What new counselors need to know about adverse childhood experiences

Brain dysregulation occurs throughout the life span for a variety of reasons. Unhealthy behavior and trauma contribute to intrabrain communication issues, structural changes within the brain and changes in brain development. According to Theodore Chapin and Lori Russell-Chapin in their book *Neurotherapy and Neurofeedback: Brain-Based Treatment for Psychological and Behavioral Problems*, sources of brain dysregulation can include genetic influences, issues during prenatal development, environmental toxins, birth complications, high fever, poor diet, insufficient exercise, emotionally suppressive psychosocial environments, brain injury, stress, medication use, substance abuse and addiction, seizure disorders, chronic pain, use of surgical anesthesia and aging.

Based on this list, the authors also developed a neurological dysregulation risk assessment to score the amount of potential dysregulation that clients have endured throughout their lives, starting from birth. But what happens when consistent dysregulation occurs in childhood? Are brain plasticity and emotional resiliency able to account for the impact that trauma may have on the developing child brain, or do adverse childhood experiences (ACEs) affect the individual across the entire life span if left unchallenged?

ACEs defined

ACEs are traumatic or stressful events, including abuse and neglect, that children endure between birth and age 18. The Substance Abuse and Mental Health Services Administration (SAMHSA) lists the following specific traumatic events as ACEs:

- Physical abuse
- Sexual abuse
- Emotional abuse
- Physical neglect
- Emotional neglect
- Intimate partner violence
- Mother treated violently
- Substance misuse within household
- Household mental illness
- Parental separation or divorce
- Incarcerated household member

Additionally, Katie McLaughlin, Margaret Sheridan and Hilary Lambert suggested in their 2014 article in *Neuroscience & Biobehavioral Reviews* that issues surrounding parental attachment and institutionalization should be included on the list of known ACEs. From a practical standpoint, we consider that these children are less likely to become socialized and have the richness of stimulation that might be provided by parents in a healthy and functional home. Adding institutionalization to the list of ACEs, especially in consideration of attachment injury and issues regarding poverty, is an interesting possibility.

According to information provided by SAMHSA, the number of ACEs experienced before age 18 turns into a numerical ACEs score. McLaughlin and her co-authors suggested that current studies show a strong correlation between high ACE scores and increased levels of life dysregulation, including the potential repetition of the initial ACEs themselves, as well as greater risk of disease, disability and early mortality. Additional issues include substance abuse and a variety of behavioral problems.

Damion Grasso, Carly Dierkhising, Christopher Branson, Julian Ford and Robert Lee suggested in a 2016 article in the *Journal of Abnormal Child Psychology* that normal childhood development takes place in stages, and because development is cumulative, ACEs can interfere with the developmental process in ways that can be seen across the life span. SAMHSA specifically lists the following negative potential life outcomes that may result from increased ACE scores:

- Early initiation of alcohol and tobacco use that can be continued into adulthood
- Prescription drug use
- Lifetime illicit drug use
- Drug dependency
- Self-reported addiction
- Suicide attempts
- Lifetime depressive episodes
- Sleep disturbances in adults
- High-risk sexual behavior
- Fetal mortality
- Negative pregnancy outcomes

Additionally, specific mental health disorders, including mood, anxiety and behavior disorders, have been associated with high ACEs scores. A marked increase in the prevalence of attention-deficit/hyperactivity disorder among those with a history of ACEs has also been indicated. Accordingly, McLaughlin and colleagues noted that exposure to ACEs accounts for approximately 30 percent of the nation's known mental health disorders.

A further review

ACEs, or childhood emotional trauma, affect children's neuronal and hormonal systems and cause a proclivity toward the negative behaviors to which they were initially exposed and additional behaviors that can significantly impair functioning.

According to Grasso and colleagues, ACEs impact social, emotional and cognitive behavior and development.

The Centers for Disease Control and Prevention (CDC) lists ACEs as a significant public health concern and considers them to be a "prime determinant of health" and an "indicator of overall lifelong health and opportunity." ACEs are also considered from a loss production perspective because individuals with high ACE scores are generally unable to lead productive lives in comparison with their counterparts who were reared in more supportive and healthy environments.

At a 2017 ACEs symposium in Albany, New York, Allison Sampson-Jackson presented some alarming statistics that provide greater understanding of the severity of this major public health issue. According to Sampson-Jackson, individuals who have an ACEs score of 4 or more are 1,500 percent more likely to commit suicide than are their counterparts. In addition, individuals with ACE scores of 4 or more are 550 percent more likely to suffer from alcoholism, chronic obstructive pulmonary disease (COPD), liver disease and asthma. Finally, Sampson-Jackson shared that individuals with an ACEs score of 6 or higher can potentially see their life expectancy drop by as much as 20 years.

ACEs are a hugely important topic with extensive public health, mental health and physical health outcomes. The CDC lists the following outcomes that are positively correlated with increased ACE scores:

- Alcoholism and alcohol abuse
- COPD
- Depression
- Fetal death
- Poor health-related quality of life
- Illicit drug use
- Ischemic heart disease
- Liver disease
- Poor work performance
- Financial stress
- Intimate partner violence
- Multiple sexual partners
- Sexually transmitted diseases
- Smoking
- Suicide attempts
- Unintended pregnancies
- Early initiation of smoking
- Early initiation of sexual activity
- Adolescent pregnancy
- Sexual violence
- Poor academic achievement

Hormonal implications of stress and ACEs

Let's now review what happens physiologically as a result of stress and how this relates to ACEs. Stress is an adaptive function that helps keep us alive. However, research has shown that over time, chronic stress has a negative impact on the body. Kathryn Douthit reviewed the process in detail for "Neurocounseling: Bridging Brain and Behavior" in the March 2015 issue of *Counseling Today*.

In summary, stress activates the sympathetic nervous system, which is responsible for providing the muscles with a boost of energy in preparation for the body to fight or run away from threat. It also increases heart rate and blood pressure. The sympathetic response is controlled by a neuroendocrine pathway called the hypothalamic-pituitary-adrenal (HPA) axis in which cortisol or glucocorticoids work along the sympathetic-adrenal-medullary axis.

After a stressful event or stimuli take place, the body regulates back to its normal state through the parasympathetic nervous system. A quick return to a nonaroused state is vital to physical and psychological health and well-being. What becomes dangerous is when people stay in the sympathetic state and are unable to regulate back to nonarousal. McLaughlin and her co-authors identified structural changes in the brain. Specifically, glucocorticoids could cause significant changes in relation to areas with larger amounts of glucocorticoid receptors, including the hippocampus, amygdala and prefrontal cortex. Additionally, glucocorticoid release can be stunted or released in excess if the HPA axis is damaged through chronic stress.

According to research published in 2016 by Sara Poletti, Clara Locatelli, Andrea Falini, Cristina Colombo and Francesco Benedetti in *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, ACEs have the potential to permanently alter the stress response system by affecting the glutamatergic system and the overall hippocampal volume as indicated in people who have mood disorders.

Psychoneuroimmunology (PNI) focuses on the relationship between chronic stress responses in the body based on emotional responses and their impact on our immune systems. Douthit identified the link between chronic stress and the prevalence of many diseases, including heart disease, diabetes, stroke, asthma, various cancers, irritable bowel, viral illnesses, Alzheimer's dementia, vascular dementia, depression and other mental health disorders. Another issue that stems from overactivation of the stress response system in the body is a neurotransmitter depletion that may lead to anxiety or depression. It is important to draw a line between the focus of PNI and ACEs stressors and how they correlate to negative health outcomes and mortality rates.

Of additional interest is long-term and continued exposure to ACEs or other trauma and stress. Among the psychologically challenging experiences that Douthit identified were long-term physical, psychological or sexual abuse; residence in crime-ridden neighborhoods with crumbling infrastructure; repeated exposure to active combat; marginality related to race, ethnicity, sexual orientation, age or ability; issues related to poverty and economic insecurity; and victimization.

Impact of ACEs on the developing brain

We will now take a look at how ACEs affect brain structure. According to Chapin and Russell-Chapin, those who suffer from posttraumatic stress disorder (PTSD) and trauma have enlarged amygdalae and, consequently, smaller prefrontal cortices, because the amygdala grows and takes up more room in the brain. This is caused by the brain's continued reaction to stimuli that produce a fight, flight or freeze response.

Growth in the amygdala corresponds with prominent use of this area of the brain, which perpetuates reactive, nonrational responses. Meanwhile, use of the prefrontal cortex, the area in which higher levels of executive functioning take place, is diminished. Conceptually, these two parts of the brain that need to work

in tandem to communicate effectively get out of sync as the amygdala is utilized more prominently.

According to research conducted by Poletti and colleagues, the hippocampus is also very susceptible to changes resulting from stress. These researchers stated that among adults who reported a trauma history, hippocampal volume was diminished. Mental health disorders associated with reduced hippocampal volume include bipolar disorder and major depressive disorder.

McLaughlin and colleagues discovered additional physical changes in the brain, including cortical thinning to different areas of the parietal cortex, as often found in children who were reared in institutions. Institutional rearing is an interesting area to study because typically positive attachment in early development is not available for children in these settings.

McLaughlin's team also suggested that anxiety associated with attachment issues in institutionalized children changed not only the structure of the amygdala but also its functioning. In addition to the changes in the amygdala and hippocampus, these researchers noted an overall decrease in the brain's gray matter volume and thickness among children reared in institutions.

PTSD is often associated with ACEs, and the number of ACEs that a child encounters can be indicative of the severity of the trauma. As noted by Chapin and Russell-Chapin, PTSD is associated with dysregulation in the prefrontal cortex, thalamus and anterior cingulate cortex. These areas of the brain are responsible for emotional control and regulation.

This is important among those who suffer from PTSD because the primary use of the amygdala is responsible for more of an emotional reaction. Individuals who are regulated can access the prefrontal cortex and are able to engage the executive functions such as rational decision-making. Research has been conducted on rational versus emotional decision-making and the activation of the different areas of the brain. At the ACEs symposium, Sampson-Jackson related the experiential process. She shared that the amygdala is consistently "on fire" in people who suffer from ACEs trauma. Thus, their baseline of acting emotionally as opposed to rationally is significantly increased in comparison with those who have not suffered from trauma.

According to McLaughlin and colleagues, current research has mainly focused on the stress pathways and how they change the brain. They contend that other factors that activate different areas of the brain should be researched. For example, they are calling for additional research to study the concepts of deprivation, defined as the absence of expected environmental inputs and complexity, and threat, defined as the presence of experiences that represent a threat to one's physical integrity. These researchers predict that exposure to these influences impacts neuronal development in different ways that cannot solely be accounted for by the activation of the sympathetic nervous system and HPA axis.

Implications for counselors

Douthit categorized the best treatments for stress and the activation of the HPA axis as those that focus on what she terms the "sympathetic-parasympathetic shift." Some of these calming activities include breath work, neurofeedback, guided imagery, creative arts expression and narrative interventions that foster a sense of autonomy and self-control. Additional calming activities include tai chi, exercise, volunteering, yoga and other mindfulness-based activities, and progressive muscle relaxation.

Recognizing that children with ACEs are often exposed to stressors chronically or for a good portion of their childhood helps us to understand the need to evaluate additional interventions. Douthit considered the impact of what she termed "psychologically challenging environments" and acknowledged that they create chronic stress, long-term disease and psychopathology. Looking at these issues from a preventive perspective raises the question: How do we account for ACEs and promote mental health across our nation? Douthit recommended that clients work with counselors trained in trauma and use talk therapy to challenge internalized oppression that may linger after multiple or continued ACEs.

Preventive approaches may include intervention at the prenatal and primary care levels. This includes promoting education systems that are trauma informed and equipped to train children on skills and characteristics such as self-control, integrity, perseverance, optimism and resilience. These interventions, in addition to knowledge of how to link people to helpful community resources and properly utilizing child protective services, are all part of what might help a child or adolescent who is dealing with trauma related to ACEs.

Trauma and PTSD related to ACEs

Chapin and Russell-Chapin noted that dysregulation of the right brain was consistent with insecure attachment and thus could create PTSD. The example they provided in their text dealt with child abuse in infancy and how it related to a future inability to cope with relational stress. This is partly due to improper development of the autonomic nervous system as elaborated in polyvagal systems theory.

Although PTSD is strongly correlated to environmental experiences, there is also a potential heritable influence. Chapin and Russell-Chapin noted a deficiency in posterior theta and alpha brain waves, which are linked to one's inability to normalize or shift from the sympathetic to parasympathetic system after a stress response. Experiences in early childhood, including attachment injury, emotional and physical abuse, car accidents, victimization and unexpected losses, can lead to PTSD. These incidents are consistent with those listed by SAMHSA, with the exception of car accidents and attachment injury. Current research suggests efficacy regarding PTSD and biofeedback and neurofeedback. ❖

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