SPTAC
STRATEGIC PREVENTION
TECHNICAL ASSISTANCE CENTER

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RISK AND PROTECTIVE FACTORS FOR SUBSTANCE USE THAT PRESENT IN CHILDHOOD

CONTENTS

INTRODUCTION

Substance use is a public health concern in the United States across all different demographic groups. According to the results of the 2023 United States National Survey on Drug Use and Health, over 17% of Americans aged 12 years and older have battled a substance use disorder (SUD) in the past year.[i] Rates of substance use—inclusive of SUD—are even higher. Researchers and health advocates alike have been able to identify different risk and protective factors associated with substance use that can manifest during childhood. Identifying and understanding the factors is essential in effective prevention efforts, as doing so can enable the timely implementation of interventions and significantly reduce the likelihood that individuals will experience substance use later in life. In this tool, *substance use* is defined as the use of illegal drugs and the inappropriate use of legal substances, such as alcohol, tobacco, and cannabis (in legalized states).

The factors included in this tool have been organized according to the Socio-Ecological Model (SEM). SEM is the Center for Disease Control and Prevention's (CDC's) multi-level framework that allows us to consider the different contexts in which risk and protective factors exist. This model considers the different contexts and settings with which a person interacts and is based on the premise that we are influenced not only by traits specific to us or what we think and believe, but by our relationships with others, the institutions and communities to which we belong, and the broader society in which those institutions are embedded. There are four levels to the SEM:

1. Individual level: Includes factors specific to the individual, such as age, education, income, health, and psychosocial problems, which may correspond with substance use and misuse.
2. Relationship level: Includes an individual's closest social circle—family members, peers, teachers, and other close relationships—that contribute to their range of experiences and that may influence their behavior.
3. Community level: Includes the settings in which social relationships occur, such as schools, workplaces, and neighborhoods. These factors can have both negative and positive associations with substance use and misuse.
4. Societal level: Includes the broad societal factors, such as social and cultural norms. Other significant factors operating at this level include the health, economic, educational, and social policies that contribute to economic and/or social inequalities between populations.

Factors that influence future behavior are often categorized as either risk or protective factors. Here, a protective factor is a characteristic operating at the individual, relationship, community, or societal level that is associated with a lower likelihood of SUD or that reduces the negative impact of a risk factor on SUD. Conversely, a risk factor is a characteristic at each level of the SEM that precedes and is associated with a higher likelihood of SUD.

Our search of the literature yielded many more risk factors than protective factors. In addition, the majority of factors are situated at the individual level of the SEM, which focuses on an individual's personal experience rather than contextual factors. Studies included risk and protective factors that were present during childhood and associated with substance use outcomes that occurred in childhood or later in life. In addition, while our literature search included search terms that included a variety of substances that are commonly used, alcohol consumption was most frequently assessed in the identified studies.

Determinants	Definition
Individual Level	
Early initiation of substance use	Engaging in alcohol or drug use at a young age
Early and persistent problem behavior	Emotional distress, aggressiveness, and "difficult" temperaments in adolescents
Rebelliousness	High tolerance for deviance and rebellious activities
Favorable attitudes toward substance use	Positive feelings toward alcohol or drug use, low perception of risk
Peer substance use	Friends and peers who engage in alcohol or drug use
Academic failure	Poor grades in school
Social, emotional, behavioral, cognitive, and moral competence	Interpersonal skills that help youth integrate feelings, thinking, and actions to achieve specific social and interpersonal goals
School performance	High school grades, teacher-rated ability, problems with school or academics
Internalizing problems	Expressing depressive symptoms, low self-satisfaction, and neurotic/immature defenses, anxiety, and/or somatic symptoms
Experience with stressful life events	The death of a parent, changes in appearance, ending a committed relationship, etc.
Religious involvement	Self-reported by adolescents who indicated that religion was important to them and expressed through religious commitment and participation
Family Level	
Family management problems	Poor management practices, including parents' failure to set clear expectations for children's behavior; failure to supervise and monitor children; and excessively severe, harsh, or inconsistent punishment

Family conflict	Conflict between parents or between parents and children, including abuse or neglect
Family bonding	A close and supportive relationship characterized by high levels of attachment between parents and offspring
Family functioning	The extent to which family activities and relationships are conducted in an ordered, structured, and rule-governed way
Family management	Parental monitoring, discipline and behavioral control, and the reward system that parents set in place to reinforce good behaviors
Family history of substance use	Persistent, progressive, and generalized substance use, use, and use disorders by family members
Recognition for positive behavior	Parents, teachers, peers, and community members providing recognition for effort and accomplishments to motivate individuals to engage in positive behaviors in the future
Bonding	Attachment and commitment to, and positive communication with, family, schools, and communities
Parental psychopathology	Antisocial personalities and/or depression expressed by parents
Community Level	
Media portrayal of alcohol use	Exposure to actors using alcohol in movies or television
Low neighborhood attachment	Low level of bonding to the neighborhood
Community disorganization	Living in neighborhoods with high population density, lack of natural surveillance of public places, physical deterioration, and high rates of adult crime
Low socioeconomic status	A parent's low socioeconomic status, as measured through a combination of education, income, and occupation
Transitions and mobility	Communities with high rates of mobility within or between communities

Healthy beliefs and standards for behavior	Family, school, and community norms that communicate clear and consistent expectations about not misusing alcohol and drugs
Perceived drinking social norms at school	Social expectations from peers about positive versus negative drinking behaviors on campus

SEARCH METHODS AND INCLUSION CRITERIA

To populate this tool, we conducted a thorough search of the academic literature to identify those factors that protect against or increase the risk for SUD. Searches were conducted using the PSYCHINFO, MEDLINE, PSYCHARTICLES, and SOCINDEX databases. Search terms included the following:

- "risk factor" OR "protective factor" OR determin* OR predict* OR contribut* OR protect* OR risk OR predispose* OR suscept* OR "adverse child* experience*" OR "protective child* experience*"
- **AND** "alcohol abuse" OR drinking OR "alcohol use disorder" OR "alcohol dependence" OR "opioid* use" OR "stimulant use" OR "cigarette use" OR "cocaine use" OR "drug abuse" OR "drug addiction" OR "drug dependence" OR "drug use" OR "heroin use" OR "methamphetamine use" OR "narcotic use" OR "nicotine use" OR smoking OR "street drugs" OR "substance abuse" OR "substance misuse" OR "substance use disorder" OR "tobacco use" OR "marijuana use" OR "cannabis use" OR "prescription drug misuse" OR "prescription drug abuse" OR "alcohol use" OR "alcohol misuse"
- **AND** child* OR baby OR boy OR daughter OR girl OR minor OR infant OR juvenile OR offspring OR son OR youngster OR youth OR "school-age" OR "school age" OR toddler OR preadolescen* OR pre-adolescen*

The result was 32 studies that met our criteria for inclusion. Specifically, these studies were:

- Published in a peer-reviewed journal between 2015 and 2024
- Available in full text
- Implemented with a U.S.-based sample
- Published in English

These studies also:

- Included clearly articulated methods for establishing associations between specific risk or protective factors in childhood and substance use in childhood or later in life

- Assessed at least one main outcome (dependent variable) specifically related to substance misuse/use or consequences
- Established a direct (and statistically significant) link between risk or protective factors and substance use outcomes of interest
- Employed longitudinal methods to establish that the risk or protective factor presented before substance use
- Used quantitative data analyses
- Included human participants

In addition, articles were excluded that:

- Focused on the evaluation of prevention or treatment strategies.
- Did not identify any risk or protective factors statistically linked ($p < .05$) to substance use outcomes.
- Were literature reviews, non-primary sources, commentaries, news report, or historical perspectives. Note, however, that studies meeting inclusion criteria were distilled from literature reviews produced in our search.
- Used cross-sectional methods to establish a relationship between risk or protective factors and substance use outcomes.
- Included a combined or composite outcome measure of multiple types of drug use.

RELATED RESOURCES AND TOOLS

This tool adds to the literature reviews that have focused on identifying childhood determinants of substance use. Here, we provide a review of more recent studies that support much of what was published in the 2010s.[ii,iii] Those high-profile reviews, which included reviews of longitudinal studies that followed children into adolescence and young adulthood, described the following to be childhood determinants of substance use. Other SAMHSA tools that support early intervention in childhood to prevent SUD later in life include the following:

- Adverse Childhood Experiences and the Role of Substance Misuse Prevention
- Who's Who in Early Childhood and How They Can Support Your Prevention Efforts

- Principles of Substance Abuse Prevention for Early Childhood: A Research-Based Guide
- Why You Should Talk With Your Child About Alcohol and Other Drugs
- Substance Use Prevention Resources for Youth and College Students

TOOL ORGANIZATION

This tool comprises two sections, each organized according to the socio-ecological levels of influence—individual, relationship, community, and societal:

- Section 1 provides at-a-glance information on which risk or protective factors are linked to which outcomes for specific population groups. When reading through the tables in this section, you should be able to say that a given protective factor is associated with a specific outcome among a given population (according to this study). For example, referencing an entry from the table highlighting individual-level factors, we can say the following: adverse childhood experiences are associated with a greater likelihood of substance use later in life.
- Section 2 provides detailed information on the research studies that identify these factors. Within each level of influence, we list relevant articles; the factors they identify; and details on participant characteristics, analyses, and any outcomes significantly associated with the identified factors.

A FEW CAUTIONARY WORDS

Please use prudence when interpreting information included in these tables. Here is why:

1. The findings are limited to the time frame, libraries, and search parameters described above. Expanding the time frame or examining risk and protective factors associated with other substances may uncover additional or conflicting factors.

2. Although all included studies used longitudinal designs to establish temporal precedence, the methods used varied. For example, some studies were based on the secondary analysis of previously completed longitudinal studies. Additionally, the longitudinal studies included in our work varied significantly in duration, with some spanning over 3 years while others encompassed even longer periods of data collection.

3. We do not include studies demonstrating insignificant or negative findings related to the risk or protective factors featured here. It is possible that for every study demonstrating a positive finding on any given factor, there is a study showing no findings—suggesting that the relationship between the contributing or associated factor and the outcome is inconclusive. For this reason, you may want to consider only those risk or protective factors supported by two or more studies.

GLOSSARY OF TERMS

To keep the tool as concise and consistent as possible, many technical terms are used without explanation. While many of these terms may be familiar to prevention experts, such as the difference between *misuse* and *dependence*, others are terms more commonly used in other fields. The following is a list of terms used in this tool with which prevention experts might be less familiar, accompanied by short definitions:

- **Attention-deficit/hyperactivity disorder (ADHD):** A neurodevelopmental disorder that is associated with consistent patterns of inattention, hyperactivity, and impulsivity. Both children and adults can be diagnosed with ADHD, with most cases commonly diagnosed during childhood.

- **Binary logistic regression:** A statistical method that describes the relationship between a binary dependent variable and one or more independent variables, predicting the values of an outcome of interest.

- **Bivariate latent growth curve:** A statistical graph that helps researchers explore how changes in one variable can impact the growth of another variable.

- **Bullying perpetration:** Initiating interactions where an individual expresses emotionally and/or physically aggressive behaviors and actions to others.

- **Bullying victimization:** Exposure to interactions where an individual is subjected to emotionally and/or physically aggressive behaviors and actions caused by others.

- **Confirmatory structural model:** A statistical technique that can validate whether an identified theoretical model fits the dataset available.

- **Cox proportional hazard model:** A statistical tool that describes how predictor variables can affect the relative risk of an event of interest from occurring.

- **Discrete-time survival analysis:** A statistical method that describes the likelihood that an event of interest occurs within specific time intervals.

- **Electronic nicotine delivery systems (ENDS):** Devices that deliver nicotine to users through vapor and include e-cigarettes, vape pens, and other similar devices.

- **Finite mixture model:** A statistical tool that can be used to classify individuals into subgroups and draws inferences about how these subgroups behave.

- **Growth mixture modeling:** A statistical tool used to help identify the longitudinal changes within different unobserved sub-populations in a study.

- **Inverse probability analysis:** A statistical method that can be used to address biases and confounding variables found within observational studies.

- **Latent class analysis:** A statistical method used to help classify individuals into different subgroups who originally reside from the same population.

- **Latent profile analysis:** A statistical method that allows researchers to identify different subgroups within their study population based on different variables of interest.

- **Linear probability model:** A statistical tool that predicts the relationship between variables through the estimates provided on a linear graph.

- **Longitudinal study:** A study for which data are collected from the same sample of subjects over a designated period of time. The use of this study design allows researchers to observe changes in behaviors, conditions, and responses over the span of the study.

- **Maximum likelihood estimator:** A statistical method that helps researchers identify which model parameters should be chosen to best describe the observed data.

- **Multilevel linear modeling:** A statistical tool that analyzes how different variables can impact the outcome of interest at different levels of the data, shown through one linear graph.

- **Multinomial logistic regression:** A statistical method that explains the relationship between a categorical dependent variable with more than two outcomes and at least one independent variable.

- **Ordinary least squares regression:** A statistical method that describes the relationship between at least one independent quantitative variable and a dependent variable, shown through one linear graph.

- **Pearson's correlation test:** A statistical method that is used to measure how closely two variables are related to one another in terms of statistical strength and direction.

- **Poisson regressions:** A statistical method that can identify the occurrence of an outcome of interest within a fixed period of time.

- **Propensity score matching:** A statistical method that provides researchers with a nonexperimental estimate of the impact of their intervention within observational studies.

- **Secondary analysis of longitudinal data:** The process of using already existing data from a longitudinal study to answer new research questions of interest.

- **Stepwise linear regression model:** A statistical tool involving the addition or removal of variables of interest to a built regression model to identify which variables produce the most statistically significant changes.

- **Structural equation modeling:** A statistical tool that describes the effects of latent variables (variables that have not been directly observed) on the measured variables of interest in the study.

- **Structural logit model:** A statistical tool that can be used to estimate the probability of binary outcomes based on different predictor variables.

- **Substance use:** The use of illegal drugs and the inappropriate use of legal substances, such as alcohol, tobacco, and cannabis (in legalized states).

SECTION 1: RISK AND PROTECTIVE FACTORS ORGANIZED BY FACTOR

Individual-Level Factors

Individuals most at risk for substance use include those **who have attention-deficit/hyperactivity disorder (ADHD), exhibit certain externalizing behaviors, have existing health conditions, or experience bullying.** In the studies included in this section, bullying includes both bullying victimization and bully perpetration at school. Experiences with ADHD include expressing symptoms associated with the disorder and being diagnosed with the disorder. Negative behavioral developments include the development of attention-seeking behaviors, poor emotional regulation/impulse control, general delinquency, and experiences with sexual victimization by other students. These individual risk factors bolster the findings of previous research[2,3] that found those who have experienced bullying, negative behavioral developments, existing health conditions, and poor academic performance during childhood can be at risk for substance use later in life. However, more recent research has focused on ADHD as a significant risk factor for substance use as well.

INDIVIDUAL-LEVEL FACTORS
How to read this table: "Among *population(s) of interest, factor* in childhood is associated with *outcome* later in life."

Population	Factor	Outcomes	Citation
Bullying			
Nationally representative sample of children and youth	Bullying victimization	Higher odds of poor mental and general health Higher odds of alcohol consumption Higher odds of cigarette use Higher odds of marijuana use Lower odds of high school diploma attainment Lower odds of college attendance	Alisheva and Mandal (2023).

		Higher odds of an earlier entry into the job market Higher odds of mental health services utilization in adulthood Higher odds of life-disrupting mental or emotional problems	
Youth who participated in the Population Assessment of Tobacco and Health	Bullying perpetration	Higher odds of past year alcohol use Higher odds of past year marijuana use Higher odds of past year cigarette use	Azevedo Da Silva and Martins (2020).
Attention-Deficit Hyperactivity Disorder (ADHD)			
Nationally representative sample of child sibling pairs	ADHD symptoms	Higher odds of substance use	Kim, S. and Kim, D. (2021)
Nationally representative sample of children and youth	ADHD symptoms	Higher odds of early cigarette use Higher odds of subsequent illicit drug use	Lee et al. (2018)
Children	ADHD diagnosis	Increased regular use of marijuana and cigarettes in adulthood	Molina et al. (2018)
Externalizing Behaviors			
Children and adolescents who participated in a study of familial alcoholism risk	Sensation seeking in childhood (novelty seeking, excitement seeking, and fun seeking)	Higher odds of alcohol, tobacco, or marijuana use initiation	Jensen et al. (2017)
5th grade public school students	Impulsiveness (urgency, sensation-seeking, and low conscientiousness)	Increase in drinking and/or smoking behavior	Peterson and Smith (2017)
Children who participated in a Johns Hopkins research study	Poor behavioral self-control	Lower odds of on-time high school graduation Lower odds of college participation Higher odds of teen pregnancy Higher odds of meeting diagnostic criteria for a substance use disorder	Johnson et al. (2023)

		Higher odds of criminal justice system involvement Higher odds of incarceration	
Children who participated in the Fast Track Project	Positive social-emotional skills	Higher odds of graduating high school on time Higher odds of completing a college degree Higher odds of employment Lower odds of criminal activity Lower odds of substance use	Jones et al. (2015)
Children and adolescents in Texas	Alcohol and other substance use	Higher odds of e-cigarette use over the course of a year	Carey et al. (2019)
Nationally representative sample of children and youth	Early (prior to high school entry) delinquency	Increase in current alcohol consumption (past 30 days)	Burdzovic Andreas and Jackson (2015)
Mental Health			
Children who participated in the Longitudinal Studies on Child Abuse and Neglect	Internalizing experiences with neglect	Increase in substance use	Duprey et al. (2017)
Children in grades 7 through 12 who participated in the National Longitudinal Study of Adolescent Health	Suicidal ideation	Increased use of substances (alcohol, marijuana, and illicit drugs; use of prescription medication)	Broman et al. (2019)
Existing Health Conditions			
Children in grades 7 through 12 who participated in the National Longitudinal Study of Adolescent Health study	Health problems (composite)[1] Learning disabilities Physical disabilities	Increased use of substances (alcohol, marijuana, and illicit drugs; use of prescription medication)	Broman et al. (2019)

[1] Composite of these health problems: Headache, feeling hot all over, stomach-ache, cold sweats, sore throat or cough, painful or frequent urination, feeling really sick, dizziness, chest pains, and aches, pains, or sore joints or muscles

Adjudicated youths who participated in the Pathways to Desistance Study	Early substance use	Increase in *lifetime risk of:* Alcohol use Cigarettes use Cannabis use Stimulants use Cocaine use Ecstasy use Hallucinogens use Inhalants use Nitrate odorizer use Sedative use Opiates use	Baggio et al. (2019)
Academic Achievement			
Children and adolescents in Texas	Poor school performance	Higher odds of e-cigarette use over the course of a year	Carey et al. (2019)

Relationship-Level Factors

At a relationship level, individuals most at risk for substance use include those who have been exposed to relationships where substance use and familial dysfunction are prevalent leading to adverse childhood experiences. **A lack of social connections outside of the traditional family structure** can contribute to risk for substance use as well. Studies cited in this section count parental substance use as including use of prescription opioids, ENDS, cannabis, cocaine, heroin, and prescription medications used outside of medical guidelines. Familial dysfunction is defined by the children's relationships with their families, primarily their parents, and often includes a lack of parental involvement, poor emotional support, and high levels of conflict and distress. These relationship-level risk factors bolster the findings of previous research findings[2,3] showing that children in families where there is an abundance of economic stress and a lack of family structure during childhood are at increased risk for substance use later in life. Further, having parents who use substances and with poor mental health in childhood as well as other adverse childhood experiences (including abuse and neglect) contribute to a child's increased risk for substance use later in life. Beyond family relations, peer relationships also play critical role, as individuals who are surrounded by peers who engage in substance use are at a heightened risk for establishing similar behaviors themselves.

RELATIONSHIP-LEVEL FACTORS
How to read this table: "Among *population(s) of interest*, having f*actor* in childhood is associated with o*utcome* later in life."

Population	Factor	Outcomes	Citation
Family Economic Stress			
Children and adolescents in Texas	Family SES	No differences in the odds of e-cigarette use over the course of a year	Carey et al. (2019)
Parental Substance Use			

Children (and their parents) who participated in the OYS-3 Generational Study	Parents who use substances	Increase in risk of alcohol, tobacco, and marijuana use	Kerr et al. (2020)
Children (and their families) who participated in the Seattle Social Development Intergenerational Project	Parents who use ENDS	Increase in past month use of ENDS	Bailey et al. (2022)
Nationally representative sample of children and youth	Mothers' who use cannabis	Increase in risk for earlier cannabis initiation	Sokol et al. (2018)
Nationally representative sample of children, youth, and young adults	Parents who use drugs	Higher odds of HIV-related drug use and sex risk in adolescence and adulthood	Khan et al. (2018)
Parental Mental Health			
Nationally representative sample of children, youth, and young adults	Parents with mood disorders	Higher odds of HIV-related drug use and sex risk	Khan et al. (2018)
Children (and their parents) who participated in the OYS-3 Generational Study	Parents with depressive symptoms	Increase in risk of alcohol, tobacco, and marijuana use	Kerr et al. (2020)
Recently immigrated Latino children (and their parents)	Parents with depressive symptoms	Lower odds of emotional well-being Higher odds of health risk behaviors (i.e., aggressive and rule-breaking behavior, cigarette and alcohol use)	Lorenzo-Blanco et al. (2017)
Family Functioning			
Nationally representative sample of children and youth	No established family routines (e.g., parental monitoring)	Increase in likelihood of alcohol use	Abar et al. (2017)
Nationally representative sample of children and youth	Parents do not know their child's activities	Increase in likelihood of alcohol use	Abar et al. (2017)
Recently immigrated Latino children (and their parents)	Poor family functioning	Lower odds of emotional well-being Higher odds of health risk behaviors (i.e., aggressive and rule-breaking behavior, cigarette and alcohol use)	Lorenzo-Blanco et al. (2017)

Nationally representative sample of children, youth, and young adults	Parents with delinquent behaviors	Higher odds of HIV-related drug use and sex risk in adolescence and adulthood	Khan et al. (2018)
Family Structure			
Nationally representative samples of children and youth in the U.S. and UK	Single, maternal-led family structure	Higher odds of cigarette use Higher odds of marijuana use	Stritzel et al. (2022)
Nationally representative sample of children, youth, and young adults	Parents who are incarcerated	Higher odds of HIV-related drug use and sex risk	Khan et al. (2018)
Adverse Childhood Experiences			
Nationally representative sample of children, youth, and young adults	Adverse childhood experiences (composite)[2]	Higher odds of early drinking and gang involvement Higher odds of intoxication and use of drugs	Trinidad (2021)
Adolescents from a large northwestern U.S. city who participated in the Flourishing Families Project	Adverse childhood experiences (composite)[3]	Increase in depression Increase in anxiety Increase in risky sexual behaviors Increase of substance abuse	Crandall et al. (2020)
Adolescents from a large northwestern U.S. city who participated in the Flourishing Families Project	Advantageous childhood experiences (counter-ACES composite)[4]	Decrease in depression Decrease in anxiety Decrease in risky sexual behaviors Decrease in substance abuse	Crandall et al. (2020)
Nationally representative sample of children, youth, and young adults	Experienced childhood traumas (composite)[5]	Higher odds of marijuana and cocaine use	Scheidell et al. (2018)

[2] Composite of these ACEs: Parental alcohol or drug problem, parental incarceration, childhood physical abuse or neglect, and domestic violence

[3] Composite of these ACEs: Experience of physical punishment, experience of psychological control from their parents, exposure to high levels of parental conflict, parental substance use, and parental legal problems

[4] Composite of these counter-ACEs: Positive parenting, school connectedness, meaningful beliefs, and close relationships with family, friends, and non-parent adults

[5] Composite of these traumas: Neglect; emotional, physical and sexual abuse; parental incarceration; parental binge drinking; and witnessing/being threatened with and experiencing violence

Childhood Abuse and Neglect			
Children who participated in the Longitudinal Studies on Child Abuse and Neglect	Experienced neglect	Increase in substance use	Duprey et al. (2017)
Children who participated in the Longitudinal Studies on Child Abuse and Neglect	Experienced chronic neglect (composite)[6]	Higher risk of substance use	Dubowitz et al. (2019)
Nationally representative sample of children and youth who were subjects of child abuse or neglect investigations	Enrollment in childhood welfare programs	Higher odds of alcohol and marijuana use over the past 30 days	Sellers et al. (2019)
Children who participated in the Longitudinal Studies on Child Abuse and Neglect	Maltreatment (composite)[7]	Higher likelihood of adolescent substance use	Yoon et al. (2018)
Peer Relationships			
Children who participated in the Minnesota Twin Family Study	Antisocial peer affiliations	Higher average number of drinks per occasion over the past 12 months Increases in maximum number of drinks in 24 hours	Brislin et al. (2021)
Youth in Colorado schools	Experienced sexual victimization by other students	Higher substance use	Mintz et al. (2022)

[6] Composite of experienced chronic neglect: Emotional support, physical needs, nurturance, and protection from hazards at age 16, as well as for emotional support and future planning at 18

[7] Composite of maltreatment: Physical abuse, sexual abuse, emotional abuse, and neglect

Community-Level Factors

At the community level, individuals most at risk for substance use include individuals who lived as children in impoverished areas with high rates of housing segregation are most at risk for substance use due to the compounded stress and lack of resources related to these conditions. In the studies included here, impoverished areas include those in which there were low county levels of (1) educational attainment, (2) high percent unemployment, and (3) personal income, as well as varying levels of neighborhood poverty (low, moderate, and high). Further, housing segregation included incidents where children and their families encountered inequitable access to housing due to differences in race and socioeconomic status. Similar to earlier reviews of the evidence,[2,3] our review found that those who reside in neighborhoods with higher poverty levels and limited community cohesion are at increased risk for substance use. These community-level factors, often referred to as elements of "neighborhood disorganization," often indirectly affect a child's upbringing and future substance use.

COMMUNITY-LEVEL FACTORS
How to read this table: "Among *population(s) of interest*, exposure to f*actor* in childhood is associated with o*utcome* later in life."

Population	Factor	Outcomes	Citation
Local Poverty			
Nationally representative sample of children, youth, and young adults	Higher neighborhood poverty level	Higher odds of smoking	Kravitz-Wirtz, N. (2016)
Nationally representative sample of Asian American children and youth	Higher neighborhood SES	Higher frequency of heavy episodic drinking over the past 12 months Higher frequency of drunkenness	Cook et al. (2015)
Nationally representative sample of children, youth, and young adults	Housing insecurity	Higher odds of early drinking and gang involvement Higher odds of intoxication and use of drugs	Trinidad, J. E. (2021)

Community Cohesion			
Children and adolescents who had participated in the Longitudinal Studies on Child Abuse and Neglect	Neighborhood disorder	Increase in substance use	Duprey et al. (2017)
Nationally representative sample of Asian American children and youth	Neighborhood co-ethnic density	Higher frequency of heavy episodic drinking over the past 12 months Higher frequency of drunkenness	Cook et al. (2015)
Prescribing Practices			
Pediatric Medicaid patients in South Carolina	Opioid exposure following appendectomy procedures	Increase in chronic opioid use	Cina et al. (2022)

Society-Level Factors

At the societal level, individuals most at risk for substance use include those who grow up in a **culture that encourages drinking alcohol**. Drinking cultures, defined as cultural norms and behavioral practices of drinking in a country of origin, can determine normative versus problematic drinking patterns among different populations. The study included in this section focuses on cultural drinking norms specific to immigrant families. Similar to previous reviews of the literature,[2,3] ours found strong temporal associations between an individual's cultural or ethnic norms during childhood and their risk of substance use later in life. If an individual is raised to follow cultural or ethnic norms that encourage, versus discourage, alcohol and drug use among youth, then their risk of substance use early in life or later in life is more likely to increase.

SOCIETY-LEVEL FACTORS
How to read this table: "Among *population(s) of interest*, exposure to *factor* in childhood is associated with o*utcome* later in life."

Population	Factors	Outcomes	Citation
Cultural/Ethnic Norms			
Nationally representative sample of Asian American children and youth	Ethnic drinking cultures (detrimental drinking patterns in origin country)	Higher frequency of heavy episodic drinking over the past 12 months Higher frequency of drunkenness	Cook et al. (2015)
Recently immigrated Latino children (and their parents)	Cultural stress (composite)[8]	Lower odds of emotional well-being Higher odds of health risk behaviors (i.e., aggressive and rule-breaking behavior, cigarette and alcohol use)	Lorenzo-Blanco et al. (2017)

[8] Cultural stress composite: Acculturative stress, perceived discrimination, and a negative context of reception

SECTION 2: RISK AND PROTECTIVE FACTORS ORGANIZED BY STUDY

This section provides detailed information on the research studies that identified the childhood risk and protective factors for substance use from Section 1 above. Within each level of influence, we list relevant articles, the factors they identify, and details on participant characteristics, analyses, and any outcomes significantly associated with the identified factors. *Please note*: For studies with more than one outcome of interest, the outcomes are numbered, and the numbers are listed (in parentheses) next to the risk and/or protective factors with which they are significantly associated.

INDIVIDUAL-LEVEL FACTORS				
Citation	**Factors**	**Population**	**Design and Analysis**	**Outcomes**
Alisheva and Mandal (2023)	Bullying victimization	Children and youth (N = 8,984) aged 12–16 who participated in the National Longitudinal Study of Youth, 1997–2009	Secondary data analysis of longitudinal data using propensity score matching and ordinary least squares regression models	Higher odds of poor mental and general health Higher odds of alcohol consumption Higher odds of cigarette use Higher odds of marijuana use Lower odds of high school diploma attainment Lower odds of college attendance Higher odds of an earlier entry into the job market Higher odds of mental health services utilization in adulthood

				Higher odds of life-disrupting mental or emotional problems
Azevedo Da Silva and Martins (2020)	Bullying perpetration	Children and youth (N = 13,068) aged 12–17 who participated in the Population Assessment of Tobacco And Health (PATH), 2013–2016	Secondary analysis of longitudinal data using binary logistic regressions	Higher odds of past year alcohol use Higher odds of past year marijuana use Higher odds of past year cigarette use
Kim, S. and Kim, D. (2021)	ADHD symptoms	Children (N = 712 sibling pairs) from a nationally representative longitudinal survey, initially interviewed at ages 12 or less in 1997 and followed through 2015 with biennial assessments	Secondary analysis of longitudinal data using baseline logistic regressions and linear probability models	Higher odds of substance use
Lee et al. (2018)	ADHD symptoms	Children and youth (N =7,332), aged 11–18, who were part of the National Longitudinal Study of Adolescent Health (Waves I–IV)	Secondary analysis of longitudinal data using binary logistic regression and discrete-time survival analyses	Higher odds of early cigarette use Higher odds of subsequent illicit drug use
Molina et al. (2018)	ADHD diagnosis	Children (N = 79), aged 7–10, diagnosed with DSM-IV ADHD combined type and 258 age- and sex-matched comparison children without ADHD.	Longitudinal study using multilevel linear modeling	Increased regular use of marijuana and cigarettes in adulthood
Jensen et al. (2017)	Sensation seeking in childhood (novelty seeking, excitement seeking, and fun seeking)	Children and youth (N = 454), aged 10–15 who participated in an intergenerational study of familial alcoholism risk, 2006–2011	Secondary analysis of longitudinal data using binary logistic regressions	Higher odds of alcohol, tobacco, or marijuana use initiation

Peterson and Smith (2017)	Impulsiveness (urgency, sensation-seeking, and low conscientiousness)	5th grade students (N = 1,897) attending public schools in Kentucky	Longitudinal study using single, confirmatory structural models	Increase in drinking and/or smoking behavior
Johnson et al. (2023)	Poor behavioral self-control	Children (N = 678) who participated in the Johns Hopkins Prevention Intervention Research Center 2nd Generation Cohort, from first grade to the age of 26	Longitudinal study using latent profile analyses and standard fit statistics	Lower odds of on-time high school graduation Lower odds of college participation Higher odds of teen pregnancy Higher odds of meeting diagnostic criteria for a substance use disorder Higher odds of criminal justice system involvement Higher odds of incarceration
Jones et al. (2015)	Positive social-emotional skills	Subsample of children (N = 753) who participated in the Fast Track Project and were interviewed in kindergarten, with follow-up assessments 13–19 years later	Secondary analysis of longitudinal data using binary logistic and Poisson regressions	Higher odds of graduating high school on time Higher odds of completing a college degree Higher odds of employment Lower odds of criminal activity Lower odds of substance use
Burdzovic Andreas and Jackson (2015)	Early (prior to high school entry) delinquency	Children (N = 891) aged 12 who participated in the National Longitudinal Survey of Youth 1997	Secondary analysis of longitudinal data using a stepwise linear regression model	Increase in current alcohol consumption (in the past 30-days)

Broman et al. (2019)	Health problems (composite) Learning and physical disabilities Suicide ideation	Adolescents in grades 7 through 12 in the United States who participated in the National Longitudinal Study of Adolescent to Adult Health	Secondary analysis of longitudinal data using binary logistic regressions	Increased use of substances (alcohol, marijuana, and illicit drugs; use of prescription medication)
Duprey et al. (2017)	Internalizing experiences with neglect	Children (N =965) who participated in the Longitudinal Studies on Child Abuse and Neglect (LONGSCAN), from ages 4–18	Secondary analysis of longitudinal data using Pearson's correlation test	Increase in substance use
Carey et al. (2019)	Poor school performance	Students (N = 3907) in the 6th, 8th, and 10th grades who participated in the Texas Adolescent Tobacco and Marketing Surveillance System (TATAMS)	Longitudinal study using weighted generalized linear mixed models	Higher odds of e-cigarette use over the course of a year

RELATIONSHIP-LEVEL FACTORS				
Citation	**Factors**	**Population**	**Design and Analysis**	**Outcomes**
Kerr et al. (2020)	Parents who use substances	Children (N = 216) and their parents (111 fathers and 136 mothers) who participated in the OYS–Three Generational Study, responding to substance use questions at ages 9–10 (N = 106), 11–12 (N = 204) and 13–14 (n = 181).	Secondary analysis of longitudinal data using Poisson regression	Increase in risk of alcohol, tobacco, and marijuana use

Carey et al. (2019)	Family SES	Students (N = 3,907) in the 6th, 8th, and 10th grades who participated in the Texas Adolescent Tobacco and Marketing Surveillance System (TATAMS)	Longitudinal study using weighted generalized linear mixed models	No differences in the odds of cigarette use over the course of a year
Bailey et al. (2022)	Parents who use ENDS	Children aged 1–13 (from 295 families) who participated in 2015, 2016, and 2017 waves of the Seattle Social Development Intergenerational Project	Longitudinal study using fixed effects analytical modeling	Increase in past month use of ENDS
Sokol et al. (2018)	Mothers who use cannabis	Children and youth (N = 12,686), aged at least 6 years, who participated in the National Longitudinal Survey of Youth 1979 (1980–1998 waves) and Child and Young Adults (1988–2014 waves) cohorts.	Secondary analysis of longitudinal data using Cox proportional hazard models	Increase in risk for earlier cannabis initiation
Khan et al. (2018)	Parents who use drugs	Children, youth, and young adults (N = 1,884), ages 12–34, who participated in waves of the National Longitudinal Study of Adolescent to Adult Health	Secondary analysis of longitudinal data using bivariate and multivariate tests of association	Higher odds of HIV-related drug use and sex risk
Abar et al. (2017)	No established family routines (e.g., parental monitoring) Parents do not know their child's activities	Children and youth (N = 5,419), aged 12–14, who participated in the National Longitudinal Survey of Youth 1997	Secondary analysis of longitudinal study using Pearson's correlation test	Increase in likelihood of alcohol use

Lorenzo-Blanco et al. (2017)	Poor family functioning	Recently immigrated Latino parents (N = 302) and their adolescent children	Secondary analysis of longitudinal data using structural equation modeling and maximum likelihood estimators	Lower odds of emotional well-being Higher odds of health risk behaviors (aggressive and rule-breaking behavior, cigarette and alcohol use)
Stritzel et al. (2022)	Single, maternal-led family structure	Children and youth from the U.S. National Longitudinal Survey of Youth 1979 Child and Young Adults, N = 6,236; UK Millennium Cohort Study, N = 11,095	Secondary analysis of longitudinal data using inverse probability analyses	Higher odds of cigarette use Higher odds of marijuana use
Trinidad (2021)	Adverse childhood experiences (composite)	Children, youth, and young adults (N = 1,155), aged 0 to 28, who participated in the Panel Study of Income Dynamics from 2007–2017	Secondary analysis of longitudinal data using logistic regression	Higher odds of early drinking and gang involvement Higher odds of intoxication and use of drugs
Duprey et al. (2017)	Experienced neglect	Children (N = 965) who participated in the Longitudinal Studies on Child Abuse and Neglect (LONGSCAN), ages 4–18	Secondary analysis of longitudinal data using Pearson's correlation test	Increase in substance use
Dubowitz et al. (2019)	Experienced chronic neglect (composite)	Children (N = 475) who participated in the Longitudinal Studies on Child Abuse and Neglect (LONGSCAN), ages 4–18	Secondary analysis of longitudinal data using latent class analysis	Higher risk of substance use
Crandall et al. (2020)	Adverse childhood experiences (composite)	Children (N = 489) from a large northwestern city in the Flourishing Families Project, ages 10–13	Secondary analysis of longitudinal data using confirmatory factor analysis and structural model regression	Increase in depression Increase in anxiety Increase in risky sexual behaviors Increase of substance abuse

Crandall et al. (2020)	Adverse childhood experiences (counter-ACES composite)	Children (N = 489) from a large northwestern city in the Flourishing Families Project, from ages 10–13	Secondary analysis of longitudinal data using confirmatory factor analysis and structural model regression	Decrease in depression Decrease in anxiety Decrease in risky sexual behaviors Decrease in substance abuse
Scheidell et al. (2018)	Experienced childhood traumas (composite)	Children (N = 12,288) who participated in the National Longitudinal Study of Adolescent to Adult Health (Waves 1, 3, 4) and followed from ages 11 to 21	Secondary analysis of longitudinal data using bivariate and multivariate tests of association	Higher odds of marijuana and cocaine use
Sellers et al. (2019)	Enrollment in childhood welfare programs	Children and youth (N = 1,050), aged 11–17, who were subjects of child abuse or neglect investigations and participated in the National Survey of Child and Adolescent Wellbeing II Study	Secondary analysis of longitudinal data using binary logistic regression	Higher odds of alcohol and marijuana use over the past 30 days
Baggio et al. (2019)	Early substance use	Adjudicated youths (N = 1,354) who participated in the Pathways to Desistance Study	Secondary analysis of longitudinal data using latent class and latent transition approaches	*Increase in lifetime risk of:* Alcohol use Cigarettes use Cannabis use Stimulants use Cocaine use Ecstasy use Hallucinogens use Inhalants use Nitrate odorizers use Sedative lifetime use Opiate use

Yoon et al. (2018)	Maltreatment (composite)	Children and youth (N = 685), aged 12–14, who participated in the Longitudinal Studies of Child Abuse and Neglect	Secondary analysis of longitudinal data using bivariate tests of association	Higher likelihood of adolescent substance use
Mintz et al. (2022)	Experienced sexual victimization by other students	Students (N = 533) from nine high schools in Colorado	Longitudinal study using latent class analysis	Higher substance use
Brislin et al. (2021)	Antisocial peer affiliations	Children, youth, and young adults (1,881 pairs), aged 11–34, who participated in the Minnesota Twin Family Study	Longitudinal study using a bivariate latent growth curve and multivariate models	Higher average number of drinks per occasion over the past 12 months Increases in maximum number of drinks in 24 hours

COMMUNITY-LEVEL FACTORS				
Citation	**Factors**	**Population**	**Design and Analysis**	**Outcomes**
Kravitz-Wirtz (2016)	Higher neighborhood poverty level	2,121 participants from the 1970 to 2011 waves of the Panel Study of Income Dynamics (PSID), aged 4 to 25	Secondary analysis of longitudinal data using a series of race-specific and discrete-time marginal structural logit models	Higher odds of smoking
Duprey et al. (2017)	Neighborhood disorder	Children (N = 965) who participated in the Longitudinal Studies on Child Abuse and Neglect (LONGSCAN), ages 4–18	Secondary analysis of longitudinal data using Pearson's correlation test	Increase in substance use
Cook et al. (2015)	Neighborhood co-ethnic density	Asian American children and youth (N = 1,333), aged 12–18, who participated in four waves of the National Longitudinal	Secondary analysis of longitudinal data using growth mixture modeling	Higher frequency of heavy episodic drinking over the past 12 months

		Study of Adolescent to Adult Health (1994–2008)	and multinomial logistic regression	Higher frequency of drunkenness
Trinidad (2021)	Housing insecurity	Children, youth, and young adults (N = 1,155), aged 0 to 28, who participated in the Panel Study of Income Dynamics from 2007–2017	Secondary analysis of longitudinal data using logistic regression	Higher odds of early drinking and gang involvement Higher odds of intoxication and use of drugs
Cina et al. (2022)	Opioid exposure following appendectomy procedures	Pediatric Medicaid patients (N = 1,789) who underwent appendectomies in South Carolina between January 2014 and December 2017	Longitudinal study using generalized linear and finite mixture models	Increase in chronic opioid use

SOCIETY-LEVEL FACTORS				
Citation	**Factors**	**Population**	**Design and Analysis**	**Outcomes**
Cook et al. (2015)	Ethnic drinking cultures (detrimental drinking pattern in country of origin)	Asian American children and youth (N = 1,333), aged 12–18, who participated in four waves of the National Longitudinal Study of Adolescent to Adult Health (1994–2008)	Secondary analysis of longitudinal data using growth mixture modeling and multinomial logistic regression	Higher frequency of heavy episodic drinking over the past 12 months Higher frequency of drunkenness
Lorenzo-Blanco et al. (2017)	Cultural stress (composite)	Recently immigrated Latino parents (N = 302) and their adolescent children	Secondary analysis of longitudinal data using structural equation modeling and maximum likelihood estimators	Lower odds of emotional well-being Higher odds of health risk behaviors (aggressive and rule-breaking behavior, cigarette and alcohol use)

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