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Adverse Childhood Experiences in relation to drug and alcohol use in the 30 days prior to incarceration in a county jail

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Abstract

Purpose.—To characterize the relationship between adverse childhood experiences (ACEs) and substance use among people incarcerated in a county jail.

Design/methodology/approach.—A questionnaire was administered to 199 individuals incarcerated in a Southwest county jail as part of a social-epidemiological exploration of converging co-morbidities in incarcerated populations. Among 96 participants with complete ACEs data, the authors determined associations between individual ACEs items and a summative score with methamphetamine (meth), heroin, other opiates, and cocaine use and binge drinking in the 30 days prior to incarceration using logistic regression.

Findings.—People who self-reported use of methamphetamine, heroin, other opiates, or cocaine in the 30 days prior to incarceration had higher average ACEs scores. Methamphetamine use was significantly associated with living with anyone who served time in a correctional facility and with someone trying to make them touch sexually. Opiate use was significantly associated with living with anyone who was depressed, mentally ill, or suicidal; living with anyone who used illegal street drugs or misused prescription medications; and if an adult touched them sexually. Binge drinking was significantly associated with having lived with someone who was a problem drinker or alcoholic.

Originality.—Significant associations between methamphetamine use and opiate use and specific adverse childhood experiences suggest important entry points for improving jail and community programming.

Social Implications.—Our findings point to a need for research to understand differences between methamphetamine use and opiate use in relation to particular adverse experiences during childhood, and a need for tailored intervention for people incarcerated in jail.

Keywords

Jail; ACEs; Adverse Childhood Experiences; Substance Use

INTRODUCTION

Adverse childhood experiences (ACEs) have been shown repeatedly to have negative impacts on a range of health outcomes, including illicit drug use and problem drinking (Dube *et al.*, 2003, Zarse *et al.*, 2019, Bellis *et al.*, 2014). ACEs are also associated with an increase in psychiatric consequences resulting from drug use (Zarse *et al.*, 2019). Non-medical opioid use (Quinn *et al.*, 2019), cocaine use (Bellis *et al.*, 2014), tobacco use (Ye and Reyes-Salvail, 2014), methamphetamine use (Ding *et al.*, 2014), and alcohol use have all been associated with adverse experiences during childhood (Hughes *et al.*, 2017). To assess net effects of interactions between multiple adverse experiences during childhood and health outcomes throughout the lifecourse (Dube *et al.*, 2003, Felitti *et al.*, 1998), ACEs questions elicit self-reported adverse experiences and are often compiled into a cumulative ACEs score. In an analysis of Behavioral Risk Factor Surveillance System (BRFSS) data, where ACEs are scored on an eleven-point scale, Lee and Chen (2017) reported that high overall ACEs scores are positively associated with substance use in the general United States population. In addition, drug overdose risk and suicide attempts are strongly associated with ACEs scores among formerly incarcerated people (Friestad *et al.*, 2014, Binswanger *et al.*, 2007). To improve substance use treatment for people incarcerated in jails, more research is needed to understand the relationship between ACEs and substance use in this population.

Among people incarcerated in jails in the United States, substance use disorder is one of the most common diagnoses and a major contributor to incarceration (Selling *et al.*, 2015, Bahr *et al.*, 2013). Substance use disorders among prison populations are similarly correlated with ACEs and psychological distress (Wolff and Caravaca Sánchez, 2019). Several studies have suggested that substance use among this population may arise from the need to cope with childhood trauma and adversity prior to incarceration experiences (Bowles *et al.*, 2012, Boppre and Boyer, 2019, Cigrang *et al.*, 2020, Henry, 2020a).

In an analysis of a nationally representative sample, Roos *et al.* (2016) reported that maltreatment experiences during childhood were more predictive of incarceration for women than for men. ACEs are associated with increased risk behaviors among women, including substance use, and having a guardian that is incarcerated is a key ACE that contributes to substance use later in life (Chung *et al.*, 2010). Links between substance use and having a guardian incarcerated suggest potential intergenerational relationships between substance use and incarceration. Among American Indian/Alaska Native women, De Ravello *et al.* (2008) found that ACEs were positively associated with arrest for violent episodes. Among incarcerated people, studies have found higher rates of substance use disorders among women than men, increasing in recent decades (Fazel *et al.*, 2017).

Multiple ACEs are associated with binge alcohol use and problem drinking (Loudermilk *et al.*, 2018, Fang and Mcneil, 2017, Hughes *et al.*, 2017, Ye and Reyes-Salvail, 2014). Some research suggests that binge drinking and depression both correlate with ACEs, however,

the effect varies by race and ethnicity (Lee and Chen, 2017). Verbal and physical abuse during childhood are often more closely related to binge drinking than other ACEs (Fang and Mcneil, 2017, Loudermilk *et al.*, 2018). Most studies report that the greater the number of ACEs reported, the higher the likelihood of problem drinking overall, yet more detailed understandings of childhood experiences of substance use are needed to serve individuals incarcerated in jail (Hughes *et al.*, 2017, Kalmakis and Chandler, 2015).

In this paper, we describe the results of analysis of a pilot survey conducted with people incarcerated in a county jail, focused on converging co-morbidities in jail populations (Trotter *et al.*, 2019, Trotter *et al.*, 2018a, 2018b). The objective of this secondary analysis of the broader survey dataset was to characterize the relationship between ACEs and substance use among individuals incarcerated in a Southwest county jail. We determined the association between individual ACEs items from the BRFSS ACE module (Ford *et al.*, 2014) and the summative score with reported use of heroin, cocaine, methamphetamine (meth), other opiates, and binge alcohol use within the past 30 days. Substance use has been associated with the greatest concern among the local communities in the region (Sanderson *et al.* 2017). From a social determinants of health perspective (Marmot & Wilkinson, 2005), understanding pathways from adverse childhood experiences to incarceration and substance use, and back is an important step toward primary and secondary prevention. We employ a social determinants of health framework, informed by Ecosocial Theory (Krieger, 1994, 2001, 2006), and Social Ecological approaches to understanding multiple spheres of influence in determining health outcomes (Golden & Earp, 2012, Stokols, 1996). Social determinants of health as a theoretical framework is useful for understanding complex relationships between broader social, political, interpersonal, and cultural factors that impact access to healthcare, mental well-being, substance use, and incarceration (Henry, 2020a, Eaves *et al.* 2020). This study draws from a broader survey of people in a county jail to contribute to more detailed understanding of the relationships between particular adverse experiences during childhood and substances used among people incarcerated in a county jail.

METHODS

Study population

The Health Disparities in Jail Populations pilot study was designed to understand the health needs and care seeking patterns related to incarceration in a county jail from a social determinants of health perspective (Trotter *et al.*, 2018a). From 2017–2018, 199 individuals 18 years and older who were able to understand and read English and housed at a County Detention Facility were recruited using a systematic targeted stratified sampling strategy. Recruited individuals completed a cross-sectional health survey that asked questions about a broad range of health topics, with the aim of identifying patterns in health history, health seeking, and health outcomes for individuals incarcerated in the local county jail. Results of the broader study are reported elsewhere (Trotter *et al.* 2018b, Trotter *et al.*, 2019). In this paper, we describe analysis of associations between adverse childhood experiences questions included in the survey, and self-reported substance use to characterize associations between these experiences among participants. Individuals housed in juvenile,

administrative confinement, severe mental illness, and administration dorms were excluded. For this secondary analysis of the broader survey data set, we additionally excluded individuals who had missing ACEs data (n=103). The study was approved by the Northern Arizona University Institutional Review Board and participants gave written, informed consent.

Demographic information

Age at interview was determined from date of birth. Sex was categorized as male or female. Race/ethnicity was categorized as American Indian/Alaska Native, Hispanic, Non-Hispanic White, or other (Table I). Due to very low numbers of participants in these categories, “other” included participants who identified as Asian or Pacific Islander, Black, or other.

Adverse Childhood Experiences (ACEs)

ACEs were collected using the 11 items from the BRFSS ACE Module (Ford *et al.*, 2014). Participants were asked about three types of child abuse (physical, emotional, or sexual) by a parent or other adult in the household; parents separated or divorced; living with parents or adults who were physically violent to each other; and living with anyone who was depressed, mentally ill, or suicidal, a problem drinker or alcoholic, used illegal street drugs or misused prescription medications, or, served time or was sentenced to serve time in a prison, jail, or other correctional facility. An ACEs score was calculated for each participant by summing the total number of reported ACEs a participant responded “yes” to experiencing in their first 18 years of life.

Substance Use

Substances including methamphetamine, heroin, other opiates, cocaine, and alcohol, were selected for this analysis because they are the most commonly used substances in Arizona, other than Marijuana. In qualitative assessments of prevention and intervention needs related to substance use in Arizona, they are also the substance most often cited as causing problems for families and communities (LeCroy & Milligan Associates, Inc. 2018, Sanderson *et al.* 2017). To assess the relationship of ACE scores with substance use, we selected those substances that are considered most related to family and community-level problems. We chose not to include Marijuana due to the contested nature of legality, medicinal use, and problematic definitions of misuse related to Marijuana use (Sznitman and Room, 2018).

Participants were asked if they had ever used any of the following: methamphetamine, heroin, other opiates, or cocaine. If a participant responded “yes” to using a substance, they were asked, “In the 30 days before admission to jail, on how many days did you use [methamphetamine, heroin, other opiates, or cocaine]”. Participants were classified as using a substance in the 30 days prior to incarceration or not using a substance in the 30 days prior to incarceration.

Participants were asked, “How many times in the past year have you had X or more drinks in a day?” (X=5 for men and X=4 for women). Aligned with the National Institute on Alcohol Abuse and Alcoholism definition (NIAAA, 2020), binge drinking in this analysis

was categorized as males having five or more drinks on one occasion or females having four or more drinks on at least one occasion.

Statistical Analysis

Demographic characteristics were presented as mean $\pm$ standard deviation (SD) or frequency and relative frequencies. Analyses were conducted using SAS version 9.4 (SAS Institute Inc., Cary, NC). As ACE scores did not violate skewness parameters, we estimated means $\pm$ SD of ACE scores by methamphetamine, heroin, other opiates, and cocaine use and binge drinking in the 30 days prior to incarceration, separately (yes vs. no). We additionally assessed frequency distributions for individual ACE questions by methamphetamine, heroin, other opiates, and cocaine use and binge drinking in the 30 days prior to incarceration. To assess the association between ACE scores and responses to individual ACEs with methamphetamine, heroin, other opiates, and cocaine use and binge drinking in the 30 days prior to incarceration, odds ratios (OR) and associated 95% confidence intervals (CI) were estimated using logistic regression models. All models were adjusted for age, sex, and race/ethnicity.

Social Determinants of Health Framework

Data for this study were collected and interpreted from the perspective of a Social Determinants of Health framework (Marmot and Wilkinson, 2005). Social determinants of health include economic, community, environmental, social, and health factors. The social determinants of health has been useful as a theoretical framework for emphasizing the “upstream” or contextual and social contributors to health and disease (Krieger, 2001, McKeown, 1988). Combined with a Social Determinants of Health framework, the adverse childhood experiences (ACEs) approach to understanding negative health outcomes is a burgeoning framework for understanding the impacts of childhood experiences on health and well-being throughout the lifecourse. The broader survey implemented as part of this study aimed to understand multiple health factors experienced by people incarcerated in a county jail. People incarcerated in jail are distinct from people incarcerated in prison because of the shorter duration of incarceration, often averaging only one day (Camplain *et al.*, 2020). More detailed understanding of ACEs and types of substance use in this population, therefore, has implications for both jail-based substance use intervention programming and community-based programming because jail experiences are often recurring and can compound the negative impacts of other social determinants of health (Lambdin *et al.*, 2018).

RESULTS

Among the 96 individuals included in this analysis, 51% of participants were 34 years or younger and 26% were female (Table I). Most participants identified as American Indian/Alaska Native (58%), 15% identified as Hispanic/Latino, 24% were white, and 3% identified as either Asian or Pacific Islander, Black, or “other”.

Substance Use

Participants who indicated they used methamphetamine (n=36), heroin (n=19), other opiates (n=15), or cocaine (n=11) in the 30 days prior to incarceration had higher average ACEs scores compared to participants who did not indicate the respective substance in the 30 days prior to incarceration (Table II). When assessing ACEs questions, separately, a higher proportion of participants who reported using methamphetamine in the 30 days prior to incarceration said “yes” to every individual ACEs question compared to participants who did not use methamphetamine. Similarly, a higher proportion of participants who reported using cocaine in the 30 days prior to incarceration said “yes” to all ACEs questions compared to participants who did not use cocaine with the exception of “Were your parents separated or divorced?”, in which results were similar by cocaine use.

A higher proportion of participants who reported using heroin in the 30 days prior to incarceration said “yes” to living with someone that was depressed, mentally ill, or suicidal; a problem drinker or alcoholic; or used illegal street drugs or who misused prescription medications compared to those who did not use heroin (Table II). Similarly, a higher proportion of participants who reported using heroin in the 30 days prior to incarceration said “yes” to having divorced parents, being physically hurt by an adult, and being forced to touch an adult sexually compared to those who did not use heroin. Responses to living with someone who served time in a correctional facility, parents abuse to each other, adults swearing or insulting them, and being forced to have sex with someone older than them were lower among participants who did not use heroin compared to those who did in the 30 days prior to incarceration.

A higher proportion of participants who reported using other opiates in the 30 days prior to incarceration said “yes” to living with someone that was depressed, mentally ill, or suicidal; a problem drinker or alcoholic; used illegal street drugs or who misused prescription medications; or someone who served time in a correctional facility compared to those who did not use heroin (Table II). Similarly, a higher proportion of participants who reported using other opiates in the 30 days prior to incarceration said “yes” to having divorced parents, being forced to touch an adult sexually, and being forced to have sex with someone older than them compared to those who did not use heroin. Responses to parents’ abuse to each other, being physically hurt by an adult, and adults swearing or insulting them were lower among participants who did not use heroin compared to those who did in the 30 days prior to incarceration.

Overall ACEs scores were associated with using methamphetamine (OR = 1.24, 95% CI: 1.05, 1.47) and other opiates (OR = 1.26, 95% CI: 1.00, 1.61) in the 30 days prior to incarceration (Table III). Although not statistically significant, with every increase of ACEs score, participants had a 17% higher odds of using heroin (OR = 1.17, 95% CI: 0.95, 1.44) and a 16% higher odds of using cocaine (OR = 1.16, 95% CI: 0.90, 1.48) in the 30 days prior to incarceration.

Regarding individual ACEs questions, living with anyone who served time in a correctional facility (OR = 3.61, 95% CI: 1.36, 9.57) and someone trying to make them touch sexually (OR = 4.70, 95% CI: 1.17, 18.8) was associated with using methamphetamine in the 30

days prior to incarceration (Table III). Living with anyone who was depressed, mentally ill, or suicidal (OR = 4.70, 95% CI: 1.17, 18.80); living with anyone who used illegal street drugs or misused prescription medications (OR = 3.68, 95% CI: 1.05, 12.86); and if an adult touched them sexually (OR = 4.86, 95% CI: 1.11, 21.28) was associated with using opiates in the 30 days prior to incarceration. There were no statistically significant associations between individual ACEs questions and heroin or cocaine use in the 30 days prior to incarceration.

Binge drinking

Participants who reported binge drinking in the 30 days prior to incarceration had a higher average ACEs score compared to participants who did not binge drink in the 30 days prior to incarceration (Table IV). When assessing ACEs questions, separately, a higher proportion of participants who reported binge drinking in the 30 days prior to incarceration said “yes” to all individual ACEs question compared to participants who did not binge drink with the exception of living with anyone who served time in a correctional facility or an adults beating each other up. However, the only statistically significant association with binge drinking in the 30 days prior to incarceration was with if they had lived with anyone who was a problem drinker or alcoholic (OR = 2.76, 95% CI: 1.14, 6.66, Table V).

DISCUSSION

The purpose of this work was to determine the association of individual and summative ACEs scores with self-reported use of heroin, cocaine, methamphetamine, other opiates, and binge alcohol use within the past 30 days. The broader study was focused on people incarcerated in a jail in a small community, rather than people incarcerated in prison, because of the heightened frequency of interaction between people incarcerated in jails, the broader community, and the healthcare system (Eaves *et al.*, 2019, Trotter *et al.*, 2019, Trotter *et al.*, 2018). The short length of stay for most inmates (2–4 days on average) allows for analysis of substance use in the past 30 days, regardless of diagnosis of dependence or treatment history. Among people in this study, people with higher average ACEs scores were more likely to indicate methamphetamine, heroin, cocaine, other opiate, and binge alcohol use in the 30 days before incarceration compared to people with lower average ACEs scores.

The association between individual ACEs and specific substance use is poorly understood among individuals incarcerated in jail and may be important to tailoring substance use intervention programming to address broader social determinants of health. Further, from a social determinants of health perspective, understanding how individuals’ life experiences impact health trajectories is important, and points to a need for more detailed analysis of the associations between particular experiences during childhood and substance use in later life. Despite the small sample size in this analysis, some types of substance use were significantly associated with particular ACEs questions. Methamphetamine use in the 30 days prior to incarceration was associated with living with anyone who served time in a correctional facility and with someone trying to make them touch sexually. Opiate use in the 30 days prior to incarceration was associated with living with anyone who was depressed, mentally ill, or suicidal; living with anyone who used illegal street drugs or

misused prescription medications; and if an adult touched them sexually. Binge drinking in the 30 days prior to incarceration was associated with having lived with someone who was a problem drinker or alcoholic. Previous research has shown that parental alcoholism is associated with alcoholism as an adult (Anda *et al.*, 2002).

Although these data were collected as part of a pilot study and the number of participants is small, significant associations between methamphetamine use and opiate use with specific adverse experiences during childhood point to a need for additional, more granular, research to determine whether these associations might be useful for improving programming for people incarcerated in jail. For example, if having a parent who is incarcerated leads to increased likelihood of methamphetamine use in adulthood, future research should consider whether programming that includes the children of people who are incarcerated may impact later use. Another example may be the use of opiate pain medications among people who lived with an adult who was depressed or suicidal. This association could have implications for opioid treatment that takes into account adverse childhood experiences, as well as family histories of depressive illness. Our results also point to a need for additional research to determine whether community substance use treatment programs that take ACEs into account could contribute to better diversion programs that provide trauma-informed care as an alternative to incarceration.

Existing jail-based intervention programs are rarely tailored to address broader social determinants of health and despite a growing evidence-base, more detailed research is needed to assist programs with understanding how best to incorporate ACEs risk and protective factors into program designs (Craig *et al.*, 2017, Garza *et al.*, 2019). Our data are aligned with the many studies that have documented relationships between substances use, ACEs, and incarceration (Henry, 2020b, Prince and Wald, 2018, Briere *et al.*, 2016, Asberg and Renk, 2012). Evidence that substance use in this population could be partially attributed to coping with childhood trauma and adversity (Bowles *et al.*, 2012, Boppre and Boyer, 2019, Cigrang *et al.*, 2020, Henry, 2020a) points to a need for more detailed understanding of specific substance use patterns and ACEs scores among people incarcerated in jails to inform programming in that addresses both trauma and substance dependence.

Research on larger data sets within the same county indicate racial/ethnic disparities in arrest outcomes (Camplain *et al.*, 2020). We did not conduct analysis of ethnic differences in our sample because of the small sample size and already skewed racial/ethnic composition of people incarcerated in the jail (58% AI/AN). This skewed racial/ethnic composition, and our data suggest, however, that greater understanding of the relationships between ACEs, incarceration, and substance use is needed in order to improve programming in jails and to interrupt intergenerational cycles of recidivism as well as to counter racial/ethnic stereotypes that lead to disparities in arrests in the first place. Health outcomes associated with incarceration are complicated by a variety of factors within jails and in local communities (Trotter *et al.*, 2019, Eaves *et al.*, 2019). Our findings point to living with someone who has been incarcerated as a potential contributor to substance use. From a social determinants of health perspective, incarceration as both a risk factor and outcome is an area in need of continued research. These findings point toward the need for ongoing research to fill gaps in our understanding of how incarceration, substance use, and ACEs

interact, as well as how they contribute to negative health behaviors and outcomes for future generations.

Limitations

These observations are limited by the pilot nature of the project and small sample size. We may have been able to detect more statistically significant associations between other ACEs and substance use with a larger sample size. All ACE questions were not available to the first 70 participants who completed the study. A subsequent revision to the questionnaire rectified this omission. Thus, in addition to sample size implications, missingness is not at random. Demographically, participants in this sample are different from the overall population of people incarcerated in the jail (Trotter *et al.*, 2019). Our sample was similar in sex breakdown, but contained a smaller proportion of 18–24 year olds and larger American Indian/Alaska Native population in our sample (58%) compared to overall (33%). The median length of stay among our sample population is 56 days compared to an average of 2 days among everyone who enters the jail. This analysis may be capturing characteristics of those who stay in jail rather than those who “go to jail”. This limitation may also be a strength of our analysis, as this group may be more similar to the group that would be exposed to programs and interventions while incarcerated. Due to the self-reported nature of the data collected in this survey, we were only able to assess use and not substance dependence or disordered use. Our sample size was further limited by an administrative error that led to the first 81 participants in the study not answering the 7th ACEs item (Before age 18, how often did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way? Do not include spanking). Only those participants who were presented with the full ACEs module are included. Participants who were included in the present study included a higher proportion of 25–34-year olds, women, and white individuals compared to those who did not complete the ACEs questions (data not shown).

CONCLUSIONS

Childhood sexual trauma and victimization have been suggested as major contributing factors to substance use and subsequent incarceration (Dehart *et al.*, 2013). As reported in other studies, verbal abuse during childhood was the most commonly reported adverse childhood experience among participants in this study (Fang and Mcneil, 2017, Loudermilk *et al.*, 2018). The association of opiate use with living with a person who is depressed or suicidal warrants investigation, as incarcerated people have high rates of depression and suicidality (Friestad *et al.*, 2014, Binswanger *et al.*, 2007). Investing in mental and behavioral healthcare in jails is one step toward addressing social determinants of health as a measure to prevent incarceration, and upon reentry into the community (Nowotny *et al.*, 2014). Incarcerated populations are characterized by disproportionately high rates of ACEs, substance use disorders, and mental health related diagnoses (Henry, 2020b, Prince and Wald, 2018, Briere *et al.*, 2016, Asberg and Renk, 2012). People with mental health conditions are more likely to be arrested, elevating rates of mental health disorders in jails (Prince and Wald, 2018). Among people incarcerated in jails, psychiatric conditions are often co-morbid with substance use disorders (Proctor and Hoffmann, 2012, Jones *et al.*, 2018, Proctor *et al.*, 2019). To address the complex health needs of people incarcerated

in jails from a social determinants of health perspective, the association of certain adverse experiences and parental circumstances during childhood with particular types of substance use and binge alcohol use warrants additional investigation. Future research should explore the reasons for differences in substance use based on particular adverse experiences during childhood. Researchers approaching incarceration from a Transformative Justice perspective have suggested that broader contexts, such as living in poverty, experiencing discrimination, and marginalization should be considered central to understanding pathways to incarceration (Nocella, 2011). Our research, informed by a social determinants of health framework, points to a need for more attention to such broader contexts in ACEs research. Although ACEs impacts are often considered as given, more attention to specific contexts could contribute to more socially informed and impactful programming. Research should consider how our findings that living with a parent who is incarcerated, or living with a parent who is depressed or suicidal, are impacted by broader social and environmental contexts. For example, does having a parent who is depressed or suicidal impact a child directly, or is the child subject to the same contextual stressors? Significant associations between these adverse experiences and particular types of substance use point to a need for more attention to social determinants of health and broader contexts in ACEs research, particularly among people incarcerated in jails.

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REFERENCES CITED

- Anda RF, Whitfield CL, Felitti VJ, Chapman D, Edwards VJ, Dube SR and Williamson DF (2002), "Adverse childhood experiences, alcoholic parents, and later risk of alcoholism and depression", *Psychiatric services*, Vol. 53 No. 8, pp. 1001–1009. DOI: 10.1176/appi.ps.53.8.1001 [PubMed: 12161676]
- Asberg K and Renk K (2012), Substance use coping as a mediator of the relationship between trauma symptoms and substance use consequences among incarcerated females with childhood sexual abuse histories. *Substance use & misuse*, Vol. 47 No. 7, pp. 799–808. doi: 10.3109/10826084.2012.669446. [PubMed: 22468563]
- Bahr SJ, Harris PE, Strobell JH and Taylor BM (2013), An evaluation of a short-term drug treatment for jail inmates. *International journal of offender therapy and comparative criminology*, Vol. 57 No. 10, pp. 1275–1296. DOI: 10.1177/0306624X12448650 [PubMed: 22641859]
- Bellis MA, Hughes K, Leckenby N, Perkins C and Lowey H (2014), National household survey of adverse childhood experiences and their relationship with resilience to health-harming behaviors in England. *BMC Medicine*, Vol. 12, p. 72. DOI: 10.1186/1741-7015-12-72 [PubMed: 24886026]
- Binswanger IA, Stern MF, Deyo RA, Heagerty PJ, Cheadle A, Elmore JG & Koepsell TD (2007), Release from prison—a high risk of death for former inmates. *New England Journal of Medicine*, Vol. 356 No. 2, pp. 157–165. DOI: 10.1056/NEJMsa064115

- Boppre B and Boyer C (2019), “‘The Traps Started During My Childhood’: The Role of Substance Abuse in Women’s Responses to Adverse Childhood Experiences (ACEs)”, *Journal of Aggression, Maltreatment & Trauma*, pp. 1–21. 10.1080/10926771.2019.1651808
- Bowles MA, Dehart D and Webb JR (2012), “Family influences on female offenders’ substance use: the role of adverse childhood events among incarcerated women”, *Journal of Family Violence*, Vol. 27 No. 7, pp. 681–686. 10.1007/s10896-012-9450-4
- Briere J, Agee E and Dietrich A (2016), “Cumulative trauma and current posttraumatic stress disorder status in general population and inmate samples”, *Psychological trauma: Theory, Research, Practice, and Policy*, Vol. 8 No. 4, pp. 439–446. DOI: 10.1037/tra0000107
- Camplain R, Camplain C, Trotter RT, Pro G, Sabo S, Eaves E, Peoples M and Baldwin JA (2020), “Racial/ethnic differences in drug-and alcohol-related arrest outcomes in a southwest county from 2009 to 2018”, *American Journal of Public Health*, Vol. 110 Suppl. 1, pp. S85–S92. doi: 10.2105/AJPH.2019.305409 [PubMed: 31967892]
- Camplain R, Warren M, Baldwin JA, Camplain C, Fofanov VY and Trotter RT (2019), “Epidemiology of Incarceration: characterizing jail incarceration for public health research”, *Epidemiology*, Vol. 30 No. 4, pp. 561–568. doi: 10.1097/EDE.0000000000001021 [PubMed: 30985527]
- Chung EK, Nurmohamed L, Mathew L, Elo IT, Coyne JC and Culhane JF (2010), “Risky health behaviors among mothers-to-be: the impact of adverse childhood experiences”, *Academic pediatrics*, Vol. 10 No. 4, pp. 245–251. DOI: 10.1016/j.acap.2010.04.003 [PubMed: 20599179]
- Cigrang JA, Fedynich AL, Nichting E, Frederick SA, Schumm JA and Auguste CB (2020), “Brief motivational interview–based intervention for women in jail with history of drug addiction and sex-trading”, *Professional Psychology: Research and Practice*, Vol. 51 No. 1, pp. 25–33. 10.1037/pro0000273
- Craig JM, Piquero AR, Farrington DP and Ttofi MM (2017), “A little early risk goes a long bad way: Adverse childhood experiences and life-course offending in the Cambridge study”, *Journal of Criminal Justice*, Vol. 53, pp. 34–45. DOI: 10.1016/j.jcrimjus.2017.09.005
- De Ravello L, Abeita J and Brown P (2008), “Breaking the cycle/mending the hoop: adverse childhood experiences among incarcerated American Indian/Alaska Native women in New Mexico”, *Health Care for Women International*, Vol. 29 No. 3, pp. 300–315. DOI: 10.1080/07399330701738366 [PubMed: 18350429]
- Dehart D, Lynch S, Belknap J, Dass-Brailsford P and Green B (2013), “Life history models of female offending: the roles of serious mental illness and trauma in women’s pathways to jail”, *Psychology of Women Quarterly*, Vol. 38 No. 1, pp.138–151. 10.1177/0361684313494357
- Ding Y, Lin H, Zhou L, Yan H and He N (2014), “Adverse childhood experiences and interaction with methamphetamine use frequency in the risk of methamphetamine-associated psychosis”, *Drug and alcohol dependence*, Vol. 142, pp. 295–300. DOI: 10.1016/j.drugalcdep.2014.06.042 [PubMed: 25064022]
- Dube SR, Felitti VJ, Dong M, Chapman DP, Giles WH and Anda RF (2003), “Childhood abuse, neglect, and household dysfunction and the risk of illicit drug use: the adverse childhood experiences study”, *Pediatrics*, Vol. 111 No. 3, pp. 564–572. DOI: 10.1542/peds.111.3.564 [PubMed: 12612237]
- Eaves ER, Williamson HJ, Sanderson KC, Elwell K, Trotter II RT, and Baldwin JA (2020), “Integrating Behavioral and Primary Health Care in Rural Clinics: What Does Culture Have to Do with It?”, *Journal of Health Care for the Poor and Underserved*, Vol. 31 No. 1, pp. 201–217. DOI: 10.1353/hpu.2020.0018 [PubMed: 32037327]
- Eaves ER, Kohlbeck BS and Camplain C (2019), “Reflexive challenges in community engaged research in a county jail”, *Practicing Anthropology*, Vol. 41 No. 4, pp. 6–30. 10.17730/0888-4552.41.4.26
- Fang L and Mcneil S (2017), “Is there a relationship between adverse childhood experiences and problem drinking behaviors? Findings from a population-based sample”, *Public Health*, Vol. 150, pp. 34–42. DOI: 10.1016/j.puhe.2017.05.005 [PubMed: 28623765]
- Fazel S, Yoon IA and Hayes AJ (2017), “Substance use disorders in prisoners: an updated systematic review and meta-regression analysis in recently incarcerated men and women”, *Addiction*, Vol. 112 No. 10, pp. 1725–1739. DOI: 10.1111/add.13877 [PubMed: 28543749]

- Felitti VJ, Anda RF, Nordenberg D, Williamson DF, Spitz AM, Edwards V, Koss MP and Marks JS (1998), "Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: the Adverse Childhood Experiences (ACE) Study", *American Journal of Preventive Medicine*, Vol. 14 No. 4, pp. 245–258. DOI: 10.1016/s0749-3797(98)00017-8 [PubMed: 9635069]
- Ford DC, Merrick MT, Parks SE, Breiding MJ, Gilbert LK, Edwards VJ, Dhingra SS, Barile JP and Thompson WW (2014), "Examination of the factorial structure of adverse childhood experiences and recommendations for three subscale scores", *Psychology of Violence*, Vol. 4 No. 4, pp. 432–444. doi: 10.1037/a0037723 [PubMed: 26430532]
- Friestad C, Åse-Bente R and Kjelsberg E (2014), "Adverse childhood experiences among women prisoners: Relationships to suicide attempts and drug abuse", *International Journal of Social Psychiatry*, Vol. 60 No. 1, pp. 40–46. DOI: 10.1177/0020764012461235
- Garza MR, Rich K and Omilian SM (2019), "A trauma-informed call to action: culturally informed, multi-disciplinary theoretical, and applied approaches to prevention and healing, part II", *Journal of Aggression, Maltreatment & Trauma*, Vol. 28 No. 4, pp. 519–525. DOI: 10.1080/10926771.2019.1601144
- Golden SD, and Earp JD (2012), "Social Ecological Approaches to Individuals and Their Contexts: Twenty Years of *Health Education & Behavior* Health Promotion Interventions", *Health Education & Behavior*, Vol. 39 No. 3, pp. 364–372. DOI: 10.1177/1090198111418634 [PubMed: 22267868]
- Henry BF (2020a), "Adverse experiences, mental health, and substance use disorders as social determinants of incarceration", *Journal of Community Psychology*, Vol. 48 No. 3, pp. 744–762. DOI: 10.1002/jcop.22289 [PubMed: 31765027]
- Henry BF (2020b), "Typologies of adversity in childhood & adulthood as determinants of mental health & substance use disorders of adults incarcerated in US prisons", *Child Abuse & Neglect*, Vol. 99, p. 104251. 10.1016/j.chiabu.2019.104251 [PubMed: 31726246]
- Hughes K, Bellis MA, Hardcastle KA, Sethi D, Butchart A, Mikton C, Jones L and Dunne MP (2017), "The effect of multiple adverse childhood experiences on health: a systematic review and meta-analysis", *The Lancet Public Health*, Vol. 2 No. 8, pp. e356–e366. DOI: 10.1016/S2468-2667(17)30118-4 [PubMed: 29253477]
- Jones MS, Worthen MG, Sharp SF and Mcleod DA (2018), "Bruised inside out: The adverse and abusive life histories of incarcerated women as pathways to PTSD and illicit drug use", *Justice Quarterly*, Vol. 35 No. 6, pp.1004–1029. 10.1080/07418825.2017.1355009
- Kalmakis KA and Chandler GE (2015), "Health consequences of adverse childhood experiences: A systematic review", *Journal of the American Association of Nurse Practitioners*, Vol. 27 No. 8, pp. 457–465. DOI: 10.1002/2327-6924.12215 [PubMed: 25755161]
- Krieger N (1994), "Epidemiology and the web of causation: has anyone seen the spider?", *Social Science & Medicine*, Vol. 39 No. 7, pp. 887–903. DOI: 10.1016/0277-9536(94)90202-x [PubMed: 7992123]
- Krieger N (2001), "Theories for social epidemiology in the 21st century: an ecosocial perspective", *International Journal of Epidemiology*, Vol. 30 No. 4., pp. 668–677. DOI: 10.1093/ije/30.4.668 [PubMed: 11511581]
- Krieger N (2006), "Researching critical questions on social justice and public health: an ecosocial perspective" Levy BS and Sidel VW (Eds.) *Social Injustice and Public Health*, p. 460. DOI: 10.1093/med/9780199939220.001.0001
- Lambdin BH, Comfort M, Kral AH, and Lorrivick J (2018), "Accumulation of jail incarceration and hardship, health status, and unmet health care need among women who use drugs", *Women's Health Issues*, Vol. 28 No. 5, pp. 470–475. DOI: 10.1016/j.whi.2018.05.005 [PubMed: 30061031]
- LeCroy & Milligan Associates, Inc. (2018), "Arizona Statewide Prevention Needs Assessment", <https://www.azahcccs.gov/Resources/Downloads/Grants/ArizonaSubstanceAbusePreventionNeedsAssessment.pdf> (accessed online 7/20/2020).
- Lee RD and Chen J (2017), "Adverse childhood experiences, mental health, and excessive alcohol use: Examination of race/ethnicity and sex differences" *Child abuse & neglect*, Vol. 69, pp. 40–48. 10.1016/j.chiabu.2017.04.004 [PubMed: 28448813]

- Loudermilk E, Loudermilk K, Obenauer J and Quinn MA (2018), "Impact of adverse childhood experiences (ACEs) on adult alcohol consumption behaviors", *Child Abuse & Neglect*, Vol. 86, pp. 368–374. DOI: 10.1016/j.chiabu.2018.08.006 [PubMed: 30241703]
- Marmot M, and Wilkinson R (Eds.). (2005), *Social determinants of health*. 2nd Edition. Oxford University Press, Oxford.
- McKeown T (1988), *The Origins of Human Disease*. Oxford: Basil Blackwell.
- Nocella AJ, and Anthony J (2011), "An overview of the history and theory of transformative justice", *Peace & Conflict Review*, Vol. 6 No. 1, pp. 1–10.
- Nowotny KM, Belknap J, Lynch S and Dehart D (2014), "Risk profile and treatment needs of women in jail with co-occurring serious mental illness and substance use disorders", *Women & Health*, Vol. 54 No. 8, pp. 781–795. DOI: 10.1080/03630242.2014.932892 [PubMed: 25204664]
- Prince JD and Wald C (2018), "Risk of criminal justice system involvement among people with co-occurring severe mental illness and substance use disorder", *International Journal of Law and Psychiatry*, Vol. 58, pp. 1–8. DOI: 10.1016/j.ijlp.2018.02.002 [PubMed: 29852999]
- Proctor SL and Hoffmann NG (2012), "Identifying patterns of co-occurring substance use disorders and mental illness in a jail population", *Addiction Research & Theory*, Vol. 20 No. 6, pp. 492–503. DOI: 10.3109/16066359.2012.667853
- Proctor SL, Hoffmann NG and Raggio A (2019), "Prevalence of substance use disorders and psychiatric conditions among county jail inmates: Changes and stability over time", *Criminal Justice and Behavior*, Vol. 46 No. 1, pp. 24–41. DOI: 10.1177/0093854818796062
- Quinn K, Frueh BC, Scheidell J, Schatz D, Scanlon F and Khan MR (2019), "Internalizing and externalizing factors on the pathway from adverse experiences in childhood to non-medical prescription opioid use in adulthood", *Drug and Alcohol Dependence*, Vol. 197, pp. 212–219. DOI: 10.1016/j.drugalcdep.2018.12.029 [PubMed: 30849646]
- Roos LE, Afifi TO, Martin CG, Pietrzak RH, Tsai J and Sareen J (2016), "Linking typologies of childhood adversity to adult incarceration: Findings from a nationally representative sample", *American Journal of Orthopsychiatry*, Vol. 86 No. 5, pp. 584–593. DOI: 10.1037/ort0000144
- Sanderson K, Williamson HJ, Eaves ER, Barger S, Hepp CM, Elwell K, Camplain R, Winfree K, Trotter RT II, and Baldwin JA (2017), "Advancing Wellbeing in Northern Arizona: A Regional Health Equity Assessment. Report by the Northern Arizona University Center for Health Equity Research" https://nau.edu/wp-content/uploads/sites/160/2018/09/Wellbeing-in-Arizona_Final-9_22_17.pdf (accessed online 7/20/2020).
- Selling D, Lee D, Solimo A and Venters H (2015), "A road not taken: substance abuse programming in the New York City jail system", *Journal of Correctional Health Care*, Vol. 21 No. 1, pp. 7–11. DOI: 10.1177/1078345814557248 [PubMed: 25403463]
- Stokols D, Allen J, and Bellingham RL (1996), "The social ecology of health promotion: implications for research and practice", *American Journal of Health Promotion*, Vol. 10 No. 4, pp. 247–251. DOI: 10.4278/0890-1171-10.4.247 [PubMed: 10159704]
- Sznitman SR, and Room R (2018), "Rethinking indicators of problematic cannabis use in the era of medical cannabis legalization", *Addictive behaviors*, Vol. 77, pp. 100–101. DOI: 10.1016/j.addbeh.2017.09.026 [PubMed: 28992573]
- Trotter II RT, Arazan C, Baldwin JA, Camplain C, Camplain R, Dmitrieva NO, Eaves ER, Fofanov VY, Hanabury M, Hepp C, Kohlbeck B, Lininger M, Peoples IM and Traustadóttir T (2019), "Health disparities in jail populations: mixed methods and multi-disciplinary community engagement for justice and health impacts", *Practicing Anthropology*, Vol. 41 No. 4, pp. 2–16. DOI: 10.17730/0888-4552.41.4.2 [PubMed: 33110290]
- Trotter II RT, Camplain R, Eaves ER, Fofanov VY, Dmitrieva NO, Hepp CM, Warren M, Barrios BA, Pagel N, Mayer A, and Baldwin JA (2018a), "Health disparities and converging epidemics in jail populations: protocol for a mixed-methods study", *JMIR Research Protocols*, Vol. 7 No. 10, p. e10337. DOI: 10.2196/10337 [PubMed: 30355562]
- Trotter RT II, Lininger MR, Camplain R, Fofanov VY, Camplain C, and Baldwin JA (2018b), "A Survey of Health Disparities, Social Determinants of Health, and Converging Morbidities in a County Jail: A Cultural-Ecological Assessment of Health Conditions in Jail Populations",

International Journal of Environmental Research and Public Health, Vol. 15 No. 11, p. 2500. DOI: 10.3390/ijerph15112500

Wolff N and Caravaca Sánchez F (2019), “Associations among psychological distress, adverse childhood experiences, social support, and resilience in incarcerated men”, *Criminal Justice and Behavior*, Vol. 46 No. 11, pp. 1630–1649. DOI: 10.1177/0093854819876008

Ye D and Reyes-Salvail F (2014), “Adverse childhood experiences among Hawai’i adults: Findings from the 2010 Behavioral Risk Factor Survey”, *Hawai’i Journal of Medicine & Public Health*, Vol. 73 No. 6, pp. 181–190. [PubMed: 24959392]

Zarse EM, Neff MR, Yoder R, Hulvershorn L, Chambers JE and Chambers RA (2019), “The adverse childhood experiences questionnaire: Two decades of research on childhood trauma as a primary cause of adult mental illness, addiction, and medical diseases”, *Cogent Medicine*, Vol. 6 No. 1, pp. 1–24. DOI: 10.1080/2331205X.2019.1581

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Table I.

Characteristics of individuals incarcerated in a County Detention Facility, 2017–2018 (N = 96)

Characteristic	N	%
Age at interview (years)		
18–24	10	10.4
25–34	39	40.6
35–44	25	26.0
45–54	17	17.7
55	5	5.2
Sex (% female)	25	26.0
Race/Ethnicity		
American Indian or Alaska Native	56	58.3
Hispanic/Latino	14	14.6
White	23	24.0
Other ^b	3	3.1

^aNot mutually exclusive^bOther included participants who identified as Asian or Pacific Islander, Black, or other

Table II.

Adverse Childhood Experiences (ACEs) of individuals incarcerated in a County Detention Facility, by substance use in the 30 days before incarceration, 2017–2018 (N = 96)

	Meth ^a		Heroin ^a		Opiates ^a		Cocaine ^a	
	Yes n = 36	No n = 60	Yes n = 19	No n = 77	Yes n = 15	No n = 81	Yes n = 11	No n = 85
Adverse childhood experience score (n = 96)	5.8 ± 3.0	3.9 ± 2.9	5.3 ± 3.7	4.5 ± 2.9	6.0 ± 3.4	4.4 ± 2.9	5.9 ± 3.9	4.5 ± 2.9
Individual ACEs (% yes)								
Did you live with anyone who was depressed, mentally ill, or suicidal?	15 (41.7)	15 (25.0)	11 (57.9)	19 (24.7)	9 (60.0)	21 (25.9)	6 (54.6)	24 (28.2)
Did you live with anyone who was a problem drinker or alcoholic?	21 (58.3)	28 (46.7)	11 (57.9)	38 (49.4)	9 (60.0)	40 (49.4)	7 (63.6)	42 (49.4)
Did you live with anyone who used illegal street drugs or who abused prescription medications?	18 (50.0)	16 (26.7)	12 (63.2)	22 (28.6)	10 (66.7)	24 (29.6)	6 (54.6)	28 (32.9)
Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?	21 (58.3)	19 (31.7)	8 (42.1)	32 (41.6)	7 (46.7)	33 (40.7)	5 (45.5)	35 (41.2)
Were your parents separated or divorced?	24 (66.7)	29 (48.3)	12 (63.2)	41 (53.3)	11 (73.3)	42 (51.9)	6 (54.6)	47 (55.3)
How often did your parents or adults in your home ever slap, hit, kick, punch, or beat each other up?	24 (66.7)	28 (46.7)	10 (52.6)	42 (54.6)	8 (53.3)	44 (54.3)	7 (63.6)	45 (52.9)
How often did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way? Do not include spanking.	22 (61.1)	25 (41.6)	12 (63.2)	35 (45.5)	7 (46.7)	40 (49.4)	7 (63.6)	40 (47.1)
How often did a parent or adult in your home ever swear at you, insult you, or put you down?	27 (75.0)	39 (65.0)	12 (63.2)	54 (70.1)	10 (66.7)	56 (69.1)	8 (72.7)	58 (68.2)
How often did anyone at least 5 years older than you or an adult ever touch you sexually?	14 (38.9)	14 (23.3)	5 (26.3)	23 (29.9)	7 (46.7)	21 (25.9)	4 (36.4)	24 (28.2)
How often did anyone at least 5 years older than you or an adult try to make you touch sexually?	15 (41.7)	12 (20.0)	6 (31.6)	21 (27.3)	8 (53.3)	19 (23.5)	5 (45.5)	22 (25.9)
How often did anyone at least 5 years older than you or an adult force you to have sex?	9 (25.0)	10 (16.7)	2 (10.5)	17 (22.1)	4 (26.7)	15 (18.5)	4 (36.4)	15 (17.7)

^aUse in the 30 days prior to incarceration

Table III.

Association between Adverse Childhood Experiences (ACEs) and substance use in the 30 days before incarceration among individuals incarcerated in a County Detention Facility, 2017–2018 (N = 96)

	Meth ^a		Heroin ^a		Opiates ^a		Cocaine ^a	
	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Adverse childhood experience score	1.24	1.05, 1.47	1.17	0.95, 1.44	1.26	1.00, 1.61	1.16	0.90, 1.48
Did you live with anyone who was depressed, mentally ill, or suicidal?	1.41	0.53, 3.76	3.12	0.89, 10.88	4.70	1.17, 18.80	2.27	0.56, 9.24
Did you live with anyone who was a problem drinker or alcoholic?	1.63	0.65, 4.09	1.53	0.46, 5.06	2.58	0.71, 9.40	1.97	0.48, 8.00
Did you live with anyone who used illegal street drugs or who abused prescription medications?	2.35	0.93, 5.96	2.96	0.89, 9.85	3.68	1.05, 12.86	1.93	0.50, 7.40
Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?	3.61	1.36, 9.57	2.08	0.58, 7.53	2.20	0.59, 8.18	1.60	0.39, 6.60
Were your parents separated or divorced?	1.88	0.76, 4.67	1.30	0.40, 4.23	2.48	0.66, 9.27	0.73	0.19, 2.78
How often did your parents or adults in your home ever slap, hit, kick, punch, or beat each other up?	2.62	0.95, 7.23	1.30	0.68, 2.50	1.32	0.35, 5.04	1.60	0.36, 7.11
How often did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way? Do not include spanking.	1.76	0.70, 4.43	2.26	0.69, 7.45	0.71	0.20, 2.52	1.61	0.40, 6.45
How often did a parent or adult in your home ever swear at you, insult you, or put you down?	1.45	0.53, 3.92	0.94	0.28, 3.17	1.00	0.27, 3.66	1.27	0.28, 5.66
How often did anyone at least 5 years older than you or an adult ever touch you sexually? (% yes)	2.21	0.72, 6.79	1.27	0.24, 6.58	3.07	0.64, 14.77	1.09	0.21, 5.54
How often did anyone at least 5 years older than you or an adult try to make you touch sexually?	3.13	1.04, 9.46	2.46	0.53, 11.31	4.86	1.11, 21.28	2.25	0.48, 10.57
How often did anyone at least 5 years older than you or an adult force you to have sex?	2.13	0.58, 7.77	0.79	0.09, 7.14	1.89	0.38, 9.35	4.00	0.71, 22.51

Abbreviations: Adjusted odds ratio (aOR); confidence interval (CI)

All models are adjusted for age, sex and race/ethnicity

^aUse in the 30 days prior to incarceration

Table IV.

Adverse Childhood Experiences (ACEs) of individuals incarcerated in a County Detention Facility, by binge drinking in the 30 days before incarceration 2017–2018 (N = 96)

	Binge drinking ^a	
	Yes n = 54	No n = 41
Adverse childhood experience score (n = 96)	5.0 ± 3.2	4.1 ± 2.8
Individual ACEs (% yes)		
Did you live with anyone who was depressed, mentally ill, or suicidal?	18 (33.3)	11 (26.8)
Did you live with anyone who was a problem drinker or alcoholic?	33 (61.1)	15 (36.6)
Did you live with anyone who used illegal street drugs or who abused prescription medications?	22 (40.7)	12 (29.3)
Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?	22 (40.7)	18 (43.9)
Were your parents separated or divorced?	30 (55.6)	22 (53.7)
How often did your parents or adults in your home ever slap, hit, kick, punch, or beat each other up?	29 (53.7)	22 (53.7)
How often did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way? Do not include spanking.	28 (51.9)	18 (43.9)
How often did a parent or adult in your home ever swear at you, insult you, or put you down?	39 (72.2)	28 (63.4)
How often did anyone at least 5 years older than you or an adult ever touch you sexually?	18 (33.3)	9 (22.0)
How often did anyone at least 5 years older than you or an adult try to make you touch sexually?	17 (31.5)	9 (22.0)
How often did anyone at least 5 years older than you or an adult force you to have sex?	12 (22.2)	6 (14.6)

^aAny binge drinking in the 30 days prior to incarceration

Table V.

Association between Adverse Childhood Experiences (ACEs) and binge drinking in the 30 days before incarceration among individuals incarcerated in a County Detention Facility, 2017–2018 (N = 96)

	aOR	95% CI
Adverse childhood experience score	1.11	0.95, 1.30
Did you live with anyone who was depressed, mentally ill, or suicidal?	1.63	0.61, 4.36
Did you live with anyone who was a problem drinker or alcoholic?	2.76	1.14, 6.66
Did you live with anyone who used illegal street drugs or who abused prescription medications?	2.15	0.84, 5.55
Did you live with anyone who served time or was sentenced to serve time in a prison, jail, or other correctional facility?	0.79	0.33, 1.91
Were your parents separated or divorced?	1.09	0.47, 2.52
How often did your parents or adults in your home ever slap, hit, kick, punch, or beat each other up?	0.89	0.55, 1.46
How often did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way? Do not include spanking.	1.42	0.60, 3.38
How often did a parent or adult in your home ever swear at you, insult you, or put you down?	1.47	0.59, 3.64
How often did anyone at least 5 years older than you or an adult ever touch you sexually?	1.95	0.65, 5.84
How often did anyone at least 5 years older than you or an adult try to make you touch sexually?	1.78	0.61, 5.18
How often did anyone at least 5 years older than you or an adult force you to have sex?	1.58	0.46, 5.46

Abbreviations: Adjusted odds ratio (aOR); confidence interval (CI)

All models are adjusted for age, sex, and race/ethnicity

^aUse in the 30 days prior to incarceration