

SYSTEMATIC REVIEW

Open Access



Teaching trauma-informed care in undergraduate medical education: A scoping review

Sarah Beth Bell^{1*}, Julie Miller-Cribbs², Juliana Meireles³, Shari Clifton⁴, Rachel Bright⁵, Alice Moon⁶, Hudia Jamshed⁶, Frances Wen³ and Martina Jelley⁷

Abstract

Background Experiencing trauma can affect health and wellbeing throughout the lifespan. Trauma-informed care is a framework that addresses the impact of trauma and promotes treatment approaches sensitive to this lived experience. In response to emerging awareness about trauma-informed care, educators are beginning to adapt undergraduate medical education (UME) to include content about using a trauma-informed approach when caring for patients. In 2023, leaders in the field of trauma-informed care developed a core set of competencies that institutions can use to guide their curricula in this area. This scoping review aggregated and synthesized studies evaluating trauma-informed care curricula in medical schools to examine the efficacy of different pedagogical approaches. It also mapped how these approaches align with the recently developed trauma-informed competencies for UME.

Methods A comprehensive search strategy was used to search seven databases for articles related to teaching trauma-informed care principles to undergraduate medical students. Articles were included only if the curricula had been implemented and evaluated. A total of 233 articles were retrieved. Independent coders used a two-tier process to determine which papers met inclusion criteria. The coders extracted key information from the studies focused on training facilitators, participants, curriculum content, teaching methods, learner outcomes, and competencies.

Results Fifteen papers were included in this scoping review, and several common themes emerged among the studies. Most trainings were brief (median 3.5 h) and taught by a multidisciplinary team. All trainings incorporated didactic components. Most also gave the trainees opportunities to apply and practice their knowledge through role playing, simulations, or patient interviews. All studies included a qualitative evaluation component, with most also having a quantitative component. Most studies reported that students acquired more knowledge and confidence in implementing trauma-informed care following the trainings. However, only two included a longitudinal follow-up component in their evaluation.

Conclusions Trauma-informed care is beginning to be implemented in undergraduate medical education. Brief trainings in this area can increase future providers' abilities to understand how trauma affects patients and to work

*Correspondence:
Sarah Beth Bell
sarah-bell@ouhsc.edu

Full list of author information is available at the end of the article



© The Author(s) 2025. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

in appropriate ways with patients who have experienced trauma. The literature in this review can be used to guide educators seeking to incorporate trauma-informed care into undergraduate medical curricula.

Keywords Trauma-informed care, Medical education, Scoping review, Competency-based, Competencies

Introduction

Trauma is highly prevalent [1] and can impact both community and individual health, often negatively affecting physical and mental health acutely and across the lifespan [2, 3]. The cumulative effects of trauma contribute substantially to disease burden and mortality [3–5]. Trauma-Informed Care (TIC) is a framework that addresses the widespread effects of trauma within service-oriented spaces such as healthcare and educational settings [6]. TIC centers on creating an environment and interpersonal interactions that foster healing and resilience. TIC enhances understanding and consideration of the pervasive nature of trauma. In healthcare, TIC entails recognizing the effects of trauma on individuals (including patients, staff, and clinicians), groups (including families and care teams), and systems (including the healthcare organization and surrounding community) [6]. In medical education settings, TIC addresses the needs of learners, staff, and educators, as well as families, educational teams, the educational system, and the surrounding community [7]. TIC promotes a care model that emphasizes safety, trustworthiness, and empowerment, reducing the risk of inadvertently re-traumatizing individuals [8]. In addition, TIC recognizes the importance of a compassionate approach that supports recovery and resilience, ultimately contributing to greater health equity and effective service delivery [9].

The high prevalence and considerable health impacts of trauma create a critical need to train medical students effectively in trauma-informed practices [7]. Recent efforts have been directed to integrating trauma-informed approaches within medical student curricula. Trauma-informed medical education (TIME), a framework that guides incorporation of TIC throughout the continuum of UME, was introduced in 2021 [7]. TIME applies TIC principles to curricular content, methods for curricular development and instruction, and the learning environment [7]. Consonant with TIC practices, TIME also addresses the needs of faculty and staff (e.g., faculty development, staff training) and the organization (e.g., trauma-informed policies and practices as well as supports for learners and faculty affected by trauma).

Established competencies [10, 11] can serve as standards for developing curricula in UME. Preparing medical students with trauma-informed competency-based skills is essential for a healthcare system that not only treats symptoms but also understands the underlying factors that contribute to a patient's well-being [12, 13]. In 2023, a national collaboration of medical educators

and students developed a set of eight TIC competency domains [14]. This UME competency set focuses on key trauma-informed knowledge (e.g., concept of resilience, epidemiology of trauma, evidence-based prevention), skills (e.g., trauma sensitive physical exam, collaborative care planning, compassionate response to patient disclosure of trauma), and values and attitudes (e.g., awareness and mitigation of systemic bias) [14]. This competency model also promotes transformation of both the learning and practice environments into trauma-informed spaces through alignment of organizational policies and resources as well as role modeling [14].

TIC and the TIC competency set are both relatively new content areas to medical school curricula and, accordingly, there are very few systematic reviews on this topic to date. Previous reviews of TIC curricula include a 2021 review of TIC for primary care providers that did not include studies with medical students [15]. A 2023 review of TIC curricula for health professions included all healthcare professional education, but only 16% were UME-focused studies [16]. Lastly, a 2024 narrative review centered on providing curricular examples of UME teaching for each of the TIC competency categories, but the review methods were not systematic [17]. Thus, to our knowledge, there has been no previous systematic review of UME TIC curricula that integrates the established competencies.

As TIC is an emerging domain in medical school curricula [18], we see a need for a comprehensive understanding of existing literature on how medical schools are teaching TIC to their students in the context of the TIC competencies for UME [14]. It is important to recognize strengths, weaknesses, and gaps in teaching to help inform future educational practices that lead to physicians who use TIC in their daily patient care. Thus, this scoping review aims to aggregate and synthesize the existing literature on the effectiveness of different methods to deliver TIC educational content to medical students as well as map alignment with specific UME TIC competencies. This information can assist medical educators in their efforts to integrate TIC into UME.

Methods

This scoping review explored literature about how TIC is taught to undergraduate medical students. This study followed the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Scoping Reviews) guidelines and used the scoping review theoretical framework developed by Arksey & O'Malley

[19] and refined by Levac et al. [20]. Key features of this framework include balancing focus and breadth, using an iterative team approach, charting the data quantitatively, synthesizing results, and identifying implications for future research and practice. The a priori protocol for this scoping review can be found at the following link: <https://osf.io/u9ryz>.

Inclusion and exclusion criteria

Inclusion criteria were as follows: 1) must include medical students; 2) must include education about TIC; 3) education must have been implemented; 4) education must have been evaluated; 4) full text must be available in English. Review papers were excluded, but their references were eligible for review as part of a supplemental research strategy. Literature determined to be of very low quality by the standards of ROBINS-E (Risk of Bias in Non-Randomized Studies of Exposures) [21] was eligible for exclusion upon consensus of the authors.

Identifying relevant studies

An experienced health sciences librarian developed the initial search strategy in Medline and then adapted it for the other included databases, which were APA PsycINFO, Embase, ERIC, PTSDPubs, Scopus, and Web of Science Core Collection. The initial searches were conducted on April 26, 2024, and the replicable search strategy with all of its terms can be found in the a priori protocol of this paper as well as in the search strategy documentation at the following link: <https://osf.io/p6zs4>. Manuscripts were imported into Covidence, which was the systematic review software used to review articles for eligibility. The search resulted in 322 de-duplicated manuscripts.

Two independent coders used a two-tiered process to review articles for eligibility. In the first tier, titles and abstracts were screened by each coder for exclusion. In the second tier, full length articles were read by each coder and examined for eligibility. The authors agreed 91.6% of the time on exclusion in tier one and 86.1% of the time after reading the full articles. Disagreements between the two coders were resolved by discussions that included other authors. Each coder explained why they thought the article met exclusion criteria to other authors, and then the group decided by mutual consensus whether the article should be excluded.

In this initial literature search, a review paper was also identified [17], and all of its citations were hand searched for eligibility in this review. This resulted in one additional paper being added to the scoping review. Finally, search updates in all databases were conducted on December 11, 2024 to see if any additional relevant papers had been published since the original round, and the updated searches are documented in the search strategy document referred to above. Seven new papers

were identified, and one met inclusion criteria and was added to the paper. Figure 1 shows a PRISMA flowchart of the literature review process beginning in the literature search phase and ending in the final selection phase.

Analysis

The following features were extracted from each of the 15 articles included in the scoping review: authors, year of publication, title, journal, the country in which the study was conducted, type of trainees (i.e., only medical students or also additional learners), number of trainees, type of trainers who facilitated or taught the curriculum, curriculum type (i.e., didactic, threaded throughout course, simulation, or another format), curriculum description, assessment methods (quantitative, qualitative, or mixed), outcomes measured, and TIC competencies addressed as described in the UME competencies framework [14].

Results

Table 1 provides author, year, country, journal, and title for each included study, and highlights the following study characteristics: type and number of training participants, length of training, training facilitators, content focus, and patient population. Table 2 summarizes for each study the UME competencies addressed, assessment methods, curriculum type, and outcomes. The following section describes these characteristics.

Training participants

Across the 15 studies, the average number of participants was 117 (rounded), ranging from 14 to 535. Most training activities targeted first-year medical students ($n=10$), with fewer including second-year students ($n=7$), third year students ($n=2$), and fourth-year students ($n=2$). While all studies focused on medical students, two included a multidisciplinary group, with one study involving dental students and the other including nursing students.

Curriculum facilitators

Most trainings included a diverse array of multidisciplinary medical staff as facilitators ($n=10$), and four also included non-medical faculty. Almost half of the training programs also used advanced medical students or residents as facilitators ($n=7$), and 6 included community experts. Across all studies, medical faculty represented a broad range of specialties and departments including Obstetrics/Gynecology, Pediatrics, Psychiatry, Internal Medicine, Family Medicine, Anesthesiology, Emergency Medicine, Surgery, and clinical and administrative staff.

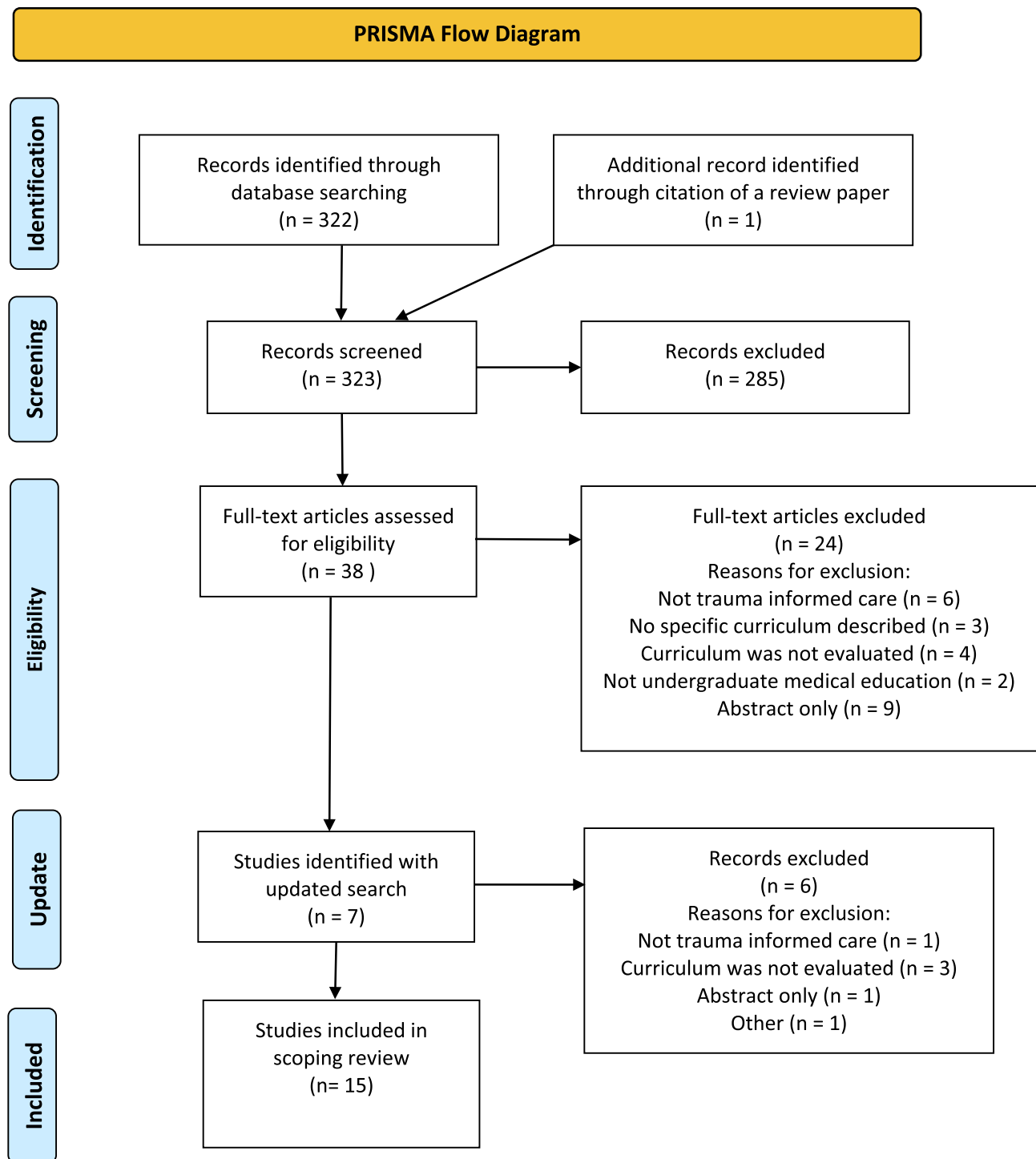


Fig. 1 PRISMA chart of literature review

Curriculum types, duration, patient population, and competencies

Among the studies, all 15 included didactic components (primarily lectures), and 10 incorporated small group discussions. A total of 12 studies provided learners with opportunities to apply their knowledge through various

methods, including role plays/practice sessions (n=6), simulations (n=2), and patient interviews (n=1). The median training duration was 3.5 h, ranging from 1 to 26 h.

About half of the studies focused on a general population (adults and/or children, any setting) while the other

Table 1 Final studies included in survey

Author (Year), Country, Journal	Title	Training participants ^a	# Participants	Total hours	Training facilitators	Content focus	Patient population
Agarwal et al. (2024), USA, Discover Education [22]	Implementation of a trauma and violence informed care elective to supplement early medical education	MS1	17	26	Students, Community Experts	IPV ^b Mandatory reporting Vicarious trauma Intersectionality Survivors' rights and resources	General
Brennan et al. (2023), USA, MedEdPORTAL [23]	Addressing a Gap in Medical School Training: Identifying and Caring for Human Trafficking Survivors Using Trauma-Informed Care	MS4	127	2	Multidisciplinary Medical Faculty, Students, Community Experts	TIC principles	Human trafficking
Brown et al. (2021), USA, MedEdPORTAL [24]	A Trauma-Informed Approach to the Medical History: Teaching Trauma-Informed Communication Skills to First-Year Medical and Dental Students	MS1 & Dentistry	164	3.5	Multidisciplinary Medical Faculty, Other Non-Medical Faculty, Students	TIC principles	General
Chokshi et al. (2020), USA, MedEdPORTAL [25]	Teaching Trauma-Informed Care: A Symposium for Medical Students	MS2	179	4	Pediatrics Faculty, Other Non-Medical Faculty	Trauma/health effects TIC principles Resilience	General
Elisseou (1) et al. (2022), USA, MedEdPORTAL [26]	A Trauma-Informed Approach to Peer Physical Examination	MS1	152	2	Multidisciplinary Medical Faculty	TIC principles TI physical exam TIPPE (trauma informed peer physical exam)	General
Elisseou (2) et al. (2019), USA, MedEdPORTAL [27]	A Novel, Trauma-Informed Physical Examination Curriculum for First-Year Medical Students	MS1	148	3	Multidisciplinary Medical Faculty, Other Non-Medical Faculty	TI physical exam TIC principles	General
Goldstein et al. (2018), USA, The Permanente Journal [28]	Medical Students' Perspectives on Trauma-Informed Care Training	MS2	20	6	Other Non-Medical Faculty	ACEs ^c Trauma/health effects Re-traumatization	General
Gore et al. (2021), USA, MedEdPORTAL [29]	Creation of a Medical Student Training to Improve Comfort Providing Trauma-Informed Care to Sexual Assault Survivors	MS2	149	3	Multidisciplinary Medical Faculty, Community Experts	Sexual assault Communication skills Avoiding re-traumatization	Sexual assault survivors
Hollis et al. (2022), USA, Carolina Journal of Interdisciplinary Medical Education [30]	Implementation of a Trauma-Informed Care Elective in Medical Education	MS1	14	14	Multidisciplinary Medical Faculty, Community Experts	TIC principles TI physical exams Trauma and substance use	Interpersonal violence
Kumar et al. (2023), USA, Academic Pediatrics [31]	Utilizing Experiential Modalities to Teach Principles of Trauma in Pediatrics: Foster Care Evaluation Services Clinic Partnership in Medical Education	MS1, MS2, Nursing	20	7	Pediatrics Faculty, Students, Community Experts	Trauma TIC principles	Children and trauma in foster care

Table 1 (continued)

Author (Year), Country, Journal	Title	Training participants ^a	# Participants	Total hours	Training facilitators	Content focus	Patient population
Lee et al. (2023), USA, MedEdPORTAL [32]	Trauma-Informed Care for Acute Care Settings: A Novel Simulation Training for Medical Students	MS1,2,3,4	17	2.5	Multidisciplinary Medical Faculty, Students/Residents	TIC principles TIC in acute care	Patients in acute care settings
Onigu-Otite et al. (2020), USA, MedEdPORTAL [33]	Introducing ACEs (Adverse Childhood Experiences) and Resilience to First-Year Medical Students	MS1	124	1	Psychiatric Medical Faculty	ACEs & health Resilience	General
Osei et al. (2022), USA, MedEdPORTAL [34]	Screening for Toxic Stress Response and Buffering Factors: A Case-Based, Trauma-Informed Approach to Health Equity	MS2	65	1.5	Multidisciplinary Medical Faculty, Community Experts, Students/Residents	Toxic stress Resilience	General
Pletcher et al. (2019), USA, MedEdPORTAL [35]	Adverse Childhood Experiences: A Case-Based Workshop Introducing Medical Students to Trauma-Informed Care	MS1	535	3	Multidisciplinary Medical Faculty, Students/Residents	ACEs & health ACEs screening Resilience	General
Siegel et al. (2017), USA, MedEdPORTAL [36]	On-the-Go Training: Downloadable Modules to Train Medical Students to Care for Adult Female Sexual Assault Survivors	MS1,2,3,4	32	1	Multidisciplinary Medical Faculty, Community Experts	Sexual assault Communication skills TIC principles	Sexual assault

^aMS(#): Medical Student (year of training)^bIPV: Intimate Partner Violence^cACEs: Adverse Childhood Experiences

half focused on a special population such as patients experiencing violence or sexual assault. One training focused on patients in acute care settings such as emergency or urgent care, one focused on human trafficking, and one focused on children in foster care.

Each study was evaluated for alignment of training content and methods with UME competencies for TIC [14]. All studies addressed Knowledge for Practice, 13 addressed Patient Care, seven addressed Interpersonal and Communication Skills, three addressed Professionalism, four addressed System-Based Practice, three addressed Interprofessional Collaboration, and two addressed Personal and Professional Development. None explicitly addressed Practice-based Learning and Improvement.

Outcomes

The most frequently measured outcomes of the training activities were improved knowledge ($n=14$), satisfaction with or general feedback about the training experience ($n=13$), and increased confidence or competence in performing TIC skills ($n=12$). Levels of knowledge,

satisfaction, and confidence increased overall across studies. However, only a few studies incorporated longitudinal outcome measures. Specifically, three studies followed participants over time: Gore et al. [29] assessed knowledge retention two weeks post-training, Osei et al. [34] utilized self-reports to evaluate whether the skills learned were applied in patient care three months after training, and Brown et al. [24] measured changes in trainees' clinical practices five months post-training. Overall, longitudinal follow-up studies that measured applied practice of skills were rare, with only two studies examining the impact of training on actual clinical practice changes. In one of these studies, one-third of the students were implementing Trauma-Informed Care (TIC) concepts in patient care three months after training [34], and in the other, nearly 75% of students reported application in their clinical practice at five months [24].

Discussion

The emerging adaptation of TIC to UME is promising. Of the 15 studies identified, most were published in the past five years. While teaching methods varied, learner

Table 2 UME competencies addressed, assessment methods, curriculum type & outcomes measured

Authors	UME competencies addressed ^a							Assessment methods			Curriculum type				Outcomes ^b				
	KP	PC	IPCS	P	PPD	SBP	IC	Mixed	Qualitative	Didactic	Small group	Role play	Simulation	Patient interview	Increased satisfaction	Increased knowledge	Increased competence	Applied practice	
Agarwal et al. (2024) [22]	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓			✓		✓		
Brennan et al. (2023) [23]	✓	✓	✓	✓				✓		✓	✓				✓		✓		
Brown et al. (2021) [24]	✓	✓	✓		✓			✓		✓	✓	✓		✓	✓		✓	✓	
Chokshi et al. (2020) [25]	✓	✓	✓					✓		✓	✓				✓		✓		
Elisseou (1) et al. (2022) [26]	✓	✓						✓		✓	✓				✓				
Elisseou (2) et al. (2019) [27]	✓	✓						✓		✓	✓	✓			✓		✓		
Goldstein et al. (2018) [28]	✓	✓	✓	✓		✓		✓		✓	✓	✓	✓		✓		✓		
Gore et al. (2021) [29]	✓	✓	✓			✓		✓		✓	✓	✓			✓		✓		
Hollis et al. (2022) [30]	✓	✓						✓		✓					✓		✓		
Kumar et al. (2023) [31]	✓		✓				✓	✓		✓					✓		✓		
Lee et al. (2023) [32]	✓	✓				✓		✓		✓		✓	✓		✓		✓		
Onigu-Otite et al. (2020) [33]	✓							✓		✓					✓				
Osei et al. (2022) [34]	✓	✓						✓		✓	✓				✓			✓	
Pletcher et al. (2019) [35]	✓	✓						✓		✓	✓				✓		✓		
Siegel et al. (2017) [36]	✓	✓						✓		✓					✓		✓		
Totals	15	13	7	3	2	4	3	14	1	15	10	6	2	1	13	14	12	2	

^aKP Knowledge for Practice, PC Patient Care, IPCS Interpersonal and Communication Skills, P Professionalism, PPD Personal and Professional Development, SBP Systems-based Practice, IC Interprofessional Collaboration

^bCheckmarks indicate a pre-post increase

outcomes were exceedingly positive, especially given that the median duration of training was only 3.5 h. Students were generally satisfied with the educational activities and demonstrated increased knowledge about TIC and improved confidence in treating patients using these principles. It is important to note that the efficacy of these trainings on patient outcomes remains relatively unknown. However, broader adoption of TIC in UME could have a wide-ranging beneficial impact on patients who future physicians will treat across their careers.

Teaching methodologies

A variety of methodologies were applied in the studies included in this scoping review. Didactic instruction was conducted in all studies. Trainings that incorporated hands-on practice opportunities, such as role play, simulations, demonstrations, or patient interviews, received highly positive feedback from learners. Small group activities were linked to improvements in understanding, confidence, and comfort with the content [34, 35]. Practice opportunities allowed learners to engage more deeply, develop trauma-informed communication skills, and receive constructive feedback, facilitating a transition from passive learning to active skill mastery. Simulations, especially, were rated as particularly beneficial, offering a more immersive and interactive way to reinforce knowledge and promote synthesis and evaluation [28, 32].

Several studies gathered qualitative feedback from participants regarding specific features of the training activities and elements that facilitated learning and retention. Participants expressed appreciation for the opportunity to engage with or learn from different disciplines, noting that a multidisciplinary approach enriched their understanding and fostered a more comprehensive view of TIC [23, 31, 35]. Small group discussions were particularly valued for promoting meaningful dialogue [25, 29, 35], while opportunities to apply what they had learned in practice settings were highlighted as essential for solidifying skills [24, 27, 34].

There is a clear need for more longitudinal follow-up to assess the sustainability of TIC training outcomes and real-world application in clinical practice. The Kirkpatrick model of evaluation suggests measuring how students react to the training, how much they are learning from the training, if they are applying the training, and if the trainings are resulting in the intended outcome [37]. While many studies measure immediate gains in knowledge and confidence, few explore whether these skills are consistently applied and maintained over time. This limited follow-up suggests that the sustained effects of TIC training on student competencies and outcomes for patients remain relatively underexplored. Longitudinal research could provide crucial insights into how well

TIC principles are integrated into daily practice and the factors that support or hinder this transition. Of critical importance are studies observing whether learners use TIC strategies, such as patient-centered communication and sensitivity to trauma histories, and how this application may change over time (e.g., continuation, augmentation, or diminution well after the initial training period). The exploration of trends in skill application and the evaluation of long-term impact on patient care would inform the development of trauma-informed UME (e.g., curricular threads, refresher skills-based trainings, mentorship programs, or other reinforcement mechanisms) to ensure that TIC training translates into enduring, positive changes in clinical settings.

Competencies

The core competencies of TIC for UME are Knowledge for Practice, Patient Care, Practice-Based Learning and Improvement, Interpersonal and Communication Skills, Professionalism, Systems-Based Practice, Interprofessional Collaboration, and Personal and Professional Development [14]. None of the studies reviewed addressed all of the TIC competencies, which is not unexpected for these short-term trainings. The most addressed competencies were Knowledge for Practice, Patient Care, and Interpersonal and Communication Skills (see Table 2 for information on which competencies each study addressed). Chokski et al. [25] and Goldstein et al. [28] included the effect of trauma on health in their didactics, which was particularly relevant for the Knowledge for Practice competency. Both Elisseau et al. [26, 27] articles as well as the Hollis et al. article [30] included a trauma-informed physical exam component, which is an important component of the Patient Care competency. Finally, studies that included role play [22, 24, 28, 29] provided a particularly hands-on opportunity for trainees to practice the Interpersonal and Communication Skills competency.

As teaching of TIC concepts and skills is relatively new, it is logical that these curricula addressed the foundational concepts of defining TIC, caring for patients in a trauma-informed way, and communication around TIC. The inclusion of all TIC competencies is needed as teaching TIC expands, develops, and is integrated throughout the curriculum. Of particular importance is developing and implementing Personal and Professional Development [38] that is trauma-informed. This centers on trainees' developing competencies in recognizing their need for and appropriately engaging in seeking help and using healthy coping strategies. As learning and healthcare environments align more with TIC, this particular competency is essential to not only address secondary trauma but other potential harms (e.g., compassion fatigue,

moral injury, and burnout) that can arise in medical education and practice settings.

Students must understand and apply TIC principles in the health systems that they are and will be working in [14]. Thus, System-Based Practice is another key area of focus for future trainings [17]. Some examples of concepts to address are environmental design, patient intake procedures, staff training, and cultural competence/humility. These principles may already be addressed to some extent in a health system science course that many schools include. However, inclusion of references and links to TIC principles within this type of course would help teach students about how TIC relates to these topics.

Assuring that the UME curriculum within a medical school addresses all of the TIC competencies will require coordination and integration of TIC principles and practices throughout the preclinical and clinical years. Currently, this may be aspirational. The early work that is being done at some medical schools should be shared to support the development and refinement of TIC curriculum at all medical schools. Some medical schools are using curricular threads, which are critical topics integrated throughout all years of a UME curriculum, specifically for content fundamental to medical practice that is not the central focus of a specific course or clerkship. Implementing TIC as a curricular thread would enhance integration of TIC competencies into UME as a whole. For example, Harvard Medical School included TIC as one of its Societal Themes, which are topic areas for longitudinal curricular integration. This designation has allowed Harvard to support faculty and programs that advance TIME [39].

In the literature in this scoping review, the most common context to teach TIC principles was within workshops in existing classes. Three of the articles included offered elective, semester-long courses that emphasized TIC [22, 30, 31]. Other opportunities to incorporate TIC into UME would be within clerkships, particularly obstetrics/gynecology, psychiatry, pediatrics, family medicine, and internal medicine. The curricular content outline by the LCME (Liaison Committee on Medical Education) includes Standard 7.5, titled Societal Problems, which says the faculty of a medical school must “ensure that the medical curriculum includes instruction in the diagnosis, prevention, appropriate reporting, and treatment of the medical consequences of common societal problems” [40]. We feel that TIC fits well in this content area that medical schools are required to include in their curricula. TIC principles could also be incorporated into the Core Entrustable Professional Activities (EPAs) that learners should be expected to be able to do by the time they are entering residency. In addition, if the United States Medical Licensing Exam (USMLE) includes TIC as part

of their testing, medical schools would be further incentivized to incorporate TIME throughout their curricula. These structural changes could help future doctors better incorporate TIC into the care of their patients.

Inclusivity

An important aspect of enhancing TIC training is the integration of inclusivity, including racial bias training, ability/disability TIC, sexual orientation and gender-sensitive practices, and respectful pronoun use. Among studies included in this scoping review, some participants felt that their courses should better address how to navigate these aspects within a trauma-informed approach, highlighting the impact of recognizing each patient's unique identity in the care process [28, 33]. Furthermore, participants underscored the need for resources and support mechanisms for patients when trauma inquiry is used, so that those who may feel overwhelmed can be connected to appropriate services or resources when necessary [22, 28]. This feedback suggests a strong interest among learners for training that not only builds practical skills but also cultivates an environment of respect, sensitivity, and support for diverse patient needs.

A strength of the research in this scoping review is that most studies linked traumatic experiences to broader social determinants of health. Some studies addressed systemic barriers to care for people with marginalized identities [26, 34, 36], providing students with a framework to understand trauma within inequitable societal structures. Three trainings specifically discussed racism [25, 34, 35]. In addition, three trainings addressed LGBTQ+ health [25, 29, 32]. Lee et al. [32] included a transgender simulated patient, emphasizing the need for gender-affirming care and teaching students how to address and mitigate stigmatizing behaviors among healthcare providers. One study specifically encouraged students to reflect critically on their own implicit biases and stereotypes, fostering self-awareness and equipping them to identify and address potential barriers to equitable care [30].

While people of some identities were focused on in trainings, others were unrepresented. Notably, we did not identify any trainings that focused on TIC for the undocumented immigrant community, who may have privacy concerns. In addition, we did not identify any TIC trainings that focused on respect for the cultures of Indigenous Peoples in healthcare settings. Finally, we did not find trainings addressing trauma informed ways to treat neurodivergent people who may have specific sensitivities and needs. It is of note that Agarwal et al. [22] is the first published training to our knowledge to focus on intersectionality in TIC.

Medical education that teaches the learner to acknowledge and respect diverse identities can significantly

improve patient comfort and trust [41]. By incorporating modules or discussions on gender diversity, racial identity, sexual orientation, disabilities, and other marginalized identities, TIC training programs can help learners recognize and address implicit biases, fostering an environment where all patients feel respected and understood. This aligns with trauma-informed principles that prioritize safety and empowerment, ensuring that care is personalized and responsive to individual identity and needs.

Limitations

Our literature search utilized seven databases, followed established PRISMA-ScR guidelines for scoping reviews, and included supplemental search strategies such as reference list reviews. However, there are limitations to this scoping review. First, we did not use additional secondary search methods such as searching for 'grey literature' available outside of traditional publishing channels, such as conference papers or theses, nor did we contact authors for additional articles or references. Additionally, the literature review only included articles available in the English language. There may be relevant articles available in other languages which were not reviewed. Finally, our inclusion criteria required that studies must include medical students and that the TIC education must have been implemented and evaluated. There could be studies relevant to educators developing TIC curricula that lacked one or more of these components.

Conclusions

TIC is an emerging topic area in UME, with the majority of publications occurring in the past 5 years. The 15 papers included in this scoping review showed that students are eager for hands-on learning opportunities in TIC that build upon what they can learn in a didactic setting. Students also expressed that they valued opportunities to learn from a multidisciplinary lens. Furthermore, the studies in this scoping review addressed some of the UME TIC competencies, but areas for growth center around Professionalism, Systems-based Practice, Interprofessional Collaboration, and Personal and Professional Development. Students also expressed that their trainings could better address inclusivity of patients of different identities and lived experiences. As competency-based trauma-informed UME continues to develop and evolve, future doctors should be better able to treat their patients in a trauma sensitive and appropriate way. Moreover, they should be better able to apply their deeper understanding of underlying factors that contribute to their patients' and their own health and wellbeing, as well as that of families, care teams, and the broader community.

Acknowledgements

Not applicable.

Authors' contributions

MJ and RB conceived the study idea. SBB led the protocol development and methodology. SC conducted the literature search. MJ, AM, and JM coded the articles. JMC, JM, MJ, and SBB synthesized the results. All authors contributed to the final manuscript.

Funding

This project was supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) as part of award T99HP33558. The contents are those of the authors and do not necessarily represent the official views of, nor an endorsement by HRSA, HHS or the U.S. Government.

Data availability

<https://osf.io/u9ryz> (protocol) and <https://osf.io/p6zs4> (literature search strategy).

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

¹Office for Research Development and Scholarly Activity, School of Community Medicine, University of Oklahoma Health Sciences, Tulsa, OK, USA

²Anne and Henry Zarrow School of Social Work, University of Oklahoma, Tulsa, OK, USA

³Department of Family and Community Medicine, School of Community Medicine, University of Oklahoma Health Sciences, Tulsa, OK, USA

⁴Robert M. Bird Health Sciences Library, University of Oklahoma Health Sciences, Oklahoma City, OK, USA

⁵School of Community Medicine, University of Oklahoma Health Sciences, Tulsa, OK, USA

⁶College of Medicine, University of Oklahoma Health Sciences, Oklahoma City, OK, USA

⁷Department of Internal Medicine, School of Community Medicine, University of Oklahoma Health Sciences, Tulsa, OK, USA

Received: 25 March 2025 / Accepted: 18 June 2025

Published online: 11 July 2025

References

1. Hamby S, Elm JH, Howell KH, Merrick MT. Recognizing the cumulative burden of childhood adversities transforms science and practice for trauma and resilience. *Am Psychol*. 2021;76(2):230.
2. Oh DL, Jerman P, Silvério Marques S, Koita K, Purewal Boparai SK, Burke Harris N, Bucci M. Systematic review of pediatric health outcomes associated with childhood adversity. *BMC Pediatr*. 2018;18:1–9.
3. Bellis MA, Hughes K, Ford K, Rodriguez GR, Sethi D, Passmore J. Life course health consequences and associated annual costs of adverse childhood experiences across Europe and North America: a systematic review and meta-analysis. *Lancet Public Health*. 2019;4(10):e517–28.
4. Senaratne DN, Thakkar B, Smith BH, Hales TG, Marryat L, Colvin LA. The impact of adverse childhood experiences on multimorbidity: a systematic review and meta-analysis. *BMC Med*. 2024;22(1):315.
5. Grummitt LR, Kreski NT, Kim SG, Platt J, Keyes KM, McLaughlin KA. Association of childhood adversity with morbidity and mortality in US adults: a systematic review. *JAMA Pediatr*. 2021;175(12):1269–78.

6. Substance Abuse and Mental Health Services Administration. SAMHSA's Concept of Trauma and Guidance for a Trauma-Informed Approach. HHS Publication No. (SMA) 14-4884. Rockville: Substance Abuse and Mental Health Services Administration; 2014.
7. Brown T, Berman S, McDaniel K, Radford C, Mehta P, Potter J, Hirsh DA. Trauma-informed medical education (TIME): advancing curricular content and educational context. *Acad Med*. 2021;96(5):661–7.
8. Goldstein E, Chokshi B, Melendez-Torres GJ, Rios A, Jelley M, Lewis-O'Connor A. Effectiveness of trauma-informed care implementation in health care settings: systematic review of reviews and realist synthesis. *Permanente J*. 2024;28(1):135.
9. Purkey E, Patel R, Phillips SP. Trauma-informed care: better care for everyone. *Can Fam Physician*. 2018;64(3):170–2.
10. AAMC, AACOM. ACGME. Foundational competencies for undergraduate medical education. AAMC, AACOM, ACGME; 2024.
11. Frank JR, Snell L, Sherbino J, editors. CanMEDS 2015 physician competency framework. Ottawa: Royal College of Physicians and Surgeons of Canada; 2015.
12. Grossman S, Cooper Z, Buxton H, Hendrickson S, Lewis-O'Connor A, Stevens J, Wong LY, Bonne S. Trauma-informed care: recognizing and resisting re-traumatization in health care. *Trauma Surg Acute Care Open*. 2021;6(1):e000815.
13. Edelman N. Doing trauma-informed work in a trauma-informed way: Understanding difficulties and finding solutions. *Health Serv Insights*. 2023;16:11786329231215037.
14. Berman S, Brown T, Mizelle C, Diep T, Gerber MR, Jelley M, Potter LA, Rush P, Sciolla A, Stillerman A, Trennepohl C. Roadmap for trauma-informed medical education: introducing an essential competency set. *Acad Med*. 2023;98(8):882–8.
15. Gundacker C, Barry C, Laurent E, Sieracki R. A scoping review of trauma-informed curricula for primary care providers. *Fam Med*. 2021;53(10):843–56.
16. Burns CJ, Borah L, Terrell SM, James LN, Erkkinen E, Owens L. Trauma-informed care curricula for the health professions: A scoping review of best practices for design, implementation, and evaluation. *Acad Med*. 2023;98(3):401–9.
17. Gerber MR, Jelley M, Potter J. Navigating the roadmap for Trauma-Informed medical education: application of undergraduate medical education competencies. *Permanente J*. 2024;28(1):169.
18. Association of American Medical Colleges. Competency-Based Medical Education (CBME). 2025.. <https://aamc.org/what-we-do/mission-areas/medical-education/cbme>. Accessed 15 Feb 2025.
19. Arksey H, O'malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol*. 2005;8(1):19–32.
20. Levac D, Colquhoun H, O'Brien KK. Scoping studies: advancing the methodology. *Implement Sci*. 2010;5:1–9.
21. Higgins JP, Morgan RL, Rooney AA, Taylor KW, Thayer KA, Silva RA, Lemeris C, Akl EA, Bateson TF, Berkman ND, Glenn BS. A tool to assess risk of bias in non-randomized follow-up studies of exposure effects (ROBINS-E). *Environ Int*. 2024;186:108602.
22. Agarwal T, Shrestha A, Garamani N, Williams R. Implementation of a trauma and violence informed care elective to supplement early medical education. *Discover Educ*. 2024;3(1):186.
23. Brennan EF, Markopoulos A, Rodriguez J, Sheth NK, Shah N. Addressing a gap in medical school training: identifying and caring for human trafficking survivors using trauma-informed care. *MedEdPORTAL*. 2023;19:11304.
24. Brown T, Mehta PK, Berman S, McDaniel K, Radford C, Lewis-O'Connor A, et al. A Trauma-informed approach to the medical history: teaching trauma-informed communication skills to first-year medical and dental students. *MedEdPORTAL*. 2021;17(1):11160.
25. Chokshi B, Walsh K, Dooley D, Falusi O, Deyton L, Beers L. Teaching Trauma-Informed care: A symposium for medical students. *MedEdPORTAL*. 2020;16(1):11061.
26. Elisseeu S, Adams E, Adler M. A trauma-informed approach to peer physical examination. *MedEdPORTAL*. 2022;18:11273.
27. Elisseeu S, Puranam S, Nandi M. A novel, trauma-informed physical examination curriculum for first-year medical students. *MedEdPORTAL*. 2019;15:10799.
28. Goldstein E, Murray-García J, Sciolla AF, Topitzes J. Medical students' perspectives on trauma-informed care training. *Permanente J*. 2018;22:17–26.
29. Gore DJ, Prusky M, Solomon CJ, Tracy K, Longcoy J, Rodriguez J, Kent P. Creation of a medical student training to improve comfort providing trauma-informed care to sexual assault survivors. *MedEdPORTAL*. 2021;17:11140.
30. Hollis E, Paterno A, Beck Dallaghan G, Tolleson-Rinehart S, Thorp J. Implementation of a Trauma-Informed care elective in medical education. *Carolina J Interdisciplinary Med*. 2022;2(1).
31. Kumar D, Forkey H. Utilizing experiential modalities to teach principles of trauma in pediatrics: foster care evaluation services clinic partnership in medical education. *Acad Pediatr*. 2023;23(6):1295–7.
32. Lee CH, Santos CD, Brown T, Ashworth H, Lewis JJ. Trauma-informed care for acute care settings: a novel simulation training for medical students. *MedEdPORTAL*. 2023;19:11327.
33. Onigu-Otite E, Idicula S. Introducing aces (adverse childhood experiences) and resilience to first-year medical students. *MedEdPORTAL*. 2020;16:10964.
34. Osei A, Paz CG, Stuparich M, Racataian-Gavan R, Nelms L, Suliman Y, Smith A, Bajwa M. Screening for toxic stress response and buffering factors: a case-based, trauma-informed approach to health equity. *MedEdPORTAL*. 2022;18:11224.
35. Pletcher BA, O'Connor M, Swift-Taylor ME, DallaPiazza M. Adverse childhood experiences: a case-based workshop introducing medical students to trauma-informed care. *MedEdPORTAL*. 2019;15:10803.
36. Siegel M, Gonzalez EC, Wijesekera O, Finkelstein K, Petricone R, Glass L, Lewis-O'Connor A, Duffy C, Quijije N, March G, Bell S. On-the-go training: downloadable modules to train medical students to care for adult female sexual assault survivors. *MedEdPORTAL*. 2017;13:10656.
37. Smidt A, Balandin S, Sigafos J, Reed VA. The Kirkpatrick model: A useful tool for evaluating training outcomes. *J Intellect Dev Disabil*. 2009;34(3):266–74.
38. Englander R, Cameron T, Ballard AJ, Dodge J, Bull J, Aschenbrener CA. Toward a common taxonomy of competency domains for the health professions and competencies for physicians. *Acad Med*. 2013;88(8):1088–94.
39. Millham LR, Potter J, Hirsh DA, Trinh NH, Royce CS, Levy-Carrick NC, Rittenberg E. Incorporation of Trauma-Informed care into entrustable professional activities for medical student assessment. *Acad Med*. 2024;10–97.
40. Liaison Committee on Medical Education. 2025. Available from: <https://lcme.org/publications/>. [cited 2025 May 8].
41. Jellins TS, Borko TL, Otero-Bell R, Arnett K, Saunders S, Poisson SN, Orjuela KD, Omran SS, Jones WJ, Leppert M, Madera A. Diversity, equity, and inclusion (DEI) in medical education: DEI at the bedside. *J Neurol Sci*. 2024;459:122946.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.