Spring 5-13-2016

An Investigation of Substance Use and Sexual Behavior with STD Incidence Among 18-year Olds Who Had Adverse Childhood Experiences in the U.S.

Keisha Francis

An Investigation of substance use and sexual behavior with STD incidence among

18-year olds who had adverse childhood experiences in the U.S.

Keisha Francis, MPH Candidate, *spring 2016*

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ABSTRACT

An Investigation of substance use and sexual behavior with STD incidence among 18-year olds who had

adverse childhood experiences in the U.S.

By

Keisha Kristen Francis

4/28/2016

INTRODUCTION: Approximately two-thirds of the U.S. population have had at least one adverse

childhood experience (CDC-Kaiser Permanente Adverse Childhood Experiences [ACE] Study, 2009). Some

consequences of ACEs are manifested as the child grows into late teenage years and young adulthood.

Research suggests that children exposed to traumatic events during childhood subsequently experience

negative health outcomes like substance abuse, engagement in risky and harmful sexual behavior, and

STD occurrence.

AIM: In this thesis I explore the associations of 18 year olds' described use of alcohol, risky sexual

behavior and sexually transmitted diseases (STDs) with childhood exposure to caregiver substance

abuse, violence and family circumstances

METHODS: Data were obtained from the Longitudinal Studies of Childhood Abuse and Neglect

(LONGSCAN) Assessments 0 - 18 from the National Data Archive on Child Abuse and Neglect (NDACAN).

Variables on adverse childhood experiences, sex behaviors, STDs and substance use were observed in

SAS. Multiple logistic regression models were used to identify odds ratios and strength of associations.

RESULTS: Results suggests significant associations among participants who were exposed to parent/caregiver use of illicit drugs during participant's childhood and subsequent self-reported heavy alcohol use 1.60 (95% CI: 1.18, 2.22), having early sexual initiation (at age 13 or younger) 1.60 (95% CI: 1.18, 2.22), having 6 or more sexual partners 1.36 (95% CI: 1.09, 1.68) and having STDs 1.83 (95% CI: 1.36, 2.46). Eighteen year olds with who were African American, were at a greater odds of having greater than 6 sexual partners, having sexual intercourse at or before age 13 and having (an) STD(s). No significant associations were found between having a parent/caregiver or member of household who was incarcerated, being exposed to violence, being exposed to yelling often or parental often use of alcohol and subsequent alcohol abuse, having greater than 6 sexual partners, having sexual intercourse at or before age 13 and having (an) STD(s) .

DISCUSSION: Based on the findings of these analyses, programs for adolescents should focus time and resources on young children who may be currently experiencing, or at risk for experiencing, parental/ caregiver illicit drug use in the home.

AN INVESTIGATION OF SUBSTANCE USE AND SEXUAL BEHAVIOR WITH STD INCIDENCE AMONG 18-YEAR

OLDS WHO HAD ADVERSE CHILDHOOD EXPERIENCES IN THE U.S.

by

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B.B.A., GEORGIA STATE UNIVERSITY

A Thesis Submitted to the Graduate Faculty

of Georgia State University in Partial Fulfillment

of the

Requirements for the Degree

MASTER OF PUBLIC HEALTH

ATLANTA, GEORGIA

30303

APPROVAL PAGE

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Acknowledgments

I would first like to thank my thesis chair, Dr. Richard Rothenberg of the School of Public Health at Georgia State University. Dr. Rothenberg has always made himself available to answer any questions that I had, and made it his duty to respond to emails about my work as soon as he could; even on the weekends. He has helped guide me academically and professionally from my first year in the MPH program at Georgia State University to my last semester as a graduate student. His critiques of my thesis helped steer me in the right direction, while allowing the paper to be my own. For all of these reasons, I will be forever grateful for him.

I would also like to thank Dr. Daniel Whitaker of the School of Public Health at Georgia State University. From the moment Dr. Whitaker agreed to be on my committee, he made himself approachable and readily available to answer any questions. He immediately suggested numerous places from which I could find a dataset that would match my research interest. He too, helped steer me in the right direction. I am greatly appreciative of him for his valuable comments on this thesis.

Finally, I would be remiss if I did not thank my loving family and friends for all of their support throughout this process.

Author's Statement Page

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 Keisha Kristen Francis

TABLE OF CONTENTS

List of Tables

Table 1. Data sets included in analysis

Table 2. Frequencies of outcomes by demographics and exposure variables

Table 3. Univariate Associations of Outcomes by Demographics and Exposures

Table 4. Multiple Logistic Regression Associations between having ACEs by 6 or more sexual partners at age 18

Table 5. Multiple Logistic Regression Associations of ACEs by early sexual initiation at 18

Table 6. Multiple Logistic Regression Associations of ACEs and STDs

Table 7. Multiple Logistic Regression Associations of ACEs and Heavy Drinking

Introduction

Approximately 35 million children in the United States have experienced one or more types of traumatic or adverse childhood experiences (National Survey of Children's Health, 2012). This is equivalent to about half of all the children in the United States. "Adverse childhood experiences (ACEs) are stressful or traumatic experiences, including abuse, neglect and a range of household dysfunction such as witnessing domestic violence, or growing up with substance abuse, mental illness, parental discord, or crime in the home." (Substance Abuse and Mental Health Services Administration (SAMHSA) 2012)

According to the Centers for Disease Control and Prevention [CDC], (2015), "A non-CPS [Child Protective Services] study estimated that 1 in 4 children experience some form of child maltreatment (which is considered to be a sub category of trauma/ adverse experiences) in their lifetimes" (CDC, 2015). Child Maltreatment as "any act or series of acts of commission or omission by a parent or other caregiver (e.g., clergy, coach, teacher) that results in harm, potential for harm, or threat of harm to a child" (The CDC Injury and Prevention Control: Division of Violence Prevention, 2015). Numbers reported to Child Protective Services are thought to be under representative of the actual occurrence of child abuse and neglect in the U.S., as most of the cases are thought to go unreported. These statistics are important to mention concurrently, not only because child maltreatment is a subcategory of ACEs, but because other ACEs like parent/ caregiver substance abuse, violence in the home or absent caregivers due to being jailed or imprisoned, can leave children in vulnerable states, therefore increasing odds of poor health outcomes.

Although some effects of adverse childhood experiences are seen almost immediately (like bruising if a child was physically or sexually abused for example), other effects are manifested as the child grows into late teenage years and young adulthood. Research has been done suggesting that

children exposed to traumatic events during childhood subsequently experience negative health outcomes. These outcomes include things such as substance abuse, which contribute to diseases like cardiovascular disease (Dong, 2014) diabetes and cancer (Brown, 2010) engagement in risky and harmful sexual behavior (Felitti & Anda, 2010), and STD occurrence (Greenberg, 2001).

Mental and emotional stress may act as a predictor to finding coping mechanisms like smoking, which ultimately causes nicotine dependence (Altunay, 2013). Other research, like the one done by Tietjen & Buse (2011) believe it may be more than just mental. Childhood trauma "alters the brain's response to stress…It is also possible that early stressful experiences may become hard-coded into DNA. This creates a memory of events that leads to impaired health at a later date." This research suggests that consequences of ACEs are physiological, therefore physically interfering with brain development, which can cause a person exposed to traumatic events to be more likely to engage in certain harmful behaviors, which in turn leads to an increase of disease.

"Prospective studies that lose funding and later become retrospective studies inevitably involve gaps in measurement which severely compromise research on questions of the relationships among variables in developmental sequence" (Battjes and Jones, 1985, p. 269). Until more recently, there has been a lack of long term prospective studies on the subject matter. Because of this, there has not been much analysis performed on data that consolidates multiple exposures to traumatic experiences in childhood and subsequent health outcomes until more recent years.

In this thesis I explore the associations of 18 year olds' described use of alcohol, risky sexual behavior and sexually transmitted diseases and childhood exposure to caregiver substance abuse, violence and family circumstances. Analyses of these ACEs and later life outcomes will help us identify the population affected, as well as associated experiences. Because these later life behaviors and diseases could lead to further issues including more extensive health complications as well as re-

victimization, prevention strategies would be most successful if these patterns of ACEs could be addressed or terminated through programs earlier on in the child's life.

Literature Review

Prevalence of Adverse Childhood Experiences

The "global burden of disease" is a term referring to a 1993 study by the World Health Organization and World Bank. It refers to the whole "impact of diseases and injuries at the individual level, at the societal level, or to the economic costs of diseases" (World Health Organization [WHO], 2009). Disability Adjusted Life Years (DALYs) are also means by which burdens of disease are quantified and the effectiveness of interventions are measured. Quantification of burden encourages investigation of these burdens, investigation of the risk and protective factors, and the implementation of policies and programs to reduce risks and outcomes through prevention methods.

In 2009, the Center for Disease Control and Prevention and Kaiser Permanente's Health Appraisal Clinic in San Diego presented the data that began in 1995 and consisted of two waves of data collection. CDC and Kaiser set out to estimate the burden of ACEs at the individual level. The study assessed the prevalence of and associations between adverse childhood experiences and later health experiences and outcomes among the sample cohort. The study of over 17,000 participants ultimately found that about two-thirds of the cohort reported having had at least one adverse childhood experience. More than 20% of participants reported having at least three ACEs. Additional findings demonstrated a "dose-response relationship between ACEs and negative health and well-being outcomes across the life course" (CDC, 2009).

The goal of the ACE Study by Kaiser was to quantify the burden of ACEs among the general population and to discover how these negative experiences in childhood ultimately affect the lives of

those exposed. Other investigators sought to quantify ACEs among sub groups of the populations who were thought to be at greater risk for perpetuation.

Benarous and a colleagues (2015) examined the occurrence and the clinical correlates of adverse childhood experiences among inpatient youths who had two types of severe psychiatric disorders. Similarly to the ACE study by Kaiser (2009), this study used a retrospective questionnaire to capture these ACEs among patients who were hospitalized for either psychiatric disorders, or "manic or mixed episodes". The findings showed similar frequencies to that of the Kaiser study as there was a 58% prevalence of ACEs among youths suffering from one type of bipolar disorder and a 57% prevalence among youths hospitalized for psychiatric disorders. About 25% of each of these groups were exposed to "severe abuse" which included "physical, sexual or emotional abuse or physical or emotional neglect" (Benarous, Hassler, Falissard, Consoli & Cohen, 2015, p 1-12). Although ACEs in the general population appear to be slightly higher, prevalence of these experiences in populations with mental disorders are still high and should be of public health concern.

The CDC – Kaiser Study asserts that ACEs are less prevalent among children who experience safe, stable and nurturing relationships and environments (CDC, 2009). These healthy environments act as an alternative or counter experience to ACEs and promote healthy cognitive development and reduced risk behaviors, which affect subsequent health. Although protective factors are typically not investigated as intently as risk factors, scientists agree of its equal importance. Healthy and supportive family and social networks have been scientifically suggested to protect against ACEs. Apart from specific kinds of relationships, heavily tied social connections in general have been shown to reduce odds of ACEs. Social relationships include interactions with surrounding individuals. Social networks highlight the strength of these interactions and the extent to which someone is integrated into social society. These integrations can include things such as involvement in organizations, church, whether or

not someone has a job, is married, has children, etc. Interconnectedness has been shown in instances to have positive effects on health in both the short and long run (Umberson & Montez, 2010).

ACEs in the U.S.

The study by the CDC and Kaiser investigators identified relationships between number of ACEs, using risk scores, correlated risky behaviors and as associated morbidity and mortality rates in the United States. Some of the subsequent diseases included heart disease, diabetes, and liver disease. Although these morbidity and mortality outcomes may not be directly caused by the trauma experienced in childhood, scientific inferences suggest that they lie on associated causal pathways.

In addition to studies like the one done by the CDC and Kaiser in San Diego, others done in the United States point to ACEs as predictive factors for some health-harming behaviors and subsequent measurable negative health outcomes. Early childhood trauma has strong associations with alcohol dependency later on in life. Similarly to coping mechanisms used by soldiers who have PTSD, alcohol is thought to be used as a coping mechanism to help deal with trauma-related indicators. In fact, the term PTSD, although greatly associated with soldiers who experience traumatic situations in war, is one that can be used synonymously for young children who are exposed to violence, abuse or alcoholism, chronically or at points during their childhood (Brady, K, & Back, S, 2006).

The National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), studied child maltreatment cases as a precursor for increased risk of alcohol and nicotine dependence. They ultimately found that a history of child maltreatment predicts insistent adult alcohol abuse and nicotine dependence (Elliot et al., 2014).

American Indians and Native Alaskans represent a demographic aspect of the U.S. population that has been shown to demonstrate higher levels of depression (Roh et. al 2014), substance use and STIs comparative to the general population (Eitle, Greene, & Elitle, 2015) . ACE studies done in the

United States typically refer to the experiences of the general population. However, the examination of

ACEs specifically among American Indians and Native Alaskans are not as thoroughly investigated.

(Brockie, TN, Dana-Sacco, G, Wallen, GR, Wilcox, HC & Campbell, JC, 2015). Roh et al. sought to gain a

better understanding of adverse childhood experiences and social support among this population. Using

self-administered surveys, they collected information on depression, ACEs and perceived social support

against the outcome of depressive symptoms. They discovered that the two experiences most positively

associated with depression was childhood neglect and household dysfunction. Social support was

negatively associated with depressive symptoms. These associations were indicative of the role ACEs

play on the immense problem of depression in the American Indian and Native Alaskan population, as

well as the extent to which social support can be considered when constructing prevention/

management programs.

Older studies like the Rochester Longitudinal Study (2000), studied the prevalence of ACEs in

children living in the United States who were identified as having grown up in high risk situations as well

as having experienced some protective factors. 4 to 13 year olds who naturally possessed "well-

developed problem solving and communication skills…succeeded" in spite of poverty and maternal

mental illness, which are thought to be risk factors for ACEs. Other identified protective factors were

similar to the ones identified by Umberson & Montez., 2010 p 54. In "high risk" families, where parents

or primary caregivers are absent, affectional social ties with alternative caregivers like grandparents,

aunts, uncles or older siblings for example, can act as "stress buffers" for children involved. When

accounted for in research, these buffers have shown to possibly help in reducing the negative health

outcomes and behaviors associated with exposures to ACEs.

ACEs in other parts of the world

Studies on adverse childhood experiences which have been conducted both in the U.S. and in

other parts of the world, yield similar results. In a study done by Bellis MA et al, between 2010 and 2013,

nearly 11,000 respondents ages 18-25 were surveyed using adverse childhood experience surveys. In

these European countries of Albania, Montenegro, Romania, The Russian Federation, Yugoslav Republic

of Macedonia and Turkey, results indicate that that those who did not develop health-harming

behaviors were more likely to "have experienced safe nurturing childhoods". These results mirror what

the ACE study by the CDC and Kaiser found on people residing in the United States. It also reiterates and

reaffirms the information found protective factors for ACEs.

Among 189 meth users in a rehabilitation center in China, findings demonstrate correlations

between ACE's and methamphetamine use along with meth-associated psychosis (Ding, Lin, Zhou, Yan &

He, 2013). The study demonstrated an association between the negative exposures as a child and the

negative health outcomes identified in adulthood. Benarous et al. (2015) research on U.S. patients with

mental illness similarly studied the prevalence of ACEs among this sub-population and found similar

correlates/results among the similar population (Benarous et al., 2015).

Prevalence of ACEs among 7485 randomly selected Australian adults was 59.5% for those who

had ever had at least one type of ACE and 37% for those who had experienced more than one adversity.

This percentage is almost 10% below the estimated prevalence in the U.S. general populations.

Additionally, the study found that the more severe forms of abuse, like sexual abuse and violence, were

a less common occurrence than some of the other forms of ACEs. The most common ACEs were

"domestic conflict, parental psychopathology and substance abuse". Despite these experiences, most

subjects described their childhood as "happy or normal despite adversity" (Rosenman, 2004 p. 695).

Although Australia' prevalence rates were similar to that of the United States, there was a

noteworthy difference in the number of ACEs seen between the two. Largely, similar odds and risks for

ACEs, along with similar subsequent outcomes were found in similarly developed countries. The question on how research compares/contrasts in developing countries can be answered, at least partially through studies like the one done by Ramiro, Madrid & Brown (2010).

In Metro Manila, Philippines, the CDC's Adverse Childhood Experiences Questionnaires was used to investigate the associations among adverse childhood experiences, "health-risk behavior and chronic disease conditions in adult life" (Ramiro et al., 2010 p. 842). They found that 75% of survey respondents had experienced at least one exposure to ACEs. 9% reported having had four or more different types of traumatic household experience. The most common types of negative childhood experiences included mental and emotional abuse, and physical and psychological neglect of essential needs. Most study participants reported living/ growing up with an alcoholic in the home as well as being exposed to various forms of violence. The tendency leaned stronger towards relationships or associations between those exposed to ACEs, risky or health harming behavior and increased rates of morbidity. "Health-risk behavior consequences were mostly in the form of smoking, alcohol use, and risky sexual behavior" (Ramiro et al. 2010 p 842). ACEs are seen about 10% more in this population than in the United States general population. Like the lower prevalence seen in Australia, this higher prevalence of ACEs seen in Manila is a noteworthy phenomenon that may help explain what methods can help with diminishing ACEs worldwide.

Risk Factors for ACEs

Regardless of ethnicity, geographic location, and cultural differences, adverse childhood experiences have shown to affect health and behaviors later on in life. Knowing what places some at a greater risk of having these experiences than others, can inform actions needed to reduce such risks and consequences. Risk factors for ACEs vary depending on the experience. Because adverse experiences encompass so many elements, literature does not often identify risks for ACEs on a whole. Rather, risk

factors are identified by specific experience. For example, the CDC found an arrangement of factors

which put children at a higher risk for the ACEs, abuse and neglect (CDC, 2016). Various individual,

familial, community and societal factors all play a role in contribution of risk.

Individual risk factors for victimization include being a young child under 4 years old and having

special needs that include disabilities, mental ailments and physical illnesses. Some risk factors for

perpetration include lack of parental skills and understanding, parental history of childhood abuse,

familial substance abuse or mental health issues, being a young parent, low income and caregivers who

have do not have biological relationships with child. Family risk factors include lack of social networks, or

social isolation and parental stress. Community risk factors are typically things like violence, poverty,

high number of alcohol venues, and lacking interconnectedness (CDC, 2016).

The National Institute on Drug Abuse suggests that drug use (which is an ACE) can be a behavior

associated with mental health disorders (NIH, 2010). Therefore, children who have parents with mental

disorders, may be at risk for exposure to parental use of illicit drugs.

Again, ACEs are often viewed as risk factors themselves. The risk factors for ACEs are usually

identified individually because they include a range of circumstances.

Teen Pregnancy

Children born to adolescent mothers tend to experience abuse and maltreatment at higher

rates than those who are not. Afifi, (2007) used Erik Erikson's model (Stages of Psychosocial

Development, 1950) to support the idea that teen pregnancy contributes to impaired identity which in

turn increases the child's risk for abuse (Afifi, 2007) According to researchers, part of establishing a

healthy adolescence, as far as development of identity is concerned, is experiencing education,

employment and positive self-esteem. Researchers argue that if these aspects are missing, healthy

formation of identity is compromised. An unhealthy parental identity has shown to be associated with an increased risk of child abuse.

Mental & Emotional

Psychologists believe that part of children's' development of a healthy identity is having mentally and emotionally healthy relationships with parents/caregivers. Children are taught to "express and regulate their emotions by interacting with parents and caregivers" (Dvir, 2014, p 149). Various forms of child abuse and neglectful experiences may have a negative impact on a child's cognitive and emotional development. This impact, in turn, could affect these individuals' coping mechanisms as a child and even into adulthood (Harkness, Bruce & Lumley, 2006). This negative effect on cognitive and emotional development may contribute to risky sexual behavior which can act as a representation at "attempts to achieve intimate interpersonal" relationships (Hillis, 2001, p 206) that were missing as children.

Substance Abuse

Fuller & Sawyer (2014) found indicators demonstrating that there were risk indicators which included parental divorce, parental unemployment, and parental addictions that placed children at higher risk for childhood physical abuse. Thomas & Fuller (2014) concluded that those who reported at least two of the risk indicators were more likely to report physical abuse as a child compared with those who had one or none of the risk indicators. Although risk for child abuse increased with any of the indicators, it was higher if the participants' parent(s) experienced addiction. It was highest if multiple indicators were demonstrated. Research also showed dose-response relationships between alcohol use in adulthood and ACEs, regardless of parental use of alcohol (Anda, Felitti & Giles 2002).

Low income

In addition to other exposures, co-variates such as gender, age, race and income may act as risk factors for exposure to ACEs and subsequent outcomes. Low-income & impoverished populations are considered especially vulnerable because they are "unable to anticipate, cope with, resist and/or recover from the impacts of disasters" (WHO, 2002).

Focus groups are typically a resourceful way to get an understanding of the background and overview of an issue. In studying ACEs among a vulnerable population of low-income urban youth in Philadelphia, participants in a focus group were asked to create a list of adverse childhood experiences as they pertained to their own experience (Wade, 2014). After creating the list, participants selected the top five most stressful of the experiences. The study found that adversity in family relationships were the most stressful of the experiences. Community stressors, personal victimization, economic hardship and peer relationships were also childhood experiences that acted as identifiable stressors for these youth.

This is an example of how this information helps inform public health research. Firsthand accounts of the most pressing and stressful situations lets program implementers know what needs to be addressed as priority in overcoming the burden of ACEs in low income communities. From here, public health professionals can analyze, ponder and compare ACEs, and its consequences on low income urban youth and youth from different environments. The results may not be unanimous across the board.

Health Outcomes

Su, et al (2015) published a cardiology report in the Psychological Aspects of Cardiovascular Disease where they examined specific ACE's and negative cardiovascular outcomes. These researchers systematically reviewed outstanding literature on the topic and drew conclusions based on their review. Dose response relationships were observed between ACEs and risk of ischemic heart disease among the ACE Study which enrolled 17,000 participants. Because this study was retrospective and mainly based on self-reported conditions and outcomes, it may have been limited in nature. However, similar studies done in Finland and another, the Nurses' Health Study, drew similar conclusions between ACEs and risks of cardiovascular diseases. A U.S. nationally representative survey also concluded a relationship between number of ACEs and higher risk of CVD (Pretty, 2013).

In addition to determining whether or not a dose-response relationship existed between adverse childhood experiences and negative cardiovascular outcomes, Su et al (2015), sought to investigate the possible pathways linking the exposure and outcome. Certain behavioral factors such as smoking have been long linked to negative health outcomes, including but not limited to cardiovascular diseases (National Institutes of Health, 2015). Studies like ones done by Felitti et al., (2002), Anda, et al., (2002) and Ford et al., (2011), demonstrated statistical correlations between adverse childhood experiences like household dysfunction and parental divorce and higher risk for smoking in adulthood, independent of socioeconomic status, education level and employment status. Cigarettes alleviate stress and are used by some as ways to cope with stress. Despite these statistically suggestive studies, Loucks et al. (2015) found that higher risks for CVDs were also found among non-smoking adults who had ACEs compared to non-smoking adults with no ACEs.

ACEs are believed by some to be predictors for other factors like obesity, type 2 diabetes and physical inactivity. Perceived stress and anger may have an effect on one's eating habits, which may lead to eating disorders that in turn lead to obesity (Su et al., 2015). Despite some self-reports and initial observations of higher fasting glucose in NHS' wave 2 study, the researchers of Su et al's., (2015) article

indicate that not much research has been done either supporting or disproving the theory that there is indeed a relationship between ACEs and type 2 diabetes. Similarly, the results of those studies on links between ACEs and physical inactivity seemed to be inconsistent and inconclusive.

A prospective longitudinal research study design is arguably one of the best way to capture the long term effects that ACEs have on young adults. The advantage of such studies is being able to follow participants from exposure to outcome, as LONGSCAN did over an 18 year time frame.

My primary interests lies in the relationships between some adverse childhood experiences and subsequent reports of risky sexual behavior and substance use. Although public health literature establishes correlations between risky sexual behavior and STDs, I am also interested in finding out how STDs relate to ACEs. Therefore, prevalence of STDs is included in the observations. My epidemiologic assertions are that risky sexual behaviors, the incidence of STDs and substance use will be higher among 18 year olds have had adverse childhood experiences than among those who have not. With my analysis, I hope to help inform investigation of ACEs and subsequent outcomes.

Methods and Procedures

Data was obtained from the Longitudinal Studies of Childhood Abuse and Neglect (LONGSCAN) Assessments 0 - 18 from the National Data Archive on Child Abuse and Neglect (NDACAN). It was selected from Cornell University's Online Database System and approved for use through NDACAN's department at Cornell University in Ithaca, New York. Once obtained, an application for the designation of non-human subjects research on Georgia State University's IRIS' website was completed, submitted and approved.

The data were collected at five sites, as well as its coordinating center at The University of North Carolina at Chapel Hill. LONGSCAN followed over 1300 children from adolescence into young adulthood. Using multiple avenues of information gathering, maltreatment data were collected on each subject

from 1991 to 2007. Annual telephone interviews allowed the sites to track families and assess yearly service utilization as well as important life events. STDs were self-reported when interviewed.

Datasets with variables of interest were selected. These datasets included information on childhood circumstances from ages 0 - 12 and information on the same subjects at age 18. Besides subject behavior, the circumstances included parents/caregivers and family members' behaviors and experiences while subject was a child and subjects' behaviors and experiences as an adult. Table 1 further describes the content of the datasets used in this analysis. The datasets were read into SAS with pre-programmed SAS codes from LONGSCAN and "cleaned" by sub setting original data sets. All subsequent analyses were done in SAS. Tables were created in Excel.

Measures

Exposure variables of interest on adverse childhood experiences and outcome variables on sex behaviors, STDs and substance use were observed, kept/dropped and combined using if-then statements.

Illicit drug use was defined with consideration of a report published by the World Health Organization. In the report it is described as "Long-term regular injecting use of opioids, amphetamines or cocaine." (Degenhardt, L, Hall, W, Warner-Smith, M and Lynskey, M, 2001, p 1110).

The variable used for parent/caregiver use of drugs asked the caregivers to respond to the following questions: "Do you use regular cocaine (powder)?" "Have you ever used regular cocaine?" "Do you use crack or freebase cocaine?" "Have you ever used crack or freebase cocaine?" "Do you use PCP or LSW (acid, mushrooms, dust)?" "Have you ever used PCP or LSW?" "Do you use heroin?" "Have you ever used heroin?" The caregiver's options for response were either "yes" or "no". After combining and formatting these variables, if a caregiver answered "yes" to any of the questions on use of drugs, then they were considered "exposed". If the caregiver answered "no" to all of the questions, then they were

unexposed. If all responses were missing, then the response to whether or not the caregiver used illicit drugs was missing.

Violence was defined using WHO's definition. According to WHO violence is "The intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a high likelihood of resulting in injury, death, psychological harm, maldevelopment or deprivation" World Health Organization (2002). Occurrence of violence was measured using LONGSCAN's Life events Scale for Children (LONGSCAN, 2004). The variable used for violence asked the following questions: "Has child seen anyone physically threatened with a weapon?" "Did s/he see anyone get shot or stabbed? (Other than on TV or movies)" "Has s/he seen someone killed or murdered?" "Did s/he witness anyone being sexually abused, assaulted or raped?" "Has s/he seen anyone getting hit, kicked or physically harmed in some other way?" The options for response were either "yes" or "no". After combining and formatting these variables, if the answer was "yes" to any of the questions on exposure to violence, then they were considered "exposed". If the answer was "no" to all of the questions, then they were unexposed. If all responses were missing, then the response to whether or not the child was exposed to violence was missing.

The variable used for child exposure to a member of child's family or someone in the household being jailed asked the following question: "Was anyone in child's family or household jailed or imprisoned?" The options for response were "yes" or "no". If the answer was "yes" then the child was considered "exposed". If the answer was "no" then s/he was unexposed. If the response to this question was missing, then the response to whether or not the child experienced anyone in their family/household who was jailed or imprisoned was missing.

The variable used for child's exposure to a parent/caregiver's daily alcohol use asked the following question: "What was the most often you ever drank alcoholic beverages?" The options for

response were "1 – 2 times per month (or less)" "3 – 5 times per month" "greater than 5 times per month" or "Daily". If the answer was "Daily" then the child was considered "exposed to parent/caregiver's daily use". If the answer was "1 – 2 times per month (or less)" "3 – 5 times per month" "greater than 5 times per month" then s/he was unexposed. If the response to these questions were missing, then the response to whether or not the child was exposed to a parent/caregiver's often alcohol use was missing.

The variable used for yelling seen/heard in the home asked the child to respond to this: "I have heard grownups in my home yell at each other". The child's options for response were either "Never", "1 time", "2 times", "3 times" or "greater than 3 times". After being formatted, if a child had never been exposed to yelling, or had been exposed up to 2 times, they were considered "unexposed". If the child had been exposed 3 or more times, they were considered to be "exposed often". Merriam-Webster's definition of often was used to inform the context. If the response was missing, then the response was formatted as missing.

The variable used for caregiver/child exposure to counseling or therapy asked the caregivers the following questions: "have you or [child] used or received a service like this: Self-help or support group like weight watchers, AA, Parents Anonymous?" "Have you or [child] used or received a service like this: Alcohol or drug counseling (for yourself)?" "Have you or [child] used or received a service like this: Any type of counseling or therapy for [child], outside of school, for a psychological or behavioral problem?" "Have you or [child] used or received a service like this: A mentor-type program for [child] like the big brother, big sister program?" After combining and formatting these variables, if the answer was "yes" to any of the questions on involvement with counseling or therapy, then they were considered "exposed". If the answer was "no" to all of the questions, then they were unexposed. If all responses were missing, then the response to whether or not the child was exposed to therapy or counseling of any kind was missing. LONGSCAN referred to this section of questions as "Service Utilization.

The variable used for defining the number of partners was self-reported and asked the following question: "During your life, how many different boys or men have you had sex with?" The options for response were "1" "2" "3" "4 to 5" or "6 or more". If no response was giving, the response was counted as "missing".

The CDC and the Youth Risk Surveillance System (YRBSS) defines early sexual debut as having had sexual intercourse between ages 11-13 or younger. This is how early sexual initiation was defined in this analysis. The variable used for defining early sexual initiation was self-reported and asked the following questions: "have you ever had sex?" and "how old were you the first time you had sex?" If the subject had sex and was 13 years old or younger, then the child experienced early sexual initiation. If no response was giving, the response was counted as "missing".

The variable used for participant's outcome of sexually transmitted diseases was self-reported and asked the following question: "In the last 12 months have you had a sexually transmitted disease, other than HIV/AIDS?" The options for response were "yes" or "no". If no response was giving, the response was counted as "missing".

The definition of "heavy alcohol use" in this analysis was based on the definition given by the Substance Abuse and Mental Health Services Administration (SAMHSA) who defines heavy drinking as 5 + drinks of alcohol on the same occasion on each of 5 or more days within the last 30 days (SAMHSA, 2015).

The variable used for participant's outcome of heavy alcohol use was again self-reported and asked the following questions: "In the past year did you drink beer, wine, wine coolers, malt liquor, or hard liquor?" The options for response were either "yes" or "no". A subsequent question on frequency and timing of use was asked: "During the past 30 days, on how many days did you have 5 or more drinks

of alcohol in a row, that is within a couple of hours?" The respondents options for response on this

question were "0 days" "1 day" "2 days" "3 to 5 days" "6 to 9 days" "10 to 19" days, "20 or more days".

Responses were combined and formatted so that 0 days equaled no use, 1 to 5 days equaled

low-to moderate use and greater than 5 days equaled heavy use. In reporting, I used the definition given

by SAMHSA to establish what exposure to "heavy drinking" and "high risk" use of alcohol was. If

participant responded "no" to question 1, and did not respond to question 2, then the participant was

counted as not using alcohol. If the participant responded "no" to both the first and second question,

then the participant was counted as not using alcohol. Otherwise, if the participant responded to the

second question, then the response given is the number days in which s/he had 5 or more drinks of

alcohol in a row, within a couple of hours. If no response was giving, the response was counted as

"missing".

Demographic variables used were sex (either male or female), family income and race/ethnic

group. Family income was divided into four categories: "< $5,000 - $14,999 per year" "$15,000 - $29,999

per year" "$30,000 - $49,999 per year" "> $50,000 per year". Low income was defined using information

for the U.S. Census Bureau, (2015). The poverty line for a family of two, according to the report, is

$15,820.

Values, formats and labels were added to account for newly created variables. Variables were

combined and categorized. Frequencies were used to quantify the variables, including the occurrence of

missing responses.

In some instances, there were 8-10 observations per subject. Data were converted from "long"

to "wide", meaning each subject was left with only one observation. This made the information on each

subject comprehensive and easier to understand.

2 x 2 contingency tables were created to observe relationships between ACEs and outcomes. Assessments of association in contingency tables and sets of contingency tables described the nature of the association between a categorical response measure and a set of explanatory variables (p.1). Ultimately, using these tables allowed for an enhanced observation and understanding of the relationship, or lack thereof. The scale of measurement of a categorical response variable is a key element in choosing an appropriate analysis strategy. (p.2)

For purposes of this study, causality may not be perceptible, but we focus rather on measures of association that are typically used in causal modeling. This modeling was used as a way to consider the possibilities of random and systematic error in data collection.

Predictive modeling was used to estimate odds of risky sexual behaviors & STDs, and alcohol abuse among the subjects who had ACEs. A multivariate logistical regression model was used to describe the factors that influence the later life outcomes of youth initiation and number of partners, sexually transmitted diseases, and drug and alcohol use (all dichotomous & nominal categorical outcomes).

Results

Participant Characteristics

A total of 1,355 participants was included in the dataset. Frequencies of outcomes by demographics and exposures are listed in Table 2. From the table, we see that the largest frequency of exposure's association to outcome was among participants who had a caregiver who drank alcohol daily and later had 6 or more sexual partners. Thirty-six percent of those who had a parent/caregiver who drank often (daily) reported having 6 or more partners by age 18. This was compared to 22.2% of those who didn't have a caregiver who used alcohol daily and had 6 or more partners by age 18. Another

frequency with a high percentage was exposure to violence in childhood and having 6 or more partners by 18 years old. Here, the table shows that 32.2% of subjects who were exposed to violence in their childhood had 6 or more partners by the time they were 18 years old, compared to 33.34% who had 6 or more partners but were not exposed to violence. There was also a high frequency between those who and a parent/caregiver/ member of household who was incarcerated during their childhood and later had 6 or more partners (33.65%), compared to those who did not have that experience as a child (21.86%). The smallest frequency was between those who had a parent/caregiver who drank alcohol daily and subsequently had an STD (2.27%, compared to 3.64% of those who did not).

The differences between the covariates race and gender are also apparent with 35.15% of all males in the study having 6 or more partners compared to 16.42% of females. Gender continues to play a difference among those who had sexual intercourse at or before age 13 (27.76% of all males and 11.79% of females) and heavy drinking by age 18, with 9.52% of all males drinking heavily compared to 8.47% of all females. A greater percentage of females did however, have STDs by age 18 than that of the male population, with 7.69% of females having an STD by age 18 compared to 1.91% of all males.

Black participants had the greatest outcome of early sexual initiation and having an STD within their racial/ethnicity group. 23.66% of black participants had an early sexual initiation compared to 18.39% of mixed participants, 11.12% of Hispanics, and 12.32% of White participants. Six percent of black participants had an STD compared to 5.68 mixed individuals, 3.17% of Hispanics and 2.35% of white participants. However Native Americans were most frequently the ethnicity to have 6 or more partners within their ethnicity. 66% of Native American participants had 6 or more partners, followed by 28% of mixed participants, 26% of white participants and 17.7% of Hispanics.

These outcome and exposure variables will be observed using univariate and multiple logistic regression models for associations in subsequent portions of this paper.

Associations of Outcomes by Demographics and Exposures

Table 3 shows the univariate associations of each outcome with each exposure of interest individually.

As shown in Table 3, many of the crude odds ratios show statistically significant associations between exposure and outcome variables. The odds ratios with significant confidence intervals for those who have 6 or more partners include individual associations between exposure to violence 1.14 (1.02, 1.27), jailed family member/ member of the household 1.29 (1.09, 1.55), exposure to parent/caregiver illicit use of drugs 1.35 (1.16, 1.57). Having a family member/ member of the household who was jail and exposure to parental/ caregiver use of drugs was associated with early sexual initiation, with odds ratios of 1.23 (1.02, 1.47) and 1.33 (1.14, 1.55) respectively. Statistically significant associations were observed among participants who were exposed to violence, jail/imprisonment and parent/caregiver use of drugs and who subsequently self-reported having an STD, with odds ratios of 1.22 (1.08, 1.37), 1.36 (1.08, 1.60) and 1.62 (1.36, 1.91), respectively. Finally, results from table 3 show crude associations between exposure to violence 1.15 (1.01, 1.31), a jailed family member/ member of the household 1.31 (1.05, 1.62) and parent/caregiver use of drugs 1.47 (1.23, 1.77), and participants who self-reported heavy drinking.

Multiple regression is used to further investigate these relationships and the unconfounded strength of these associations.

Multiple Logistic Regressions

Sexual Behavior among 18-year olds who had adverse childhood experiences: 6 or more sexual partners

Using a multiple logistic regression model, the odds of experiencing ACEs if participants had 6 or more partners are listed in Table 4. Table 4 shows both the significant and insignificant findings from the multiple logistic regression model, modeling having more than 6 partners by age 18. Two demographic factors showed associations between themselves and having 6 or more of partners. Participants who had 6 or more partners by age 18 were 1.37 (95% CI: 1.04, 1.78) times at greater odds of being black and 1.11 (95% CI: 1.02, 1.21) times at greater odds of having had an annual household income of less than $14,999 per year. Parent/Caregiver drug use was the only ACE that showed a significantly related relationship to number of partners. Participants who were exposed to a parent/caregiver who used drugs during childhood were at a 1.36 (95% CI: 1.09, 1.68) greater odds of subsequently having 6 or more partners.

Other predictor variables including exposure to violence, having had a jailed parent or member of household, caregiver daily use of alcohol and hearing yelling between adults often yielded insignificant associations between ACEs and number of partners in this model (see Table 4). The final covariate of interest is sex. When put into the model, it has an odds ratio of 1.2, but a confidence interval which encompasses 1, suggesting statistical insignificance. Counseling/therapy showed to not have a relationship with having more sexual partners. Violence is another exposure variable which had an odds ratio over 1 but was statistically insignificant because of a confidence interval containing 1. When a parent in the child's home is put in jail or prison at some time during childhood, ORs were as followed 1.31 (0.81, 1.58), or statistically insignificant.

Sexual Behavior among 18-year olds who had adverse childhood experiences: initiation

Odds ratios were again used to estimate strength of associations between ACEs and the subsequent sexual initiation experiences. The findings of associations between ACEs and early sexual

initiation (ages 13 or younger) demonstrate similar results to what was found in the previous section, between ACEs and number of partners. See Table 5 for associated findings.

Race was the only category in demographics that suggested statistical association to early initiation. Participants who first had sex before 13 years old were at a 1.54 (95% CI: 1.19, 2.0) times greater odds of being of a black race/ethnicity, than a white race/ethnicity. Additionally, those who were exposed to parent/caregiver use of drugs during their childhood were 1.6 (95% CI: 1.18, 2.22) times at greater odds of an early initiation compared to those who were not. This predictor value yielded the strongest association between any ACE and early sexual initiation as shown in Table 5.

Statistical insignificance for ACEs and early initiation are almost identical to that of ACEs and number of partners. Parent being jailed, using drugs and child exposure to violence showed no statistically significant relationships to early initiation. Sex and income also showed insignificant associations with the outcome (see Table 5).

Sexual Behavior among 18-year olds who had adverse childhood experiences: STD incidence

Odds associated with ACEs and STDs shows the strength of the relationships listed in Table 6. Again, those who reported having an STD by age 18 were at a 1.45 (95% CI: 1.08, 1.95) times greater odds of being of black racial/ethnic group as opposed to a white racial/ethnic group. Those who had been exposed to parental/caregiver use of drugs during their childhood, were also at a 1.83 times greater odds of later having an STD. Insignificant associations included associations with exposure violence, jailed parent/caregiver, alcohol use and yelling in childhood (see Table 6).

Alcohol Use

To estimate epidemiologic associations between ACEs and subsequent alcohol use, odds ratios were again used in this final aspect of the analysis. Table 7 highlights the ACEs and associated odds to

heavy alcohol use by age 18. Exposure to Drug Use by parent/caregiver during childhood yielded the highest odds ratio between ACEs and subsequent heavy drinking. Participants who had a parent or caregiver who used drugs were 1.60 (95% CI: 1.18-2.22) times greater odds of subsequently reporting heavy drinking.

As in previous model, insignificant associations included associations with exposure violence, jailed parent/caregiver, alcohol use and yelling in childhood.

Discussion

Results of the analysis indicate that the observed adverse childhood experiences do not, on a whole, suggest association of a risk for sexual behavior, STD incidence and alcohol abuse. Parental drug use was the only statistically significant ACE that showed an association with subsequent behavior and STD incidence. Drug use suggested a 1.83 (95% CI: 1.36, 2.46) elevated odds of self-reported STD occurrence by age 18, a 1.36 (95% CI: 1.09, 1.68) odds of having 6 or more partners, and 1.60 (95% CI: 1.18, 2.22) odds of sexual initiation before age 13.

Apart from the association with parental drug use in childhood, ACEs did not demonstrate statistically significant associations with subsequent incidence of STDs. In results prior to adjustments for confounding, findings suggested that 18 year old participants who were exposed to violence, parental drug use and of having a family member jailed or imprisoned in childhood were at a 1.22 (95% CI: 1.08, 1.37), 1.62 (95% CI: 1.36, 1.91) and a 1.36 (95% CI: 1.08, 1.60) greater odds of having subsequent STDs. After adjustments were made however, the statistical associations in all scenarios except for parental/caregiver drug use were null.

Before adjusting for confounding, results from the analysis suggested that exposure to violence in childhood suggested that participants were at a greater odds of (1.14 (95% CI 1.02, 1.27)) of having 6 or more sexual partners. This relationship showed no statistically significant association once the model was adjusted for confounders (1.07 (0.84, 1.36)). Other findings, however, suggest that adolescents who experienced violence "exhibited a number of health risk behaviors significantly more often than did those who had neither witnessed nor experienced violence" (Berenson, 2001, p 1238).

Adolescents in Berenson's study were more than twice as likely to have more than 2 sexual partners along with increased likelihoods of other risky sexual behaviors. Studies like the one done by Berenson found significant results on associations between a smaller number of sexual partners and non-exposure to violence in childhood.

Other insignificant findings included associations between having a parent or caregiver who was jailed/imprisoned, exposure to a caregiver who drank alcohol often in participants' childhood and subsequently having 6 or more sex partners. Perhaps a future direction of this analysis would be to include investigations of various numbers of sexual partners, maybe some less than 6, to see how the outcomes could be associated.

Sexual initiation at (or younger than) age 13 yielded similar associations with ACEs as did high number of partners and STD incidence. Early initiation also showed no association to childhood exposure to caregiver alcohol use and violence. Prior to adjustments, having a parent or member of the household who was jailed/imprisoned seemed to be related to early sexual initiation with an odds ratio of 1.23 (1.02, 1.47). However, subsequent findings found an odds ratio of 1.00 (95% CI: 0.70, 1.42) suggesting no significance.

Associated literature suggests that incarceration of a parent disrupts a child's emotional connectional with that parent, which can ultimately disrupt emotional well-being and development

(Thompson & Harm, 2000). This is true not only of mother/child relationships, but father/child relationships as well (Barr et al., 2014). Research has also shown that children of imprisoned parents are nearly double as likely to display issues of reclusive behavior and other mental health problems as their counterparts (Murray, 2009).

 Since literature has been written on the significantly associated relationships between *parental* incarceration and negative emotional and mental wellbeing, it would be beneficial to further investigate how those with early initiation differ with respects to having a *parent* become jailed or imprisoned and having experienced another member of the household become jailed or imprisoned. The investigation of these factors could lead to results that differ from what was found in this study.

There was no statistical association between having a parent or caregiver who often in participants' childhood and participants who were drinking heavily by age 18. Recall that SAMHSA defines heavy drinking as having 5 or more drinks on the same occasion on each of 5 or more days, within the last 30 days. Expectations were to find statistically significant associations between participant heavy use of alcohol and previous experience with having a parent(s) who used alcohol often. However, the results showed differently. A study by Van Der Zwaluw CS, et al. (2008) found that "higher levels of both parenting and parental problem drinking were related to lower engagement in drinking over time. This implies that shared environment factors influence the development of alcohol use in young adolescents" (p 189).

Another study done by Rossow, Keating, Felix & McCambridge (2016) suggested "There is a fairly large and consistent literature demonstrating that more parental drinking is associated with more drinking in offspring. Despite this, existing evidence is insufficient to warrant causal inferences at this stage." (p 204) Again, further investigation into the risks associated with parent abuse of alcohol and child's later use could help with pragmatic development of interventions.

One reoccurring ACE was associated with risky sexual behaviors, STD occurrence and alcohol use in adulthood. That ACE was parent/caregiver use of drugs. The National Household Survey on Drug Abuse estimate that over 7 million children (about 10%) have at least one parent who has dependency on alcohol or an illicit drug of some kind (Conners, et al., 2001). The results of this study also suggested that these children who were exposed, specifically to the mother's abuse of substances, were at greater risk for physical, emotional and academic issues.

There is not a substantial amount of literature on parental/caregiver use of illicit drugs and its impact on children into young adulthood. Most of the associated literature speaks to the associations between parental drug use and child abuse or neglect. Marina Barnard studied more of the neglect aspect. She found that "problem drug use can impede parenting and the provision of a nurturing environment" (Barnard, 2004, p 552). This impediment may have a negative effect on cognitive and emotional development of the child. Negative effects on cognitive and emotional development may contribute to risky sexual behavior which can act as a representation at "attempts to achieve intimate interpersonal" relationships (Hillis, 2001, p 206).

Walsh, MacMillan & Jamieson (2003) found that while the mechanisms of associations are unclear, "parental substance abuse is associated with a more than twofold increase in the risk of exposure to both childhood physical and sexual abuse". "Child maltreatment predicts intercourse by ages 14 and 16" according to a study done in 2008 (p 1409). "Maltreated children are at risk for early initiation of sexual intercourse and sexually active adolescents should be evaluated for possible maltreatment" (Black, et al., 2008). The study done by Black et al. (2008) does not discuss parental drug use as a predictor or associated factor with early initiation of sexual intercourse. However, research has identified parental drug abuse as a risk factor for the perpetration of child abuse/neglect (CDC Injury Prevention and Control: Division of Violence Prevention, 2016). Parents on drugs often demonstrate to some extent, omission of care and support to their children (Dunn, et al., 2002), which may explain the

subsequent risky and health-harming behaviors that young adults with this ACE engage in. Inferences could be suggested through a series of intermediate and associated factors as previously described.

These findings suggests a need for more rigorous investigations of associations between young adult risky sexual behavior, STD incidence and heavy alcohol use and parental/caregiver illicit drug use. Perhaps a program making children aware of their feelings and cognitive growth as well as the harms of risky sexual behavior and heavy alcohol use, will promote awareness of self, and encourage healthy behaviors.

Findings did indicate that there are racial/ethnic group differences among those who reported having STDs. Findings also suggested the existence of these demographic differences in those with higher-risk sexual behavior, but not in those who abused alcohol. The origin for such gender and racial/ethnic differences are not conclusive, however they may be attributed to cultural and societal expectations based on ethnicity or economic differences between races (Kinsman, Romer, Furstenberg & Schwarz, 1998). Other sociology theories assume that human behaviors, including sexuality, are socially learned "…behaviors exhibited by individuals [that] are a product of social rather than biological forces" (DeLamater et al., 2008 p 11). DeLamater's, et al. (2008) sociological stance on the reason for a particular subculture's increased sexual behavior may at least partially explain the elevated risks seen in this group.

If these are behaviors that start young, interventions should be implemented to prevent these outcomes at an even younger age. Based on the findings of these analyses, programs for adolescents should focus time and resources on young children who may be currently experiencing, or at risk for experiencing, parental/ caregiver illicit drug use in the home. Special attention should be focused on approaching this group using public health secondary prevention methodology. It would be beneficial to

consider creating and developing programs intentionally aimed at young African American children with

exposure to drug use in the home.

Limitations

Limitations to my analysis included a population size which was about 1,300. Similar studies like

the one done by the CDC and Kaiser, had over 17,000 participants, which gives us a much larger

population sample and a therefore a lower chance of random error.

Missing responses may have limited the scope of my results. In selecting variables, skip patterns

in some of the questionnaires were taken into consideration to account for possible missing responses.

Even so, some of the variables showed a substantial amount of missing responses. Heavy alcohol use by

participant showed the greatest amount of missing responses. They were addressed by exclusion from

the analysis.

For the purposes of this study, participant behavior and incidence until age 18 were observed.

Inferences found at this age are important and relevant to the literature on ACEs and later life

outcomes. However, it would be beneficial to follow adolescents into young adulthood to capture the

effects on health and behaviors that ACEs could have at later ages, which may not be able to be

captured by age 18.

Conclusions

Because of its longitudinal design, this analysis of The Longitudinal Study of Child Abuse and

Neglect (LONGSCAN) addressed Battjes's, & Jones (1985), concerns of prospective studies losing

funding and therefore not being able to "capture relationships among variables in developmental

sequence" (Battjes & Jones 1985 p 296). Data analysis was able to inform which childhood experiences

put individuals at higher and lower risks of subsequent sexual behaviors and alcohol abuse. Analysis was also able to tell us which ACEs demonstrated no effect on outcomes.

Public health prevention and intervention programs addressing high risk exposures like parent/caregiver illicit drug use, would be advantageous. Programs focused more rigorously on children who have this exposure would be beneficial as this was a reoccurring theme amongst participants. Additional considerations should include emphasis on the African American population. These considered, efficacious prevention strategies could be created to help minimize the health disparities in these populations and ultimately promote healthier, more productive members of society.

Tables

Table 1

Data sets included in analysis

Descriptions of Data Sets Included in Analysis	
Name of Dataset	**Description of Content**
Ceva0404	Things that participants have seen and heard at age 6.
Csa0603	Parent/Caregiver use of drugs and alcohol
Leb0708	Family circumstance, including parent/caregiver separation, divorce, homlessness, family member being jailed or imprisoned, and child exposure to violence
Sua0708	Service utilization, including counseling, therapy, weight watchers classes, etc.
Ahsb1201	Young adult health status including STDs
Asec1201	Sexual experiences and parenting status
Tada1201	Use of tobacco, alcohol and drugs
Bkga0404	Demographics
De6a0404	Family income

This table is a description of the information included in the data analysis. All datasets are from LONGSCAN. Variables relevant to the goals of this analysis were kept

Table 2.

Frequencies of outcomes by demographics and exposure variables

Table 2				
Frequencies of Outcomes by Demographics and Exposures				
Variable				
Dependent Factors	Independent Factors	Independent Factors	Independent Factors	Independent Factors
	>6 partners	Early sexual initiation	Had STD	Drank heavily
Household Income				
Low: (<$14,999/year)	26.14%	22.80%	5.39%	7.50%
$15,000, >/year	53.57%	40.27%	11.59%	21.17%
Gender				
Male	35.15%	27.76%	1.91%	9.52%
Female	16.42%	11.79%	7.69%	8.47%
Race				
Asian	0.00%	0%	0%	0.00%
Black	24.70%	23.66%	6.29%	4.79%
Hispanic	17.70%	11.12%	3.17%	12.12%
Mixed	28.00%	18.39%	5.68%	6.52%
Native American	66.00%	0.00%	0.00%	0.00%
White	26.62%	12.32%	2.35%	15.89%
Other	0.00%	0.00%	0.00%	0.00%
Caregiver Use of Alcohol				
Caregiver drank often (daily)	36%	21.43%	2.27%	13.60%
Caregiver did not drink/drank less often	22.15%	22.10%	3.64%	5.95%
Exposure to violence				
Yes	32.17%	18.67%	5.65%	3.65%
No	33.34%	18.31%	4.77%	8.78%
Someone jailed/imprisoned				
Yes	33.65%	25.22%	6.50%	6.20%
No	21.86%	17.16%	4.70%	7.89%
Parent/caregiver used drugs				
Yes	24.10%	20.40%	4.74%	9.17%
No	23.00%	16.60%	4.93%	6.47%
Adults yelling				
Often	30.00%	21.72%	4.64%	10.29%
Less often	21.81%	15.61%	4.82%	4.02%
Therapy/Counseling				
Yes	27.24%	22.63%	5.65%	8.39%
No	21.21%	15.15%	4.46%	6.96%
Table 2				

Table 3.

Univariate Associations of Outcomes by Demographics and Exposures

Table 3. Univariate Associations with Outcomes by Demographics and Exposures				
Variable				
Dependent Factors	Independent Factors	Independent Factors	Independent Factors	Independent Factors
	>6 partners	**Early sexual initiation**	**Had STD**	**Drank heavily**
Low Household Income(<$14,999/year)	**1.15 (1.04, 1.28)**	**1.15 (1.03, 1.28)**	1.02 (0.91, 1.15)	0.87 (0.78, 0.99)
Gender				
Male	**1.81 (1.44, 2.29)**	1.02 (0.83, 1.27)	0.55 (0.44, 0.70)	0.95 (0.74, 1.22)
Female				
Race				
Black	**1.39 (1.08, 1.78)**	**1.6 (1.24, 2.07)**	**1.39 (1.07, 1.84)**	0.82 (0.61, 1.1)
White				
Caregiver drank	1.14 (0.94, 1.38)	1.15 (0.94, 1.39)	1.00 (0.81, 1.24)	1.07 (0.85, 1.35)
Exposed to violence	**1.14 (1.02, 1.27)**	1.1 (0.99, 1.22)	**1.22 (1.08, 1.37)**	**1.15 (1.01, 1.31)**
Someone jailed/imprisoned	**1.29 (1.09, 1.55)**	**1.23 (1.02, 1.47)**	**1.36 (1.08, 1.60)**	**1.31 (1.05, 1.62)**
Parent/cargiver used drugs	**1.35 (1.16, 1.57)**	**1.33 (1.14, 1.55)**	**1.62 (1.36, 1.91)**	**1.47 (1.23, 1.77)**
Adults yelling	1.02 (0.90, 1.16)	1.01 (0.88, 1.15)	1.04 (0.91, 1.20)	1.04 (0.89, 1.21)
Table 3				

Table 4

Associations between having ACEs by 6 or more sexual partners

Odds between ACEs and > 6 partners	
Demographics/ACEs	Odds Ratio
Male*	1.20 (95% CI: 0.93, 1.54)
Black *	**1.37 (95% CI: 1.04, 1.78)**
Income of <$14,999 per year*	**1.11 (95% CI: 1.02, 1.21)**
Did parent/caregiver use drugs?*	**1.36 (1.09,1.68)**
Has child been exposed to violence?	1.07 (0.84, 1.36)
Has parent or member of household ever been jailed or imprisoned?	1.12 (95% CI: 0.80, 1.58)
Did parent/caregiver drink alcohol daily?	0.99 (95% CI: 0.78, 1.26)
Did child hear grownups yell at each other often?	0.79 (95% CI: 0.66, 0.95)
Did parent/caregiver or child ever go to therapy or counseling?	1.00 (95% CI: 0.76, 1.31)

18-year olds who had six or more sexual partners compared to those who had 1 or less partners

Parent/Caregiver use of drugs: Did parent or caregiver ever use cocaine, crack or freebase cocaine, LSD or PCP, or heroine?

Exposure to violence: Did child seen anyone physically threatened with weapon or get shot or stabbed? Did child see someone killed or murdered? Did child witness anyone being sexually abused, assaulted or raped? Did child witness anyone getting kicked, hit or physically harmed? Did someone threaten to stab/shoot someone else in your home? Did someone threatened to kill you?

Yelling: Did child hear adults in the home yelling at each other more than 3 times by age 6

Therapy/ Counseling: Has parent/caregiver or child used self-help or support groups like AA, weightwatchers, alcohol or drug counseling, psychological or behavioral problems?

Referent Groups
Referent group for male= female
Referent group for black=white
Referent group for <14,999/ year = >$15,000/ year

Table 5

Associations of ACEs by early sexual initiation

Odds between ACEs and early sexual initiation	
Demographics/ACEs	**Odds Ratio**
Income*	1.13 (95% CI:0.98, 1.30)
Male*	1.16 (0.90, 1.49)
Black*	**1.54 (95% CI: 1.19, 2.0)**
Did parent/caregiver use drugs?*	**1.60 (95% CI: 1.18, 2.22)**
Has child been exposed to violence?	1.01 (95% CI: 0.78, 1.29)
Has parent or member of household ever been jailed or imprisoned?	1.00 (95% CI: 0.70, 1.42)
Did parent/caregiver drink alcohol daily?	0.94 (95% CI: 0.74, 1.21)
Did child hear grownups yell at each other often?	0.80 (95% CI: 0.67, 0.96)
Did parent/caregiver or child ever go to therapy or counseling?	1.14 (95% CI: 0.86, 1.50)

*Early Sexual Initiation: Also called early sexual debut. First having intercourse at 13 years old or younger (CDC & YRBSS, 2007).

Parent/Caregiver use of drugs: Did parent or caregiver ever use cocaine, crack or freebase cocaine, LSD or PCP, or heroine?

Exposure to violence: Did child seen anyone physically threatened with weapon or get shot or stabbed? Did child see someone killed or murdered? Did child witness anyone being sexually abused, assaulted or raped? Did child witness anyone getting kicked, hit or physically harmed? Did someone threaten to stab/shoot someone else in your home? Did someone threatened to kill you?

Yelling: Did child hear adults in the home yelling at each other more than 3 times by age 6

Therapy/Counseling: Has parent/caregiver or child used self-help or support groups like AA, weightwatchers, alcohol or drug counseling, psychological or behavioral problems?

Referent Groups
Referent group for male= female
Referent group for black=white
Referent group for <14,999/year =>$15,000/year

Table 6

Associations of ACEs and STDs

Odds between ACEs and STDs*	
Demographics/ACEs	**Odds Ratio**
Income*	0.99 (95% CI: 0.85, 1.16)
Male*	0.55 (95% CI: 0.42, 0.72)
Black *	**1.45 (95% CI: 1.08, 1.95)**
Did parent/caregiver use drugs?*	**1.83 (95% CI: 1.36, 2.46)**
Has child been exposed to violence?	0.85 (95% CI: 0.65, 1.12)
Has parent or member of household ever been jailed or imprisoned?	1.09 (95% CI: 0.73, 1.61)
Did parent/caregiver drink alcohol daily?	1.27 (95% CI: 0.97, 1.67)
Did child hear grownups yell at each other often?	1.23 (95% CI: 1.01, 1.51)
Did parent/caregiver or child ever go to therapy or counseling?	1.04 (95% CI: 0.77, 1.40)

18-year olds who had an STD: Any sexually transmitted diseases, not including HIV/AIDS within the previous 12 months

Parent/Caregiver use of drugs: Did parent or caregiver ever use cocaine, crack or freebase cocaine, LSD or PCP, or heroine?

Exposure to violence: Did child seen anyone physically threatened with weapon or get shot or stabbed? Did child see someone killed or murdered? Did child witness anyone being sexually abused, assaulted or raped? Did child witness anyone getting kicked, hit or physically harmed? Did someone threaten to stab/shoot someone else in your home? Did someone threatened to kill you?

Yelling: Did child hear adults in the home yelling at each other more than 3 times by age 6

Therapy/ Counseling: Has parent/caregiver or child used self-help or support groups like AA, weightwatchers, alcohol or drug counseling, psychological or behavioral problems?

Referent Groups
Referent group for male=female
Referent group for black=white
Referent group for <14,999/ year = >$15,000/ year

Table 7

Associations of ACEs and Heavy Drinking

Odds between ACEs an heavy drinking*	
Demographics/ACEs	Odds Ratio
Income*	0.85 (95% CI: 0.72, 1.00)
Male*	0.92 (95% CI: 0.68, 1.26)
Black *	0.92 (95% CI: 0.67, 1.29)
Did parent/caregiver use drugs?*	**1.60 (95% CI: 1.18, 2.22)**
Has child been exposed to violence?	1.10 (95% CI: 0.82, 1.47)
Has parent or member of household ever been jailed or imprisoned?	1.20 (95% CI: 0.79, 1.83)
Did parent/caregiver drink alcohol daily?	0.81 (95% CI: 0.59, 1.10)
Did child hear grownups yell at each other often?	0.81 (95% CI: 0.65, 1.00)
Did parent/caregiver or child ever go to therapy or counseling?	0.76 (95% CI: 0.54, 1.06)

18 year old respondent's heavy use of alcohol: Those who had 5 + drinks on the same occasion on each of 5 or more days within the last 30 days (SAMHSA)

Parent/Caregiver use of drugs: Did parent or caregiver ever use cocaine, crack or freebase cocaine, LSD or PCP, or heroine?

Exposure to violence: Did child seen anyone physically threatened with weapon or get shot or stabbed? Did child see someone killed or murdered? Did child witness anyone being sexually abused, assaulted or raped? Did child witness anyone getting kicked, hit or physically harmed? Did someone threaten to stab/shoot someone else in your home? Did someone threatened to kill you?

Yelling: Did child hear adults in the home yelling at each other more than 3 times by age 6

Therapy/ Counseling: Has parent/caregiver or child used self-help or support groups like AA, weightwatchers, alcohol or drug counseling, psychological or behavioral problems?

Referent Groups
Referent group for male= female
Referent group for black=white
Referent group for <14,999/year = >$15,000/year

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