Adverse Childhood Experiences and Their Impact Upon Health and Education: A Social Determinant Overview

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Learning Objectives

• Gain a understanding of Adverse Childhood experiences research and findings.
• Gain further insight into how the factors impacting health and education are interrelated and share the same causes.
• Understand mitigating strategies for cross-cutting programs that provide protective factors.
• Understand the medical implications of Adverse Childhood Experiences and the development of clinical protocols.
Preventable Diseases

Premature Deaths

Access to Care

Workforce

Environmental Health

Emergency Preparedness

Synergy with Stakeholders

Virus
10 Core Components of Public Health
Social Determinants of Health
Proportional Causes of Poor Health Outcomes

- Behavioral patterns: 40%
- Genetic predisposition: 30%
- Social circumstances: 15%
- Environmental exposure: 5%
- Health care: 10%

What Goes Into Your Health?

- Socioeconomic Factors
  - Education
  - Job Status
  - Family/Social Support
  - Income
  - Community Safety

- Physical Environment

- Health Behaviors
  - Tobacco Use
  - Diet & Exercise
  - Alcohol Use
  - Sexual Activity

- Health Care
  - Access to Care
  - Quality of Care

Source: Institute for Clinical Systems Improvement, Going Beyond Clinical Walls: Solving Complex Problems (October 2014)

Adapted from The Bridgespan Group
Economics of Public Health

• $1 prevention yields $50 Return on Investment (ROI)

• 2015
  • National Commission on Prevention Priorities - the rising costs of health care poses a formidable challenge for businesses and policymakers.

  • Today, health care already accounts for 16% of the gross domestic product (GDP $14,993,258M) and is projected to increase to 25% by 2025. In short, a healthier community is stronger economically.
TOTAL LIFETIME COSTS OF CHILD MALTREATMENT IN 2010 DOLLARS


- Short-term Health care, $18,903,192,000
- Long-term Health care, $6,096,870,000
- Productivity Losses, $83,584,440,000
- Special Education, $4,631,421,000
- Criminal Justice, $3,906,513,000
- Child Welfare, $4,474,512,000

Total Costs: $123.8B
Non Fatal-$121.6 B
Health Factors and Outcomes

Health Outcomes
Flagler 9th
The overall rankings in health outcomes represent how healthy counties are within the state. The healthiest county in the state is ranked #1. The ranks are based on two types of measures: how long people live and how healthy people feel while alive.

Health Factors
Flagler 21st
The overall rankings in health factors represent what influences the health of a county. They are an estimate of the future health of counties as compared to other counties within a state. The ranks are based on four types of measures: health behaviors, clinical care, social and economic, and physical environment factors.
Factors: Adult Obesity

Percentage of adults that report a BMI of 30 or more

Adult obesity in Flagler County, FL
County, State and National Trends

No significant trend was found in Flagler County for this measure.

Please see Measuring Progress/Rankings Measures for more information on trends. Trends were measured using all years of data.
Note: Starting with the 2011 data, a new BRFSS methodology was introduced that included cell phone users. Data from prior years should only be compared with caution.
Factors: Violent Crimes

Number of reported violent crime offenses per 100,000 population
Factors: Children In Poverty

Percentage of children under age 18 in poverty

Please see Measuring Progress/Rankings Measures for more information on trends. Trends were measured using all years of data.

Note: Prior to 2005, children in poverty was based on the Current Population Survey; beginning in 2005, it was based on the American Community Survey.
Opioid Events YTD as of 10/31/2019
Vehicle Accidents YTD as of 10/31/2019

Source: Biospatial Online Reports 2019
CDC Strategic Plan

The different forms of violence—child abuse and neglect, youth violence, intimate partner violence, sexual violence, elder abuse and suicidal behavior—are interconnected and often share the same root causes. Understanding the overlapping causes of violence and the things that can protect people and communities can help us better prevent violence in all its forms.

-CDC, 2016
The Division of Violence Prevention at CDC will strategically focus efforts on four key areas:

- Childhood and adolescence to achieve long-term impact
- Populations and communities at highest risk for experiencing or perpetrating violence
- Shared risk and protective factors that are most important for reducing multiple forms of violence
- Identification, implementation, and scaling-up of approaches that have cross-cutting impact
“Adverse childhood experiences are the single greatest unaddressed public health threat facing our nation today.”

* Dr. Robert Block, the former President of the American Academy of Pediatrics
Early Stages of ACEs Research - Dr. Felitti, MD

• The ACE study originated in 1985 in Dr. Vincent Felitti’s obesity clinic in California.

• Felitti was frustrated that a number of the people in his program dropped out, even though they were successfully losing weight.

• Upon reviewing the history of the people who dropped out, Felitti found that many people in his clinic had a background of adverse childhood experiences, such as physical or sexual abuse.

• He began to wonder if obesity might be, for some people, an unconscious defense that lingered as a result of adverse childhood experiences.
CDC-Kaiser Study
Dr. Felitti, MD & Dr. Anda MD, Et. Al.

• One of the largest investigations of childhood abuse and neglect and later life-health and well-being.
• Kaiser Permanente study from 1995-97
• 2 waves of data collection
• Over 17,000 HMO members from Southern California
• Published in the American Journal of Preventive Medicine in 1998, Volume 14
The prevalence estimates reported below are from the entire ACE Study sample (n=17,337).

### Prevalence of ACEs by Category for CDC-Kaiser ACE Study Participants by Sex, Waves 1 and 2.

<table>
<thead>
<tr>
<th>ACE Category</th>
<th>Women</th>
<th></th>
<th>Men</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent (N = 9,367)</td>
<td>Percent (N = 7,970)</td>
<td>Percent (N = 17,337)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ABUSE</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional Abuse</td>
<td>13.1%</td>
<td>7.6%</td>
<td>10.6%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Abuse</td>
<td>27%</td>
<td>29.9%</td>
<td>28.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sexual Abuse</td>
<td>24.7%</td>
<td>16%</td>
<td>20.7%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>HOUSEHOLD CHALLENGES</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother Treated Violently</td>
<td>13.7%</td>
<td>11.5%</td>
<td>12.7%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household Substance Abuse</td>
<td>29.5%</td>
<td>23.8%</td>
<td>26.9%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household Mental Illness</td>
<td>23.3%</td>
<td>14.8%</td>
<td>19.4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parental Separation or Divorce</td>
<td>24.5%</td>
<td>21.8%</td>
<td>23.3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incarcerated Household Member</td>
<td>5.2%</td>
<td>4.1%</td>
<td>4.7%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>NEGLECT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional Neglect³</td>
<td>16.7%</td>
<td>12.4%</td>
<td>14.8%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Neglect³</td>
<td>9.2%</td>
<td>10.7%</td>
<td>9.9%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: ³Collected during Wave 2 only (N=8,629). Research papers that use Wave 1 and/or Wave 2 data may contain slightly different prevalence estimates.

### ACE Score Prevalence for CDC-Kaiser ACE Study Participants by Sex, Waves 1 and 2.

<table>
<thead>
<tr>
<th>Number of Adverse Childhood Experiences (ACE Score)</th>
<th>Women</th>
<th></th>
<th>Men</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Percent (N = 9,367)</td>
<td>Percent (N = 7,970)</td>
<td>Percent (N = 17,337)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>34.5%</td>
<td>38.0%</td>
<td>36.1%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>24.5%</td>
<td>27.9%</td>
<td>26.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>15.5%</td>
<td>16.4%</td>
<td>15.9%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>10.3%</td>
<td>8.5%</td>
<td>9.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 or more</td>
<td>15.2%</td>
<td>9.2%</td>
<td>12.5%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Research papers that use Wave 1 and/or Wave 2 data may contain slightly different prevalence estimates.

### 2008 Behavioral Risk Factor Surveillance Survey - ACEs

| Question FL10_1: Did your parents divorce or did you have a parent die during your childhood? | 9,960 | 28% |
| Question FL10_2: Did you live with anyone who was a problem drinker, alcoholic, or who used illicit drugs? | 9,958 | 18.7% |
| Question FL10_3: Was anyone in your childhood home mentally depressed, mentally ill, or tried to attempt suicide? | 9,955 | 11.2% |
| Question FL10_4: Did parents or adults in your home ever push, grab, shove, slap, or throw something at each other? | 9,954 | 16.2% |
| Question FL10_5: Were you abused by someone during your childhood? | 9,954 | 11.3% |
### 2014 Behavioral Risk Factor Surveillance Survey - ACEs

<table>
<thead>
<tr>
<th>FL02.6 How often did your parents or adults in your home ever slap, hit, kick, punch or beat each other up? N=3918</th>
<th>19.7%</th>
</tr>
</thead>
<tbody>
<tr>
<td>FL02.7 Before age 18, how often did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way? N=3890</td>
<td>17.4%</td>
</tr>
</tbody>
</table>
2014 BRFSS ACE Follow-Up Results

• There is an association with current smoking and education, and no significantly statistic association with obesity.

• Adults being exposed to violent behaviors during their childhood were 1.5 times more likely to be a current smoker. (p-value=0.0035)

• Adults being exposed to violent behaviors during their childhood were two times less likely to have high school or higher education. (p-value=0.0035)
### Prevalence by Education

<table>
<thead>
<tr>
<th>Education</th>
<th>0 ACE</th>
<th>1 ACE</th>
<th>2 Aces</th>
<th>3+ Aces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than High School</td>
<td>38.4%</td>
<td>28.1%</td>
<td>15.1%</td>
<td>18.4%</td>
</tr>
<tr>
<td>High School/GED</td>
<td>44.6%</td>
<td>29.6%</td>
<td>11.0%</td>
<td>14.8%</td>
</tr>
<tr>
<td>Greater than High School</td>
<td>53.3%</td>
<td>24.3%</td>
<td>11.2%</td>
<td>11.2%</td>
</tr>
</tbody>
</table>

### Prevalence by Income

<table>
<thead>
<tr>
<th>Income</th>
<th>0 ACE</th>
<th>1 ACE</th>
<th>2 Aces</th>
<th>3+ Aces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than $25,000</td>
<td>42.1%</td>
<td>28.4%</td>
<td>15.1%</td>
<td>18.4%</td>
</tr>
<tr>
<td>$25,000-$49,999</td>
<td>48.7%</td>
<td>27.8%</td>
<td>12.0%</td>
<td>11.5%</td>
</tr>
<tr>
<td>$50,000 or more</td>
<td>53.9%</td>
<td>23.7%</td>
<td>10.9%</td>
<td>11.4%</td>
</tr>
</tbody>
</table>
Adverse Childhood Experiences

In 2017-2018, one in three children ages 0-17 (33.3%) had experienced at least one ACE, and 14.1% had experienced two or more ACEs.

The most prevalent ACE was “Parent/guardian divorced or separated” (23.4%), followed by “Lived with anyone with alcohol/drug problem” (8.0%), and “Parent/guardian served time in jail” (7.4%).

Reports of ACEs varied significantly by family income and race/ethnicity. Specifically:

- A larger percentage of children in households with incomes below 100% of the federal poverty level (FPL) experienced two or more ACEs compared with children in households with incomes at or above 400% FPL (22.2% vs. 7.3%).
- A larger percentage of non-Hispanic black children experienced two or more ACEs compared with non-Hispanic white children (21.3% vs. 12.9%)
The Truth About ACEs

What Are They?

ACEs are Adverse Childhood Experiences

How Prevalent Are ACEs?

The ACE study* revealed the following estimates:

What Impact Do ACEs Have?

As the number of ACEs increases, so does

*The three types of ACEs include:

- Abuse: Physical, Emotional, Sexual
- Neglect: Physical, Emotional
- Household Dysfunction: Mental illness, Incarcerated Relative, Mother treated violently, Substance Abuse
Mechanisms by Which Adverse Childhood Experiences Influence Health and Well-being Throughout the Lifespan
Relationship to glucocorticoids- (Diamond Et. al., 2007)
A 2007 review of the effects of stress hormones (glucocorticoids, GC) and human cognition revealed that memory performance vs. circulating levels of glucocorticoids does manifest an upside down U shaped curve and the authors noted the resemblance to the Yerkes–Dodson curve. For example, long-term potentiation (the process of forming long-term memories) is optimal when glucocorticoid levels are mildly elevated whereas significant decreases of LTP are observed after adrenalectomy (low GC state) or after exogenous glucocorticoid administration (high GC state).
Healthy Brain

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.

An Abused Brain

This PET scan of the brain of a Romanian Orphan, who was institutionalized shortly after birth, shows the effect of extreme deprivation in infancy. The temporal lobes (top), which regulate emotions and receive input from the senses, are nearly quiescent. Such children suffer emotional and cognitive problems.
Consequences of Lifetime Exposure to Violence and Abuse

Neurological
Dental
Surgery
Rheumatology
Dermatology
Mental Health
Behavioral issues
Orthopedics
Respiratory/pulmonary
Oncology

ENT
Infectious disease
General/Other Categories
Cardiovascular
Gastrointestinal
Opthalmology
Ob-Gyn
Allergies
Genito-Urological
Endocrine

COLEVA

News & Perspective > Psychiatry
Brain Imaging Shows Ability, Inability to Cope With Stress

Nancy A. Melville
July 21, 2016

Distinct brain patterns visible on neuroimaging reveal patterns of response that correlate with the ability, or inability, to cope with psychological stress.

"The findings from this paper add to the field by showing how the brain responds to acute stress while it is happening and unfolding," first author Rajita Sinha, PhD, the Foundation Fund Professor of Psychiatry at Yale University and director of the Yale Stress Center, in New Haven, Connecticut said. https://medicalxpress.com/news/2016-07-brain-imaging-shows-ability.html
Education

Unemployment rates and earnings by educational attainment, 2016

<table>
<thead>
<tr>
<th>Educational Attainment</th>
<th>Unemployment Rate (%)</th>
<th>Median Usual Weekly Earnings ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctoral degree</td>
<td>1.6</td>
<td>1,664</td>
</tr>
<tr>
<td>Professional degree</td>
<td>1.6</td>
<td>1,745</td>
</tr>
<tr>
<td>Master’s degree</td>
<td>2.4</td>
<td>1,380</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>2.7</td>
<td>1,156</td>
</tr>
<tr>
<td>Associate’s degree</td>
<td>3.6</td>
<td>819</td>
</tr>
<tr>
<td>Some college, no degree</td>
<td>4.4</td>
<td>756</td>
</tr>
<tr>
<td>High school diploma</td>
<td>5.2</td>
<td>692</td>
</tr>
<tr>
<td>Less than a high school diploma</td>
<td>7.4</td>
<td>504</td>
</tr>
</tbody>
</table>

Total: 4%                                     All workers: $885

America’s Promise Alliance and Tufts University Study
Methodology

• June- September 2013
• 30 Facilitated group interviews
• 16 communities across the U.S
• Final survey was 58 questions
• 3,000 respondents from all 50 states
• Participants recruited via phone and email through national partner organizations.
• 1,936 individuals (18-25 year olds)
• Additional 1,023 young adults who graduated HS in 4 years were included as well.

Source: www.GradNation.Org
Interrupted Enrollment Risk Factors Reported by Respondents

- 87% = Homelessness
- 79% = Incarcerated Parent
- 50% = Moving Homes
- 50% = Changing Schools
- 11% = Foster Care
## Expectations Shift Behavior

### Perceived Parent Characteristics of Students with Interrupted Enrollment

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>% Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expected me to complete HS</td>
<td>85%</td>
</tr>
<tr>
<td>Knew my friends</td>
<td>74%</td>
</tr>
<tr>
<td>Expected me to complete college</td>
<td>69%</td>
</tr>
<tr>
<td>Asked about my school work</td>
<td>69%</td>
</tr>
<tr>
<td>Told me they were proud of me</td>
<td>63%</td>
</tr>
<tr>
<td>Called me names</td>
<td>38%</td>
</tr>
<tr>
<td>Used drugs in front of me</td>
<td>19%</td>
</tr>
<tr>
<td>Were in jail</td>
<td>18%</td>
</tr>
<tr>
<td>Were physically abusive</td>
<td>18%</td>
</tr>
</tbody>
</table>

About one-fifth of respondents had parents who had high educational expectations but were also verbally abusive.
<table>
<thead>
<tr>
<th>Reason for Stopping School</th>
<th>Percent of Total Dropouts</th>
</tr>
</thead>
<tbody>
<tr>
<td>I was kicked out or expelled</td>
<td>0.6%</td>
</tr>
<tr>
<td>Pushed or pulled out of school</td>
<td>0.6%</td>
</tr>
<tr>
<td>Family issues or problems</td>
<td>0.8%</td>
</tr>
<tr>
<td>Lost a family member or friend</td>
<td>0.8%</td>
</tr>
<tr>
<td>Financial issues and work</td>
<td>1.2%</td>
</tr>
<tr>
<td>Teacher and school problems</td>
<td>1.2%</td>
</tr>
<tr>
<td>School environment</td>
<td>1.4%</td>
</tr>
<tr>
<td>Residential or school instability</td>
<td>2.0%</td>
</tr>
<tr>
<td>Mental health issues</td>
<td>2.1%</td>
</tr>
<tr>
<td>I was bullied</td>
<td>2.2%</td>
</tr>
<tr>
<td>Physical or other medical problems</td>
<td>2.7%</td>
</tr>
<tr>
<td>I was a member of a gang</td>
<td>3.5%</td>
</tr>
<tr>
<td>I got pregnant/gave birth</td>
<td>10.8%</td>
</tr>
<tr>
<td>I got into drugs</td>
<td>11.6%</td>
</tr>
<tr>
<td>I was held back</td>
<td>14.2%</td>
</tr>
<tr>
<td>No one cared if I attended</td>
<td>17.7%</td>
</tr>
<tr>
<td>I had to make money to support my family</td>
<td>19.0%</td>
</tr>
<tr>
<td>School wasn't relevant to my life</td>
<td>20.3%</td>
</tr>
<tr>
<td>I became a caregiver</td>
<td>25.9%</td>
</tr>
<tr>
<td>I was bored</td>
<td>25.9%</td>
</tr>
<tr>
<td>I was failing too many classes</td>
<td>27.6%</td>
</tr>
</tbody>
</table>

*Source: GradNation.org*
General Findings

01 Clusters of Factors
02 Environments are Toxic
03 Yearning for Connectedness
04 Resilience in Need of Support
• Joint research by Florida Departments of Health, Education, Children and Families and Juvenile Justice.
• 65,776 Students
• 724 Schools
Q: All in all, I am inclined to think that I am a failure.

Source: 2016 Florida Youth Substance Abuse Survey

High School

Middle School
Q: At times I think I am no good at all.

High School

Middle School

Source: 2016 Florida Youth Substance Abuse Survey
Applying the Public Health Model

1. Define the problem
2. Identify risk and protective factors
3. Develop and test prevention strategies
4. Assure widespread adoption
SIX PROTECTIVE FACTORS

Concrete Support
Families who can meet their own basic needs for food, clothing, housing, and transportation and who know how to access essential services such as childcare, health care, and mental health services to address family-specific needs and are better able to ensure the safety and well-being of their children.

Social and Emotional Competence
Children's early experiences of being nurtured and developing a positive relationship with caring adults affects all aspects of behavior and development.

Resilience
Parents who can cope with the stresses of everyday life, as well as an occasional crisis, have resilience; they have the flexibility and inner strength necessary to bounce back when things are not going well.

Knowledge of Parenting and Child Development
Children thrive when parents provide not only affection, but also respectful communication and listening, consistent rules and expectations, and safe opportunities that promote independence.

Nurturing and Attachment
Research consistently shows children who receive affection and nurturing from a consistent caregiver have the best chance of growing up to be happy, healthy, and productive. Research also shows these children do better academically, behaviorally, and have an increased ability to cope with stress.

Social Connections
Parents with a social network of emotionally supportive friends, family, and neighbors often find that it is easier to care for their children and themselves.

ACEs can have devastating impacts on long-term health.
When a child experiences adverse childhood experiences (ACEs), it can have life-long consequences for physical and mental health. But, one caring adult can make a difference. That’s why we know building protective factors in parents, communities and businesses is important.
Playing Teen Sports May Protect From Some Damages Of Childhood Trauma
May 2019, Shots Health News, NPR

https://www.npr.org/sections/health-shots/2019/05/28/727661899/playing-teen-sports-may-protect-from-some-damages-of-childhood-trauma
Impact on Health System

• Visit 1, Survey was given to be filled out at home and returned.
• Visit 2, Questionnaire was reviewed with Pt.
  • 135,000 clients reviewed with a combination of Adult Medical Hx with questions relating to their developmental years.

• Results:
  • In subsequent year:
    • 35% reduction in outpatient visits
    • 11% reduction in ER visits
Changing the Conversation

- Impact of trauma on the person.
  - How has it impacted you?
- System of care.
- Protective Factors.
- Resiliency
- Treatment protocols
- Mentoring
Health Equity

Equality

Equity


References


Questions

Joseph D. Pepe, Ed. D. MSA
Health Officer
Charlotte, Hendry and Glades Counties