



Getting to Why: Adverse Childhood Experiences' Impact on Adult Health

Rebecca Hilgen Bryan, DNP, AGNP

ABSTRACT

Exposure to adverse childhood experiences (ACEs) contributes to 7 of the 10 leading causes of death in the United States as well as health risk behaviors, including substance abuse, physical inactivity, and high-risk sex behaviors. ACEs are traumatic childhood events that effect biopsychosocial health across the lifespan. It is vital for health care providers to view individuals from a trauma-informed perspective to guide best practice, but few are aware of ACEs, particularly those who treat adults. A review of the science of ACEs research, feasibility of screening for ACEs, and effective responses to trauma-impacted patients is presented in this report.

Keywords: ACEs, ACE screening, adult health, adverse childhood experiences, primary care, trauma-informed care

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Rebecca Hilgen Bryan, DNP, AGNP, is affiliated with Urban Promise Ministries, Camden, NJ. She is available at rbryan64@gmail.com. In compliance with national ethical guidelines, the author reports no relationships with business or industry that would pose a conflict of interest.

In the 1990s, the Centers for Disease Control and Prevention together with Kaiser Permanente discovered that traumatic events during childhood, termed adverse childhood experiences (ACEs), were common, with 64% of the original 17,337 mostly white, mostly college-educated study participants having 1 ACE, 40% having 2, and 12.5% having 4 or more.¹ The traditional 10 categories of ACEs are physical, emotional, and sexual abuse; physical and emotional neglect; witnessing domestic violence, having a family member affected by mental illness, substance abuse, or incarceration, and losing a

parent to separation or divorce² (see the Supplementary Appendix, available online at <http://www.npjjournal.org>).

Importantly, this seminal ACEs study demonstrated a dose-response relationship between childhood adversity and health risk behaviors such as substance abuse, physical inactivity, and high-risk sex behaviors as well for the leading causes of death in the United States, including ischemic heart disease, any cancer, stroke, chronic obstructive pulmonary disease, diabetes, and suicide.² Ongoing research has demonstrated that exposure to childhood trauma

This CE learning activity is designed to augment the knowledge, skills, and attitudes of APNs and other health care providers about the impact of ACE on health outcomes across the lifespan, as well as how to respond to trauma-impacted patients, as measured by a score of 70% on the CE evaluation quiz.

At the conclusion of this activity, the participant will be able to:

- Describe how ACE increase the risk of physical and mental health diseases
- Explain how and why to assess for childhood maltreatment in adult patients
- Identify how to respond to patients with ACE exposure

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The author does not present any off-label or non-FDA-approved recommendations for treatment.

This activity has been awarded 1 Contact Hours of which 0 credit is in the area of Pharmacology. The activity is valid for CE credit until March 1, 2021.

alters brain development, affects immune and endocrine systems,³ and alters genetic expression.⁴ An ACEs score of 6 or more puts individuals at high risk of dying 20 years younger, compared with individuals without exposure to ACE, of diseases commonly diagnosed in the primary care setting.⁵ “The findings suggest that the impact of these adverse childhood experiences on adult health status is strong and cumulative.”^{1(p251)} ACEs are a phenomenon distinct from single forms of childhood abuse⁶ because they capture the cumulative effect of experiencing multiple adversities and have been likened to the germ theory as the root cause of a majority of noninfectious diseases.⁷

The Centers for Disease Control and Prevention have offered an ACEs module for the Behavior Risk Factor Surveillance System since 2009. More than 500,000 patients have been screened for ACEs, and the results have been remarkably consistent.² ACEs are being studied in diverse populations living in concentrated urban poverty, where prevalence is higher, especially as the categories of ACEs are being expanded to reflect community effect: these include racism, bullying, living in foster homes, witnessing community violence, and homelessness.⁸

Despite the research available, health care provider (HCP) knowledge about ACEs is lacking, and screening for ACEs in adult patients in the primary care setting is uncommon.⁹ It is time for HCP to shift to trauma-informed care so that individuals are asked, “What happened to you?” instead of “What’s wrong with you?”^{10(p476)}, because when you understand the trauma, you understand the behavior.

ACEs AND CHRONIC DISEASE IN ADULTHOOD

Evidence demonstrating the relationship between exposure to childhood adversity and adult health outcomes continues to grow.¹¹ The dose-response relationship between ACEs and chronic disease is complex, with many variables affecting gene expression, inflammation, and disease progression; therefore, given the current rigor of research available, causation cannot be asserted. That said, the fields of neuroscience and genetics are generating data that help to explain how what happens in childhood affects health across the lifespan. The American Heart Association recently published a statement recognizing the strong association between

exposure to ACEs and cardiometabolic outcomes, including heart disease, hypertension, obesity, and type 2 diabetes.¹² ACEs strongly predict behaviors that increase the risk of adult cancer, something that HCPs would benefit from knowing when assessing risk.¹³ After controlling for smoking and other risk contributors, the risk for chronic obstructive pulmonary disease increased as the number of ACEs increased, suggesting that childhood maltreatment was an independent risk factor.¹⁴ ACEs exposure increases the risk of type 2 diabetes by 32% compared with patients with no ACEs.¹⁵

DEPRESSION AND SUICIDE

Suicide remains one of the overall leading causes of death in the US and the second leading cause of death in adolescents.¹⁶ A dose-response relationship exists between the number of ACEs and the likelihood of depression and suicide, such that a patient with an ACEs score of 6 or more is 24-times more likely to attempt suicide than a patient with an ACEs score of 0.¹⁷ The risk for depression nearly triples with ACEs exposure, as does the risk of drug and alcohol use. This most recent study replicated findings from earlier studies, again highlighting the importance of HCP recognition of the role exposure to ACEs plays in overall health and well-being.

ACEs AND HEALTH-RISK BEHAVIORS

ACEs exposure predicts adult obesity after controlling for several confounders,¹⁸ with strong relationships between all categories of childhood maltreatment and disordered eating.¹⁹ The original ACEs study was a result of follow-up to recidivism in a weight loss program involving 30,000 patients: clients who had lost > 100 pounds and gained it back were queried, “Why,” and it was here that unexpected histories of childhood sexual abuse and markedly dysfunctional households were discovered. Losing weight was experienced as sexually or physically threatening; obesity functioned as a protective factor emotionally.²⁰

A strong, dose-response relationship between ACEs exposure and smoking nicotine has been repeatedly demonstrated, with recent research expanding the association to other substances, including marijuana, hard drug use, and binge

drinking.²¹ Exposure to a specific ACE stands out here, with household substance abuse having the strongest causal link.

The association between ACEs and high-risk sex behaviors, including having unprotected sex, giving or receiving money for sex, and being diagnosed with sexually transmitted disease was demonstrated in a large data Behavior Risk Factor Surveillance System study.²² The seminal ACEs study demonstrated an association between ACEs exposure, having multiple partners, and sexually transmitted disease.¹

THE BIOLOGIC PLAUSIBILITY OF ACEs EFFECT ON HEALTH ACROSS THE LIFESPAN

In another landmark study, ACEs researchers, together with neuroscientists, integrated data on the neurobiological effects of childhood trauma with the epidemiologic data from the ACEs study.²³ Asserting that ACEs are the connection between dissimilar but comorbid social and health problems, this study highlighted the artificial split between body and mind disorders, a point that was echoed in Kalmakis and Chandler's¹¹ systematic review of 42 studies on the association between ACEs and adult health outcomes. ACEs have a profound effect on the developing brain: neurons wire together based on lived experience, and children growing up in toxically stressful situations have brains that function out of survival mode.²⁴ Documented brain changes include reduced global volume; alterations in limbic circuitry, particularly the amygdala and hippocampus, responsible for emotion; and alterations in prefrontal cortex development, responsible for attention, executive function, and self-regulation.²⁴

The concept of allostatic load helps to understand why what happens in childhood is so strongly associated with chronic disease in adulthood.³ In addition to impairing brain structures (changes that persist through adulthood) ACEs affect the endocrine system, with adults showing chronic activation of the hypothalamic-pituitary-adrenal axis, and affect the immune system, with adults showing persistently elevated inflammation levels. These changes contribute to an adult's allostatic load. Elevated allostatic load persists despite changes in the environment, such that years after living without maltreatment, adults who had exposure to ACEs demonstrate significant changes in allostatic systems.

Epigenomes are proteins that interact with mammal genomes and appear to be the link between environment and genetic expression. Childhood adversity has been associated with methylation, which alters gene function without changing the DNA nucleotide sequence.⁴ This has been likened to a "stop sign" being inserted into the instructions for protein construction, in effect, silencing healthy gene expression. Epigenetic changes to DNA due to stress persist, and research has demonstrated intergenerational transmission.²⁵ Exposure to ACEs is also associated with premature shortening of telomeres, the protective end sequences of DNA.²⁶ The cumulative effect of childhood adversity on the developing body-mind is profound.

THE VALUE OF SHIFTING TO A TRAUMA-INFORMED PARADIGM

HCPs who recognize the prevalence and effect of exposure to childhood adversity on health and well-being across the lifespan experience a shift in perspective that has the potential to increase empathy and compassion.²⁷ Health conditions, such as obesity, and behaviors, such as smoking, are considered to be problems by HCPs (not incorrectly); for the patient, though, overeating and smoking may be the solutions to overwhelming emotions from life experiences.²⁰ In other words, risky behaviors or health issues are the marker of a problem, rather than the core problem. Understanding this can alter the way questions are asked, for example, with the use of motivational interviewing techniques, because a trauma-informed HCP realizes that changes in health status, such as a major weight gain, tend to be abrupt, occurring at the time of a life event. When taking the history of a health issue, the question shifts to, "What was happening around the time (the health issue) began?" For instance, I had a 17-year-old male patient suffering from insomnia that caused significant academic issues, beginning at age 9. When queried, the young man stated that was when his father abandoned his family, which no one ever discussed.

In the only study that has looked at the effect of screening on outcomes, Felitti²⁸ addressed the importance of asking, "Why?" regarding the development of illness and disease. He noted that in an unpublished analysis of a 125,000-patient cohort

in which patients were screened with ACEs questions, physician office visits dropped by 35% the following year.²⁸ Felitti et al,²⁰ “learned that discussion of these (ACE) experiences is usually *not* uncomfortable to those who have had them if they are supported by someone comfortable with their discussion. Patients often find a great sense of relief in discussing their life experiences.”^(p26)

ACEs SCREENING IN THE PRIMARY CARE SETTING

Clinicians express concern about ACEs screening in the face of primary care office time constraints and concerns of offending or distressing patients; however, multiple studies have demonstrated feasibility.^{9,29,30} Clinician study participants felt that the ACEs survey did not interfere with the visit, and patients found being screened acceptable. Although the ACEs discussion did lengthen the visit, it was 5 minutes or less if the ACEs score was ≤ 4 ; with a high ACEs score, 75% of visits lengthened but no visit was more than 15 minutes longer.⁹ This is consistent with ACEs screening at Kaiser Permanente, where the seminal ACEs study occurred and where they have continued to screen since the 1990s. Patients took only 1 to 2 minutes to describe how their childhood trauma affected them in later life, a discussion that was not only helpful for the clinician to understand what the patient experienced but also healing for the patient to gain insight about the connection between ACEs and health outcome, with the insight pointing to what, if anything, needed to be done.²⁸ Screening is best performed by having patients complete the survey before their visit, at home or in the clinical setting, using an electronic device.³¹ Nadine Burke Harris, MD, director of the Center for Youth Wellness and advocate of trauma-informed practice, screens patients for their ACEs score without identifying individual ACEs, recognizing that the score is the risk factor for poor health outcomes.⁷ Clinicians express increased confidence in screening when they have been educated about ACEs.^{29,30}

There are those in the ACEs field who believe that every patient should be screened, given their ubiquitous presence, and lack of screening has been called unethical given the significant evidence of ACEs effect on health.¹¹ However, no research exists that demonstrates improvement in health outcomes with screening, and

neither the US Preventive Services Task Force nor the World Health Organization has made screening recommendations.³² The lack of high-level evidence needs to be balanced with case study evidence: Kaiser-Permanente has interviewed more than 2,000 patients about childhood adversity in their weight loss program, finding that many patients experience relief in the process. One patient in their obesity recidivism study wrote, “The shame, guilt, and pain for the abuse and molestations in childhood, and being raped, was so great that I had to come forward or die. If your questionnaire had been put in front of me, it would have shown me that people existed in the medical profession who knew about the sad things that happen to some people.”^{20(p26)}

HOW DO CLINICIANS BEST RESPOND TO PATIENTS WITH ACEs?

HCPs at Kaiser-Permanente were coached to say in response to patients with ACEs, “I see you said yes to this question. Can you tell me how that has affected you later in your life?” Felitti²⁸ continued, “It turns out that asking, listening, and accepting are a powerful form of doing that appears to provide great relief to patients.”^(p4) It is healing to be heard and affirmed. If patients seek guidance, modalities to recommend include practicing mindfulness (ie, meditation, yoga), creating a narrative, journaling, theater, and sometimes therapy.³³

HCPs can practice trauma-informed, universal precautions by creating safe and predictable environments. Trauma-impacted patients often have lost a sense of control with an increased need for safety.²⁷ Clinicians can create safe environments by providing and respecting privacy, such as draping, knocking before entering a room, and allowing a loved one to remain present if desired. Predictability can be increased through clear communication of what to expect and by calling patients with test results and understandable explanations rather than waiting for the next visit.

JOIN THE NATIONAL ACEs MOVEMENT

There is a national, cross-sector movement to recognize and address the public health epidemic of ACEs. Trauma-informed tools are being created to screen all ages of patients, to create trauma-informed classrooms, and to promote posttraumatic growth. HCPs have the responsibility to educate themselves

about ACEs, address their own ACEs if necessary, and create environments where the whole person is addressed. “Understanding ACE research allows us a new avenue in an area where medicine has largely failed; helping patients who have been suffering from decades of chronic illness with little hope.”³⁴(p229)

Although there is no doubt that it is easier to treat the presenting symptoms rather than addressing the root cause, empowering patients to see the connections of their whole lives may well enable deep healing.

SUPPLEMENTARY DATA

The Supplementary Appendix associated with this article can be found in the online version at <https://doi.org/10.1016/j.nurpra.2018.09.012>. **JNP**

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APPENDIX 1*The Adverse Childhood Experiences Survey**(from <https://acestoolhigh.com/got-your-ace-score/>)*

Prior to your 18th birthday:

1. Did a parent or other adult in the household often or very often... Swear at you, insult you, put you down, or humiliate you? or Act in a way that made you afraid that you might be physically hurt?
No__If Yes, enter 1 __
2. Did a parent or other adult in the household often or very often... Push, grab, slap, or throw something at you? or Ever hit you so hard that you had marks or were injured?
No__If Yes, enter 1 __
3. Did an adult or person at least 5 years older than you ever... Touch or fondle you or have you touch their body in a sexual way? or Attempt or actually have oral, anal, or vaginal intercourse with you?
No__If Yes, enter 1 __
4. Did you often or very often feel that ... No one in your family loved you or thought you were important or special? or Your family didn't look out for each other, feel close to each other, or support each other?
No__If Yes, enter 1 __
5. Did you often or very often feel that ... You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you? or Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?
No__If Yes, enter 1 __
6. Were your parents ever separated or divorced?
No__If Yes, enter 1 __
7. Was your mother or stepmother: Often or very often pushed, grabbed, slapped, or had something thrown at her? or Sometimes, often, or very often kicked, bitten, hit with a fist, or hit with something hard? or Ever repeatedly hit over at least a few minutes or threatened with a gun or knife?
No__If Yes, enter 1 __
8. Did you live with anyone who was a problem drinker or alcoholic, or who used street drugs?
No__If Yes, enter 1 __
9. Was a household member depressed or mentally ill, or did a household member attempt suicide?
No__If Yes, enter 1 __
10. Did a household member go to prison?
No__If Yes, enter 1 __

Now add up your "Yes" answers: _ This is your ACE Score