graduate assistant athletic trainers' professional preparation. *Athl Train Educ J*. 2015;10(4):275–286. doi:10.4085/1004275
6. Ostrowski JL, Durics B, Vallorosi J, Gray AM, Payne E. Frequency of, confidence in, and educational satisfaction with mental illness recognition and referral among certified athletic trainers. *J Athl Train*. 2023;58(1):71–78. doi:10.4085/1062-6050-0606.21
7. Eberman LE, Walker SE, Floyd RT, et al. The prioritized research agenda for the athletic training profession: a report from the Strategic Alliance Research Agenda Task Force. *J Athl Train*. 2019;54(3):237–244. doi:10.4085/1062-6050-374-18

8. Board of Certification. *Content Outline for Practice Analysis*. BOC for the Athletic Trainer; 2021.
9. 2020 standards for accreditation of professional athletic training programs. Commission on Accreditation of Athletic Training Education. Published January 2018. Accessed October 10, 2023. https://caate.net/Portals/0/Standards_and_Procedures_Professional_Programs.pdf?ver=01iHqzdBAW0IsGARUc-19Q%3d%3d
10. Mental Health First Aid. National Council for Mental Well-being. Published October 10, 2013. Accessed May 23, 2021. https://www.mentalhealthfirstaid.org/
11. Davies EB, Beever E, Glazebrook C. A pilot randomised controlled study of the mental health first aid eLearning course with UK medical students. *BMC Med Educ*. 2018;18(1):45. doi:10.1186/s12909-018-1154-x
12. O'Reilly CL, Bell JS, Kelly PJ, Chen TF. Impact of mental health first aid training on pharmacy students' knowledge, attitudes and self-reported behaviour: a controlled trial. *Aust N Z J Psychiatry*. 2011;45(7):549–557. doi:10.3109/00048674.2011.585454
13. Ostrowski JL, Gray A, Payne EK, Wilkenfeld D, Scifers JR. Interactive activities to aid in a comprehensive understanding of mental health within the professional athletic training curriculum. *Athl Train Educ J*. 2021;16(4):262–269. doi:10.4085/1947-380X-20-73
14. Dettl-Rivera MG. Promotion of Mental Health Referral Efficacy in College Athletic Trainers. EdD thesis. University of North Carolina at Greensboro; 2019.
15. Al-Elq AH. Simulation-based medical teaching and learning. *J Fam Community Med*. 2010;17(1):35–40. doi:10.4103/1319-1683.68787
16. Gantt LT, Overton SH, Avery J, Swanson M, Elhammoumi CV. Comparison of debriefing methods and learning outcomes in human patient simulation. *Clin Simul Nurs*. 2018;17:7–13. doi:10.1016/j.ecns.2017.11.012
17. Armstrong KJ, Jarriel AJ. Standardized patients provide a reliable assessment of athletic training students' clinical skills. *Athl Train Educ J*. 2016;11(2):88–94. doi:10.4085/110288
18. Armstrong KJ, Jarriel AJ, Hardin BM. The longitudinal impact of standardized patient encounters during professional education on athletic training professional practice. *Athl Train Educ J*. 2021;16(3):169–177. doi:10.4085/1947-380X-20-001
19. Thistlethwaite JE, Davies D, Ekeocha S, et al. The effectiveness of case-based learning in health professional education. A BEME systematic review: BEME guide no 23. *Med Teach*. 2012;34(6):e421–e444. doi:10.3109/0142159X.2012.680939
20. Anderson B. Teaching development theory with interrupted video case studies. *J Scholarsh Teach Learn*. 2019;19(5):123–136. doi:10.14434/josotl.v19i5.25385
21. Walker S, Weidner T, Armstrong KJ. Standardized patient encounters and individual case-based simulations improve students' confidence and promote reflection: a preliminary study. *Athl Train Educ J*. 2015;10(2):130–137. doi:10.4085/1002130
22. Kinslow BL, Schmies H, Armstrong KJ, Martin M. Effective teaching methods for the assessment and treatment of exertional heat illness in athletic training education. *Athl Train Educ J*. 2019;14(2):128–134. doi:10.4085/1402128
23. Plos JM, Crowley K, Polubinsky RL, Cerullo C. Implementing suicide prevention training into an athletic training curriculum: an introductory model. *Athl Train Educ J*. 2021;16(2):87–100. doi:10.4085/1947-380X-19-077
24. Östlund U, Kidd L, Wengström Y, Rowa-Dewar N. Combining qualitative and quantitative research within mixed method research designs: a methodological review. *Int J Nurs Stud*. 2011;48(3):369–383. doi:10.1016/j.ijnurstu.2010.10.005
25. Polit D, Beck CT. The content validity index: are you sure you know what's being reported? Critique and recommendations. *Res Nurs Health*. 2006;29(5):489–497. doi:10.1002/nur.20147
26. Armstrong KJ, Jarriel AJ. Standardized patient encounters improved athletic training students' confidence in clinical evaluations. *Athl Train Educ J*. 2015;10(2):113–121. doi:10.4085/1002113
27. DeCarlo LT. On the meaning and use of kurtosis. *Psychol Methods*. 1997;2(3):292–307. doi:10.1037/1082-989X.2.3.292
28. Burns S, Crawford G, Hallett J, Hunt K, Chih HJ, Tilley PJM. What's wrong with John? A randomised controlled trial of Mental Health First Aid (MHFA) training with nursing students. *BMC Psychiatry*. 2017;17:111. doi:10.1186/s12888-017-1278-2
29. Schwartz LR, Fernandez R, Kouyoumjian SR, Jones KA, Compton S. A randomized comparison trial of case-based learning versus human patient simulation in medical student education. *Acad Emerg Med*. 2007;14(2):130–137. doi:10.1197/j.aem.2006.09.052
30. Aluisio AR, Daniel P, Grock A, et al. Case-based learning outperformed simulation exercises in disaster preparedness education among nursing trainees in India: a randomized controlled trial. *Prehosp Disaster Med*. 2016;31(5):516–523. doi:10.1017/S1049023X16000789
31. Lee Chin K, Ling Yap Y, Leng Lee W, Chang Soh Y. Comparing effectiveness of high-fidelity human patient simulation vs case-based learning in pharmacy education. *Am J Pharm Educ*. 2014;78(8):153. doi:10.5688/ajpe788153
32. Tivener KA, Gloe DS. The effect of high-fidelity cardiopulmonary resuscitation (CPR) simulation on athletic training student knowledge, confidence, emotions, and experiences. *Athl Train Educ J*. 2015;10(2):103–112. doi:10.4085/1002103
33. Popp JK, Walker SE. A teaching simulation is effective in improving athletic training students' football helmet facemask removal clinical skills and confidence. *Athl Train Educ J*. 2017;12(4):208–215. doi:10.4085/1204208
34. Sheng T, Wang M, Hu Q, Ling H, Chen S. Effectiveness of the standardized patient (SP) and case-based learning (CBL) in teaching cell biology to college students majoring in medical laboratory technology. *Res J Sci Technol*. 2019;11(4):265–267. doi:10.5958/2349-2988.2019.00037.8