

ORIGINAL CONTRIBUTION

Structural competency in emergency medical education: A scoping review and operational framework

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Abstract

Objectives: Existing curricula and recommendations on the incorporation of structural competency and vulnerability into medical education have not provided clear guidance on how best to do so within emergency medicine (EM). The goal of this scoping review and consensus building process was to provide a comprehensive overview of structural competency, link structural competency to educational and patient care outcomes, and identify existing gaps in the literature to inform curricular implementation and future research in EM.

Methods: A scoping review focused on structural competency and vulnerability following Arksey and O'Malley's six-step framework was performed in concurrence with a multistep consensus process culminating in the 2021 SAEM Consensus Conference. Feedback was incorporated in developing a framework for a national structural competency curriculum in EM.

Results: A literature search identified 291 articles that underwent initial screening. Of these, 51 were determined to be relevant to EM education. The papers consistently conceptualized structural competency as an interdisciplinary framework that requires learners and educators to consider historical power and privilege to develop a professional commitment to justice. However, the papers varied in their operationalization, and no consensus existed on how to observe or measure the effects of structural competency on learners or patients. None of the studies examined the structural constraints of the learners studied.

Conclusions: Findings emphasize the need for training structurally competent physicians via national structural competency curricula focusing on standardized core competency proficiencies. Moreover, the findings highlight the need to assess the impact of such curricula on patient outcomes and learners' knowledge, attitudes, and clinical care delivery. The framework aims to standardize EM education while highlighting the

need for further research in how structural competency interventions would translate to an ED setting and affect patient outcomes and experiences.

INTRODUCTION

The emergency department (ED) has long been recognized as the “safety net” of the U.S. health care system, providing acute care, primary care, and a range of other services to the most disenfranchised patients and populations.¹⁻⁴ Recent scholarship in emergency medicine (EM) has turned to studying the upstream drivers of disenfranchised patients’ reliance on ED services and the structural barriers to their overall health and well-being.⁵⁻⁸ Similarly, EM educators have called for training *structurally competent* physicians—ones engaged in lifelong learning and self-reflection to recognize and respond to societal forces and structures that affect signs and symptoms of individual illness.⁹

“Structural competency,” first proposed by Metzl and Hansen, is defined as the trained ability for health professionals to recognize and respond to signs and symptoms of individual illness as the downstream effects of broad historical, social, political, and economic structures.¹⁰ This framework draws upon interdisciplinary knowledge and proposes five core components: (1) recognizing the structures that shape clinical interactions, (2) developing an extraclinical language of structure, (3) articulating “cultural” presentations in structural terms, (4) observing and imagining structural interventions, and (5) developing

structural humility (Table 1 provides more details of these core components).

A related term, “structural vulnerability” refers to physical and emotional suffering that is imposed on specific population groups and individuals in patterned ways resultant from class-based economic exploitation and cultural, gender/sexual, racialized, and other forms of discrimination.¹¹ Structural vulnerability manifests in myriad ways, including chronic diseases (e.g., diabetes and hypertension),¹² traumatic injuries (e.g., in people experiencing homelessness),¹³ and stigma within the health care encounter.^{14,15}

A variety of journals have published curricula,^{16,17} recommendations,¹⁸⁻²⁰ and research studies²¹ on incorporating structural competency and vulnerability into medical education.²² However, publications in the EM literature are relatively few.^{9,23} In this paper, we extend and operationalize the framework of structural competency into EM education. We begin by describing the results of a scoping review of medical education research and published curricula focused on structural competency and structural vulnerability, followed by a multistep consensus process culminating in the 2021 Consensus Conference of the Society for Academic Emergency Medicine (SAEM). Our aim was to provide a comprehensive overview of structural competency and its links to educational and patient care outcomes and to identify existing gaps in the literature to

TABLE 1 Examples of core structural competencies (see Salhi et al.⁹ for more detailed, ED-specific examples)

Core structural competency	Example
Recognizing the structures that shape clinical interactions	<ul style="list-style-type: none"> Recognize how constraints such as housing affordability, eviction policies, working conditions, outpatient services, and drug pricing affect how patients experience and manage illness Recognize how ED working conditions (e.g., availability of social services, pressures to efficiently manage and disposition high numbers of patients) affect how marginalized ED patients are diagnosed and managed
Developing an extraclinical language of structure	<ul style="list-style-type: none"> Think about and articulate ED patient presentations as manifestations of broader conditions of inequality, including housing, education, incarceration, and drug enforcement (among others)
Articulating “cultural” presentations in structural terms	<ul style="list-style-type: none"> Avoid thinking of culture in broad, overly simplistic terms (i.e., this patient believes X because s/he is Y) Consider a structurally based approach to the patient history, focusing on availability of food, housing, basic income, and legal difficulties, among other constraints
Observing and imagining structural interventions	<ul style="list-style-type: none"> Incorporate ways for learners to observe and work alongside local organizations working to ameliorate the effects of poverty and mitigating other forms of stigma and social marginalization (e.g., orientation programs, social medicine electives, invitation of local leaders to didactic conferences)
Developing structural humility	<ul style="list-style-type: none"> Avoid thinking about social problems as easily solvable with health care or other discrete interventions Cultivate productive, ongoing engagement and self-awareness among learners Recognize the boundaries and fallibility of medical knowledge

inform curricular implementation and future research. We conclude by proposing concrete steps to incorporating this approach into EM education.

MATERIALS AND METHODS

Scoping review

We conducted a scoping review of published work focused on structural competency and structural vulnerability following Arksey and O'Malley's six-step framework for scoping reviews, without the optional consultation exercise.²⁴ Our data collection and processing were guided by the following aims: (1) to provide a comprehensive overview of the medical education literature published on structural competency and structural vulnerability, (2) to identify the ways in which structural competency and structural vulnerability have been operationalized in medical education and related research, and (3) to identify existing gaps in the literature that could inform medical education and related research in EM.

We identified relevant studies using the key terms "structural vulnerability" and "structural competency" searching records published before November 2020 in MEDLINE, Scopus, and Web of Science. We chose these search terms because: (1) they were developed to address existing gaps in medical education; and (2) they are inclusive of concepts such as racism and social determinants of health, among others, and may be modified according to specific local contexts and individual programs' needs. All publication types (e.g., original research, reviews, perspectives) and methods (qualitative and quantitative) were considered. Articles were included in the initial screen if they were published in a peer-reviewed journal, written in English, performed in the United States or Canada, and addressed a topic broadly relevant to EM education and/or practice. Prior to abstract and full record screening, B.A.S. and A.Z. independently screened results from the initial database searches to exclude literature that did not meet the inclusion criteria (e.g., publications from structural engineering or molecular biology). The remaining articles were reviewed by two independent reviewers for title and abstract screening and inclusion. The reviewers were asked to determine if the articles were relevant to EM education (graduate or undergraduate [e.g., medical student clinical rotations or electives]). Any disagreement between the independent reviewers was resolved by B.A.S. and A.Z. If no abstract was available, the full text was retrieved for assessment of eligibility.

Each eligible article was reviewed by two additional independent reviewers who used Covidence²⁵ to complete a standardized data extraction form developed a priori (Table 2). Extracted variables included literature characteristics (e.g., author, journal, year of publication, funding source), study method and/or article type, and variables related to the initial aims (e.g., stated definitions or operationalization of structural competency and/or structural vulnerability). Reviewers were able to make inductive additions or

modifications (e.g., relevant notes or observations) to identify any information that may have been overlooked in the a priori categories.

Consensus building process

The scoping review was undertaken alongside a multistep consensus process culminating in the 2021 SAEM Consensus Conference, which aimed to create a focused research agenda for social EM and population health. The conference and the consensus building process are described elsewhere in greater detail.²⁶ Briefly, the consensus building process began in the year prior to the SAEM meeting and included a structural competency working group of 21 people divided into two working subgroups that met regularly to discuss findings from the scoping review, to develop a structural competency framework for EM education and research, and to shape content for two conference breakout sessions. During these breakout sessions, held two weeks apart to maximize participation and engagement, the working group leaders (B.A.S. and A.Z.) presented an assessment of the current literature and a draft of the educational framework to operationalize the concepts of structural competency and structural vulnerability. Attendees (41 during the first session and 42 during the second session) included SAEM members and non-SAEM stakeholders (specifically, representatives from the Association of American Medical Colleges [AAMC] and the Beyond Flexner Alliance) provided feedback during breakout sessions and participated in anonymous surveys following each session. Feedback from the meeting and surveys were incorporated into the framework presented in this paper.

RESULTS

Scoping review

The literature search identified 291 articles that underwent initial title and abstract screening. Of these articles, 53 were determined to be relevant to EM education and underwent full-text screening and standardized data extraction. Two articles were excluded following full-text review, as they were conducted outside the United States or Canada. The characteristics of included articles are summarized in Table 3. Most (29/51) of the articles reviewed were editorials, commentaries, or letters to the editor.^{9,10,19,27-52} Thirteen of the articles reviewed were original research.^{21,53-64} The remaining articles (9/51) were case studies, case reports, descriptions of implemented curricula, reviews of the literature, or a combination thereof.^{16-18,20,65-69}

The papers examined and conceptualized structural competency as an interdisciplinary framework that requires learners and educators to continually reflect on issues of power, privilege, difference, and identity in their professional development and care delivery. However, the papers varied in their operationalization of structural competency. For example, Bourgois et al.⁶⁵ operationalized structural competency in the form of a "structural vulnerability

TABLE 2 Scoping review data extraction form

Article characteristics	<ul style="list-style-type: none"> • Study title • Journal name • Year published • Funded (yes/no, if yes, source) • Publication/article type (letter to the editor, editorial/commentary, case study/case report, review, original research, other) • Study type (experimental study, RCT, cohort study, observational study, survey, focus group and/or interview study, ethnographic study, community-based research, other) • Academic discipline of journal (undergraduate medical education, emergency medicine, psychiatry/psychology/mental health, primary care, infectious disease, sociology, anthropology, nursing, social work, public health, other or multidisciplinary—specify drop down)
Education related variables	<ul style="list-style-type: none"> • Graduate or undergraduate medical education or professional/continuing medical education or not applicable (select all that apply) • Research question/purpose (free text) • Study population (medical students, residents, nursing students, community health workers, primary care providers, nurses, social workers, educators, other—free text) • Recruitment process/methods: direct recruitment through department or institution, public recruitment through advertising/media notices/community flyers, universal inclusion • Consent process <ul style="list-style-type: none"> ○ Written/verbal/mixed/waived ○ Other/free text: <ul style="list-style-type: none"> • Incentive ○ y/n; if yes free text • Curriculum design/implementation (yes/no; if yes describe briefly) • Topic/category of curriculum or intervention—choose all that apply (community health, COVID-19 pandemic, food insecurity, gender disparities, HIV/STI, homelessness, immigration, incarceration/policing, LGBTQ+, mental health, migrant or farm labor, race/racial disparities, sex work, substance use, violence, other/free text) • Other interventions (yes/no; if yes describe briefly) • Outcomes measured or observed: cognitive/affective/or behavioral changes, procedural or process changes, patient care outcomes, patient outcomes, other (free text)

TABLE 3 Summary of article characteristics

Article characteristic	n (%)
Location of study	51(100)
United States	13
Canada	3
Not applicable (e.g., editorial or commentary)	35
Article type ^a	51(100)
Editorial/commentary	27
Letter to the editor	2
Original research	13
Case report, case study, or curriculum description	6
Literature review	2

^aSome articles were assigned to more than one category. Therefore, the total count of articles will exceed 51.

checklist” to screen for conditions including former incarceration status, access to food, housing insecurity, or residency status using predefined questions. In contrast, Wear et al.⁵⁰ proposed incorporating film, literature, written texts, bioethics, and clinical and community experiences to guide students in their learning and clinical care. Finally, Sudak et al.⁴⁶ proposed the following action items for medical education: (1) bias training, (2) quality improvement activities involving community members, (3) recognizing past wrongs in medicine, (4) observed structural clinical encounters, (5) integrating

structural competency into continuing medical education (CME), and (6) institutional commitment to diversity.

Only 12 of 51 studies examined or measured a specific outcome. Of these, 10 studies^{21,52,54,56,57,59,61,64,67,69} defined an outcome as an affective or cognitive change in the learner, and two studies^{17,63} examined changes to clinical practice as a result of a specific intervention. None of the studies took place within an ED setting (e.g., learners or patient population). Thus, an important opportunity remains to study how structural competency interventions would translate to an ED setting and affect patient outcomes and experiences.

Notably, no consensus exists on how to observe or measure the effects of structural competency on learners or patients. Andress and Purtill⁵⁴ performed a study of medical students’ understanding of how health is related to place-specific systemic, institutional, and structural forces (Table 4). In doing so, they proposed a standardized proficiency scale to measure students’ understanding of the relationship between structural forces and individual health. Castillo et al.²⁸ offer a critique of the “systems-based” Accreditation Council for Graduate Medical Education (ACGME) competency, arguing that it is health care centric and overly focused on issues of cost containment, which may not be salient to all populations, particularly those who are stigmatized and disenfranchised. Instead, they argue for the introduction of a new ACGME core competency “centered on health equity, social responsibility, and structural competency to address this gap in graduate medical education.”²⁸

TABLE 4 Standardized structural competency proficiencies for practitioners

Level of proficiency	Definition
First	Knowledge about patient that exceeds the individual body to include an understanding of how social and structural systems—the nine domains—of a place shape population health
Second	Knowledge of external nonmedical resources, practices, or policies in the community that address structural issues from the nine domains that contravene the ability of health care practices to improve well-being
Third	Able to recognize how “I see” that patient and understand how that characterization (individual stigmatization) may be multiplied in systems to result in societal-level, structural stigmatization
Fourth	Acts as an informed citizen to undo unsuccessful policies, regulations, structures, and systems that influence the population health of groups in a place

Note: Modified slightly from Andres and Purtill.⁵⁴

Finally, none of the studies we reviewed examined the structural constraints of the learners studied or the ED or health care setting. Indeed, the COVID-19 pandemic has been revelatory of the vulnerabilities of health care workers,⁷⁰ particularly residents and other learners.

Consensus building process

Findings from the scoping review were presented at the 2021 SAEM Consensus Conference, during which participants in the two breakout sessions used these findings to make the following recommendations:

1. Standardization of core competencies and proficiencies for training structurally competent emergency physicians;
2. Developing effective national structural competency curricula that should be adapted for a specific local context;
3. Assessment of the educational impact of these educational curricula on learners' knowledge, attitudes, and clinical care delivery;
4. Assessment of the impact of these educational interventions on patient outcomes (e.g., health outcomes, patient experiences).

Following the original proposition by Hansen and Metz¹⁰ and building upon published structural competency curricula,²² we proposed that these recommendations address specific local or regional variations (e.g., in housing, access to health care, racial and gender-based discrimination) and be realized with the input and feedback of community partners and stakeholders.

Although there was general agreement with the propositions, important questions were raised during the consensus conference about what constitutes a “community partner” or “stakeholder.” We take “stakeholders” to be the target audience of a particular intervention, curriculum, or research study. We use “community partners” to refer to an intended audience or group (e.g., stakeholders) for the purposes of an intervention or research study. Community partners may be unaffiliated individuals with lived experiences or members

or leaders of a local, regional, or national organization. We recognize that, without adequate context, these definitions remain inherently ambiguous and may elide existing conflicts and tensions between people and institutions. For example, police departments are undoubtedly part of communities across the United States but have complicated and often antagonistic relationships with these communities, individuals, and other local institutions.⁷¹ Despite these difficulties, police departments may be valuable partners in some ED interventions and research efforts.^{72,73} We therefore urge that these definitions—and any resultant partnerships—be approached with humility and nuance. An in-depth exploration of the specifics of community and stakeholder engagement is beyond the scope of this paper. However, the Community Engagement Studios, developed by the Meharry-Vanderbilt Community-Engaged Research Core, is an excellent example of a structured, meaningful community engagement model that can be adapted to educational research and intervention development.⁷⁴

Participants also noted the importance of developing and disseminating robust faculty development resources given that structural competency and structural vulnerability are nascent concepts in EM education. Participants noted that faculty development resources are most helpful when designed to include explicit methods and specific, replicable examples in EM education. Indeed, much like any other EM competency (e.g., ultrasound or resuscitation), becoming “structurally competent” does not imply taking in a static set of facts or orientation to clinical practice. Rather, structural competency refers to an ongoing, iterative process of engagement, reflection, and adaptation.¹⁶ Thus, scholarship and faculty development resources should also reflect the processual nature of this competency rather than presenting a “check-the-box” model.

Additionally, participants noted that a singular focus on vulnerability may unintentionally reinforce stigma and belie the humanity, strength, and resiliency of people experiencing poverty, discrimination, and other adversities. We urge that when discussing and studying *conditions* of poverty, these should not be conflated with *people* living in poverty to avoid inadvertently undermining their dignity and humanity and reinforcing harmful stereotypes.

Participants voiced the importance of recognizing and measuring “success” or “progress” and, when possible, aligning these measures with existing EM milestones. Success can be measured or observed on an individual learner level, at the level of institutions, or in the clinical realm. Importantly, it should be noted that structural competency deliberately seeks to decenter and disrupt medicine’s focus on individuals and “personal choice” as primary contributors to beliefs, behaviors, and health outcomes. We therefore advocate that institutions, rather than individuals, be the primary focus of research and analysis. The focus on institutions—along with historical, economic, and political processes—is especially important now, when conversations about racial and other inequities are emotionally charged and laden with misinformation.

DISCUSSION

This review synthesizes a broad sample of peer reviewed literature to describe the ways that structural competency and structural vulnerability been described and deployed in graduate and undergraduate medical education. The literature describes how these terms are burgeoning in medical education and contributing to learners’ more robust understanding of the relationship between individual health and social systems writ large. Given that EDs are the “front door” of the hospital, structural competency is especially salient to EM education and practice, yet there remain opportunities to build our resources and knowledge base.

It should be noted that learners—who are the targets of any curriculum or intervention incorporating structural competency and vulnerability—are not a monolith. Some may be skeptical of or limited in their understanding of this approach. Others may have lived experience(s) with discrimination, socioeconomic disadvantage, or other structural vulnerabilities. To minimize harm or disengagement with the subject matter, educators should engage learners with the knowledge and recognition of the power dynamics inherent to medical education and the ethical nuances of studying learners. EM educators and trainees can overcome these difficulties by focusing on the preponderance of evidence from around the world demonstrating the clear links between poverty, inequity, discrimination, and poor health outcomes.

A STRUCTURAL COMPETENCY EDUCATIONAL FRAMEWORK

Figure 1, adapted from Kessler et al.⁷⁵ and based on Kern’s six steps of curricular development,⁷⁶ represents a framework for a developing a national structural competency curriculum for EM learners. We contend that a national framework can help standardize EM education and structural proficiency for learners. Specifically, we propose a national set of learner and faculty development tools to ensure that our understanding and deployment of structural terms and concepts are accurate and reproducible. This may include on-line blogs, podcasts, and/or an interdisciplinary scholarly base of articles and books available for educators and learners. Central to

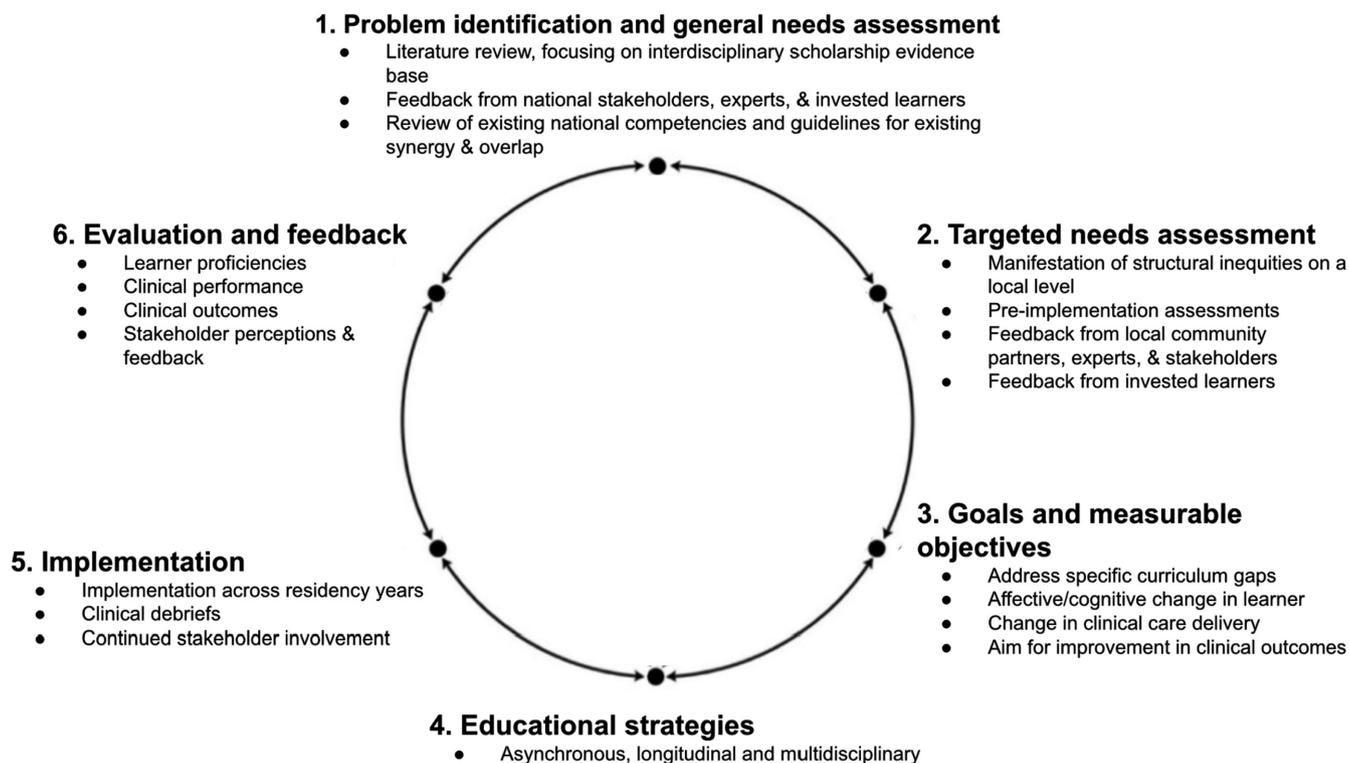


FIGURE 1 Proposed structural competency educational research framework

this framework is that invested learners, along with national stakeholders, are included throughout the development, implementation, and evaluation of the curriculum. Moreover, the development of a national curriculum removes the burden of structural competency from individual learners and educators, recognizing that institutions are primarily responsible for reforming medical education.²²

We propose that this national framework and associated curriculum be used to provide the foundational aspects of structural competency. This scoping review and consensus building process serves as the beginnings of the needs assessment for that national curriculum. In addition to this foundational curriculum, individual programs should follow the framework to develop locally related structural competency curricula, involving community partners who can provide viewpoints of the relevant structural vulnerabilities in the area.

To illustrate how this framework could be used both nationally and locally using a specific aspect of structural competency, consider the well-demonstrated link between place of residence and life expectancy in the United States.⁷⁷⁻⁷⁹ Focusing on this identified problem, national-level experts may include experts in social medicine, historians of U.S. housing policy, social scientists expert in urban and/or rural housing, public health practitioners, EM researchers, and/or activists and advocates working to expand affordable housing and end homelessness. A national-level panel of these experts and invested EM learners (e.g., ones who have worked with local, regional, or national housing organizations) may be convened to perform an interdisciplinary literature review, pointing out that neighborhood-level variation is a result of deliberate engineering of racialized and classed inequality by the federal government and the Federal Housing Administration (e.g., through redlining and mortgage discrimination).^{80,81} The literature review can point to the ways that residence patterns have simultaneously evolved (e.g., through migration patterns and neighborhood gentrification) and retained vestiges of discrimination in the New Deal Era.^{82,83} Further, the literature review can highlight ways that residence patterns can influence access to food, health care, education, and other resources in the United States.⁸³ This would serve as Point 1 on the framework in [Figure 1](#). National experts could take this information and propose associated goals and measurable objectives (Point 3) based on existing ACGME competencies as well as potential educational strategies (Point 4) that might serve to best convey the desired information and methods of evaluation of learners' intake and use of education (Point 6). Findings and resources may be publicly disseminated for use by individuals, residencies, and institutions.

Individual residency programs would then need to take the national-level structural patterns and do a "targeted needs assessment" (Point 2) to identify and meet local needs. Building on the example of residence patterns, local scholars and community partners should be invited to weigh in on the importance of local histories and ongoing changes in local residence patterns and how this affects the health of the patients served by the residency program hospitals. Taking all of this information into consideration, local curriculum developers could design education strategies around this including having learners use interactive maps⁸⁴ and online tools^{85,86} to

identify local census tract variations in life expectancy. The previously invited community partners might be invited in to help with the didactic series to make the information on paper more real and relatable to learners, focusing on structural vulnerabilities *and* local resilience strategies. In addition to didactic series, learners may be encouraged to attend local meetings, teach-ins, or other activities to develop their familiarity with local processes.

Residency programs should continue to work with local scholars and community partners as they develop their curriculum and involve community partners in implementation decisions. Indeed, the sudden influx of a number of "privileged" and "undereducated" (in this world) people into the local meetings and processes may damage any trust or existing relationships with community partners. Within the implementation process, a structured method of debriefing learner involvement in local activities and their clinical observation and experiences, for learners, local partners, and other educators, should be developed. Learners should be encouraged to link their experiences outside of the clinical environment with the patients they care for clinically. All stakeholders and community partners should be involved in assessments of the learning process and its impact on patient outcomes, with explicit emphasis on how increasing structural competency can affect patient care and outcomes. Experiences and results from ongoing local education, research, and assessment may be used to inform further iterations of national level recommendations and resources. We argue that this approach will enhance residents' understanding and insight into local vulnerabilities and strengths and will enhance empathy and competency in clinical care.

LIMITATIONS

This review has several limitations. First, our review included only studies that utilized frameworks of structural competency and structural vulnerability. Our search terms may have excluded published papers that add to our understanding of the ways that historical, political, and economic structures influence health, illness, and clinical care delivery. However, our database search results underwent multiple reviews and discussions, and we are confident that the data presented are representative of the current state of structural competency in medical education. Second, we excluded studies published outside of the United States or Canada. While we recognize that historical, political, and economic structures are salient to medical education and health care delivery across the world, we sought to summarize data and propose a framework adaptable to medical education in the United States and Canada and we believe that our selection criteria have accomplished this. Third, we limited our searches to the medical education literature. Other areas of education have made valuable contributions in applying structural competency and structural vulnerability frameworks. However, we believe that limiting our focus to the medical education literature is appropriate given the unique features of medical education and EM training.

CONCLUSIONS

Further evaluations of these contributions in the future may help refine any approach taken in EM. However, structural competency and structural vulnerability were developed for application in medical education and practice. We therefore believe that there is a solid foundation in the medical education literature to support the limitation of our review to the medical education literature. Finally, the transferability of findings to emergency medicine education is limited by the small number of articles conducted in an EM setting. Nevertheless, a large body of evidence strongly suggests that EM education and clinical practice are fertile ground for a unifying structural competency framework.^{2,87-89} Moreover, the consensus building process helped make our framework relevant and specific to EM education.

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