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Short Communication

Joining a Compassionate Search for ACE-inhibitors for the Pediatrician's Office

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Childhood trauma is a prevalent theme in literature, with numerous characters bearing the scars of their early experiences. I recall reading Dickens' Oliver Twist and awing at his resilience in the face of a harsh and solitary childhood. In Harper Lee's classic To Kill a Mockingbird, we witness young Scout Finch's journey as she confronts the harsh realities of a deeply flawed and hypocritical society. When Harry Potter is finally freed from an abusive childhood under the care of his aunt and uncle, we celebrate alongside him. The plots often revolve around the characters confronting and resolving their past traumas.

Unfortunately, none of these literary works, nor my 6-year-long medical education, adequately prepared me for a training in Pediatrics. Months into my intern year, I still find myself leaving my clinic with a heavy heart. I am left pondering the circumstances of a family that immigrated two years ago but needed to leave the mother behind. A teenage mother proudly shares the nutritious vegetables she lovingly prepares for her 1-year-old, only to reveal that she doesn't know how much longer she can handle it all on her own. I receive an email one day, saying that my twin newborns are removed from home because the father, affectionate and caring during many visits, had physically abused the mother.

In response, I send a message to our social needs pool asking for their assistance with resources, debrief with my seasoned preceptor, order the scheduled childhood vaccines, and start towards my next patient, naively hoping that maybe this time I will have the perfect words and solutions. We have marvelous social workers, I console myself. They are at times immigration lawyers, generous Uber and gift card lenders, therapists, child protection specialists, and superhumans. Except, there are no superhumans, and our dedicated social workers are limited by the same constraints as us: time, resources, and deeply ingrained structural barriers.

The varied and complex social dynamics that child healthcare professionals navigate every day are encompassed by the term "adverse childhood experiences" (ACEs). Prevention and counseling are second nature to pediatricians but the incorporation of ACEs into our daily practice is poised to herald a new era in our roles in preventive medicine. We know that traumatic experiences that are not countered by protective factors have lasting biological impacts on social, psychological, medical, and economic wellbeing in adulthood, and carry over generations. The magnitude of the extent and impact of social adversity is staggering to comprehend.

To illustrate, let us consider the following statistics: Individuals who smoke cigarettes are 30 times more likely to develop lung cancer(1). Similarly, those who have experienced 4 or more ACEs are also 30 times more likely to attempt suicide. Heavy alcohol use raises the risk of liver disease by 5-fold(1). Childhood trauma is associated with a 5-fold increase in Alzheimer's disease. Compounding the issue, patients with a history of ACEs are 2 times more likely to smoke and 3 times more likely to become heavy alcohol drinkers. Regrettably, ACEs are not uncommon entities. Nearly 60% of the population has a history of at least 1 ACE(2).

ACEs were introduced to the medical literature 25 years ago when Fitelli et al. surveyed 17,000 adults followed at Kaiser Permanente San Diego Clinic on 7 categories of childhood adversity: psychological, physical, or sexual abuse; violence against mother; or household members who are substance abusers, mentally ill, or ever imprisoned. When these were compared against adult health behaviors and diseases, there was a statistically significant dose-response relationship between the number of ACEs and poor health outcomes in adulthood(3).

Going beyond *just correlation*, biomedical research has established numerous pathophysiological links between ACEs and diseases. One prevailing model suggests that childhood adversity, in the absence of protective factors, triggers toxic stress and leads to persistent, dysfunctional neurohormonal responses, inducing a complex interplay of epigenetic, hormonal, cellular, and structural changes. Supported by rodent studies, direct human studies show that cortisol response is increased, inflammatory markers are upregulated, EEG waves change, prefrontal cortex and limbic structures shrink(4). These neuroplastic changes are most pronounced during the fetal to toddler period, and the window of opportunity for intervention narrows with age, reinforcing the urgent need to address the ACEs epidemic(5).

As pediatricians-in-training, we are presented with a compelling body of evidence that underscores the importance of prioritizing and advocating for ACE-conscious care. However, a nationwide study in the UK revealed that nearly 90% of pediatric residents reported a lack of necessary knowledge about ACEs or trauma-informed care (TIC). Similarly, a study from Wisconsin demonstrated that many residents did not feel confident in bringing up ACEs, which improved with online training (6) (7). Another perceived barrier is the absence of consolidated data on the optimal timing and methods for screening, but a longitudinal study is currently underway to validate a comprehensive screener. In addition to effectively optimizing the screening process, ongoing efforts are being made to develop and evaluate pipelines for addressing positive screens(8).

To add to the complexity, the definition and impact of ACEs are dynamic, shaped by findings from developmental biology, shifts in societal values and policies, and a myriad of uncontrollable factors. The COVID-19 pandemic has been associated with a worrisome rise in the incidence of self-reported ACEs, depression, and suicidal behaviors(9). The war in Ukraine and the earthquake in Turkey and Syria left many children without caregivers and homes. Changing abortion laws threaten the mental health of many adolescents, potentially paving the way to repeated cycles of intergenerational trauma. Technology and social media are increasingly isolating children and creating novel mental health concerns.

These challenges should not be viewed as barriers, but rather as catalysts for further investigation, advocacy, and change. In our day-to-day encounters, remembering the ACE pyramid and generations of preventable and reversible impact can only fuel more compassion. Research shows that a lot of us would benefit from training on how to navigate TIC and discussions around ACEs compassionately but professionally. Allocating protected time during residency to first-hand participate in primary care programs and witness our patients' lives outside the hospital motivates us when we make referrals and fosters empathy. Akin to finally performing a spot-on lumbar puncture after many failed attempts and with good coaching, we can develop the skills necessary to build resilience and establish safe and supportive therapeutic relationships with the families we serve.

As we journey on the path of becoming compassionate and dedicated physicians, we may not be able to escape the sharp pangs of pain and disappointment that arise when we confront the entrenched social, racial, and political inequities in our modern, profit-driven societies. Not all books will end with inheriting a fortune or defeating an evil wizard. But we can find solace in that we have committed ourselves to searching for and providing the tools to prevent, confront, and resolve the scars of adversity.
With the hope for a future, where healing extends to systems and society.

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