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Mary Catherine Minke

Philadelphia College of Osteopathic Medicine

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Philadelphia College of Osteopathic Medicine
Graduate Program in Biomedical Sciences
School of Health Sciences

**Incorporating Adverse Childhood Experiences in
Medical Student Trauma-Informed Training**

A Capstone in Biomedical Science -Public and Population Health Leadership

By Mary Catherine Minke

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Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Science
in Biomedical Sciences, Public and Population Health Leadership Concentration
May 2021

ABSTRACT

One of the emerging fields in public health has become how behavior and personal experiences shape the health experience. Particularly, there is interest in understanding how the environment that one lives in changes one's biology, causing disease, and how interventions can combat this change. A 1998 study conducted by the CDC and Kaiser Health first characterized negative household environments that suffered from dysfunction or abuse and showed how this could be a leading cause of death in adults (Vincent, et al., 1998). Researchers termed these Adverse Childhood Experiences (ACEs). Since that time, additional studies have found that those who suffered from one or more ACEs had increased chronic health issues, mental illness, and substance misuse (CDC, 2020). Studies have also shown that patients who suffer from trauma who visit a doctor with training in ACE and trauma-informed care are more likely to have fewer ER visits, hospitalizations, and repeat physician visits to manage chronic issues. (Felitti & Anda, 2014). Physicians must have knowledge and training surrounding ACEs and trauma to increase trust in the physician-patient relationship, increasing communication. (Stewart, 1995). Since the idea of ACEs is relatively new, research shows physicians are less likely to be exposed to this concept, and additional studies have found that physicians were less likely to have experienced an ACE themselves (Stork, Akselberg, Qin, & Miller, 2020). While education and training around this topic should occur at all medical education levels, medical students must be exposed to this early on in their careers. Additional research around physician communication has shown that medical students who participated in programs centered around these skills had greater communication and empathy later in training than their counterparts who did not

participate (Joeke, Noble, Kubaki, Potts, & Llyod, 2011). Similar ACE programs are beginning to be implemented in various forms around the country. Early qualitative measures show that students appreciate knowledge around this topic and have some increase in knowledge around the topic. A professional development program could increase knowledge around this area, increasing trust in the physician-patient relationship and reducing ACE-related health complications.

INTRODUCTION

Since the 1990s, there has been increasing interest and research around the idea that traumas in early childhood can play a role in future health outcomes. In 1998 the CDC and Kaiser Health completed a large cross-sectional study that showed a link between childhood trauma and preventable disease and early death (Vincent, et al., 1998). Researchers labeled these Adverse Childhood Experiences (ACEs). Since that time, there has been extensive further research to understand the nature in which ACEs impact health and in what ways can physicians and public health officials intervene. Physicians are a key element of the public health team and can address some of these issues. Two essential public health services are building a diverse and skilled workforce and increasing effective communication to educate and inform the public (CDC, 2021). By increasing physician training around the concept of ACEs, trauma-informed care, and diagnostic tools to screen patients who might be suffering from certain types of traumas, consequences from ACEs could be minimized, and patients could receive more effective care. This is a call for action is timely given the COVID-19 pandemic and its challenges presented to a variety of families, including already disadvantaged families (Tomaz & Castro-Vale, 2020). Some physicians have already called for greater trauma-informed care training to help better navigate complex patient issues (Sciolla , Eckstrand, & Potter, 2016)

BACKGROUND

Adverse Childhood Experiences

What exactly are Adverse Childhood Experiences (ACEs), and how do they contribute to physician-patient interactions and health outcomes later in life? ACEs are any traumatic event that leads to long-term negative consequences. The CDC (2020) classifies these experiences as occurring before 18 and falling under three categories: abuse, household challenges, and neglect. Abuse ranges from physical, sexual, and emotional abuse in and out of the home. Examples of household challenges include parental violence, substance abuse, mental illness, divorce, or incarceration that a child might have seen a family member suffer. Neglect consists of emotional and physical neglect that a child could have suffered (CDC, 2020).

For their initial study, CDC/Kaiser mainly interviewed white and middle/upper-class people. Additional research was conducted to expand understanding of these factors in more diverse racial/ethnic populations and varying sociodemographic populations. Philadelphia has been an area where ACEs have been studied, and interviews with participants in studies conducted in Philadelphia expanded the CDC classification of ACEs based on their stories (Cronholm, et al., 2015). The study included 1,784 participants, and according to surveys conducted in this study, 7/10 Philadelphians had experienced an ACE, and 2/5 had experienced four or more ACEs ($p < 0.001$).

The CDC classifies the risk of developing a chronic condition linked to four or more ACEs (CDC, 2020). There has been research in various specialties that have shown some sort of link between ACEs and chronic conditions, such as sexual assault and

obesity, exposure to smoking, and lung disease (Boullier & Blair, 2018). The CDC has even developed a pyramid model to illustrate better how ACEs can lead to chronic health conditions over the life course (CDC, 2020).

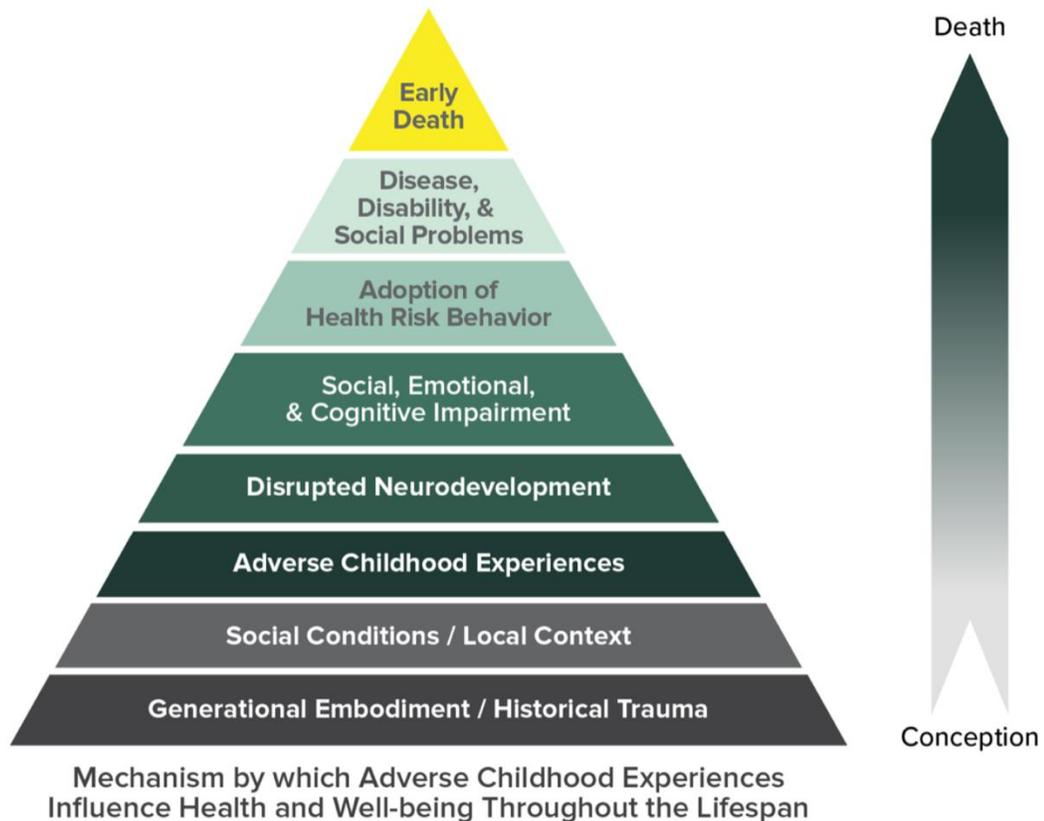


Figure 1. ACE pyramid model, Source: CDC. Used with general authorization permission

Research has now begun to understand the biological mechanism of action that could be causing these chronic conditions. There has been some evidence to suggest that toxic stress alters biological mechanisms, increasing allostatic load, accelerating the aging processes (Boullier & Blair, 2018).

On a behavioral and social-emotional level, certain types of trauma can lead to decreased trust in personal relationships and institutions, such as healthcare. (Birkhäuser, et al., 2017). Those who have suffered from betrayal trauma, such as sexual assault, partner violence, or violence in the home are less likely to trust physicians and exhibit medical nonadherence. Women are at greater risk of suffering from betrayal trauma (Klest, Tamaian, & Boughner, 2019). Additionally, those who have decreased physician trust or lack of a relationship with a primary care provider are more likely to have repeat emergency room visits and hospital admissions for the same chronic health conditions (Felitti & Anda, 2014).

Physician-Patient Communication

Empathy, trust, and connection are some of the core components that lead to a successful physician-patient relationship. At the heart of these components is effective communication, which leads to a better understanding from both parties. Effective communication has been shown to lead to increased patient satisfaction, including a better understanding of medical conditions and greater adherence to medical treatment (Birkhäuser, et al., 2017). Meta-analysis has shown that physicians who participate in communications training score better on the communication portion of board examinations and are more skilled communicators than their colleagues who did not receive such training (Stewart, 1995). Given that a large percentage of the population suffers from some ACE, including trauma-informed care into communications training is vital. There are three elements in trauma-informed care practice: recognizing the prevalence of trauma, understanding the trauma affects everyone, and putting knowledge of trauma into practice (Substance Abuse and Mental Health Association). A brief survey

conducted among 226 general practitioners in a Michigan community hospital showed limited understanding of ACEs, and the study showed few physicians to have suffered from an ACE themselves (Stork, Akselberg, Qin, & Miller, 2020). There also was limited knowledge around screening tools for patients and strategies for dealing with patients who had suffered from ACEs.

This capstone will investigate the few programs that have been initiated early in medical education, at the medical school level to address education regarding ACEs and trauma-informed care. It will compare findings and recommend strategies for the development of future programs.

RESEARCH STRATEGIES

Research around the topic was collected using PubMed and Google Scholar. The phrases “trauma-informed training ACE,” “Physician communication programs,” “professional development medical students,” “adverse childhood experiences,” and “physician-patient trust” were typed into the search box to yield results. Studies were selected that included some sort of physician communication training program that also educated around the topic of ACEs and included some quantitative measures that showed the program’s effectiveness. Studies were limited around this topic, so all studies at the medical school level that included communication training around ACEs were included. Additionally, studies that focused on trauma-informed care that acknowledged the health consequences of trauma but didn’t explicatively state ACEs were included.

Summaries are drawn from each study and are broken into study accordingly. Key points included a focus on the type of education received, including the content that was presented to students. It will also compare and contrast the differences in the training and highlight areas of strength and weakness where future programs could improve upon. The focus is to show these studies in a digestible format for public health officials and medical educators who wish to create programs of their own to educate around this topic.

Review of Data

Although studies were limited around this topic, several studies were found that described curriculum created around this topic from 2011-2021. The first was published in the UK in 2011, focusing on professional development training to improve communication skills with first-year medical students (Joekes, Noble, Kubaki, Potts, & Llyod, 2011). They also assessed whether this communications training impacted later clinical assessments that occurred in years 3 & 4. Questionnaires were used to evaluate student's confidence levels surrounding communication before and after training. The sample included 626 students, with 307 receiving traditional training and 323 receiving professional development training. The professional development ranged on various topics from integrated communications skills, ethics, and law. Students met once a week for a year, and content was delivered via lecture, small group, simulated patient, and a visit to a community health facility. Teaching assistants were also available. Students who participated in this program scored better on communications assessments than their counterparts ($p < 0.001$), however, there was no significance when assessed in a clinical setting in later years. This was specifically around communication rather than ACEs, but the program shows how a holistic education curriculum can be incorporated throughout the foundational science medical years of medical education.

In the US, most program that exists for medical students typically address the broader category of trauma-informed care (TIC), rather than specifically address ACEs. One curriculum at Brown University that was developed for first-year students focused on trauma-informed physical examination during a clinical skills course (Elisseou, Puranam & Nandi, 2018). During a typical three-hour class for clinical skills, 35 students

initially participated in a lecture around trauma-informed care. They then had small group time to practice both a physical exam and medical interview using trauma-informed practices with a supervising faculty member. This was reviewed favorably by students, and three months after the session, surveys found that the students were still showed familiarity, comfortability, and practiced TIC ($p < 0.001$). Brown decided to scale this program and incorporate all first-year students.

One specific study addressed introducing ACEs in a lecture format to first-year medical students, and resiliency was also a study component. One hundred twenty-four students participated in either a live or online recorded 1-hour lecture. The focus of the lecture included an introduction to ACEs and the link between ACEs and chronic medical conditions. Self-assessments completed pre, and post-lecture showed a significant increase in student knowledge surrounding the topic ($p < 0.001$). (Onigu-Otite & Idicula, 2020). There was no further assessments to show how the students incorporated this into their communications style with patients or how long students retained the material.

Another study that incorporated the specific role of ACEs within a course was at Rutgers New Jersey Medical School (Pletcher et al., 2019). They created a three-hour workshop as a part of a larger health equity and social justice mandatory course. Specific themes of the course included the power dynamics of the physician-patient relationship, social determinants of health, and partner violence. This workshop ran for three years with 535 students participating. It included topics related to foundational knowledge of the topic and a review of assessment tools that providers can use with patients.

Two additional recent studies also focused on educating medical students but were more event-based electives like symposiums, or discreet trainings that students could electively choose to participate in. The first was at UC Davis, with 20 students over two separate summers (9 students in 2014 and 11 students in 2015) as part of a summer institute on Race and Health. The lecture format was 6 hours in total, two hours apiece spread out over three days. The content revolved around foundational learning of the prevalence of trauma, foundational knowledge of ACEs, and their impacts on health. Students then used this foundational knowledge to educate around and practice a trauma-sensitive assessment. Qualitative data were collected using five open-ended questions. Most students showed a favorable response to the training and felt it beneficial (Goldstein et al, 2018).

George Washington University School of Medicine and Health Sciences created a symposium where 179 second-year medical students attended. The symposium was 4 hours and included lectures around trauma, childhood adversity, and health. It also attempted to address the health effects that those with trauma experience and help develop a trauma-informed approach to patient care. Qualitative surveys were collected from students, and 4/5 gave the symposium a positive rating and stated that it had increased their knowledge around TIC (Chokshi et al., 2020).

Authors	Length	Delivery	Content	Significance
Joeke et al	once a week/year	lectures and small groups	communication, ethics, law	p <0.001
Goldstein et al	6 hours	lectures, discussions, practice	foundational learning of the prevalence of trauma, foundational knowledge of ACEs and their impacts on health, trauma-informed assessments	positive response
Onigu-Otite et al	1 hour	Live and online lecture	Foundational ACE knowledge, link between ACE and Health	p <0.001
Elisseou et al	3 hours	lecture, small group	Hour 1: foundational lecture; Hour 2-3: small group practice of physical exam and medical interviewing skills	p<0.001
Chokshi et al	4 hours	lecture, small group	principles of TIC, application of TIC	qualitative 4/5 positive rating
Pletcher et al.	3 hours	Lecture, small group discussion	Foundational principles, application of ACE assessments, case study	

Table 1. Summary of studies and main points

DISCUSSION

The most striking observations of this research are the limited number of studies that surround this topic and the lack of clear distinction between ACE and trauma-informed care. While ACEs are certainly a part of trauma-informed care and should be taught hand in hand, ACEs have separate considerations that should be taken. Given that trauma occurred in childhood, certain developmental factors can influence a patient and the trauma recovery period. While having a trauma informed approach will certainly help providers navigate relationships with patients who have suffered an ACE, there are also specific assessment tools that providers can use to identify patients that are at risk of ACE-related health conditions. Not educating around the particular health conditions that can arise from ACEs and strategies that providers can use to intervene both one-on-one and, in the community that they practice in, would be a mistake.

Content

Most programs had a hybrid of lecture and hands-on components. Lectures established foundational knowledge, either of ACEs or the trauma process. Additionally, they discussed conducting trauma-informed interviews and assessments or discussed ongoing research and community data collected. Often these lectures were used as the groundwork for students practicing trauma-informed care skills through interviews and physicals exams while being overseen by an expert. Many programs brought in psychological experts on the topic to conduct this training, or they modeled it around theories and principles established by trauma psychologists.

Students responded favorably to these hands-on experiences, and often those who responded to surveys or other assessments of the experiences asked for more practice time with a standardized patient or more small-group time (Elisseou, Puranam & Nandi, 2018) (Chokshi et al., 2020). They also felt that the lectures increased their knowledge around the topic, and often these lessons were retained several months after they were taught. Exposure to and knowledge around TIC and ACEs allowed students to be more mindful of their approach with patients. There was also a feeling of wanting more time to learn about and practice these principles by those who responded to surveys, particularly by those in programs where the time spent was more limited, or the programming was elective based. Most programs were only several hours in length and were found incorporated into an event or course focused on humanities. Mostly first-year medical students attended these courses, especially if they were mandatory course-based.

Only one study, by Pletcher et al. (2019), made a clear distinction in instructing around power-based trauma issues that can arise with ACE. While this can be a separate issue occurring later in the life-course and should be a point of consideration with all TIC, ACEs that have power-based or relationship-based violence often lead to patients having a more negative experience with providers and less adherence to medical advice. This type of trauma also disproportionally affects women, particularly women of color, who are already marginalized within the healthcare system. Effective communication is already shown to be a benefit to patient adherence. Therefore, it is essential that programming makes a note of this during training and incorporate it into the TIC process.

Reliability

Given the rise in knowledge around this topic, studies are just beginning to be conducted on the effectiveness of programming and the future consequences of such training. For now, the primary measure of this type of programming is qualitative around how much students felt they learned and how well they retained some of the lessons. Given that there was a high percentage of programs incorporated in elective symposiums, usually dealing with issues of equity and justice, it is likely that this attracted a certain type of student who would find this topic beneficial. In Elisseou, Puranam & Nandi (2018), in which the foundational knowledge and the skills of taking a trauma-informed assessment and physical exam were assessed, students could retain some of the lessons three months after the clinical skills lab. Response rates were generally lower with follow-up surveys, and multiple authors noted that the students who responded to these surveys were often those who were engaged in other justice and equity projects and had previously shown an interest in the subject matter.

It is unclear yet if this training early in medical education will have implications on physician communication and patient adherence in the future. There are limited quantitative measurements of the effectiveness of these programs yet, especially since studies are so limited.

RECOMMENDATIONS FOR FUTURE STUDIES

Given the fact that this is a new area of study and conversation, both in the public health and the biological science communities, there will be plenty of further information surrounding this topic that is likely to emerge in the future surrounding trauma and the biological mechanisms that can cause disease and what we can do to intervene. One of the core tenants of public health is creating a competent and educated workforce. While new research is being conducted, healthcare providers must be educated around ACEs.

The future of medicine is one where there is more emphasis placed on the patient-doctor relationship and the patient experience. Some healthcare systems and insurance companies are moving towards a model rooted in patient-reported outcomes for assessing the physician's performance and value of the healthcare received (Abdurrob & Smith, 2020). If this is the model moving forward, physicians must have effective communications training, specifically rooted around issues that could have implications with patient's health, confidence, and trust in their healthcare. Much of the research surrounding physician communication, patient trust, and satisfaction has been limited to areas outside the United States in areas such as Canada and the UK. There are many opportunities in this country to implement and study programs of this nature.

While trauma-informed training is not a new concept, incorporating the ACE model into this training will give physicians and future physicians tools to address specific health complaints that might arise due to previous trauma. Additionally, it could benefit students to understand this while they are learning about core sciences in medicine.

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