Fostering Healthy Development in Tennessee

Understanding Positive and Adverse Childhood Experiences and the Effect on Lifelong Health

Jennifer Trail and Hannah Duiven, Office of Strategic Initiatives
Presentation Overview

1. Strong Foundations of Healthy Development
2. ACEs and PCEs
3. Positive Childhood Experiences in Tennessee
4. Strategies for Action
Strong Foundations of Healthy Development
Foundation of Community Health

Strong Communities

Healthy Economy

Successful Parenting of Next Generation

Educational Achievement
Economic Productivity
Responsible Citizenship
Lifelong Health

Healthy Child Development
Four Core Concepts of Development

1. **Brain Architecture** is established early in life and supports lifelong learning, behavior and health.

2. Stable, caring relationships and “Serve and Return” interactions shape brain architecture.

3. **Toxic Stress** in the early years of life can derail healthy development.

4. **Resilience** can be built through “Serve and Return” relationships, improving self-regulation skills and executive function. Though there are sensitive periods of brain development in early childhood and adolescence, resilience can be strengthened at any age.
The early years matter because, in the first few years of life, more than 1 million new neural connections are formed every second. Neural connections are formed through the interaction of genes and a baby’s environment and experiences, especially “serve and return” interaction with adults, or what developmental researchers call contingent reciprocity. These are the connections that build brain architecture – the foundation upon which all later learning, behavior, and health depend.

Serve & Return Interactions Build Brains and Skills
Still Face Experiment

https://www.youtube.com/watch?v=apzXGEbZht0
The brain starts to undergo a “remodeling” project in adolescence, making it an opportune time to build resilience.

- **Air Traffic Control**: Before and during puberty, a second period of rapid neural growth occurs in the prefrontal cortex.
- **“Use it or lose it”**: The adolescent brain strengthens the neural connections that are used most often and prunes away those that aren’t used as frequently.
- **Integration**: The *corpus callosum*, which relays information between different parts of the brain, also undergoes waves of growth during adolescence, improving self-regulation.

Sources: Siegel, 2015; Spinks, n.d.
Toxic Stress Disrupts Brain Development
Three Types of Stress

**Positive Stress**

Short, stressful events like meeting new people or starting the first day of school are healthy for brain development. They prepare the brain and body for stressful situations later in life.

**Tolerable Stress**

Tragic, unavoidable events like a natural disaster or losing a loved one aren't good for us. But if supportive caregivers are around to buffer the stress response, these events won't do lasting damage to the brain and body.

**Toxic Stress**

Ongoing, repeated exposure to abuse or neglect is bad for brain development. If no supportive adults are present to help buffer the stress response, stress hormones will damage developing structures in the child’s brain. The result is an increased vulnerability to lifelong physical and mental health problems, including addiction.
Experience Alters Brain Development

This PET scan of the brain of a normal child shows regions of high (red) and low (blue and black) activity. At birth, only primitive structures such as the brain stem (center) are fully functional; in regions like the temporal lobes (top), early childhood experiences wire the circuits.

Sources: Felitti, 2011; Nelson et al., 2007
“Air Traffic Control” System in the Brain
Improving Air Traffic Control Across the Lifespan

- Focusing Attention
- Problem Solving
- Planning Ahead
- Behavior Regulation
- Controlling Impulses
- Adjusting to New Circumstances

Executive Function and Self Regulation Skills can be built at any point across the lifespan.

Source: Cameron, n.d.
ACEs and PCEs
Adverse Childhood Experiences (ACEs) are potentially traumatic experiences during childhood (0-17 years) that can affect lifelong health. ACEs can impact physical, mental, emotional, and behavioral development.
Adverse Childhood Experiences (ACEs)

**ABUSE**
- Physical
- Emotional
- Sexual

**NEGLECT**
- Physical
- Emotional

**HOUSEHOLD DYSFUNCTION**
- Mental Illness
- Incarcerated Relative
- Mother treated violently
- Substance Abuse
- Divorce
The Realms of ACEs

1. Household
   - Incarcerated family member
   - Physical and emotional neglect
   - Domestic violence
   - Divorce
   - Homelessness
   - Parental mental illness
   - Alcoholism and drug abuse
   - Emotional and sexual abuse

2. Community
   - Climate crisis
   - Natural disasters
   - Income inequality
   - School violence
   - Racial prejudice
   - Lack of social capital and mobility
   - Poor housing quality and affordability
   - Poor water and air quality
   - Food scarcity
   - Poverty
   - Substandard wages
   - Substandard schools
   - Structural racism
   - Violence
   - Lack of social capital and mobility

3. Environment
   - CLIMATE CRISIS
   - Recent heat & droughts
   - Wildfires & smoke
   - Record storms, flooding & mudslides
   - Sea level rise
   - Volcanic eruptions & tsunamis
   - Earthquakes
   - Pandemic

Adverse childhood and community experiences (ACEs) can occur in the household, the community, or in the environment and cause toxic stress. Left unaddressed, toxic stress from ACEs harms children and families, organizations, systems and communities, and reduces the ability of individuals and entities to respond to stressful events with resiliency. Research has shown that there are many ways to reduce and heal from toxic stress and build healthy, caring communities.
ACEs Can Have Lasting Effects On...

- Health (obesity, diabetes, depression, suicide attempts, STDs, heart disease, cancer, stroke, COPD, broken bones)
- Behaviors (smoking, alcoholism, drug use)
- Life Potential (graduation rates, academic achievement, lost time from work)

ACEs have been found to have a graded dose-response relationship with 40+ outcomes to date.

*This pattern holds for the 40+ outcomes, but the exact risk values vary depending on the outcome.

Source: Centers for Disease Control and Prevention, 2016
Outcomes of ACEs

ACEs are associated with increased risk to overall health and wellbeing outcomes across the lifespan.
ACEs Compromise Community Prosperity

*based on an ACE score of 4+

Source: ACE Response, n.d.
The Annual Economic Impact of Adverse Childhood Experiences in Tennessee is 5.2 Billion

Source: Sycamore Institute, 2019

Note: Obesity-related costs include only direct medical costs. Source: The Sycamore Institute’s analysis of data from the 2014-2017 CDC BRFSS provided by the TN Department of Health, the CDC Chronic Disease Calculator, Trogdon et al. 2012, CDC/AMMMEC, and Ford et al. 2014.
Mechanisms by Which Adverse Childhood Experiences Influence Health and Well-being Throughout the Lifespan

Source: Anda, n.d.
Positive childhood experiences (PCEs) are experiences in childhood that relate to children’s ability to have safe, stable, nurturing, and equitable relationships and environments. PCEs can help children develop a sense of belonging, connectedness, and build resilience.
Living in a clean home with enough food
Having a mentor
Availability of culturally appropriate, effective mental & behavioral health services
Age-appropriate parental monitoring
Having goals and/or academic motivation
Opportunities to engage in community’s traditions
Having a best friend
Having beliefs that give comfort
Access to opportunities to learn
Access to affordable, safe housing
Unconditional love and support from a parent
Ability to regulate one’s emotions
Availability and access to high quality medical and dental care
Engaging in a hobby
Engagement with school and in the community
Secure attachment to parent
Access to quality, affordable education
Positive parent well-being and overall health
Unconditional love and support from a parent
Parent has sufficient social support
Opportunities to have fun
Having a parent with whom child feels close
Low alcohol outlet density
Having prosocial peers
Belonging at school
Opportunity to engage in community traditions, including Native culture engagement
Development of positive coping strategies
Positive self-esteem
Sense of community or cultural belonging
PCEs influence health throughout the lifespan through prevention of ACEs, mitigation of ACEs impact, and direct impact on health.
1. Felt able to talk to family about feelings
2. Felt their family stood by them during difficult times
3. Enjoyed participating in community traditions
4. Felt a sense of belonging in high school
5. Felt supported by friends
6. Had a least 2 non-parent adults who took genuine interest in them
7. Felt safe and protected by an adult in their home
PCEs Buffer ACEs and Promote Adult Health

6-7 vs. 0-2 PCES: Adults reporting 6-7 PCEs have **72% lower odds** of having depression or poor mental health compared to those reporting 0-2 PCEs.

48% v. 12.6%, OR 0.28; 95% CI 0.21-0.39. 3.8x higher rate for 0-2 vs. 6-7 PCEs.
6-7 vs 3-5 PCES: Adults with 6-7 PCEs have 50% lower odds of adult depression or poor mental health compared to those with 3-5 PCEs.

25% v. 12.6%, OR 0.50; 95% CI 0.36-0.69. 1.98x higher rate for 3-5 vs. 6-7 PCEs.
PREVENTING CHILDHOOD TOXIC STRESS: PARTNERING WITH FAMILIES AND COMMUNITIES TO PROMOTE RELATIONAL HEALTH

Andrew Garner, MD, PhD, FAAP;
Michael Yogman, MD, FAAP COMMITTEE ON PSYCHOSOCIAL ASPECTS OF CHILD AND FAMILY HEALTH, SECTION ON DEVELOPMENTAL AND BEHAVIORAL PEDIATRICS, COUNCIL ON EARLY CHILDHOOD
ACEs and PCEs in Tennessee
ACEs in Tennessee

Percentage of ACEs Experienced

Source: Tennessee BRFSS, 2020

ACEs by Race and Ethnicity
## Tennessee ACEs and Health

### Ever Diagnosed with Depressive Disorder among Tennessee Adults by ACE Category

<table>
<thead>
<tr>
<th>ACE Category</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ACEs</td>
<td>60.7%</td>
</tr>
<tr>
<td>1 ACE</td>
<td>54.5%</td>
</tr>
<tr>
<td>2 ACEs</td>
<td>50.1%</td>
</tr>
<tr>
<td>3 ACEs</td>
<td>56.5%</td>
</tr>
<tr>
<td>4+ ACEs</td>
<td>60.7%</td>
</tr>
</tbody>
</table>

Source: Tennessee BRFSS, 2020

### Current Smoking Status among Tennessee Adults by ACE Category

<table>
<thead>
<tr>
<th>ACE Category</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ACEs</td>
<td>15.1%</td>
</tr>
<tr>
<td>1 ACE</td>
<td>24.2%</td>
</tr>
<tr>
<td>2 ACEs</td>
<td>50.7%</td>
</tr>
<tr>
<td>3 ACEs</td>
<td>22.7%</td>
</tr>
<tr>
<td>4+ ACEs</td>
<td>31%</td>
</tr>
</tbody>
</table>

Source: Tennessee BRFSS, 2020

### Days with Poor Physical Health in the Last 30 Days among Tennessee Adults by ACE Category

<table>
<thead>
<tr>
<th>ACE Category</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ACEs</td>
<td>72.4%</td>
</tr>
<tr>
<td>1 ACE</td>
<td>71.8%</td>
</tr>
<tr>
<td>2 ACEs</td>
<td>72.5%</td>
</tr>
<tr>
<td>3 ACEs</td>
<td>68%</td>
</tr>
<tr>
<td>4+ ACEs</td>
<td>56.9%</td>
</tr>
</tbody>
</table>

Source: Tennessee BRFSS, 2020

### Delayed Care Due to Medical Cost among Tennessee Adults by ACE Category

<table>
<thead>
<tr>
<th>ACE Category</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ACEs</td>
<td>20%</td>
</tr>
<tr>
<td>1 ACE</td>
<td>24%</td>
</tr>
<tr>
<td>2 ACEs</td>
<td>30%</td>
</tr>
<tr>
<td>3 ACEs</td>
<td>22%</td>
</tr>
<tr>
<td>4+ ACEs</td>
<td>25%</td>
</tr>
</tbody>
</table>

Source: Tennessee BRFSS, 2020
TN BRFSS Data

- Data collection from the 2021 Behavioral Risk Factor Surveillance System (BRFSS)
- Representative sample of adult Tennesseans
- Bethell PCEs Scale included at conclusion of the phone survey
Most reported feeling **safe and supported at home** and by their friends while growing up. In fact, **nearly half of adults reported experiencing all 7**. Only 7.4% reported 2 or fewer PCEs.

The least common PCE was “**I felt a sense of belonging in high school**” (71.3%).

*Source: Tennessee BRFSS, 2021*
Tennessee PCEs and Health

**Ever Diagnosed with Depression**

<table>
<thead>
<tr>
<th>PCEs</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>42.6%</td>
</tr>
<tr>
<td>3-5</td>
<td>27.1%</td>
</tr>
<tr>
<td>6-7</td>
<td>15.3%</td>
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</tbody>
</table>

**Physical Activity**

<table>
<thead>
<tr>
<th>PCEs</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>□</td>
</tr>
<tr>
<td>3-5</td>
<td>□</td>
</tr>
<tr>
<td>6-7</td>
<td>□</td>
</tr>
</tbody>
</table>

**Self-Reported Health Status**

<table>
<thead>
<tr>
<th>PCEs</th>
<th>Good or better</th>
<th>Fair or worse</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>57.4%</td>
<td></td>
</tr>
<tr>
<td>3-5</td>
<td>72.9%</td>
<td></td>
</tr>
<tr>
<td>6-7</td>
<td>84.7%</td>
<td></td>
</tr>
</tbody>
</table>

**Healthcare Access: Employment, Insurance, and Delayed Care**

<table>
<thead>
<tr>
<th>PCEs</th>
<th>Unemployed</th>
<th>Uninsured</th>
<th>Delayed Care Due to Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-2</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>3-5</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>6-7</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

*Source: Tennessee BRFSS, 2021*
Public Health Implications

High PCEs scores improve resilience, well-being, and prosperity for us all.

Adapted from Center for Community Resilience, Community Resilience Tree
Strategies for Action

- Teach Relationship and Self-Regulation Skills
- Focus on whole-person wellness
- Support early childhood programs
- Support mentorship, civic, arts, and cultural program for kids
- Collaborate across sectors for policy and systems change
- Improve economic support for families
Anticipated Multi-Sector, Multi-Level Public and Private Impacts

Philanthropy

- Bioethics
- Professional Practice
- Programs and Services
- Policies and Funding
- Philosophy and Approach

- Media
- Human Services
- Health Care Services
- Community
- Higher education and academia
- Faith based communities

Businesses and Corporations

- Education and Early Childhood Care
- Child Welfare and Juvenile Justice
- Mental Health and Substance Abuse Services
“The surprising finding is that our relationships and how happy we are in our relationships has a powerful influence on our health” - Robert Waldinger, PhD

The Harvard Study of Adult Development
Questions?
Thank you!

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