

Prevalence of Depressive Symptoms Among Children Exposed to Parental Incarceration in the 2019 and
2021 National Health Interview Survey (NHIS)

Aaron Davis

A thesis

submitted in partial fulfillment of the
requirements for the degree of

Master of Public Health

University of Washington

2023

Committee:

Mienah Z. Sharif

Amanda I. Phipps

Program Authorized to Offer Degree:

Epidemiology

©Copyright 2023
Aaron Davis

University of Washington

Abstract

Prevalence of Depressive Symptoms Among Children Exposed to Parental Incarceration in the 2019 and 2021 National Health Interview Survey (NHIS)

Aaron Davis

Chair of the Supervisory Committee:

Mienah Z. Sharif

Department of Epidemiology

Background: Depression is a prevalent mental health disorder among 2.7 million (4.4%) children aged 3-17 in the United States (US), with adverse childhood experiences (ACEs) being a contributing factor. Parental incarceration is an ACE associated with various negative social and health outcomes for this demographic. Such outcomes include inequitable healthcare access, increased risk of housing instability, mental health problems, poor educational performance, and a 10% increased risk of antisocial behavior compared to peers who do not have incarcerated parents. This study aimed to investigate the relationship between parental incarceration and the prevalence of depressive symptoms among children aged 4-17.

Methods: Using cross-sectional data from the 2019 and 2021 National Health Interview Survey (NHIS) child survey, the association between parental incarceration exposure and depressive symptom outcomes was investigated. To construct the dependent outcome of interest, child depressive symptoms, key survey responses were selected across three domains of interest: 1) reported feelings (including feeling depressed, anxious, worried, or unhappy), 2) reported difficulties (such as difficulties with changes,

controlling behavior, concentrating, and making friends) and 3) reported mental health care received (including therapy, and/or medication for mental health challenges). Covariates considered included child age, sex, race, poverty status, insurance coverage, parent education, and region. Data analysis incorporated a Poisson error variance into general linear models for hypothesis testing, accounting for the complex survey design.

Results: The study included 13,502 participants, among whom 6.2% had been exposed to parental incarceration. Children exposed to parental incarceration reported a significantly higher prevalence of depressive symptoms (88 per 100, 95% CI: .85-.91) compared to children who had not been exposed to parental incarceration (58.9 per 100, 95% CI: .58-.59). After adjusting for covariates, exposure to parental incarceration was associated with an excess of 28 cases of depressive symptoms per 100 children (95% CI: .25-.29, P-value< .0001). Significant associations with depressive symptoms were observed for child age, race, and parental incarceration.

Conclusions: Experiencing parent removal from the household due to incarceration was associated with increased difficulties and negative mental health outcomes for children. The results emphasize the urgent need for policies such as decarceration and early interventions in the form of bolstered mental health support to address the mental health impact that results from the adverse experience. By illuminating the link between ACEs, such as parental incarceration and depressive symptoms, this research underscores the importance of a holistic approach to support the well-being of impacted children.

Introduction

Depression is one of the most prevalent mental health disorders among children in the United States (US), affecting a striking 1 in 6 children (CDC, 2023). Among children aged 12-17 experiencing mental health conditions such as depression, 18.8% seriously considered attempting suicide, 15.7% made a suicide plan, and 8.9% had a suicide attempt (Bitsko et al., 2022). The past decade has witnessed an escalation in suicidality among US children, as suicide has become the eighth-leading cause of death in the age group of 5-11 (CDC, 2023). To help mitigate suicidality risk among children, early detection of depressive symptoms is critical. Central to this discourse is Adverse Childhood Experiences (ACEs), described as potentially traumatic events occurring before the age of 18, including physical, sexual, or emotional abuse, community violence, neglect, household disruption, and separation (Felitti et al., 1998). ACEs have been linked to depression outcomes among children experiencing maltreatment, violence, and household dysfunction broadly; evidence also supports associations between ACEs and depression trajectories across the lifespan (Kim et al., 2021; Desch et al., 2023). Recent data underscores that 45% of US children have encountered at least one ACE, with higher prevalence among Black non-Hispanic and Latine children (61% and 51%, respectively) (Sacks & Murphey, 2018).

Increasing understanding of individual ACEs, such as exposure to parent or guardian incarceration, is of great importance when considering life course impacts. Recent literature has unveiled a concerning association between exposure to parental incarceration and a heightened risk of health problems that extend into young adulthood (Hunter & Flores, 2021). These health issues include post-traumatic stress disorder, depressive disorders, asthma, high cholesterol, self-reported poor health, emotional challenges, and diminished future outlooks (Lee et al., 2013; Riyantono & Kusnadi, 2022). Furthermore, mounting evidence underscores that children exposed to parental incarceration face heightened susceptibility to mental health impacts, including depression and behavioral complexities (Luk et al., 2023).

An estimated 6.6% of the general US population is expected to experience incarceration at some juncture in their lives (Lee et al., 2013). In 2019 alone, over 10.3 million jail admissions were recorded. The Bureau of Justice Statistics reports that nearly two million individuals are confined within the American prison system, with parents constituting nearly half (47%) of state-imprisoned populations and more than half in federal prisons (58%) (BJS, 2021). Hence, the possible impacts of parental incarceration resonate within a sizable demographic of children across the United States. While racial and ethnic gaps have shrunk among incarcerated populations, data still shows persistent trends of overrepresentation of Black Americans within jail populations compared to white counterparts (Zeng & Minton, 2021; BJS, 2021). The War on Drugs led to increased surveillance of communities of color, and significant inclines of mass incarceration (LeMasters et al., 2022). 60.5% of Black Americans are projected to experience incarceration during their lifetimes (Wildeman et al., 2018). This disproportionate impact resonates among Black American women as well, with 44% reported to have a family member imprisoned at some point (Lee et al., 2013). Racial and ethnic disparities in incarceration contribute to the perpetuation of disparities downstream, such as poor mental health, as they are mirrored in the subsequent effects of parental incarceration on children's depressive experiences.

Incarceration also takes a disproportionately heavy toll on impoverished, lower-income individuals. The Prison Policy Initiative highlights that individuals experiencing incarceration are more likely to live in poverty; incarcerated individuals earned 41% less than their non-incarcerated counterparts of similar ages before their incarceration (Rabuy & Kopf, 2015). Moreover, research highlights the prevalence of housing instability, homelessness, and recidivism among those experiencing incarceration, particularly affecting adults with young children (Muentner et al., 2018). Among children living below the federal poverty level, more than 1 in 5 (22%) had a mental, behavioral, or developmental disorder; additionally, age and poverty level impacted the likelihood of children receiving treatment for anxiety, depression, or behavior problems (CDC, 2023).

The stark statistics surrounding parental incarceration and its disparate impact on socially marginalized communities underscore the pressing need for equity-driven research into the mental health outcomes of affected children. The profound negative repercussions of parental or guardian incarceration have been found to include reduced sources of care (such as caregivers at home), reduced access to physical health care needs, and delayed or forgone mental health care (Khazanchi et al., 2022). With close to two million individuals incarcerated in the US, it is evident that incarceration poses a substantial threat to the health and well-being of the next generation of American children. The pervasive overrepresentation of Black Americans in jail populations, coupled with a significant proportion of Black families grappling with an imprisoned family member, exposes deep-rooted systemic inequalities and implications of intergenerational and life course adverse health. This is compounded by socioeconomic disparities linked to parental incarceration, exacerbating the detrimental effects on economically disadvantaged families.

The present study examines the prevalence of depressive symptoms among US children exposed to parental incarceration. The study hypothesizes an association between parental incarceration and child depression outcomes, this study contributes to understanding the implications of parental incarceration on child mental health.

Methods

Study Design and Data Source

This study employs a cross-sectional design and utilizes data from the 2019 and 2021 National Health Interview Survey (NHIS) Child Sample to examine the association of parental incarceration exposure with depressive symptom outcomes among children aged 4-17. The final sample (n=13,502) included 832 children who experienced parent removal from home due to incarceration and 12,709 children who did not report this experience. This ACE was selected based on overwhelming evidence of the impact of parental/guardian incarceration and child mental health disorders as described. Institutional

Review Board approval was not required for this secondary analysis of the non-identifiable and publicly available dataset used.

Study Setting and Study Population

The NHIS child sample is a cross-sectional survey that has been conducted since 1960. The survey gathers information through in-person interviews with non-institutionalized adults aged 18 years or older and children aged 17 years or younger residing within the 50 states and the District of Columbia using geographically clustered sampling techniques to select a sample of dwelling units (CDC, 2022). Given the COVID-19 pandemic, the 2020-2021 survey was conducted remotely through phone and online interviews. Questionnaires were completed by parents or guardians of children and youth aged 0-17 in the United States and associated territories. The subjects consist of survey respondents from the NHIS child sample. However, it's important to note that the survey excludes institutionalized populations and families/individuals experiencing homelessness, living in shelters, or vehicles. The NHIS survey sample size comprises approximately 87,500 individuals in 35,000 households. Details about the sampling methodology and the specific phrasing of the 2019 and 2021 NHIS Child Sample questionnaires are available publicly online through the Centers for Disease Control and Prevention (CDC, 2023).

The NHIS survey captures annual data on the physical, emotional, and developmental health of children. The collected information covers behaviors, depression symptoms, anxiety, injuries, impairments, disabilities, cognitive concerns, and more (CDC, 2022). The questionnaires also encompass topics such as exposure to violence, parental incarceration, access to food, encounters with families dealing with substance use disorders and mental illness, and socioeconomic status. The surveys are available in both English and Spanish.

The child sample survey, which forms the basis of this study, includes 9,193 children from the 2019 dataset and 8,261 children from the 2021 dataset. Respondents with missing data or who did not provide responses to the parental incarceration variables were not included in the analysis and were

recorded as “missing”. Additionally, children less than 3 years of age were excluded from the sample, as measures of mental health were not assessed for this subpopulation.

Measures

To address the research objective, an analytic sample was constructed based on responses to the question related to parental incarceration, the study’s independent variable. NHIS has a rotating core of questions on Stressful Life Events, initiated in the 2019 and 2021 sample years. The rotating core asks whether the sample child “ever lived with a parent or guardian who served time in jail or prison after they were born.” Notably, this variable includes both current and previous instances of parent incarceration; however, only in the context of parents who live jointly with the sample child. The questions do not apply to parents who live in separate households from their children; thus, the overall prevalence of parent incarceration is likely underestimated within this data sample.

To measure the dependent variable of interest, child depressive symptoms, the dependent variable representing the outcome was constructed from questions asked for all sample children aged 4-17 across three domains of interest: 1) reported feelings (including feeling depressed, sad, anxious, worried, or tearful), 2) reported difficulties (including difficulty with changes, controlling behaviors, concentrating, and making friends), 3) reported mental health care received (including receiving therapy for depression or mental health challenges, and taking medication for mental health concerns). Depressive symptoms, the central outcome, were assessed according to the self-reported presence or absence of symptoms. These questions draw from the first two items of the eight-item Patient Health Questionnaire (PHQ-2) and the seven-item Generalized Anxiety Disorder (GAD-2) scale. Additionally, the NHIS child model employs the validated screening tool, the Strengths and Difficulties Questionnaire (SDQ), to gauge depression symptoms. The SDQ is designed for clinical assessment of mental disorders and epidemiological research on emotional and behavioral problems in children and adolescents aged 4-17 years.

Covariates

Guided by the extant literature (Chapman et al., 2004; Murray & Farrington, 2005; Wildeman, 2010), several confounders were accounted for that could otherwise bias the association between parental incarceration and child mental health outcomes. Individual-level covariates included children's age (4-10, 11-17), reported sex (recorded as male or female, per NHIS convention), race/ethnicity (White, Black/African American, Asian, American Indian/Alaskan Native, multiracial), US poverty threshold (determined by US Census income to poverty ratios; 0.00-0.99 is considered living in poverty), child insurance coverage status (no, yes), highest education level among parent(s)/guardian (grade 1-11, 12^a grade with no diploma, high school graduate/ GED equivalent, some college/no degree, associates degree, bachelor's degree, masters degree, profession school/doctoral degree), and geographic region (Northeast, Midwest, South, West).

Statistical Analysis

In conducting this study, a series of systematic steps were followed to ensure methodological accuracy. Initially, a study sample was created, comprising children aged 4–17 years, by filtering respondents with complete data for all variables of interest. First, the demographics and socioeconomic characteristics of the sample were described. Ten individual-reported depressive symptom variables across the three domains of interest (reported feelings, reported difficulties, and reported mental healthcare received) were identified, in addition to constructing a composite variable encompassing all depressive symptoms to capture the presence of any depressive symptoms and individual symptoms occurring. To maximize data utility, the survey sample years of 2019 and 2021 were pooled, ensuring robust average reporting due to comparable size and outcomes across these years. Descriptive statistics were then calculated to outline the prevalence of pertinent outcomes within the study population and prevalence differences according to parental incarceration. The proportion of reported depressive symptoms by individual symptom variables was also examined. Associations between individual

depressive symptoms and parental incarceration were examined through both covariate-adjusted and unadjusted Poisson simple and multiple general linear models with log-link functions. To establish statistical significance, a threshold of $\alpha=0.05$ was adopted. The analysis was executed using the R software package (R Core Team, 2023), which accounted for the clustered, stratified, complex survey design.

Results

A total of 13,502 participants were included in the final analysis. As shown in Table 1 with combined 2019 and 2021 survey years, 88% of children who had a parent removed from the home due to incarceration (i.e., the exposed group) reported one or more depressive symptoms, as compared to 58% among children who had not had a parent removed from the home (i.e., unexposed group). Compared to the children who had not been exposed to parental incarceration, the group of children whose parents experienced incarceration also had a greater representation of children in the older age category, of males, and of children living below the family poverty threshold. Among children with parents removed due to incarceration, the prevalence of depressive symptoms was similar by age group (94% vs. 92% among those aged 4-10 vs. 11-17 years, respectively), whereas the prevalence was higher among older children in the group that did not experience parental incarceration (51% vs. 64%, respectively). There was a greater number of males across the sample than females. Among children impacted by parent incarceration, the prevalence of depressive symptoms was similar by sex (88% vs. 89% for males vs. females, respectively); within the group that did not have parent incarceration exposure, the prevalence of depressive symptoms was slightly lower among males than females (57% vs. 59%). Across survey sample years, the prevalence of depressive symptoms among children with the exposure of interest was lowest for those with family income 4-5 times the US poverty level (81% vs. 91% among those with family income below the US poverty level); in contrast, the prevalence of depressive symptoms among those without parental incarceration exposure was highest in this highest income group (62% vs. 52%, respectively). The most commonly reported highest parent education level among children whose parents

experienced incarceration across the sample years was high school graduate/GED or equivalent (27%). 17% of children without the exposure of interest reported the highest parent education of high school graduates / GED, whereas 24% reported a highest parent education level beyond college.

The overall prevalence of depressive symptom(s) in the sample among children aged 4-17 was found to be significantly higher among children who had parents removed due to incarceration (88 per 100, 95% confidence interval (CI): .85-.91) than among children without the exposure to parent incarceration in the samples (58.9 cases per 100, 95% CI: .58-.59) (unadjusted prevalence difference (PD) 30 per 100, 95% CI: .28-.32, P-value < .0001) (Table 2). After adjusting for child sex, race, age, poverty threshold, insurance coverage, parent education, and region of the US, the PD remained statistically significant (adjusted PD 28 per 100, 95% CI: .25-.29, P-value < .0001). Children exposed to parental incarceration also reported a markedly higher prevalence of individual depressive symptoms compared to the children without the exposure in both sample years, with an 8-18% higher prevalence varying by symptom (Table 2). In particular, the prevalence of reporting in the affirmative to the prompt "I feel depressed" was 46 per 100 children among the exposed (95% CI: 0.43-0.48) compared to 28 per 100 children (95% CI: .27-.28) among unexposed children (adjusted PD 18 per 100, 95% CI: .12-.24, P-value < .0001). Solely among the exposed group, all depressive symptom categories increased in prevalence in 2021 compared to 2019, with the exception of the variables "Received therapy" and "Took medication," which went down in prevalence (a reduction of 4 cases per 100) in the 2021 sample (Table 6).

Using combined 2019 and 2021 sample years (Table 4), Poisson simple general linear models with log-link functions suggest there is evidence of a statistically significant relationship between depressive symptoms and the following participant factors: parent incarceration exposure (PR 1.75, 95% CI: (1.57-1.93), P-value < .0001), child race (PR .95, 95% CI: (.94-.96), P-value < .0001), and child age (PR 1.06, 95% CI: (1.06-1.07), P-value < .0001). Point estimates remained statistically significant after multivariate adjustment (Table 4).

Discussion

Research consistently highlights the detrimental effects of incarceration on families and the children of incarcerated adults, such as stigma, traumatic separation, reduced family resources, increased housing instability, unstable caregiving arrangements, and behavioral challenges (Del Toro et al., 2023; Arditti J., 2016; Murray et al., 2012). This study builds upon existing knowledge of the broader implications of parental incarceration on child mental health by investigating the prevalence of depressive symptoms among children exposed to parental incarceration within a nationally representative sample.

The findings of this study reveal a significant association between exposure to parental incarceration and an elevated prevalence of reported child depressive symptoms. Moreover, consistent links between parental incarceration exposure and reported social difficulties, such as controlling their social behaviors and making friends, were also observed. Even after adjustment for relevant covariates, the analysis highlights that exposure to parental incarceration is tied to a statistically significant excess of 28 cases of reported depressive symptoms per 100 children, compared to children unexposed to parental incarceration within the specified time frames.

The study's observation of similarly high reported prevalence of depression among male and female children exposed to parental incarcerations (88% and 89%, respectively) contrast with other studies focusing on similar age ranges and adverse experiences, where females tended to exhibit higher depression trajectories (Hankin et al., 2001; Ge et al., 2016; Desch et al., 2023). This divergence from existing literature might be attributed to differences in the age at which depression becomes apparent, with prior research suggesting that after age 15, females are twice as likely as males to report depression (Nolen-Hoeksema et al., 2001). Notably, the study's sample predominantly consisted of children under 15. This study examined potential phenomena associated with depressive outcomes across genders, drawing from existing research that underscores health disparities in gender-related variations affecting depressive outcomes (Salk et al., 2017). This is particularly relevant due to observed growing gaps in

depression outcomes among children of different genders, in addition to historical oversight that has often marginalized the experiences of male children (Salk et al., 2017; Platt et al., 2021).

Among children reporting parental incarceration, the highest prevalence of depressive symptoms was observed among children with parents who had lower levels of education obtained and those living at or below the US poverty threshold; this falls in line with extant research. Individuals experiencing incarceration are twice as likely to possess an education only up to the eighth grade, with a substantial proportion lacking a high school diploma, its equivalent, or higher education (Couloute, L., 2018). Learning disabilities are prevalent, and individuals with an ethnic minority background frequently exhibit lower educational attainment within incarcerated populations (BJS, 2003). A Prison Policy report detailed that in 2014 dollars, incarcerated people had a median annual income of \$19,185 prior to their incarceration, which is 41% less than non-incarcerated people of similar ages (Rabuy et al., 2015). Experiencing incarceration dramatically impacts individuals earning potential and in turn, impacts the availability of resources and support for children of incarcerated parents. According to a report by the Bureau of Justice Statistics (BJS), out of 50,000-plus individuals leaving federal prisons in 2010, a remarkable 33% remained unemployed during the four years following their release (BJS, 2021). Furthermore, at any point within this period, the percentage of the cohort that was employed did not exceed 40%. Even among those who secured employment, challenges persisted; the study found that participants who had been previously incarcerated held an average of 3.4 jobs over the span of the four-year investigation. This suggests that the jobs obtained often lacked stability and opportunities for upward mobility. Experiencing poverty in childhood is associated with poor mental health through social stresses, stigma, and trauma (Kniffton et al., 2020). This study's findings underscore the intricate interplay of socioeconomic factors and mental health outcomes across generations.

Incarceration is also a key component of structural racism in the US that creates and exacerbates social and health inequities for individuals and families impacted (LeMasters et al., 2022). Black Americans are disproportionately represented among incarcerated populations due to a long history of

targeted policing as a form of structural violence against marginalized communities (Zeng & Minton, 2021). Structural bias and racism within areas such as healthcare and educational systems can perpetuate inequitable access to quality mental health services and resources for children exposed to parental incarceration (Johnson, T., 2020). Disparities in funding, facilities, and trained professionals can limit the availability of specialized support. Additionally, stigma and lack of awareness about the unique needs of racialized children whose families are exposed to incarceration may further hinder their access to appropriate and timely interventions, contributing to the cycle of disadvantage and exacerbating mental health disparities among these groups.

Amidst the backdrop of ACEs' effects on long-term health trajectories, public health researchers and policymakers are increasingly invested in understanding the downstream impacts of these adversities. This study plays a role in advancing comprehension of the intricate relationship between parental incarceration and its enduring impact on child mental health. It unearths specific adverse outcomes for children grappling with the removal of a parent due to incarceration, highlighting the urgency of preventative measures and robust support systems. The results of this study met the hypothesized expectations and align with extant research linking ACEs to depression among children and adolescents (Chapman et al., 2004; Murray et al., 2012; Sacks et al., 2018; Kim et al., 2021; Del Toro et al., 2022; Desch et al., 2023). Furthermore, the study indirectly highlights the possible unmet mental healthcare needs often experienced by children from households affected by parental incarceration. While this study did not delve into unmet needs specifically, it revealed that most children in the sample had health insurance coverage; however, notably, the reported utilization of therapy or medication for mental health challenges decreased from 2019 to 2021. While US healthcare for children has evolved positively in the last two decades, access challenges persist, especially for children exposed to parental incarceration (Felitti et al., 1998; Khazanchi et al., 2023; Wildeman et al., 2018). Importantly, the full extent of the impact on mental healthcare access during the COVID-19 pandemic remains to be fully explored.

Limitations and Strengths

While the findings of this study complement the growing body of research on mental health outcomes among children exposed to ACEs, it's essential to acknowledge its limitations. The use of cross-sectional data from the NHIS precludes the establishment of causal relationships between variables. The absence of information on the exact timing and frequency of parental incarceration events limits a comprehensive understanding of its developmental impact on children. The lack of data regarding which parent is incarcerated, or their role in the child's life further constrains interpretation. This study also lacks insight into the event that caused the parent to be incarcerated or how that might have affected the depressive symptoms emergence. This study is limited by the range of depressive symptoms reported. Within the survey, there is only one question that directly asks if the child is feeling depressed or sad. The study's reliance on self-reported data might introduce bias to the extent that information on parent incarceration and depressive symptoms may be under-reported due to social desirability and/or misclassified due to recall inaccuracies. It is notable that the analysis did not investigate pre-existing health disparities within the sample; thus, there is a lack of understanding of the magnitude of impact parental incarceration might have on those with existing health challenges. The study's geographical focus may also limit generalizability beyond the specific context of the US. Additionally, this study is limited through the utilization of gender binary, resulting in systematic exclusion of non-binary respondents. Lastly, incarceration is known to disrupt individual and household housing stability (Wildeman et al., 2014), yet households experiencing homelessness or living in non-permanent housing situations such as shelters, vehicles, and outdoor encampments are excluded from the survey. Additionally, the survey does not ask questions related to housing instability. While intersections of homelessness could not be examined in this study, it is understood that excluding the experiences of those living unhoused introduces a large gap in understanding the impacts of a child's mental health outcomes at the intersection of parental incarceration and housing instability.

Contributions

This study aimed to build upon existing research. A significant portion of the current body of literature draws from older nationally representative data sets, often with minimal accounting for confounding variables (Luk et al., 2023; Arditti, 2016; Wildeman et al., 2014). In contrast, this study utilizes more recent data, encompassing a snapshot of child mental health immediately before and during the COVID-19 pandemic. By analyzing the outcomes of depressive symptoms using this recent information, public health practitioners can tailor interventions specifically to the generation of children currently reflecting adverse experiences in the survey. Strengths lie in the study's use of current nationally representative NHIS data and the use of analytic methods and linear modeling to obtain robust estimates of the associations with depressive symptoms within the child sample. Considering the increasing attention paid to lifecourse epidemiology in addressing health inequities, it is critical to think of the invisibilized experiences among children that are often overlooked in research and policy. To continue building upon understanding, future research should find ways to include families and children living in homelessness or navigating housing insecurity. Additionally, future studies should use a resilience approach and explore possible mediators and moderators for depressive symptom outcomes among children exposed to parent incarceration, such as the impacts of food security and access to supportive systems/ networks that help bolster survival and support healing.

Conclusion

With nearly two million people incarcerated in the US, half of whom are parents, the life course implications of incarceration, such as inadequate access to care, poor health outcomes, and sustained mental health impacts from trauma, extend beyond confinement periods for individuals, families, and communities, making this issue a critical public health matter. The findings emphasize the urgent need for targeted interventions and policies as the study reveals an association between exposure to parental incarceration and an increased risk of reported depressive symptoms in children, alongside social difficulties. These findings are critical for advancing equity as public health practitioners strive to address the intergenerational cycle of disadvantage. The study's identification of specific adverse outcomes for

children in households affected by parental incarceration underscores the imperative need to develop preventive strategies and robust support systems. In a broader context, where ACEs are increasingly recognized as influential determinants of long-term health, this research aligns with the growing body of evidence linking ACEs to depression among youth. The implications of this study encourage a holistic approach, emphasizing the necessity of multi-pronged cross-sector efforts, including decarceration, reunification, family support, and enhanced access to mental healthcare, to mitigate the enduring consequences of parental incarceration on children's mental well-being.

Table 1. Demographic characteristics of children ages 4-17 exposed and unexposed to experience of parent removal from the household due to incarceration, with and without at least one reported depressive symptom. National Health Information Survey 2019 (exposed n=470, unexposed n=6627) and 2021 (exposed n=362, unexposed n=6082) combined years.

Sample Characteristics	Exposed Group Reported Depression Symptom(s) (% among exposed)	Exposed Group No Reported Depression Symptom(s) (% among exposed)	Unexposed Group Reported Depression Symptom(s) (% among unexposed)	Unexposed Group No Reported Depression Symptom(s) (% among unexposed)	Total with the outcome of interest (N=13,502) *
Total	699 (88%)	94 (12%)	7394 (58%)	5315 (42%)	8093
Child Age					
4-10 years old	276 (33%)	18 (2.2%)	2844 (22%)	2779 (22%)	3120
11-17 years old	423 (51%)	38 (9%)	4550 (36%)	2536 (20%)	4973
Child Sex					
Male	372 (45%)	53 (6.4%)	3729 (29%)	2818 (22%)	4101
Female	327 (39.4%)	41 (4.8%)	3664 (29%)	2494 (20%)	3991
Child Race					
White	463 (56%)	73 (9%)	5224 (41%)	3118 (25%)	5687
Black/African American	103 (12%)	10 (1.2%)	679 (5.3%)	792 (6.2%)	782
Asian	9 (1.1%)	0 (0%)	413 (3.2%)	485 (3.8%)	422
American Indian/Alaskan Native	11 (1.4%)	2 (0.3%)	70 (0.6%)	50 (0.4%)	81
Multiracial	112 (13.7%)	9 (1.1%)	92 (0.7%)	54 (0.4%)	204
Family Poverty Threshold**					
0.00-0.99	201 (24%)	21 (2.5%)	799 (6.3%)	718 (5.6%)	1000
1.00-1.99	203 (25%)	28 (3.2%)	1436 (11%)	1155 (9.1%)	1639
2.00-3.99	199 (24%)	22 (2.7%)	2249 (18%)	1673 (13%)	2448
4.00-5.00 or greater	96 (11.5%)	23 (3%)	2910 (23%)	1769 (14%)	3006
Child Insurance Coverage****					
No	40 (4.7%)	1 (0.2%)	308 (2.4%)	274 (2.2%)	348
Yes	658 (79%)	93 (11%)	7063 (56%)	5011 (39%)	7721
Parent Education Level***					

Grade 1-11	46 (5.5%)	4 (0.5%)	220 (1.7%)	234 (1.8%)	266
12th grade, no diploma	16 (2%)	0 (0%)	68 (0.5%)	73 (0.6%)	84
High School graduate/ GED or equivalent	192 (24%)	26 (3%)	1084 (8.5%)	1016 (8%)	1276
Some college, no degree	159 (19%)	20 (2.5%)	1021 (8%)	713 (5.6%)	1180
Associate degree	131 (16%)	19 (2.3%)	1095 (8.6%)	735 (5.7%)	1226
Bachelor's degree	100 (12%)	12 (1.5%)	2006 (16%)	1378 (11%)	2106
Master's degree	44 (5.3%)	6 (0.7%)	1369 (11%)	845 (6.6%)	1413
Professional school/ Doctoral degree	11 (1.3%)	7 (1%)	527 (4.1%)	312 (2.5%)	538

*23 missing/unreported depression statuses, 1 missing/unreported insurance coverage status from 2019. 16 missing/unreported depression statuses, 1 missing/unreported race status from 2021. Total of 39 missing/unreported cases in the data set.

** Poverty thresholds determined by US Census income to poverty ratios; 0.00-0.99 is considered living in poverty.

***Education is based on the sample child's parent with the highest education level.

****Children are considered uninsured if they did not have private health insurance, Medicare, Medicaid, Children's Health Insurance Program (CHIP), a State-sponsored health plan, other government programs, or military health plan (includes TRICARE, VA, and CHAMP-VA) at the time of interview. This definition of uninsured matches that used in United States.

2019 and 2021 survey samples combined to report out average between the years. Supplemental table with individual year data available upon request.

Table 2: Prevalence and prevalence difference of reported depressive symptoms among children ages 4-17 according to the experience of having a parent removed from the household due to incarceration, NHIS 2019 (exposed n=470, unexposed n=6627) and 2021 (exposed n=362, unexposed n=6082) combined years. *

Reported Depressive Symptom	Exposed % (95% CI)	Unexposed % (95% CI)	<i>Unadjusted</i>	<i>Adjusted</i> ^
			PD (95% CI)	PD (95% CI)
Any reported depressive symptom**	88 (85.3-90.7)	58.9 (58.2-59.6)	0.30 (.28-.32) ***	0.28 (.25-.29) ***
Feeling depressed/sad	45.5 (42.7-48.2)	27.5 (26.8-28.2)	0.18 (.16-.25) ***	0.184 (.12-.24) ***
Feeling anxious	57.5 (54.7-60.2)	44.7 (44-45.4)	0.124 (.08-.18) ***	0.155 (.10-.21) ***
Many worries †	36 (33.3-38.7)	21.1 (20.4-21.8)	0.148 (.11-.19) ***	0.142 (.10-.18) ***
Often unhappy/tearful †	20.8 (18.1-23.5)	9.2 (8.5-9.9)	0.117 (.09-.14) ***	0.099 (.07-.13) ***
Difficulty with changes	32.5 (29.7-35.2)	19.3 (18.6-20)	0.135 (.08-.18) ***	0.127 (.07-.17) ***
Difficulty controlling behavior	27.1 (24.4-29.8)	12.5 (11.8-13.2)	0.149 (.09-.21) ***	0.131 (.07-.19) ***
Difficulty concentrating	14.9 (12.2-17.6)	5.8 (5.1-6.5)	0.095 (.05-.14) ***	0.081 (.04-.13) ***
Difficulties making friends	18.3 (15.6-21)	8.7 (8-9.4)	0.098 (.06-.14) ***	0.088 (.05-.13) ***
Received therapy	25.6 (22.8-28.3)	5.4 (4.7-6.1)	0.155 (.09-.21) ***	0.155 (.10-.2) ***
Took medication	16.7 (13.9-19.4)	8.2 (7.5-8.9)	0.086 (.05-.12) ***	0.081 (.05-.11) ***

Abbreviations: NHIS = National Health Information Survey; CI = Confidence Interval; PD = Prevalence Difference, obtained via simple linear regression models

*Reported depressive symptoms based on reported feelings, perceived difficulties, reported attendance to therapy or counseling for mental health challenges, and reported mental health-related medication used, all over the past 12 months. 2019 and 2021 survey samples prevalence combined to report out average between the years

** At least one reported depressive symptom reported.

^ Adjusted PR adjusted by child sex, race, age, poverty level, parent education, insurance coverage, and region

† "many worries and often unhappy" questions only asked in 2019 survey

*** P-value <0.000

Table 3: Proportion of reported depressive symptoms by individual symptom variable, children 4-17 years old, NHIS 2019 (n=7097) and 2021 (n=6444).

Outcomes Among Unexposed Groups				Outcomes Among Exposed Groups		
2019 Survey Sample						
<i>Depressive symptom variable</i>	<i>No reported symptoms</i>	<i>Reported symptoms</i>	<i>NA</i>	<i>No reported symptoms</i>	<i>Reported symptoms</i>	<i>NA</i>
Feeling depressed/sad	4615 (69.6%)	1593 (24%)	419	241 (51.3%)	209 (44.5%)	20
Feeling anxious	3534 (53.3%)	2673 (40.3%)	420	195 (41.5%)	253 (53.8%)	22
Many worries#	5214 (78.7%)	1402 (21.2%)	11	300 (63.8%)	169 (36%)	1
Often unhappy/tearful#	5998 (90.5%)	616 (9.3%)	13	369 (78.5%)	98 (20.8%)	3
Difficulty with changes	5021 (75.8%)	1193 (18%)	413	298 (63.4%)	153 (32.6%)	19
Difficulty controlling behavior	5359 (80.9%)	854 (12.9%)	414	332 (70.6%)	118 (25.1%)	20
Difficulty concentrating	5818 (87.8%)	399 (6.0%)	410	387 (82.3%)	64 (13.6%)	19
Difficulties making friends	5663 (85.5%)	545 (8.2%)	419	371 (79%)	80 (17%)	19
Received therapy	5985 (90.3%)	634 (9.6%)	8	342 (72.8%)	128 (27.2%)	0
Took medication	6076 (91.7%)	548 (8.3%)	3	386 (82.1%)	84 (17.8%)	0
2021 Survey Sample						
Feeling depressed/sad	3789.1 (62.3%)	1885.4 (31%)	408.7	179 (49.4%)	168.1 (46.4%)	14.8
Feeling anxious	2694.3 (44.3%)	2980.2 (49%)	413.6	126.7 (35%)	220.8 (61%)	16
Difficulty with changes	4440 (73%)	1247 (20.5%)	401.4	228.1 (63%)	117.5 (33%)	14.8
Difficulty controlling behavior	4944.7 (81.3%)	736 (12.1%)	401.4	241.8 (66.8%)	105 (29%)	14.8
9Difficulty concentrating	5352.2 (88%)	334.5 (5.5%)	395.3	288.2 (79.6%)	59 (16.3%)	14.8
Difficulties making friends	5115 (84.1%)	559.5 (9.2%)	407.5	275.8 (76.2%)	70.9 (19.6%)	14.8
Received therapy	5413 (89%)	66.3 (10.9%)	0	273 (75.4%)	86.9 (24%)	21.7
Took medication	5595.4 (92%)	486.6 (8%)	0	304.8 (84.2%)	56.1 (15.5%)	10.9

Abbreviations: NHIS = National Health Information Survey

*Reported depressive symptoms based on reported feelings, perceived difficulties, reported attendance to therapy or counseling for mental health challenges and reported mental health-related medication used, all over the past 12 months.
#” many worries and often unhappy” questions only asked in 2019 survey

Table 4. Poisson general linear regression model table where the outcome of interest, any one reported depressive symptom*, is predicted from explanatory variables via simple regression that includes parental incarceration exposure, and multiple regression model containing all variables of interest, 2019 and 2021 NHIS child survey combined years.

Simple					Multi regression model^		
Model	Explanatory variables	PR	95% CI	P-value**	PR	95% CI	P-value**
1	Jail	1.751	1.57, 1.93	0.000	1.701	1.67, 1.81	0.000
2	sex	0.992	0.97, 1.03	0.354	1.025	1.01, 1.09	0.512
3	race	0.953	0.94, 0.96	0.000	0.962	0.96, 0.98	0.000
4	age	1.061	1.06, 1.07	0.000	1.061	1.05, 1.064	0.000
5	Poverty threshold***	0.997	0.99, 1.00	0.084	0.99	0.99, 1.00	0.138
6	Insurance coverage****	0.96	0.96, 1.03	0.399	1.002	0.96, 1.05	0.462
7	Parent education*****	1.004	0.996, 1.012	0.133	1.019	1.018, 1.04	0.43
8	region	0.945	0.93, 0.97	0.062	0.979	0.978, 1.02	0.433

Abbreviations: NHIS = National Health Information Survey; CI = Confidence Interval; PR = Prevalence Rate, based on exponentiated estimate from Poisson general linear model

*Reported depressive symptoms based on reported feelings, perceived difficulties, reported attendance to therapy or counseling for mental health challenges, and reported mental health-related medication used, all over the past 12 months. 2019 and 2021 survey samples prevalence combined to report out average between the years

^Adjusted PR adjusted by child sex, race, age, poverty level, parent education, insurance coverage, and region

** P-value <0.000

*** Poverty thresholds determined by US Census income to poverty ratios; 0.00-0.99 is considered living in poverty.

****Children are considered uninsured if they did not have private health insurance, Medicare, Medicaid, Children's Health Insurance Program (CHIP), a State-sponsored health plan, other government programs, or military health plan (includes TRICARE, VA, and CHAMP-VA) at the time of interview. This definition of uninsured matches that used in United States.

*****Education is based on the sample child's parent with the highest education level.

Table 5. Demographic characteristics of children ages 4-17 exposed and unexposed to experience of parent removal from the household due to incarceration, with and without at least one reported symptom of depression. National Health Information Survey 2019 (exposed n=470, unexposed n=6627) and 2021 (exposed n=362, unexposed n=6082) years.

Sample Characteristics	2019 Reported Depression Symptom(s) (%)	2019 No Reported Depression Symptom(s) (%)	2021 Reported Depression Symptom(s) (%)	2021 No Reported Depression Symptom(s) (%)	Total with the exposure of interest (N=832)
Exposed to parental incarceration	350 (75.5%)	120 (25%)	278 (76%)	84 (23.2%)	628
Child Age					
4-10 years old	154 (32.8%)	8 (1.7%)	122 (33.7%)	10 (2.8%)	294
11-17 years old	237 (50.4%)	48 (10.2%)	186 (51.4%)	28 (7.7%)	499
Child Sex					
Male	209 (44.5%)	29 (6.2%)	163 (45%)	24 (6.6%)	425
Female	182 (38.7%)	27 (5.7%)	145 (40.1%)	14 (3.9%)	368
Child Race					
White	260 (55.3%)	43 (9.1%)	203 (56.1%)	30 (8.3%)	536
Black/African American	66 (14%)	5 (1.1%)	37 (10.2%)	5 (1.4%)	113
Asian	4 (0.8%)	0 (0%)	5 (1.4%)	0 (0%)	9
American Indian/Alaskan Native	5 (1.1%)	1 (0.2%)	6 (1.7%)	1 (0.3%)	13
Multiracial	56 (11.9%)	7 (1.5%)	56 (15.5%)	2 (0.6%)	101
Family Poverty Threshold**					
0.00-0.99	110 (23.4%)	13 (2.8%)	91 (25.1%)	8 (2.2%)	222
1.00-1.99	114 (24.3%)	22 (4.7%)	89 (24.6%)	6 (1.7%)	231
2.00-3.99	112 (23.8%)	11 (2.3%)	87 (24%)	11 (3%)	221
4.00-5.00 or greater	55 (11.7%)	10 (2.1%)	41 (11.3%)	13 (3.6%)	119
Child Insurance Coverage****					
No	26 (5.5%)	1 (0.2%)	14 (3.9%)	0 (0%)	41
Yes	364 (77.4%)	55 (11.7%)	294 (81.2%)	38 (10.5%)	751

Parent Education Level***					
Grade 1-11	26 (5.5%)	3 (0.6%)	20 (5.5%)	1 (0.3%)	50
12th grade, no diploma	10 (2.1%)	0 (0%)	6 (1.7%)	0 (0%)	16
High School graduate/ GED or equivalent	95 (20.2%)	18 (3.8%)	97 (26.8%)	8 (2.2%)	218
Some college, no degree	85 (18%)	10 (2.1%)	74 (20.4%)	10 (2.8%)	179
Associate degree	82 (17.4%)	11 (2.3%)	49 (13.5%)	8 (2.2%)	150
Bachelor's degree	60 (12.7%)	7 (1.5%)	40 (11%)	5 (1.4%)	112
Master's degree	26 (5.5%)	4 (0.8%)	18 (5%)	2 (0.6%)	50
Professional school/ Doctoral degree	7 (1.5%)	3 (0.6%)	4 (1.1%)	4 (1.1%)	18

*23 missing/unreported depression statuses, 1 missing/unreported insurance coverage status from 2019. 16 missing/unreported depression statuses, and 1 missing/unreported race status from 2021. Total of 39 missing/unreported cases in the data set.

** Poverty thresholds determined by US Census income to poverty ratios; 0.00-0.99 is considered living in poverty.

***Education is based on the sample child's parent with the highest education level.

****Children are considered uninsured if they did not have private health insurance, Medicare, Medicaid, Children's Health Insurance Program (CHIP), a State-sponsored health plan, other government programs, or military health plan (includes TRICARE, VA, and CHAMP-VA) at the time of interview. This definition of uninsured matches that used in United States.

Table 6: Prevalence and prevalence difference of reported depressive symptoms* among children ages 4-17 according to the experience of having a parent removed from the household due to incarceration, individual NHIS years, 2019 (exposed n=470, unexposed n=6627) and 2021 (exposed n=362, unexposed n=6082).

2019 NHIS survey sample			<i>Unadjusted</i>	<i>Adjusted[^]</i>
Reported Depressive Symptom	Exposed % (95% CI)	Unexposed % (95% CI)	PD (95% CI)	PD (95% CI)
Feeling depressed/sad	44.5 (39.9-49)	24 (23-25.1)	0.208 (.16-.25) ***	.202 (.16-.24) ***
Feeling anxious	53.8 (49.2-58.4)	40.3 (39.1-41.5)	.134 (.08-.18) ***	.156 (.11-.20) ***
Many worries [#]	36 (31.6-40.5)	21.1 (20.2-22.1)	.148 (.11-.19) ***	.142 (.10-.18) ***
Often unhappy/tearful [#]	20.8 (17.3-24.8)	9.2 (8.6-10)	.117 (.09-.14) ***	.099 (.07-.13) ***
Difficulty with changes	32.5 (28.3-37)	18 (17.1-19)	.147 (.11-.18) ***	.133 (.09-.17) ***
Difficulty controlling behavior	25.1 (21.2-29.3)	12.9 (12.1-13.7)	.125 (.09-.16) ***	.104 (.07-.14) ***
Difficulty concentrating	13.6 (10.6-17)	6 (5.5-6.6)	.078 (.05-.10) ***	.062 (.04-.09) ***
Difficulties making friends	17 (13.7-20.7)	8.2 (7.6-8.9)	.09 (.06-.12) ***	.077 (.05-.10) ***
Received therapy	27.2 (23.2-31.5)	9.6 (8.9-10.3)	.177 (.15-.21) ***	.172 (.14-.2) ***
Took medication	17.9 (14.5-21.6)	8.3 (7.6-8.9)	.096 (.07-.12) ***	.086 (.06-.11) ***
2021 NHIS survey sample				
Feeling depressed/sad	46.4 (41.2-51.7)	31 (29.8-32.2)	.152 (.1-.2) ***	.166 (.12-.22) ***
Feeling anxious	61.1 (55.8-66.1)	49 (47.7-50.3)	.114 (.06-.17) ***	.155 (.10-.21) ***
Difficulty with changes	32.6 (27.8-37.7)	20.5 (19.5-21.5)	.123 (.08-.17) ***	.120 (.07-.17) ***
Difficulty controlling behavior	29 (24.4-34)	12.1 (11.3-13)	.173 (.14-.21) ***	.158 (.12-.19) ***
Difficulty concentrating	16.3 (12.6-20.5)	5.5 (4.9-6.1)	.111 (.08-.14) ***	.10 (.07-.13) ***
Difficulties making friends	19.6 (15.6-24.1)	9.2 (8.5-10)	.106 (.07-.14) ***	.099 (.07-.13) ***
Received therapy	24 (19.7-28.8)	1.1 (0.8-1.4)	.132 (.09-.17) ***	.138 (.10-.17) ***
Took medication	15.5 (12-19.6)	8 (7.3-8.7)	.076 (.05-.11) ***	.076 (.05-.11) ***

Abbreviations: NHIS = National Health Information Survey; CI = Confidence Interval; PD = Prevalence Difference, obtained via simple linear regression models

*Reported depressive symptoms based on reported feelings, perceived difficulties, reported attendance to therapy or counseling for mental health challenges, and reported mental health-related medication used, all over the past 12 months.2019 and 2021 survey samples prevalence combined to report out average between the years

** At least one reported depressive symptom reported.

[^]Adjusted PR adjusted by child sex, race, age, poverty level, parent education, insurance coverage, and region

[#]”many worries and often unhappy” questions only asked in 2019 survey

*** P-value <0.000

References

1. Arditti, J. A. (2016). A family stress-proximal process model for understanding the effects of parental incarceration on children and their families. *Couple and Family Psychology: Research and Practice*, 5(2), 65–88. <https://doi.org/10.1037/cfp0000058>
2. Bureau of Justice Statistics. (2021). *Parents in Prison and Their Minor Children: Survey of Prison Inmates, 2016*. Bureau of Justice Statistics. Retrieved 6, 1, 2023, from <https://bjs.ojp.gov/library/publications/parents-prison-and-their-minor-children-survey-prison-inmates-2016>
3. Centers for Disease Control and Prevention, National Center for Health Statistics. National Vital Statistics System, Mortality 2018-2021 on CDC WONDER Online Database, released in 2023. Data are from the Multiple Cause of Death Files, 2018-2021, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program. Accessed at <http://wonder.cdc.gov/mcd-icd10-expanded.html> on Jan 23, 2023.
4. CDC. (2022). *Children Living in Households That Experienced Food Insecurity: United States, 2019–2020* (Brief 432; NCHS Data Brief). CDC. Retrieved December 2, 2022, from https://www.cdc.gov/nchs/products/databriefs/db432.htm#Suggested_citation
5. CDC. (2023). *Data and Statistics on Children’s Mental Health*. CDC. Retrieved December 2, 2022, from <https://www.cdc.gov/childrensmentalhealth/data.html>
6. CDC. (2023). *National Health Interview Survey*. CDC. Retrieved December 2, 2022, from <https://www.cdc.gov/nchs/nhis/index.htm>
7. Chapman, D. P., Whitfield, C. L., Felitti, V. J., Dube, S. R., Edwards, V. J., & Anda, R. F. (2004). Adverse childhood experiences and the risk of depressive disorders in adulthood. *Journal of Affective Disorders*, 82(2), 217–225. <https://doi.org/10.1016/j.jad.2003.12.013>
8. Del Toro, J., Fine, A., & Wang, M.-T. (2023). The intergenerational effects of paternal incarceration on children’s social and psychological well-being from early childhood to adolescence. *Development and Psychopathology*, 35(2), 558–569. <https://doi.org/10.1017/S0954579421001693>
9. Desch, J., Mansuri, F., Tran, D., Schwartz, S. W., & Bakour, C. (2023). The association between adverse childhood experiences and depression trajectories in the Add Health study. *Child Abuse & Neglect*, 137, 106034. <https://doi.org/10.1016/j.chiabu.2023.106034>
10. Ge, X., Natsuaki, M. N., & Conger, R. D. (2006). Trajectories of depressive symptoms and stressful life events among male and female adolescents in divorced and nondivorced families. *Development and Psychopathology*, 18(1), 253–273. <https://doi.org/10.1017/S0954579406060147>
11. Hankin, B. L., & Abramson, L. Y. (2001). Development of gender differences in depression: An elaborated cognitive vulnerability-transactional stress theory. *Psychological Bulletin*, 127(6), 773–796. <https://doi.org/10.1037/0033-2909.127.6.773>
12. Hunter A.A., Flores G. Social determinants of health and child maltreatment: A systematic review. *Pediatr. Res.* 2021;89:269–274. doi: 10.1038/s41390-020-01175-x
13. Johnson, T. J. (2020). Intersection of Bias, Structural Racism, and Social Determinants With Health Care Inequities. *Pediatrics*, 146(2), e2020003657. <https://doi.org/10.1542/peds.2020-003657>
14. Khazanchi, R., Heard-Garris, N. J., & Winkelman, T. N. A. (2023). Health Care Access and Use Among Children & Adolescents Exposed to Parental Incarceration—United States, 2019. *Academic Pediatrics*, 23(2), 464–472. <https://doi.org/10.1016/j.acap.2022.10.001>
15. Kim, I., Galván, A., & Kim, N. (2021). Independent and cumulative impacts of adverse childhood experiences on adolescent subgroups of anxiety and depression. *Children and Youth Services Review*, 122, 105885. <https://doi.org/10.1016/j.childyouth.2020.105885>
16. Knifton, L., & Inglis, G. (2020). Poverty and mental health: Policy, practice and research implications. *BJPsych Bulletin*, 44(5), 193–196. <https://doi.org/10.1192/bjb.2020.78>

17. LeMasters, K., Brinkley-Rubinstein, L., Maner, M., Peterson, M., Nowotny, K., & Bailey, Z. (2022). Carceral epidemiology: Mass incarceration and structural racism during the COVID-19 pandemic. *The Lancet. Public Health*, 7(3), e287–e290. [https://doi.org/10.1016/S2468-2667\(22\)00005-6](https://doi.org/10.1016/S2468-2667(22)00005-6)
18. Luk, M. S. K., Hui, C., Tsang, S. K. M., Fung, Y. L., & Chan, C. H. Y. (2023). Physical and Psychosocial Impacts of Parental Incarceration on Children and Adolescents: A Systematic Review Differentiating Age of Exposure. *Adolescent Research Review*, 8(2), 159–178. <https://doi.org/10.1007/s40894-022-00182-9>
19. Muentner, L., Holder, N., Burnson, C., Runion, H., Weymouth, L., & Poehlmann-Tynan, J. (2019). Jailed Parents and Their Young Children: Residential Instability, Homelessness, and Behavior Problems. *Journal of Child and Family Studies*, 28(2), 370–386. <https://doi.org/10.1007/s10826-018-1265-3>
20. Murray, J., & Farrington, D. P. (2005). Parental imprisonment: Effects on boys' antisocial behaviour and delinquency through the life-course. *Journal of Child Psychology and Psychiatry*, 46(12), 1269–1278.
21. Murray, J., Farrington, D. P., & Sekol, I. (2012). Children's antisocial behavior, mental health, drug use, and educational performance after parental incarceration: A systematic review and meta-analysis. *Psychological Bulletin*, 138(2), 175–210. <https://doi.org/10.1037/a0026407>
22. Nolen-Hoeksema, S., & Girgus, J. S. (1994). The emergence of gender differences in depression during adolescence. *Psychological Bulletin*, 115(3), 424–443. <https://doi.org/10.1037/0033-2909.115.3.424>
23. Rabuy, B., & Kopf, D. (2015). Prisons of Poverty: Uncovering the pre-incarceration incomes of the imprisoned. Prison Policy Initiative. <https://www.prisonpolicy.org/reports/income.html>
24. Riyantono, E. R., & Kusnadi, A. (2022). Psychological Impacts on Children With Parents in Prison: Scoping Review. *ICPsyche*. <https://proceeding.internationaljournallabs.com/index.php/picis/article/view/106/152>
25. Sacks, V., & Murphey, D. (2018). The prevalence of adverse childhood experiences, nationally, by state, and by race or ethnicity.
26. Wildeman, C. (2010). Paternal incarceration and children's physically aggressive behaviors: Evidence from the Fragile Families and Child Wellbeing Study. *Social Forces*, 89(1), 285–309.
27. Wildeman, C. (2014). Parental Incarceration, Child Homelessness, and the Invisible Consequences of Mass Imprisonment. *The ANNALS of the American Academy of Political and Social Science*, 651(1), 74–96. <https://doi.org/10.1177/0002716213502921>
28. Wildeman, C., Goldman, A. W., & Turney, K. (2018). Parental incarceration and child health in the United States. *Epidemiologic Reviews*, 40(1), 146–156.
29. Zeng, Z., & Minton, T. (2021, March). Jail inmates in 2019. *Jail Inmates in 2019*. <https://bjs.ojp.gov/content/pub/pdf/ji19.pdf>