A Scoping Review of Trauma-Informed Curricula for Primary Care Providers

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BACKGROUND AND OBJECTIVES: Traumatic experiences such as abuse, neglect, and household dysfunction have a lifetime prevalence of 62%-75% and can negatively impact health outcomes. However, many primary care providers (PCPs) are inadequately prepared to treat patients with trauma due to a lack of training. Our objective was to identify trauma-informed approach curricula for PCPs, review their effectiveness, and identify gaps.

METHODS: We systematically identified articles from Medline, Scopus, Web of Science, Academic Search Premier, Cochrane, PsycINFO, MedEd Portal, and the STFM Resource Library. Search term headings "trauma-informed care (TIC)," "resilience," "patient-centered care," "primary care," and "education." Inclusion criteria were PCP, pediatric and adult patients, and training evaluation. Exclusion criteria were outside the United States, non-English articles, non-PCPs, and inpatient settings. We used the TIC pyramid to extract topics. We analyzed evaluation methods using the Kirkpatrick Model.

RESULTS: Researchers reviewed 6,825 articles and identified 17 different curricula. Understanding health effects of trauma was the most common topic (94%). Evaluation data revealed overall positive reactions and improved knowledge, attitudes, and confidence. Half (53%) reported Kirkpatrick level 3 behavior change evaluation outcomes with increased trauma screening and communication, but no change in referrals. Only 12% (2/17) evaluated Kirkpatrick level 4 patient satisfaction (significant results) and health outcomes (not significant).

CONCLUSIONS: Pilot findings from studies in our review show trauma-informed curricula for PCPs reveal positive reactions, an increase in knowledge, screening, communication, and patient satisfaction, but no change in referrals or health outcomes. Further research is needed to examine the impact of trainings on quality of care and health outcomes.

With an increasingly higher prevalence (62%-75%) of individuals experiencing a traumatic event, such as abuse, neglect, or household dysfunction (domestic violence, substance abuse, divorce, incarcerated relative, untreated mental illness) throughout their lives, trauma and care via a trauma-informed approach have become active areas of study.[1-3] A trauma-informed approach is defined by the Substance Abuse and Mental Health Services Administration as

> …a program, organization, or system that […] *realizes* the widespread impact of trauma and understands potential paths for recovery; *recognizes* the signs and symptoms of trauma in clients, families, staff, and others involved with the system; *responds* by fully integrating knowledge about trauma into policies, procedures, and practices; and seeks to actively resist *re-traumatization*.[4]

In the foundational "Adverse Childhood Experiences (ACE) Study" on childhood trauma, over half of the patients reported having at least one adverse childhood experience, including physical or psychological abuse and household dysfunction.[1] These traumatic experiences can have lasting effects on survivors including increased health care utilization and expenditure, mental health problems such as posttraumatic stress disorder and anxiety, as well as cardiovascular and other physical diseases.[1,5-9]

Given the prevalence of trauma, it is likely primary care providers (PCPs) will interact with patients who have experienced trauma at some point during their lifetime. It is vital that PCPs are trained on trauma, its impact on health, and skills and strategies for implementing a trauma-informed approach, to provide high-quality care and improve health outcomes. Studies on the outcomes of implementing a trauma-informed approach in behavioral and mental health settings show that a trauma-informed approach improves patient care, provider satisfaction, and health outcomes by reducing depression, increasing compliance and

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engagement, and improving provider understanding of patient needs.[10,11] However, many PCPs currently feel discomfort in treating patients with prior traumatic experiences due to a lack of time, feeling uncomfortable, and unsure as to how to respond.[12] Discomfort with discussing trauma and symptoms from prior traumatic experiences may hinder the patient-provider relationship and patient health outcomes.[12,13] Patients with previous traumas are more likely to avoid health care preventative care visits and rely primarily on emergency room and urgent care visits for treatment, which ultimately results in increased morbidity and poorer outcomes throughout their lifespans.[14,15]

It is important that primary care providers are trained in working with patients with a trauma history to be able to meet their needs and help patients feel more comfortable going to preventative visits, rather than seeking emergency room care. One study of family medicine residency programs found that only about 27% of respondent programs reported including education and training on trauma-informed care (TIC).[16] Of those who included TIC in their curriculum, 72.9% reported dedicating 5 or less hours per year to trauma education. While many family medicine residency programs did not have TIC curricula, family medicine residency program directors expressed a desire for the curricula to meet their patients' needs. TIC curricula for PCPs can help fill that gap.

Given the prevalence of trauma, the potentially negative impact it can have on health throughout the lifespan, and the fact that many PCPs do not feel prepared to work with patients with prior traumatic experiences, the objective of this scoping review was to identify and review the effectiveness of PCP trauma-informed approach curricula in the United States. Identifying current PCP trainings that utilize a trauma-informed approach will assist teaching programs, providers, and practices interested in improving knowledge, confidence, and skills

in trauma-informed approaches. Furthermore, strengths and gaps in current trauma-informed approach curricula can be identified so that researchers and educators can adapt and develop curricula to improve patient care and outcomes.

Methods

The approach of this scoping review meets the guidelines for the PRISMA extension for scoping reviews (PRISMA-ScR).[17] We selected articles for review using search term headings including "trauma-informed care," "resilience," "patient-centered care," "primary care," "education," and "training." We combined the search results for each heading to find articles related to trauma-informed approach curricula for primary care providers. The search strategy for Ovid Medline is shown in Table 1. We identified articles by searching online databases including Ovid Medline, PsycINFO, Cochrane Library, Scopus, Web of Science, EBSCO's Academic Search Premier, and MedEd Portal. There was no restriction on year or status of publication; articles through August 25, 2020 were included in the search. We also searched the STFM Resource Library on February 22, 2021 using the terms "trauma informed care" and "adverse childhood experience." We considered grey literature, including conference abstracts, if they met inclusion and exclusion criteria. Article inclusion and exclusion criteria are shown in Table 2. We defined trauma using the Substance Abuse and Mental Health Services Administration's concept as it combines existing definitions and expert panel input:

> Individual trauma results from (1) an event, series of events, or set of circumstances (2) that is experienced by an individual as physically or emotionally harmful or life threatening and (3) that has lasting adverse effects on the individual's function and mental, physical, social, emotional, or spiritual well-being.[4]

Two of the authors uploaded database search results to Rayyan for a blinded, independent evaluation. Rayyan is a web-based application that assists authors completing systematic reviews by providing a platform for article upload, blinded and unblinded comparison of article inclusion/exclusion by each contributing author, and monitoring of reasons for exclusion.[18] Each article was screened by at least two authors and included or excluded based first on title/abstract review, and subsequently on full-text review. Following independent screening, any articles that were not unanimously included or excluded were discussed as a group to resolve any conflicts. Final analysis included identification of unique curricula from each of the articles.

We evaluated curricula based on the following criteria: participants, mode and length of training, TIC pyramid category, and evaluation methods and results. We utilized the TIC pyramid, a conceptual and operational framework developed by Raja et al, to extract data from the articles.[19] This framework breaks down trauma into five categories: (1) patient-centered communication and care, (2) understanding the health effects of trauma, (3) interprofessional collaboration, (4) understanding your own history and reactions, and (5) screening. These categories fall under two main domains (universal trauma precautions and trauma-specific strategies). The first two categories are considered universal trauma precautions as they help establish trust/rapport and are applicable to all patients, regardless if trauma history is known or unknown. The last three categories are trauma-specific strategies and are used when a patient's trauma history is known. The description of the training topics covered in each curriculum were extracted under each of these five TIC pyramid categories (Table 3, column 4). To assess change and outcomes, we utilized the Kirkpatrick Model focusing on different levels of learning as shown in Figure 1.[20]

Table 1: Ovid Medline Search Strategy, 1946 to August 25, 2020

1   (trauma informed or (aces or adverse child* event* or adverse child* experience*)).mp.
2   trauma.ti. or trauma.ab. or traumatiz*.mp. or traumatis*.mp.
3   exp stress, psychological/ or psychological stress*.mp. or stressful event*.mp. or stressful experience*.mp. or exp life change events/ or life chang* event*.mp.
4   exp Resilience, Psychological/ or resilien*.mp. or coping.mp. or cope.mp. or coped.mp.
5   exp Adaptation, Psychological/ or (psychological* adj5 adapt*).mp. or (emotional* adj5 adjust*).mp. or exp emotional adjustment/
6   exp Stress Disorders, Post-Traumatic/ or post traumatic stress disorder*.mp. or posttraumatic stress disorder*.mp. or ptsd.mp. or posttraumatic neuros*.mp. or post traumatic neuros*.mp. or (moral* adj5 injur*).mp.
7   exp social support/ or social support*.mp. or social network*.mp.
8   exp self care/ or self care.mp.
9   well being.mp. or exp "Quality of Life"/ or qol.mp. or quality of life.mp. or life quality.mp.
10   or/2-9
11   patient centered*.mp. or exp Patient-Centered Care/ or patient focused*.mp. or medical home*.mp. or client centered*.mp.
12   exp "Delivery of Health Care, Integrated"/ or (behavioral adj5 health adj5 integrat*).mp. or (behavioural adj5 health adj5 integrat*).mp. or (integrated adj5 care).mp.
13   11 or 12
14   10 and 13
15   1 or 14
16   exp education/ or exp curriculum/ or exp education, professional/ or exp education, medical/ or curricul*.mp. or ed.fs.
17   (educat* or train* or orientat* or lectur* or teach*).mp.
18   exp Lectures/ or exp simulation/ or simulat*.mp. or screen*.mp.
19   exp Teaching/ or exp Teaching Materials/
20   exp Education, Medical, Continuing/ or continuing medical educat*.mp. or cme.mp.
21   exp Health Personnel/ed or interprofessional educat*.mp.
22   exp program development/ or (program* adj5 develop*).mp.
23   exp quality improvement/ or (quality adj5 improv*).mp.
24   exp Evaluation Studies as Topic/ or (research adj5 evaluat*).mp. or (program* adj5 evaluat*).mp.
25   or/16-24
26   exp Primary Health Care/ or primary care.mp. or primary health care.mp.
27   exp Family Practice/ or family medicine.mp. or family practice.mp. or family practitioner*.mp.
28   exp Physicians, Family/ or family physician*.mp. or family doctor*.mp.
29   exp Pediatrics/ or (pediatric* or paediatric*).mp.
30   internal medicine.mp. or exp Internal Medicine/
31   or/26-30
32   15 and 25 and 31
33   limit 32 to english language

Table 2: Inclusion/Exclusion Criteria for Scoping Review of Trauma-Informed Approach Curricula for Primary Care Providers

Inclusion Criteria	Exclusion Criteria
Population = • Primary care providers (medical doctors and advanced practice providers) • Primary care residents (family medicine, internal medicine, pediatrics, combined medicine and pediatrics)	• Nonprimary care providers, including medical students
Concept = • Trauma-informed approach training for primary care providers of pediatric and/or adult patients • Includes description of training evaluation (utilizing the Kirkpatrick Model)	• Guide for organizational implementation of trauma-informed approach without describing provider training • No description of training evaluation • Adverse childhood experience or trauma screening with no description of training
Context = • Primary care outpatient setting • In the United States • English language	• Inpatient and nonprimary care setting • Outside the United States • Non-English articles

Results

Database search identified 6,823 unique articles (Figure 2). We found two additional articles, one on final review of MedEd Portal on November 3, 2020, and another during the review process on February 22, 2021, for a total of 6,825 unique articles. After title and abstract review, we excluded 6,729 articles for relevance or non-US settings and the remaining 96 full-text articles were then reviewed independently by two authors for final inclusion or exclusion. Following the full-text review, 77 articles were excluded. The most common reasons for exclusion of articles at the full-text stage were no curricula or training and no evaluation of curricula. The resulting 19 articles, with two conference abstracts,[21,22] were examined in-depth to determine the participants, mode and length of training, topics, and evaluation methods and results.[21-39] We identified 17 different curricula in the 19 articles included for final analysis. The two articles by Green et al discuss the same curriculum, but evaluate different outcomes.[23,24] Additionally, Wen et al and Miller-Cribbs discuss the same curriculum, but utilize different evaluations.[30,39] Articles contained varying levels of description of training topics, mode and length of training, and evaluation, with some giving a brief mention of how primary care providers were trained as a small part of a larger manuscript, and others giving in-depth explanations as the focus of the manuscript (Table 3). Trainings were taught by a mixture of health professionals including TIC experts, clinical psychologists, social workers, physicians, and nurses.[21-39]

Table 3: Summary of 17 Trauma-Informed Approach Curricula for Primary Care Providers

Source	Participants	Mode, Length of Training, CME	TIC Pyramid Category	Evaluation Method	Kirkpatrick Level and Results
Bodendorfer V, et al[28]	Primary care physician (PCPs; eight residents, four attendings, one physician assistant) in family medicine residency clinic	Two sessions (length not specified) including discussion on ACEs/health impacts, workflow, sample scripts, ACE Conversation card.	- Patient-centered communication and care - Understand the health effects of trauma - Interprofessional collaboration	Postsurveys of: (1) providers on acceptability and feasibility (immediate and quarterly x 4) and (2) immediate parent/guardian (N=238) acceptability.	**Kirkpatrick level 1** 1. 76% parents/guardians felt positively about ACE conversation. 2. 81% parents/guardians felt comfortable receiving information from PCP. 3. 97% parents/guardians preferred to learn information from their PCP. 4. 71% providers felt parents/guardians receptive to ACE conversation. 5. 61% providers said conversation took 1-2 minutes.
Bryant C, et al[37]	59 pediatric PCPs (57 medical residents, two nurse practitioners)	Education as part of QI initiative: PowerPoint presentation (length not specified).	- Understand the health effects of trauma - Interprofessional collaboration - Screening	Pre/posttest survey	**Kirkpatrick levels 1, 2 & 3:** 1. Statistically significant improvement in provider's knowledge after ACE education ($P<.001$) and awareness of resources ($P<.001$). 2. Significant improvement in provider's comfort level of screening ($P<.001$). 3. No change in provider's role of screening for ACEs ($P=.13$). 4. Post-12 weeks implementation, 480 screening tools completed. 93% of providers used tool.
Bursch B, et al[25]	Pediatrics and internal medicine-pediatrics residents (83 completed one survey, 27 completed both pre/postsurveys)	Trauma-informed, evidence-informed resilience skills training program. Six 1-hour modules with biological/science frame, skill-based practice, and five-10-minute videos.	- Patient-centered communication and care - Understand the health effects of trauma - Understand your own history and reactions	Online pre/postsurvey on beliefs and self-efficacy.	**Kirkpatrick levels 1 & 2:** 1. Increased self-perceived ability to recognize trauma in others ($P=.005$). 2. Increased knowledge of evidence-based approaches to assisting those with trauma ($P<.001$). 3. Increased knowledge on what helps if they disagree with medical decision making of an attending with one of their patients ($P=.01$). 4. More likely to believe attendings affected by patient deaths ($P=.03$).

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Table 3: Continued

Source	Participants	Mode, Length of Training, CME	TIC Pyramid Category	Evaluation Method	Kirkpatrick Level and Results
Cahill T, et al[22]	Residents and faculty at a family medicine residency (number not specified)	Presentation to residents and faculty on ACE study, role play, ACE questionnaire given to patients and education to residents on how to respond.	- Patient-centered communication and care - Understand the health effects of trauma - Screening	Qualitative feedback from residents, patients, and faculty including faculty focus group.	**Kirkpatrick levels 1 & 2:** 1. All experiences with ACE intervention reported as positive. 2. Recognized the importance of screening for mental and physical health. 3. Patients: No complaints or negative interactions reported. 4. Perceived increased resident confidence.
Chokshi B, et al[31]	28 pediatric residents, four attending physicians, one fellow, two medical students	Four computer-based childhood adversity and trauma-informed (CA-TIC) individual, interactive, case-based e-modules for pediatric primary care (2 hours). Protected time to complete during 1-week advocacy rotation.	- Patient-centered communication and care - Understand the health effects of trauma - Interprofessional collaboration - Screening	17-item 5-point Likert scale pre/postsession questionnaire with four categories (knowledge, attitudes, practice, confidence). Post-included three short-answer questions and one Likert overall rating question.	**Kirkpatrick levels 1 & 2:** 1. Rated 4.6 out of 5 for design and quality. 2. Statistically significant increases from pre- to postsession for knowledge, attitudes, likelihood to practice TIC, and confidence related to CA-TIC ($P<.001$). 3. Most cited qualitative learning points/practice changes: asking about trauma in practice and 7 C's of resilience.
Dueweke AR, et al[27]	33 pediatric residents	One 2-hour in-person training. Two-sided index "pocket card" with information on STAR acronym (Screen/Tally/Ask additional questions if positive/Refer if needed) and local community referral list.	- Understand the health effects of trauma - Interprofessional collaboration - Screening	Posttraining interviews measured perceptions. Pre/postsurveys on attitudes, perceived competence, perceived barriers to TIC practices. Retrospective chart review measured pre/post change in residents' TIC practices (screen/refer).	**Kirkpatrick levels 1, 2 & 3:** 1. Training helpful; positive perceptions STAR pocket card. 2. Trend toward more favorable attitudes ($P=.065$); significantly greater perceived competence ($P<.001$) to enact TIC practices; decrease in perceptions that time constraints, lack of training, confusing information interfered with provision of TIC practices at T2 compared with T1 ($P<.05$); no change in perceptions that worry about retraumatizing children/families interfered with provision of TIC practices. 3. Significant increase in completed trauma screens ($P<.0001$); slight increase referrals for psychology/psychiatry services (not significant).

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Table 3: Continued

Source	Participants	Mode, Length of Training, CME	TIC Pyramid Category	Evaluation Method	Kirkpatrick Level and Results
Green BL, et al[23] and Green BL, et al[24]	17 family medicine residents, 13 community physicians	6-hour course, called Trauma-Informed Medical Care, delivered in two sessions at least 1 week apart including: case study, experiential exercises, poster, worksheets, and a manual. CME offered.	- Patient-centered communication and care - Understand the health effects of trauma - Understand your own history and reactions	Randomized to training or wait-list. Patient-centeredness score derived from Roter Interactional Analysis System ratings of three audiotaped visits of PCP and standardized patients. Actual patients completed surveys before provider trained or 1 week to 3 months after provider trained (not matched pre/post-; overall numbers compared).	**Kirkpatrick level 3 & 4:** _Standardized Patients:_ 1. Larger increase in patient centeredness score for immediately trained PCPs compared with delayed PCPs, moderate effect size (0.66). 2. Increased patient-centeredness composite score for combined trained PCPs pre- to posttraining ($P<.01$). _Actual Patients_: 1. Increased Partnership score posttraining ($P<.01$). 2. Increased Information score posttraining (not statistically significant, $P<.07$). 3. No difference in Rapport scale posttraining. 4. Patients with ≥1 posttraumatic stress disorder (PTSD) symptom ($P<.01$) and patients with ≥2 traumas ($P=.02$) rated PCPs lower on Partnership scale both pre/posttraining compared with patients without trauma or PTSD.
Harmon S, et al[21]	35 pediatric residents (26 completed presurvey, 17 completed postsurvey)	Multidisciplinary training: (1) in-person orientation, (2) electronic supplementary materials, (3) nurse home visiting experience. Evidence-based safety card to guide trauma/resilience discussions.	- Understand the health effects of trauma - Interprofessional collaboration	13-item presurvey, 18-item postsurvey.	**Kirkpatrick levels 1 & 2:** 1. Increased understanding (47% vs. 12% strongly agree/agree post vs pre) and comfort (41 vs 0%) with use of evidence-based safety card intervention to discuss toxic stress with families. 2. Increased awareness of evidence-based benefits of home visitation for at-risk families (59% vs 15%). 3. Increased awareness of local home visitation program (71% vs. 23%). 4. Greater confidence referring families to home visitation programs (35% vs 7%).
Helitzer DL, et al[32]	26 internal medicine and family practice providers (physicians, physician assistants, nurse practitioners)	Full day training using lecture and role-play. Video-review of simulated patients and audio review of actual patient. Two optional role-playing workshops. CME offered.	- Patient-centered communication & care - Understand the health effects of trauma - Interprofessional collaboration	Randomized Control Trial 1) Simulated video-taped patient pre/post-full-day training 2) Actual patients: 6 months and 18 months posttraining.	**Kirkpatrick level 3:** 1. Higher provider communication proficiency score ($P<.05$). Higher patient-centeredness summary score ($P<.05$). 2. 6-months posttraining: higher patient-centeredness scores ($P<.01$) and discussion of ACEs ($P<.001$). 18-months posttraining: higher patient-centeredness summary score ($P=.032$) and discussion of ACEs ($P<.001$).

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Table 3: Continued

Source	Participants	Mode, Length of Training, CME	TIC Pyramid Category	Evaluation Method	Kirkpatrick Level and Results
Marsicek SM, et al[36]	Pediatric residents (n=24 surveyed) and faculty (n=5).	Education as part of quality improvement (QI) initiative for ACEs screening: 1-hr educational seminar at 1 month; simulation experience of at-risk ACE score with standardized caregiver with debriefing at 2 months; lecture at 8 months.	- Understand the health effects of trauma - Interprofessional collaboration - Screening	Pre/postinitiative surveys via email (only resident surveys compared pre/post due to insufficient faculty numbers post).	**Kirkpatrick levels 1 & 2:** 1. No significant difference in resident familiarity with clinical and scientific findings of ACE study (P=.258). 2. No significant difference in likelihood to administer and assess an ACEs questionnaire on patients (P=.091). 3. No significant difference in comfort discussing patient's personal history of physical, emotional, or sexual abuse (P=.219). 4. No significant difference in familiarity with local resources for children exposed to ACEs (P=.342).
Schmitz A, et al[35]	Pediatric residents (29 completed premodule survey, 11 completed pre/ postsurvey)	25-minute self-directed online module.	- Patient-centered communication and care - Understand the health effects of trauma - Understand your own history and reactions	Pre/postsurvey assessing: 1) Knowledge of ACEs, TIC, toxic stress, resiliency 2) Confidence in discussing ACEs, TIC, toxic stress, resiliency 3) Self-reported frequency of discussion of all topics.	**Kirkpatrick levels 1, 2 & 3:** 1. Increase confidence in knowledge of ACEs (P<.05), TIC (P<.05), toxic stress (P<.05), and resiliency (P<.05). 2. Increase in confidence in discussing all topics (ACEs, TIC, toxic stress, resilience) (P<.05). 3. Increase in self-reported frequency of discussion of all topics (P<.01).
Shamaskin-Garroway AM, et al[26]	Eight medical residents (specialty not specified)	Three directly observed patient visits on 3 days over 2-week VA rotation at women's primary care clinic. Feedback from clinical psychology fellow.	- Patient-centered communication and care	Pre/posttraining survey (Likert scale) on self-perceived skill, comfort, use of patient-centered approaches, understanding of trauma-sensitive care.	**Kirkpatrick levels 1, 2 & 3:** 1. Increased knowledge of strengths/ weaknesses in interviewing patients and confidence in patient communication skills (P=.03). 2. Increased provider comfort discussing trauma, knowledge of responding sensitively to trauma exposure, adjusting interview-style to TIC (P=.01). 3. No change in resident perception of patient-centered interviewing skills, comfort discussing mental health, use of motivational interviewing techniques.

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Source	Participants	Mode, Length of Training, CME	TIC Pyramid Category	Evaluation Method	Kirkpatrick Level and Results
Shamaskin-Garroway AM, et al[38]	16 internal medicine residents, five nurse practitioner residents at a VA inter-professional primary care residency program	Five 1-hour didactic sessions; 10-minute group reflection rounds regarding patient interactions; Optional patient care observation and feedback.	- Patient-centered communication and care - Understand the health effects of trauma - Understand your own history & reactions - Screening	Pre/post-self-report questionnaire on trauma-informed primary care (TIPC)-related knowledge, attitudes, beliefs, and self-reported practices. Feedback on observed patient encounters: 10-item checklist of specific clinician behaviors with written quantitative and qualitative feedback.	**Kirkpatrick levels 1, 2 & 3:** 1. Improved self-reported knowledge ($P<.001$). 2. Improved self-reported trauma-informed attitudes ($P<.001$). 3. Improved self-reported trauma-informed practice ($P<.001$). 4. No significant change in beliefs about TIPC (however high baseline score).
Sorkin DH, et al[34]	16 family medicine providers, two general internal medicine providers: 10 intervention arm/eight control arm	*3-Component Intervention Arm:* 1. One 3-hour web-based tutorial 2. Patient screening via iPad 3. Web-based mobile application with clinical guidelines and algorithms *2-Component Control Arm:* 1. One online tutorial 2. Patient screening	- Patient-centered communication and care - Understand the health effects of trauma - Screening	Baseline and 12-week follow-up assessment using (1) electronic mental health screening tool, (2) paper surveys, (3) patient electronic/paper medical record (initiation of evidence-based guideline care, initiation of trauma-informed care as defined by ≥ 1 of following in patient's records: - conducted a risk assessment of depression/PTSD - discussed trauma history - asked if patients wanted to improve their well-being - assessed psychiatric symptoms).	**Kirkpatrick level 3 & 4:** 1. Intervention providers had 4 times higher odds of utilizing evidence-based guidance care ($P=.049$). 2. Intervention providers were more likely to initiate medication ($P<.001$) or provide supportive psychological counseling and postpone prescription initiation ($P=.008$). 3. No difference in referral to mental health ($P=.44$). 4. Intervention group had 16 times higher odds of being provided with trauma-informed care ($P<.001$). 5. Identified with PTSD and depression during screening 5 times higher odds of receiving trauma informed care compared with those who were screened with depression only ($P=.001$). 6. Receiving evidence-based guideline care significantly associated with lower depression score at follow-up ($P=.003$) but no significant changes in PTSD scores. 7. Receiving trauma-informed care neither associated with changes in depression nor PTSD scores at follow-up. 8. Intervention providers more likely to diagnose depression ($P=.013$) and PTSD ($P=.002$) among those screened.

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Table 3: Continued

Source	Participants	Mode, Length of Training, CME	TIC Pyramid Category	Evaluation Method	Kirkpatrick Level and Results
Stefanski K, Mason K.[29]	18 pediatric residents	*Two-part Curriculum:* 1. Online module 2. Multimodal in-person workshop: video vignette, didactics, gamification with reflection, facilitated discussion.	- Understand the health effects of trauma - Screening	Postworkshop written feedback on reaction and three practice changes plan to make.	**Kirkpatrick level 1:** 1. Residents most surprised by high prevalence of ACEs reported in initial ACE study. 2. Perceived most helpful aspects of trainings: interactive activities and resources provided. 3. Most common anticipated practice changes was "more systematically screening patients for ACEs".
Weiss D, et al[33]	440 health care professionals including primary care physicians and residents (specialty not specified, 294 completed both pre/postsurveys)	1-hour in-person session using didactic presentation and group discussion. CME offered.	- Patient-centered communication & care - Understand the health effects of trauma - Interprofessional collaboration - Understand your own history and reactions	Pre/posttraining Trauma-Informed Medical Care Questionnaire (TIMCQ) and Post-training Satisfaction Questionnaire.	**Kirkpatrick level 1 & 2:** 1. Increased favorable attitude toward TIC ($P<.001$). 2. Increased confidence in delivering TIC ($P<.001$). 3. High satisfaction with trainings: 90% agreed/strongly agreed acquired new knowledge/skills; 86% agreed/strongly agreed TIC training enhanced their professional expertise; 88% would recommend the training.
Wen F, et al[30]	Internal medicine and family medicine residents (59 in 2014-2015 and 22 preliminarily in 2015-2016)	Professional ACEs-Informed Training for Health (PATH): 4-hour training with didactics, provider and patient videos, standardized patient (SP) visits, trainee feedback, facilitated discussion.	- Patient-centered communication and care - Understand the health effects of trauma - Interprofessional collaboration - Understand your own history and reactions	Online survey 2-5 months following the training.	**Kirkpatrick level 1, 2 & 3**: 1. Enhanced understanding of ACEs (64.5% initial, 81.8% 2015-2016 preliminary results following modifications to curriculum). 2. Training helped apply concepts and principles in practice (66% initial, 73% revised). 3. Faculty feedback was helpful (77.4% initial, 96% revised). 4. Planned on implementing the skills learned in the simulation in clinical practice (62.5% initial, 63.6% revised).

Table 3: Continued

Source	Participants	Mode, Length of Training, CME	TIC Pyramid Category	Evaluation Method	Kirkpatrick Level and Results
Miller-Cribbs J, et al[39]	53 participants (38 family medicine or internal medicine residents in years 1 through 4; 15 OT and PT doctoral students)	Same PATH curriculum as above. Participate each year of residency: year 1 and 2 focus on individual ambulatory encounters, year 3 focuses on modifying the SP ambulatory encounter to group simulation for vicarious learning.	Same as above	Audiovisual recordings of individual learner-standardized patient encounters coded using standardized behavioral codes. Subset 10 recordings of PC residents who participated in simulations in first and fourth years of training allowed for evaluation over time.	**Kirkpatrick level 3:** Demonstrated skills congruent with TI training on: 1. Explaining ACEs 2. Demonstrating empathy 3. Collaborative treatment planning 4. Stigma reduction Year 1 compared with year 4: 1. Slight increases in using metaphors and infographics, explaining ACEs effects on brain/body, stigma reduction and validation 2. Slight decreases in empathy and collaborative treatment planning.

Abbreviations: CME, continuing medical education; PCP, primary care physician; ACE, adverse childhood experience; TI, trauma informed; TIC, trauma-informed care; TIPC, trauma-informed primary care; PTSD, posttraumatic stress disorder; SP, standardized patient.

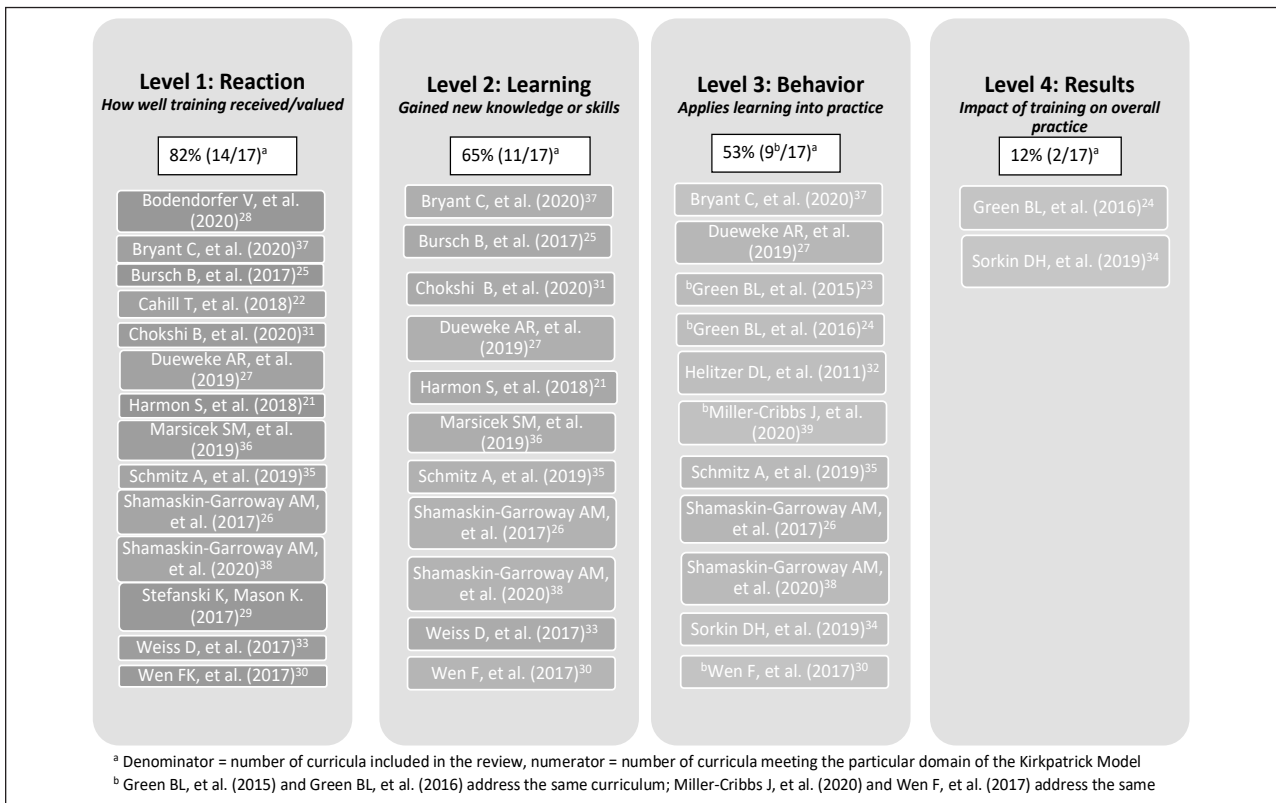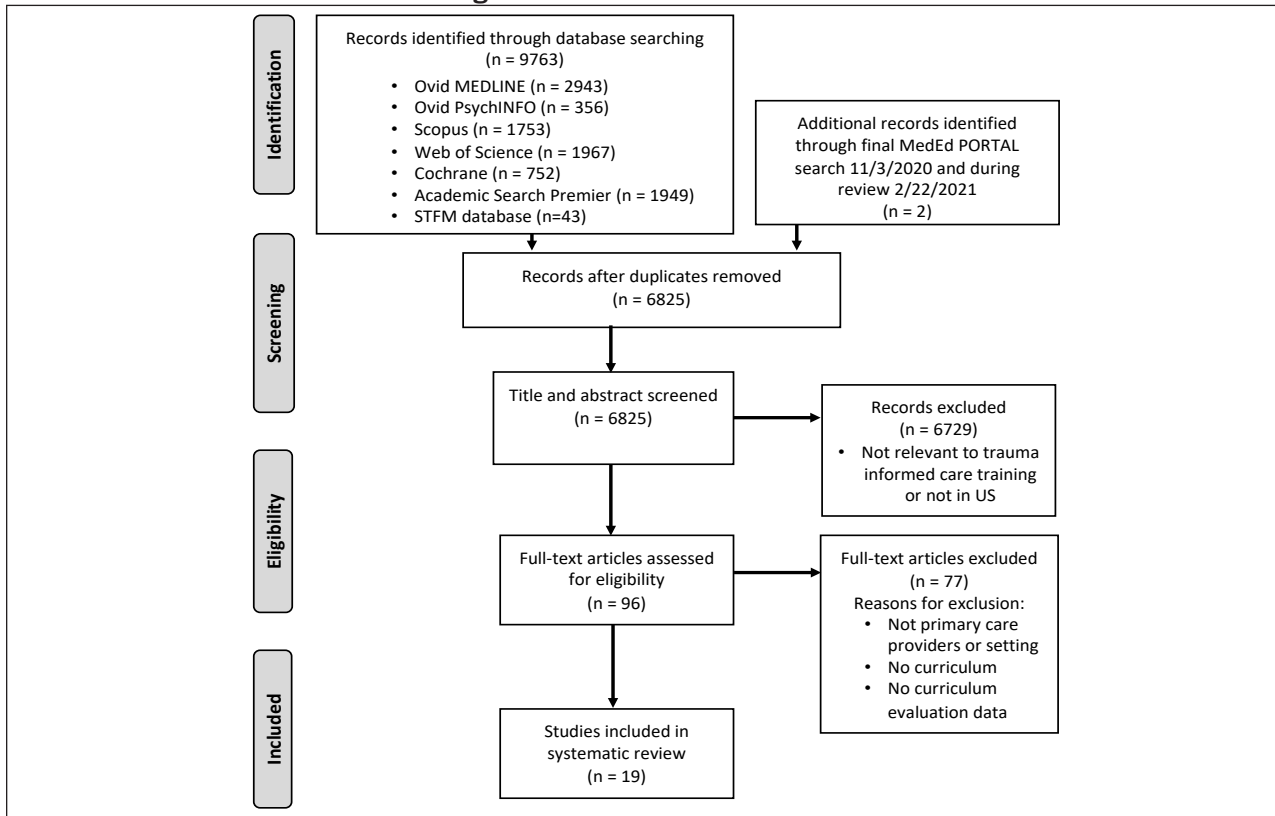**Figure 1: Articles Reporting Curriculum Evaluation by Kirkpatrick Model Level of Learning[20]**

Level 1: Reaction
How well training received/valued

82% (14/17)[a]

- Bodendorfer V, et al. (2020)[28]
- Bryant C, et al. (2020)[37]
- Bursch B, et al. (2017)[25]
- Cahill T, et al. (2018)[22]
- Chokshi B, et al. (2020)[31]
- Dueweke AR, et al. (2019)[27]
- Harmon S, et al. (2018)[21]
- Marsicek SM, et al. (2019)[36]
- Schmitz A, et al. (2019)[35]
- Shamaskin-Garroway AM, et al. (2017)[26]
- Shamaskin-Garroway AM, et al. (2020)[38]
- Stefanski K, Mason K. (2017)[29]
- Weiss D, et al. (2017)[33]
- Wen FK, et al. (2017)[30]

Level 2: Learning
Gained new knowledge or skills

65% (11/17)[a]

- Bryant C, et al. (2020)[37]
- Bursch B, et al. (2017)[25]
- Chokshi B, et al. (2020)[31]
- Dueweke AR, et al. (2019)[27]
- Harmon S, et al. (2018)[21]
- Marsicek SM, et al. (2019)[36]
- Schmitz A, et al. (2019)[35]
- Shamaskin-Garroway AM, et al. (2017)[26]
- Shamaskin-Garroway AM, et al. (2020)[38]
- Weiss D, et al. (2017)[33]
- Wen F, et al. (2017)[30]

Level 3: Behavior
Applies learning into practice

53% (9[b]/17)[a]

- Bryant C, et al. (2020)[37]
- Dueweke AR, et al. (2019)[27]
- [b]Green BL, et al. (2015)[23]
- [b]Green BL, et al. (2016)[24]
- Helitzer DL, et al. (2011)[32]
- [b]Miller-Cribbs J, et al. (2020)[39]
- Schmitz A, et al. (2019)[35]
- Shamaskin-Garroway AM, et al. (2017)[26]
- Shamaskin-Garroway AM, et al. (2020)[38]
- Sorkin DH, et al. (2019)[34]
- [b]Wen F, et al. (2017)[30]

Level 4: Results
Impact of training on overall practice

12% (2/17)[a]

- Green BL, et al. (2016)[24]
- Sorkin DH, et al. (2019)[34]

[a] Denominator = number of curricula included in the review, numerator = number of curricula meeting the particular domain of the Kirkpatrick Model
[b] Green BL, et al. (2015) and Green BL, et al. (2016) address the same curriculum; Miller-Cribbs J, et al. (2020) and Wen F, et al. (2017) address the same

Figure 2: Source Selection Process

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┌─────────────┐   ┌──────────────────────────────────────┐
│             │   │ Records identified through database   │
│ Identifica- │   │ searching (n = 9763)                  │
│ tion        │   │  • Ovid MEDLINE (n = 2943)            │   ┌──────────────────────────┐
│             │   │  • Ovid PsychINFO (n = 356)           │   │ Additional records       │
│             │   │  • Scopus (n = 1753)                  │   │ identified through final │
│             │   │  • Web of Science (n = 1967)          │   │ MedEd PORTAL search      │
│             │   │  • Cochrane (n = 752)                 │   │ 11/3/2020 and during     │
│             │   │  • Academic Search Premier (n = 1949) │   │ review 2/22/2021         │
│             │   │  • STFM database (n=43)               │   │ (n = 2)                  │
└─────────────┘   └──────────────────────────────────────┘   └──────────────────────────┘
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Records after duplicates removed (n = 6825)

Title and abstract screened (n = 6825)

Records excluded (n = 6729)
• Not relevant to trauma informed care training or not in US

Full-text articles assessed for eligibility (n = 96)

Full-text articles excluded (n = 77)
Reasons for exclusion:
• Not primary care providers or setting
• No curriculum
• No curriculum evaluation data

Studies included in systematic review (n = 19)

Stages: Identification, Screening, Eligibility, Included

Half of the curricula self-identified as pilots, feasibility studies, or discussed curricula in development, revealing that trauma-related trainings for primary care providers is still an area of active development and research.[23-31] Two educational curricula were adapted from prior curricula, while the remainder were created from a variety of sources, including Substance Abuse and Mental Health Services Administration principles,[4] the American Academy of Pediatrics Trauma Toolbox for Primary Care,[40] guidelines from the American Psychological Association,[41] evidence-based literature, and expert feedback.[21-39] Bursch et al adapted the "Families OverComing Under Stress" resiliency training program (a strength-based, trauma-informed training program for deployed military personnel) for use with medical residents.[25] Green et al adapted the Risking Connection curriculum (a strength-based training program for helping people who have been hurt in interpersonal relationships,

previously used in mental health, congregate care, faith-based, and medical facilities) for use with primary care residents, advanced practice providers, and physicians.[23,24]

Utilizing the TIC pyramid by Raja et al 2015 as a framework to extract TIC training topics from articles,[19] the majority of the curricula covered topics related to universal trauma precautions; 71% (12/17) covered topics related to patient-centered communication and care[22-26,28,30-35,38,39] and 94% (16/17) covered topics related to understanding the health effects of trauma.[21-25, 27-38] The only curriculum that did not cover topics related to understanding the health effects of trauma was Shamaskin-Garroway et al, which focused on patient-centered communication skills.[26] Shamaskin-Garroway et al expanded on their initial pilot to include background teaching about trauma in their extended trauma-informed primary care curriculum.[38] Patient-centered communication and care included patient-centered communication

skills, trauma-related communication skills, communicating with patients with complex needs, and motivational interviewing. Many of the communication skills trainings discussed the importance of using alternative language and reframing negative comments, with a focus on patients who had experienced prior trauma. Curricula coverage of trauma-specific strategies included 53% (9/17) addressing interprofessional collaboration[21,27,28,30-33,36,37]; 35% (6/17) addressing understanding your own history and reactions,[23-25,30,33,35,38] and 47% (8/17) addressing screening.[22,27,29,31,34,36-38]

We analyzed reported evaluation methods using the Kirkpatrick Model's four levels of training evaluation as shown in Table 3 and Figure 1.[20] Examples of level 1 (reaction) evaluation results include training satisfaction, relevance, and engagement.[21,22,25-31,33,35-38] Examples of level 2 (learning) evaluation results include increased favorable attitude toward TIC, and improved provider's

knowledge after ACE education and awareness of resources.[21,25,31,33,37] We evaluated behavior change (level 3) in a variety of ways including pre/posttrainings chart review[27,34]; rated observed, audio or videotaped visits with patients (standardized or actual)[23,24,32,38]; patient surveys[24]; and self-reported behavior change.[26,35,38] Two studies reported level 4 outcomes for patient satisfaction and health outcome. Green et al had patients rate their PCPs using a survey derived from measures assessing patient satisfaction and interactions with providers.[24] They found increased *partnership* scores posttraining, an increased but not significant *information* score, and no difference in *rapport* scores posttraining (excellent at baseline). Sorkin et al found receiving TIC was neither associated with changes in patients' depression nor posttraumatic stress disorder scores at 12-week follow-up.[34] Zero studies assessed impact of trainings on the organization (eg, cost).

Discussion

This review illustrates the relative infancy but growing literature base on the effectiveness of trauma-informed approach curricula for PCPs. As many of these curricula had relatively small sample sizes, their significance is limited, but may be promising, once tested in larger and multiple settings. Replicating, testing, and building on some of these curricula will advance the field further, rather than reinventing new curricula. Adaptations and additions can be made where current gaps exist in the training of PCPs. As training programs and primary care practices consider different trauma-informed curricula for adoption and/or adaptation in their program, the authors recommend the following considerations to guide curricula selection: (1) program goals and objectives, including patient population, training time availability, and setting; (2) the TIC pyramid categories (categories currently taught versus gaps); and (3) the desired Kirkpatrick Model level for evaluation.

If programs and practices currently have no TIC education, studies that have well-developed and explained curricula and/or modules include Bursch et al,[25] Chokshi et al,[31] Green et al,[23,24] Schmitz,[35] Sorkin et al,[34] Wen et al,[30] and Miller-Cribs et al.[39] Selection of which curricula to adopt/adapt should be guided by program needs. For example, if a practice/program is interested in improving skills training related to resiliency and vicarious trauma, we would recommend the curriculum used by Bursch et al.[25] Online modules targeted for pediatric primary care providers are available for download via MedEdPortal for both Chokshi et al[31] and Schmitz et al.[35] However, they have different TIC pyramid categories, time commitment, and delivery which might impact selection based on program/practice need. The curricula described in Green et al[23,24] and Wen et al[30]/Miller-Cribs et al[39] target adult primary care providers. Sorkin et al[34] specifically focuses on a refugee population. While each of these curricula could be adaptable for other populations, it might be easiest for programs/practices to start with a previously developed curriculum aimed at their target population. Surveys previously used for evaluation can also be used, such as those used by Weiss et al[33] (Trauma-Informed Medical Care Questionnaire) and Shamaskin-Garroway et al[38] (Trauma-Informed Primary Care-related Knowledge, Attitudes, Beliefs and Self-reported Practices). Previously developed standardized primary care patient cases, such as those created by Helitzer et al,[32] Green et al,[23] and Wen et al[30]/Miller-Cribs et al,[39] can also be utilized in future studies to evaluate training effectiveness.

Educational topics and methods varied among the curricula, likely reflecting the needs and scheduling flexibility of the population trained (eg, residents vs practicing community physicians). Understanding health effects of trauma was the most common topic (94%) utilizing a variety of modalities, including online, in-person, and a hybrid approach. Further research is needed to determine what elements of online versus in-person trainings are most beneficial. Furthermore, in identifying educational components, tangible resources for providers to refer to during the clinical encounter should be considered as a curriculum component and was used in multiple studies.[21, 27, 28, 34] Two of these studies measured objective behavior change through utilizing a pocket card[27] and web-based mobile application.[34] Another component to consider for providers is three curricula offered continuing medical education credit for the training, which we believe is essential to incentivize practicing PCPs to participate in the training.[23, 24, 32, 33] Additionally, the two small randomized controlled trials that revealed a statistically significant improvement in provider communication scores used case studies, experiential exercises, or role plays.[23, 24, 32] We believe the use of interactive educational methods such as these is essential to allow providers to practice trauma-informed communication skills prior to interaction with actual patients. We were not able to determine a minimum curriculum coverage or time commitment related to evaluation outcome due to the pilot nature and heterogeneity of these studies. More research is needed to help answer this question, including how often booster or continuing training is needed.

Further research is needed to identify how training PCPs in delivering care via a trauma-informed approach can impact patient satisfaction, health outcomes, and cost of care. Only two studies evaluated Kirkpatrick level 4 patient outcome results: one with no change in patients' depression nor posttraumatic stress disorder scores at 12-week follow-up[34]; and the other with patient's rating an increased *partnership* score posttraining, an increased but not significant *information* score, and no difference in *rapport* score posttraining (excellent at baseline).[24]

Zero studies evaluated impact of the training on the organization (eg, cost-effectiveness).

Additionally, further study is needed on the impact of trauma-informed approach curricula on providers' ability to recognize and respond to vicarious trauma (trauma symptoms that can result in providers from repeated exposure to other people's trauma). While at least three of the identified curricula included topics on vicarious trauma, self-awareness, and self-care,[23-25,33] only one paper, that reported a small sample size, indicated measuring resiliency beliefs and self-efficacy, which showed a shift in the desired direction on several measures.[25] While it is important to identify trauma in patients and utilize a trauma-informed approach in treating these patients, it is also important to recognize how providers may respond to patients with a trauma history (countertransference) and the signs of secondary traumatic stress in providers in order to reduce burnout. In order to prevent secondary traumatic stress and ultimately burnout, more research is needed to further identify vicarious trauma for primary care providers and how addressing this type of trauma may impact burnout.

Limitations of this scoping review include the potential for publication bias and inclusion of only English articles published in the United States. It is possible other curricula exist that have been evaluated, but the curricula or the results may not have been published due to negative findings. However, multiple curricula identified in this review included both statistically significant and nonsignificant findings, showing evidence against publication bias. In this literature review, we chose to include only curricula that included an evaluation component. We did this to help limit the number of possible missed curricula as there are multiple curricula that have been, or are currently being developed, for which no evaluation data exist yet. Also, it is possible curricula exist in other countries and other languages, which were excluded for the purposes of this scoping review.

Conclusion

Current data on the impact of trauma-informed approach curricula for primary care providers reveals improved confidence in delivering care via a trauma-informed approach, improved knowledge about trauma and its impact on health outcomes, improved attitudes toward patients who have experienced prior trauma, and changes in PCP behavior post-training with both simulated and actual patients. However, most of the current evidence is based on small pilot studies. Training programs and practices can adopt and/or adapt some of these curricula, utilizing the TIC pyramid framework and Kirkpatrick levels, based on their program's needs. Further research is needed to build improved referral connections to trauma-informed providers, and to examine how trauma-informed trainings might impact both short- and long-term quality of care, patient satisfaction, vicarious trauma, and health outcomes.

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