thebmj Visual summary

From bitter experience

Lifelong implications of adverse childhood experiences

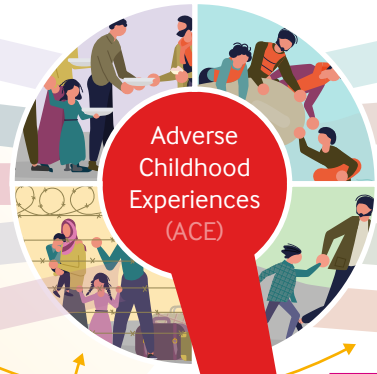
Today's youth face challenges unforeseen in previous generations. Adversity in the first years of life may deleteriously affect the course of human development. This graphic presents some of these challenges and introduces the biological and psychological mechanisms by which they can affect health throughout a child's development and journey into adulthood

Biological

- Malnutrition
- Infectious diseases
- Injury and disability
- Premature or traumatic birth
- Prenatal substance exposure

Psychosocial

- Witnessing violence
- Maltreatment
- Extreme poverty
- Parental discord
- Stigmatisation



Adverse Childhood Experiences (ACE)

Context

Each child's situation is unique, and their particular circumstances can have an important impact on how they are affected by their experiences

- Type of adversity
- Duration of adversity
- Number of adversities
- Interactions between adversities
- Timing and developmental status
- Child's temperament and reaction to adversity
- Pre-existing characteristics
- Family environment
- Health status and comorbidities

Experiences and responses can compound one another

Biological changes

Exposure to adversity early in life interacts with a child's genetic endowment, which in turn leads to a host of biological changes across multiple levels. These changes, in turn, influence adult outcomes

Epigenetic

DNA methylation, such as glucocorticoid receptor promoter, IGF-2 antisense vasopressin

Neurodevelopmental

Changes to cortical volume, functional activity, tract connectivity, or neurotransmitters

Response systems

Reprogramming of stress and immune regulatory systems

Behaviour embedding

Biological changes embedded in beviour, such as substance abuse, exercze, diet, or stress management

Health problems that have been observed more commonly in people that have experienced adversity in childhood

Childhood impacts

Childhood exposure to adversity may lead to increased risk of adverse health conditions. Physical problems often stem from inadequate nutrition, restricting growth and increasing disease risk. Neurobiological and psychological effects can also increase risk of a range of behavioural and mental health problems

Examples of **physical** impacts

- Somatic symptoms
- Headaches
- Poor dental health
- Asthma
- Allergies
- Increased infections

Examples of **behavioural** impacts

- Learning and/or behavioural problems
- Early use of illicit drugs
- High school absenteeism
- Early use of alcohol
- Attention deficit hyperactivity disorder

Adult impacts

Disruption of the development of brain architecture and other organ systems can increase lifelong risk for physical and mental disorders. Such impacts can be observed across multiple systems, affecting cardiovascular, immune, metabolic and brain health, and may extend far beyond childhood, impacting life course health

- Chronic obstructive pulmonary disease
- Somatic symptoms
- Skeletal fracture
- Hepatitis or jaundice
- Cancer
- Cardiovascular disease

- Suicide attempts
- Cannabis use
- Suicidal ideation
- Injected drug, crack cocaine, or heroin use
- Violence perpetration
- Violence victimisation

The way forward

In their BMJ analysis article, Nelson and co-authors explain their recommendations for policy and research in this area, including:

- Development of new metrics
- Implementation of evidence-informed policies
- More individualized research
- A range of interventions at all stages of childhood

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