

ADDRESSING THE AFTERMATH OF ADVERSE CHILDHOOD EXPERIENCES IN YOUR PRACTICE: A Call to Implement the ACE Score

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In 2012, there were 3.4 million referrals alleging childhood trauma to Child Protective Services in the United States.¹ While this number is startling, it does not include the millions of undocumented cases, nor does it portray the long-term consequences of abuse. Providers of pediatric and adolescent care are on the front lines of identification and prevention of childhood trauma, and without proper tools, health care providers may be ill equipped to address the long-term negative health outcomes.^{2,3} However, the Adverse Childhood Experiences (ACEs) score is an available and perhaps underutilized tool that can better equip providers to recognize and understand the impact of childhood trauma on physical, mental, and behavioral health.

The term “ACEs” is used to describe abuse, neglect, and/or dysfunctional household environments experienced by children under the age of 18. Challenging commonly held perceptions, ACEs have indeed been shown to be “the main determinant of the health and social well-being of the nation.”⁴ It is therefore important to screen this population for traumatic experiences, including parents’ divorce, incarcerated family members, mental illness in the home, etc. ACEs have been translated into a validated tool referred to as the ACE score.

Originally used as a screening tool for adult populations, an ACE score can also be used to objectively quantify adverse experiences in pediatric and adolescent patients through a systematic chart review and comprehensive history.³ Providers may additionally assess the ACE score of parents with an ACE score questionnaire.⁵ Research has shown correlations between ACEs and negative outcomes such that a high ACE score in a child or adolescent could indicate they are at higher risk for chronic health conditions. Furthermore, high scores for parents could also indicate how unresolved childhood trauma may impact parenting practices.³ Therefore, knowing a patient’s ACE score can equip the provider to be trauma informed, or able to acknowledge how the patient’s past experiences may impact their current health as well as their future health. Including an ACE score in the workup of a patient, the provider can continually work with the patient and/or parent to tailor a more informed and comprehensive in-

tervention plan. For example, the provider may address a high score by utilizing resources such as local services and self-help websites and apps that can assist the patient and/or parent to receive further assessment and treatment.³ When providers utilize the ACE score, they will be empowered “...with the skills and resources needed to educate parents about the impact of ACEs upon both parenting and their child’s development,”⁶ and work to prevent future poor health outcomes in their patients.

In this article, we will be discussing the original study that developed the ACE score, findings correlating trauma in the developing years with long-term health consequences, and mechanisms by which these happen. Finally, we will discuss examples for implementing the ACE score in one’s clinical practice.

ACE Study

From 1995-1997, the ACE Study⁷ was conducted by Dr. Vincent Felitti and Dr. Robert Anda at Kaiser Permanente in San Diego, CA, in partnership with the Centers for Disease Control and Prevention (CDC). The purpose of the study was to determine the relationship between childhood abuse/household dysfunction and health risk behavior and disease in adulthood.⁷ Hence more than 17,000 middle-class participants who were members of Kaiser Health Plan were mailed a survey asking them about their adverse childhood experiences.⁸ The average age of these participants was 57 (range: 19-92 years), and the reported ethnicities were Caucasian (including Hispanic), 80%; Asian, 10%; and African American, 10%.⁸ In addition, 74% had attended college, and there were approximately 50% men and 50% women.⁸

These participants were assessed for adverse childhood experiences with 3 categories of childhood abuse: physical, sexual, and psychological, and 4 categories of household dysfunction: exposure to substance abuse, mental illness, violent treatment of mother or stepmother, and criminal behavior in the household in the first wave of the study.⁷ Additional categories including childhood neglect (both physical and emotional) and household dysfunction (parental separation or divorce) were also assessed later on in these participants in the second survey wave.⁸ If the participant replied “yes” to any one of the questions asked

in the 10 different categories (e.g. for the question under Household Dysfunction of “Did a household member go to prison?”), they received an ACE score of 1, with 10 being the highest ACE score possible.

The study determined that more than half of the participants had an ACE score of at least 1 or more, demonstrating ACEs are common.⁷ Moreover, an ACE score predicted adult risky behaviors such as smoking, physical inactivity, alcoholism, drug abuse, number of sexual partners, depressed mood, and suicide attempts; diseases such as ischemic heart disease, cancer, chronic obstructive pulmonary disease (COPD), diabetes, and liver disease; and overall health status.⁷ It was determined that participants who had an ACE score of 4 or more had a 4- to 12-fold increase in health risks for alcoholism, drug abuse, depression, and suicide attempt in comparison to participants who had a score of zero.⁷ In addition to the health risks, there was a 2- to 4-fold increase in smoking, poor self-rated health, and sexually transmitted disease (STD) and also 1.4- to 1.6-fold increase in physical inactivity and obesity.⁷ Lastly, there was a strong correlation between a higher ACE score and having conditions such as heart disease, cancer, and chronic lung disease.⁷

Long-Term Impact of ACEs

Understanding the mechanism of long-term negative effects of ACEs requires a look into how children respond to different environmental stressors. In young children, there are 3 different types of stress responses: positive, tolerable, and toxic, as proposed by the National Scientific Council on the Developing Child.⁹ A positive stress response is short and results in mild to moderate elevations in the levels of cortisol. This type of stress response occurs, for example, when a child is getting immunized or is left at a childcare center for the first time.⁹ However, there is support and protection provided by a caring adult to bring the stress response back to baseline levels.⁹ In contrast, a tolerable stress response is higher in magnitude and can occur when there is a death in the family, serious illness, injury, etc. This is accompanied by minimal protection provided by a supportive and caring adult.⁹ In the case of toxic stress, on the other hand, the stress response is activated for a prolonged duration with a relative absence of protection and support provided by an adult. This form of stress is the most dangerous and can have an adverse impact on a child’s brain architecture.⁹ Thus, the magnitude of harm done to the developing brain of a child depends on the severity of the stressor as well as how much protection is provided by an adult.⁹

Chronic exposure to ACEs commonly leads to a toxic stress response, which is associated with excessively high

levels of stress hormones, such as cortisol. The high levels of cortisol can then potentially lead to disruptions in the amygdala, hippocampus, and prefrontal cortex (PFC) due to the abundance of glucocorticoid receptors in these structures.⁹ For example, there can be overactivity and hypertrophy of the amygdala and also neuronal loss in the hippocampus and PFC, leading to impairments in learning, memory, behavior, executive functioning, mood, and impulse control.⁹ Hence, the disruption in neurodevelopment due to toxic stress has the potential to cause social, emotional, and cognitive impairment of a young child as shown in Figure 1.

In addition to the biological and neurological effects from ACEs, the adoption of risky behaviors is another powerful contributor to poor outcomes. The fear and anxiety caused by the aforementioned impairments can potentially lead adolescents and adults to adopt behaviors such as smoking, drinking, and illicit drug use as coping mechanisms.⁹ For example, the psychoactive and mood-regulating effects of nicotine can be appealing to struggling adolescents and adults suffering from ACEs, thus providing a means of self-medicating their anxiety and affect through the use of tobacco products.¹⁰ To these adolescents and adults who have experienced several ACEs, such risky behaviors are not seen as a problem for their health, but rather a short-term solution to their problems. These behaviors can then exacerbate risk for long-term

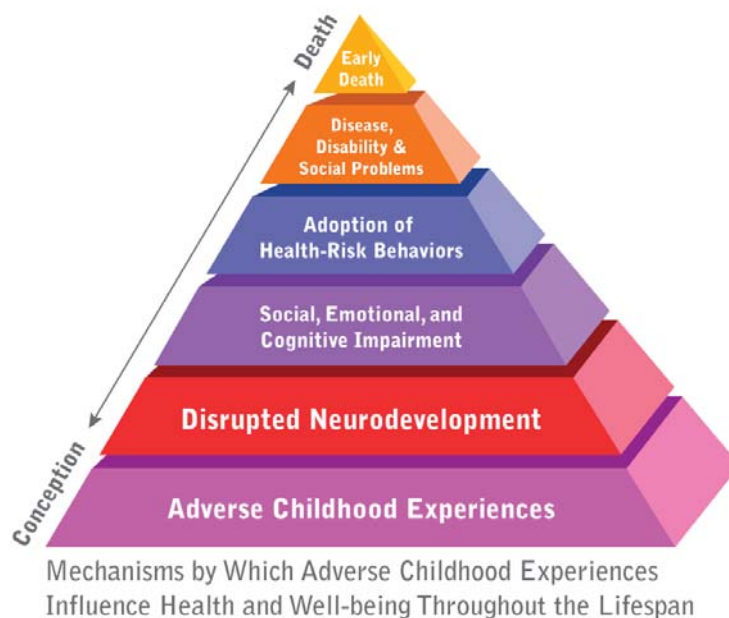


Figure 1. Impact of adverse childhood experiences (ACEs). Provided with permission from ACE Study, Academy on Violence and Abuse. Available at www.acestudy.org.

diseases such as COPD, coronary artery disease, liver disease, and even early death later in adulthood.

In addition to adopting risky behaviors, such children and adolescents with a higher ACE score who become parents are less likely to provide supportive relationships to their children or give them protection from toxic stress, partly due to their own poor mental health.^{9,11} Hence, the next generation is also impacted by ACEs, perpetuating a cycle of intergenerational transmission.

Incorporating the ACE Score Into Treatment

The formal ACE score may be obtained by administering a questionnaire to child and/or adult populations. The questionnaire addresses 10 different ACE scenarios (Figure 2). While some pediatric providers may offer it to patients, others may determine the child or adolescent cannot fully comprehend the questionnaire and may therefore gather the information through a retrospective chart review.

Upon the results, health care providers can then address and tailor a suitable therapeutic approach. In addition, others will assess the ACE score of the patient's parent by inviting him or her to fill out his or her own questionnaire. In screening the parent's ACEs, providers have found it "does not significantly diminish the productivity of their practice and is well accepted by parents and providers who believe it improves the quality of their care."³ For a parent who willingly fills out the questionnaire, providers can then pursue an intervention plan by asking, "Tell me how that has affected you later in your life," or "How would you feel if you learned that a child you care about was growing up exactly as you did?"³ By asking these questions, health providers can then identify patients who are currently experiencing problems consequent to their parent's unresolved trauma, so they can then tailor a treatment and begin a team approach.

Various health and educational programs have developed and are still developing appropriate methods to best

help individuals affected by ACEs. Maine Children's Growth Council is one such entity that has recommended a variety of resources and methods to address a patient's ACE score.¹² They recommend a team approach due to the manifestation of ACEs across multiple health systems (physical, mental, emotional) in a patient. The approach includes forming a list of referrals of other health professionals with whom the patient and/or parent can work in the future.

Specifically relating to children and adolescent patients, there are current providers utilizing the ACE score to

While you were growing up, during your first 18 years of life:

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?
Yes 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?
Yes 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?
Yes 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?
Yes 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?
Yes No If yes enter 1 _____
6. Were your parents **ever** separated or divorced?
Yes 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 at least a few minutes or threatened with a gun or knife?
Yes No If yes enter 1 _____
8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?
Yes No If yes enter 1 _____
9. Was a household member depressed or mentally ill, or did a household member attempt suicide?
Yes No If yes enter 1 _____
10. Did a household member go to prison?
Yes No If yes enter 1 _____

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

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Figure 2. An example of the questionnaire. Provided with permission from ACE Study, Academy on Violence and Abuse. Available at www.cestudy.org.

make a difference in their patients' lives. For example, the Center for Youth Wellness in San Francisco, CA, screens each child who uses its services. The Center has incorporated the ACE score into a variety of interventions such as home visits, psychotherapy, mindfulness, and coping tools, among many others. Moreover, "numerous cognitive behavioral therapy programs also have shown efficacy in improving outcomes for children with significant adversity."³ Additionally, the Center on the Developing Child at Harvard University utilizes the ACE score with an adapted screening tool to evaluate health risks in children whose parents have been affected by ACEs.¹³ From Harvard to individual health care practices across the nation, providers have recognized the importance of screening for ACEs. These programs are then determining ACEs early so that they can teach both children and parents methods of building resilience, a term used to describe the ability to cope and manage effects of childhood maltreatment in a healthy way.³ Gaining a "better understanding of why people do what they do [should lead to] more effective interventions and more positive outcomes" for both children and adult populations alike.¹²

Economic Benefits of Addressing a Patient's ACE Score

The ability to build resilience in individuals affected by ACEs has been shown to not only address the physical, mental, and behavioral impact of ACEs, but to additionally provide a widespread economic benefit as well. The CDC estimates the cost associated with childhood trauma across the lifetime is between \$124 and \$585 billion.³ Of these costs, the largest components include both health care and lost productivity costs, including areas such as high utilization of the health care system, extra doctors' office visits by patients whose complaints were not addressed sufficiently during the first visit, and lost productivity by individuals with chronic but preventable illnesses. The implementation of the ACE score as a screening tool has been demonstrated to address multiple factors that compound these excessive costs. Resulting from a screening of around 135,000 patients, researchers determined that the rate of outpatient doctor's visits during the following year dropped by approximately 35% by simply asking the patients about their ACEs.⁴ Given the high costs of frequent yet unnecessary visits of many patients

with chronic illnesses, the potential savings of reducing the overutilization of the health care system is expansive.

Conclusion

Scores derived from the ACE score questionnaire have a strong correlation with negative future health outcomes, and there is much that can be done to address those individuals with a high ACE score, as well as work toward decreasing the incidence of childhood trauma. The benefits of addressing one's ACE score work in two ways: to address the events in an individual's life that may have set them up for present and future negative health outcomes, as well as to prevent the intergenerational transmission of ACEs. Health care providers can actively help reduce the occurrence of ACEs, as well as promote healing for those affected by them. Research shows individuals affected by ACEs have the ability, given adequate positive influences and protective factors, to overcome the negative impact of childhood trauma.³ However, the ability to overcome the impact of these ACEs begins with an understanding and acknowledgement of their power over the lifetime physical, mental, and emotional state.

Additional Resources

- CDC: <http://www.cdc.gov/violenceprevention/acestudy>
- ACE Score Questionnaire: http://acestudy.org/ace_score
- Academy on Violence and Abuse: <http://www.avahealth.org>
- ACEs Connection: <http://www.acesconnection.com>
- ACEs Too High: <http://acestoohigh.com>
- AAP Early Brain and Child Development: <http://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/EBCD/Pages/default.aspx>

Take Home Summary

Adverse childhood experiences (ACEs) have been shown to determine lifelong mental, emotional, and physical health outcomes. By screening for ACEs through the ACE score, providers are equipped to comprehensively intervene, mitigating risk of chronic health conditions, early death, and intergenerational transmission.

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