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ORIGINAL ARTICLE

The Risk for Readmission to Juvenile Detention: The Role of Trauma Exposure and Trauma-related Mental Health Disorders

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Abstract

The purpose of this study was to examine the impact of childhood trauma exposure, posttraumatic stress disorder, and trauma-related comorbid diagnoses on the risk for readmission to juvenile detention among youth in a large metropolitan area ($N = 1282$). The following research questions were addressed: 1) Does a greater number of childhood traumas increase the risk for readmission to detention following release? 2) Does the risk for readmission differ by type of trauma? 3) Do PTSD and other co-morbid diagnoses increase the risk for readmission? and 4) What role do demographic factors play in the relationship between trauma-related variables and risk for readmission? This study utilized the screening results of 1282 youth who were voluntarily screened for PTSD, depressive symptoms and substance use during their initial intake to detention. More than half of the sample was readmitted during the three-year study period, with readmissions most likely to occur within one year of release. Returning to detention within one year was also associated with increased risk for multiple readmissions. Youth readmitted to detention were more likely to have a history of sexual abuse and problematic substance use. No other significant relationships were found between risk for readmission and trauma-related variables. Although trauma-related symptoms may be crucial targets for treatment, focusing solely on trauma exposure and traumatic stress symptoms without considering the impact of other risk factors may not be enough to decrease the likelihood of readmission for youth of color in a large urban environment.

Keywords Child abuse · Juvenile justice · Recidivism · Trauma · Posttraumatic stress disorder

In 2018, more than 700,000 youth were arrested (Puzzanchera, 2020) and more than 35,000 youth were residing in a juvenile detention or placement facility in the United States (Hockenberry & Sladky, 2020). Although the national rate of youth returning to the juvenile justice (JJ) system following their initial release is difficult to capture, data from various states across the United Statesy suggests that within 2–3 years of exiting the system, 68 to 75% of youth are re-arrested and 15 to 65% of youth are readmitted to a JJ facility (Annie E. Casey Foundation, 2011). Consequently, identifying targets for reducing recidivism continues to be a priority (Robertson et al., 2020).

Studies have documented the social, economic, and public safety implications of youth offending and justice system involvement (Cohen et al., 2010; Welsh, et al., 2008). Adolescents impacted by the justice system, particularly those with repeated involvement, have fewer opportunities to achieve developmental milestones, such as graduating from high school and obtaining stable employment (Hjalmarsson, 2008; Sweeten, 2006; Wiesner et al., 2010), as well as a greater likelihood of involvement in the adult criminal justice system (Aizer & Doyle, 2015). This impact is particularly detrimental for youth of color, who are disproportionately represented at every level of the system in the United States (Padgaonkar et al., 2021).

One major challenge in capturing consistent rates of recidividism among justice-involved youth is that the definition of recidivism differs across studies, with re-arrest, subsequent adjudication and readmission to a correctional facility being

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the most commonly used variables (Robertson et al., 2020). Moreover, in a 2009 survey of juvenile correctional agencies, 48% of respondents reported using re-commitment to a juvenile facility and/or re-adjudication as the definition of recidivism in their state (Harris et al., 2011).

Regardless of the definition used, a number of predictors have been associated with an increased risk for juvenile recidivism, including an earlier age of first arrest/offense (Barrett & Katsiyannis, 2016), early onset of antisocial behaviors (Moffitt et al., 2002), and greater frequency and severity of past justice involvement (Baglivio et al., 2014; Lai et al., 2015). In their risk-need-responsivity (RNR) model, Andrews and Bonta (2010) established a core group of static and dynamic risk factors for recidivism known as the "central eight." These include four factors with the most direct association with recidivism (prior history of delinquent behavior, association with peers involved in delinquent behavior, an antisocial personality, and antisocial attitudes), and four factors that are more moderately associated with repeat offending (connection to school or work, relationships with family, recreation/leisure time, and substance use). (Andrews et al., 2012; Cuevas et al., 2019). Additionally, systemic racial and ethnic biases are important factors to consider within the context of youths' repeated involvement in the JJ system. For example, in the United States, as compared to white youth with similar charges, youth of color are significantly more likely to be arrested (Tapia, 2010), referred for formal court processing (Bishop et al., 2010) and placed in juvenile detention (Mallett & Stoddard-Dare, 2010).

Experiencing adversity in childhood and adolescence is not conceptualized as a criminogenic risk factor risk factor in the RNR model, but rather is considered as a responsivity factor that could impact the effectiveness of treatment (Fritzon et al., 2021; Vitopoulos et al., 2018) However, the findings from a study by Vitopoulos and colleagues (2018) suggest that trauma exposure, and child maltreatment in particular, may play an important role within the context of RNR criminogenic factors and the risk forw juvenile recidivism. More specifically, in a sample of 100 Canadian male and female youth referred to a juvenile justice clinic, they found that PTSD symptomotology and adversity were not significant predictors of a future conviction for a new offense after accounting for criminogenic risk factors, but number of different types of childhood maltreatment experienced was an even stronger predictor than the criminogenic risk variable (i.e., criminal history).

There is also a well-established relationship between experiencing adversity in childhood and adolescence and an increased risk for juvenile offending and JJ involvement overall (Duke et al., 2010; Fox et al., 2015; Fritzon et al., 2021). Cross-sectional studies have found that upwards of 90% of justice-involved youth have been exposed to at least one potentially traumatic event (Abram et al., 2004; Ford et al., 2008), including domestic violence e, community violence, traumatic loss, and/or child abuse/neglect (Butcher et al., 2016; Dierkhising et al., 2013; Ford et al., 2008). Studies that specifically examine the impact of Adverse Childhood Experiences (ACEs), including neglect, abuse, and household dysfunction, have found that youth in JJ settings are more likely to have experienced an ACE as compared to the general population (Wolff & Baglivio, 2017), with a greater number of adverse experiences increasing the likelihood of JJ involvement (Graf et al., 2021). Youth residing in JJ settings are also at higher risk for exposure to both direct and indirect violence (Dierkhising et al., 2014) and the development of PTSD symptoms following release. Additionally, numerous studies have found that co-morbid mental health disorders are significantly higher in this population as compared to community samples (Abram et al., 2004, 2007; Dierkhising et al., 2013).

In addition to an increased risk for overall JJ involvement, youth who have experienced ACEs are also more likely to return to the JJ system following an initial encounter (Weber & Lynch, 2021). In particular, youth who experience childhood adversity in the form of maltreatment (e.g., child abuse and neglect) demonstrate higher rates of recidivism as compared to youth in the JJ system with no maltreatment history (Folk et al., 2021; Wylie & Rufino, 2018). In one study of justice-involved youth, 56% of youth with substantiated histories of adverse childhood experiences that included physical abuse, sexual abuse, emotional abuse, neglect, and/or exposure to parental substance use were re-arrested within five years as compared to a 41% re-arrest rate for justice-involved youth with no maltreatment history (Huang et al., 2012). Ryan et al. (2013) also found that youth with a history of exposure to parental neglect were significantly more likely to re-offend than youth with no substantiated neglect history. Similarly, in a study of more than 1300 youth, Cho and Lee (2022) found that youth with histories of child maltreatment were significantly more likely to reoffend within three years as compared to a matched sample of non-maltreated youth, even after accounting for confounding factors such as age, race/ethnicity and co-morbid emotional or behavioral diagnoses.

Some studies have found associations between the number of adverse experiences and the likelihood of recidivism, For example, Fox et al. (2015) found that as the number of reported ACEs increased, so did a youth's risk for being classified as a serious, violent and chronic offender. In fact, two or more ACEs increased the risk of having three or more felony charges (versus one offense) by 70%, after controlling for other known risk factors for re-offending. In contrast, a history of exposure to more ACEs was not predictive of juvenile recidivism following release for a sample of youth incarcerated in a state facility (Craig et al., 2020). However, Craig et al. (2020) used a sample of incarcerated youth, which includes youth charged and convicted for more serious offenses than those in prior studies of the ACE-juvenile revidivism link.

Exposure to childhood adversity has also been implicated in length of time to re-arrest. In a subsequent study, justice-involved youth with a greater number of reported ACEs were more likely to be re-arrested within one year of completing a community-based program as compared to youth with fewer ACEs. Those with a higher number of ACEs also had a shorter time to re-arrest, and this relationship remained statistically significant after controlling for known recidivism factors such as prior history of felony offenses, substance abuse, and association with negative peers (Wolff et al., 2017).

Different types of maltreatment have also been found to be differentially related to risk for recidivism. Kingree et al. (2003), found that detained youth with self-reported histories of emotional neglect were significantly more likely to be charged with another offense within 6 months, whereas youth with histories of physical neglect were less likely to be charged with a subsequent offense. In contrast, neither physical abuse, sexual abuse, nor emotional abuse were related to recidivism. Race and gender also appear to play a pivotal role in the association between type of trauma exposure and recidivism. In a retrospective study of court-involved youth, a history of childhood sexual abuse predicted a subsequent criminal charge within 12 months for females but not males (Conrad et al., 2014). However, history of sexual abuse was identified using a bivariate self-report variable, which may have led to underreporting of experiences among participants. In contrast, a history of childhood sexual abuse did not increase the risk for a subsequent conviction for either males or females on probation (Van der Put & de Ruiter, 2016). However, for males only, neglect and physical abuse predicted a subsequent conviction for a general offense and a violent offense respectively. In a study examining the impact of race, neighborhood disadvantage, and trauma exposure on recidivism among female youth specifically, Chauhan et al. (2009) found that although white and Black youth reported similar levels of exposure to community violence and caregiver abuse, parental abuse predicted recidivism for white female youth whereas witnessing violence in the neighborhood predicted recidivism for Black female youth. However, the limitations of this study include reliance on self-report measures for identifying adversities and a broad definition of neighborhood violence.

Less attention has been paid to examining the link between PTSD or symptoms of traumatic stress following an adverse event and juvenile recidivism.Moreover, in studies that have explored this relationship, the findings have been mixed. In a study of male youth residing in juvenile detention, those with higher levels of PTSD symptoms had more lifetime and past year arrests, and more severe charges in the prior year (Becker & Kerig, 2011). In contrast, there were no significant differences in rates of subsequent court filings for youth in a diversion program who endorsed anxiety symptoms, including symptoms of PTSD, versus those who did not endorse such symptoms (Wylie & Rufino, 2018). However, in this study, PTSD symptoms were clustered with anxiety disorders that included agoraphobia, social anxiety, and panic disorder, making it difficulty to disentangle the specific impact of traumatic stress symptoms. With regard to a PTSD diagnosis, Smith and colleagues (2006) found that the cumulative nature and degree of trauma exposure, but not full or partial PTSD, were significantly related to the number of JJ referrals made for female participants. Additionally, as noted above, there was no significant relationship between PTSD symptoms and a new conviction among Canadian youth in a juvenile justice setting (Vitopoulos and colleagues, 2018).

In one of the few studies focusing exclusively on readmission to detention as a proxy for recidivism, Becker et al. (2012) examined the role of PTSD in predicting subsequent admissions to juvenile detention within three years of initial release. PTSD did not have an overall main effect on readmission to detention for the 587 youth in their study, but there were significant interactions between PTSD, age, and gender. Specifically, readmissions to detention were highest for younger African American youth with PTSD (full or partial) as compared to white youth, and African American females with PTSD had the highest risk for recidivism. These findings suggest that the role of PTSD and traumatic stress symptoms on risk for readmission to detention may differentially impact males and females, as well as African American versus white youth. However, it is also important to consider how confounding systemic factors may influence these results, including the increased risk of pretrial detention for youth of color (Wen et al., 2023), as well as the adultification and overcriminalization of Black girls in the United States (Epstein et al., 2017).

The extant literature suggests that exposure to adverse events in childhood increases the risk for juvenile recidivism,with age, race and gender differences found within this relationship (Astridge et al., 2023). However, there is still little consensus with regard to the mechanisms underlying this relationship and existing studies have focused primarily on the impact of traumatic events, with more limited research examining the role of PTSD and/or traumatic stress symptoms in the risk for subsequent JJ contact. Given the elevated rates of PTSD and trauma-related disorders among justice-involved youth, this is an important area for exploration. Additionally, many of the aforementioned studies exclude community violence exposure, which is a common experience for justice-involved youth. Finally, although readmission is commonly used by JJ stakeholders to define recidivism, few studies examine readmission to detention as a measure of juvenile recidivism.

To address these limitations, the current study sought to examine the impact of exposure to traumatic experiences,

as well as PTSD and co-morbid diagnoses, on the risk for readmission following release from juvenile detention. Age, race/ethnicity, and gender differences were also examined. The following research questions were addressed: 1) Are youth who experience a greater number of childhood traumas at increased risk for readmission to juvenile detention following release? 2) Does the risk for readmission differ by type of traumatic event? 3) Do PTSD and other co-morbid diagnoses increase the risk for readmission? and 4) What role do age, race/ethnicity and gender play in the relationship between trauma exposure, trauma-related disorders, and risk for readmission? The link between traumatic experiences and JJ involvement has been established and studies have found that the impact of trauma exposure on adolescents is cumulative (Oberth et al., 2021). Therefore, we hypothesized that exposure to a greater number of adverse events in childhood and adolecesnce would be related to an increased risk for readmission to detention (Q1). However, there is no clear consensus on which types of traumatic experiences have the greatest influence on recidivism. The findings with regard to the impact of PTSD and co-morbid diagnoses, as well as the role of demographic factors, are similarly mixed. Consequently. the remaining research questions (Q2-Q4) were exploratory and therefore no specific hypotheses were made.

Methods

Population and Procedure

The study population included all youth with a "Juvenile Delinquent" designation remanded to a pre-adjudication detention facility by a Family Court judge in a Northeastern city between July 2013 and October 2016 ($N=3888$). In this jurisdiction, a Juvenile Delinquent (JD) designation included youth aged 7–15 who were charged with a felony or misdemeanor in Family Court. Youth charged with a felony or misdemeanor that allegedly took place at age 16 or 17 were prosecuted in adult court and are not included here. This jurisdiction has five Family Courts with approximately 50 judges who preside over delinquency, child protective, custody, and status offense cases. Prior to the filing of a formal petition, youth arrested for low-level offenses can be diverted away from the court system using referrals for counseling, mediation, and/or youth court. If diversion is not available and a youth is formally charged, the Family Court judge uses the results of a risk assessment instrument to determine whether the youth will remain in the community, with or without an alternative to detention program, or will be remanded to a secure or non-secure juvenile detention facility. In this particular jurisdiction, judges are required to consider the best interests of the youth and the protection of the community in making detention decisions (New York Family Court Act, N.Y. Fam. Ct. Act §320.5, 2021).

All youth who are remanded and admitted to detention receive an initial screening to identify any immediate medical or mental health concerns upon admission. Subsequently, within five to seven days of admission, a Master's-level clinician conducts a more in-depth mental health screening which includes a clinical interview to gather psychosocial and demographic information and the administration of several validated self-report measures to assess for trauma exposure and symptoms of depression, post-traumatic stress, and problematic substance use. Depending upon a youth's preference and reading ability, clinicians administer the self-report measures by reading the questions aloud and recording the youth's answers or by allowing the youth to complete the measure in writing. Upon completion, the screening results are shared with the detention mental health team, including psychologists, psychiatrists and Master's-level clinicians, and youth with elevated screening scores are referred to a psychiatrist and/or psychologist for further diagnostic evaluation. Clinicians make every effort to conduct a full intake screening for every youth and will follow-up several times if a youth initially refuses. However, youth have the right to refuse participation. If a youth refuses to participate, then an intake screening is not completed.

Of the total population of 3888 youth entering detention with a JD designation during the study period, 1986 youth were eligible to be screened (i.e., remained in the facility for a minimum of five days). The current study utilized the screening results of 1282 youth with a JD designation who were voluntarily screened and between the ages of 11 and 15 at the time of screening (64.5% of youth who were eligible). Although some youth received multiple screenings over the course of several admissions to detention ($N=591$), only the initial screening results for each youth were included in the analyses.

The retrospective analysis of the screening data was approved by the institutional review boards for the affiliated medical school and hospital, as well as the JJ authority overseeing the detention facilities where the study took place. Since the data was collected as a usual part of clinical practice, the IRB granted a waiver of informed consent.

Variables and Measures

Demographic Variables

Demographic information was obtained from the JJ authority's administrative database and included age, race/ethnicity and sex.

Trauma Exposure and PTSD

The UCLA PTSD Reaction Index for *DSM-IV* (PTSD-RI; Steinberg et al., 2013) was used to assess for trauma exposure and PTSD symptoms. The PTSD-RI is a self-report measure with 49-items that assess for a history of exposure to traumatic events (Criterion A), as well as frequency of traumatic stress symptoms within three categories that

correspond to the DSM-IV diagnostic criteria for PTSD: Intrusion (Criterion B), Avoidance (Criterion C), and Arousal (Criterion D). The measure produces total symptom scores and subscale scores for each criterion, as well as scores for both full and partial PTSD. A full PTSD diagnosis is likely when all four criteria are met, whereas a partial PTSD diagnosis is likely when Criterion A and at least two other criteria are met. There was good to excellent internal consistency across race/ethnic groups, sex, and age ranges for the total symptom scale ($\alpha = 0.88$-0.91). The Avoidance ($\alpha = 0.73$-0.80) and Intrusion ($\alpha = 0.72$-0.86) subscales demonstrated acceptable to good consistency, with weaker internal consistency ($\alpha = 0.61$-0.71) for the Arousal subscale. The total symptom scale was also strongly correlated ($r = 0.75$) with the Posttraumatic Stress scale of the Trauma Symptom Checklist for Children-Alternative (TSCC-A; Briere, 1996), indicating good convergent validity.

The 13 traumatic events on the UCLA PTSD RI were also grouped into five categories proposed by Ford et al. (2010), including accident/disaster, physical abuse/assault, witness of an assault, community violence exposure, and sexual abuse or assault. For purposes of the current study, youth were identified as polyvictims if they had a summed score of two or more categories (McNair et al., 2019).

Depressive Symptoms

Depressive symptoms were assessed using the Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001), which is a self-report measure consisting of 9 items that map onto the DSM-IV diagnostic criteria for Major Depressive Disorder. Items are scored from 0 ("not at all") to 3 ("nearly every day"), and self-harm and suicidal ideation are addressed in a separate question that asks respondents whether they have experienced "thoughts that you would be better off dead, or of hurting yourself" in the past 2 weeks. The PHQ-9 was designed to be administered in medical settings and has demonstrated excellent reliability in obstetrics-gynecology and primary care settings ($\alpha = 0.86$-0.89). Compared to diagnoses generated by mental health professionals, the PHQ-9 had a sensitivity of 0.88 and a specificity of 0.88 for major depression in adolescents receiving routine medical care. Consistent with the scoring of the measure, depressive symptoms were categorized according to the number of total symptoms endorsed, including Absent/Minimal/Mild (0–9 symptoms); Moderate (10–14 symptoms); and Moderately Severe/Severe (15 to 27 symptoms).

Problematic Substance Use

Problematic substance use was assessed using the CRAFFT (Knight et al., 2002), which is a 6-item measure that was designed to be used in medical settings for the detection of adolescents in need of further assessment and/or treatment for substance use. In adolescents receiving routine health care, the CRAFFT demonstrated acceptable internal consistency ($\alpha = 0.68$), and was statistically significantly correlated with severity of substance-related problems (Spearman $\rho = 0.72$). The receiver operating characteristic areas for the CRAFFT were high for any substance-related problem (0.92), substance-related diagnosis (0.90), and substance dependence (0.93).

Readmission

The outcome measure was readmission to detention, which was obtained from the JJ authority's administrative database. Two measures for readmission were used in the current study: any readmission during the study period and readmission within one year of release following the initial screening.

Data Analysis

Univariate statistics were used to describe the demographic characteristics and screening results of all youth screened (Table 1). Bivariate analyses and chi-square tests (or Fisher's exact tests where appropriate) were used to examine differences in categorical variables between those who were readmitted to detention, either during the entire study period or within a year, and those who were not readmitted. Group differences on continuous variables were evaluated with two-sample t-tests with a significance level of 0.05. Spearman rank correlation was performed to examine the relationship between length of stay days and number of traumas. Mann–Whitney U test was conducted to examine the relationship between length of stay days, any comorbidity, and PTSD.

Univariate Cox proportional hazards regression was performed to identify independent predictors of readmission (Table 2). Time to readmission was defined as days between release date and the first subsequent readmission date. Youth who were not readmitted were censored, either during the entire study period or within a year. For the youth who were not readmitted, time to readmission was calculated as the period between release date and the end of our study "2016–10-31". For the analysis of time to readmission within a year, 365 days was set as the follow-up time for any youth with follow-up days greater than a year. P values of less than 0.05 were considered statistically significant. Upon the completion of the univariate analysis, variables with a p-value < 0.1 were selected for the multivariable analysis. In order to determine the best predictors, we used backward stepwise regression. P values for all the selected variables in the final multivariable model were less than 0.05. Logistic regressions were also performed for readmission and readmission within one year with similar results. All analyses were conducted with R.

Table 1 Screening and readmission results for total sample (2013–2016)

All youth	Total Screened	No Readmission	Readmission	P value	No Readmission within One Year of Initial Release	Readmission within One Year of Initial Release	P value
	n or M (% or SD)	*n or M (% or SD)*	*n or M (% or SD)*		*n or M (% or SD)*	*n or M (% or SD)*	
Total	1282	487	795		533	749	
Age	14.32 (0.84)	14.51 (0.77)	14.20 (0.86)	**< 0.001**	14.42 (0.84)	14.24 (0.84)	**< 0.001**
Sex				0.812			1.000
Female	346 (27.0)	128 (26.3)	218 (27.4)		144 (27.0)	202 (27.0)	
Male	935 (72.9)	359 (73.7)	576 (72.5)		389 (73.0)	546 (72.9)	
Transgender	1 (0.1)	0 (0.0)	1 (0.1)		0 (0.0)	1 (0.1)	
Race				0.752			0.975
Black	797 (62.4)	308 (63.5)	489 (61.7)		338 (63.7)	459 (61.5)	
Hispanic	404 (31.6)	148 (30.5)	256 (32.3)		162 (30.5)	242 (32.4)	
White	45 (3.5)	19 (3.9)	26 (3.3)		19 (3.6)	26 (3.5)	
Asian/PI[a]	23 (1.8)	9 (1.9)	14 (1.8)		9 (1.7)	14 (1.9)	
Amer Indian	1 (0.1)	0 (0.0)	1 (0.1)		0 (0.0)	1 (0.1)	
Other	7 (0.5)	1 (0.2)	6 (0.8)		3 (0.6)	4 (0.5)	
Number of Traumas				0.497			
0	300 (23.4)	107 (22.0)	193 (24.3)		122 (22.9)	178 (23.8)	
1–3	616 (48.0)	242 (49.7)	374 (47.0)		264 (49.5)	352 (47.0)	
4–5	258 (20.1)	102 (20.9)	156 (19.6)		108 (20.3)	150 (20.0)	
6+	108 (8.4)	36 (7.4)	72 (9.1)		39 (7.3)	69 (9.2)	
Type of Trauma							
Accident or disaster	467 (36.7)	183 (37.8)	284 (36.0)	0.565	200 (37.8)	267 (35.9)	0.533
PA[b] or assault	492 (38.6)	196 (40.3)	296 (37.6)	0.364	214 (40.2)	278 (37.5)	0.357
Assault witnessing	855 (67.1)	329 (67.7)	526 (66.7)	0.75	352 (66.2)	503 (67.7)	0.607
Community viol	337 (26.5)	127 (26.2)	210 (26.6)	0.917	137 (25.8)	200 (26.9)	0.703
SA[c] or assault	70 (5.5)	20 (4.1)	50 (6.3)	0.12	22 (4.2)	48 (6.5)	0.096
Polyvictimization	697 (55.2)	269 (55.9)	428 (54.7)	0.722	290 (55.1)	407 (55.2)	1.000
PTSD							
Any PTSD	195 (15.2)	74 (15.2)	121 (15.2)	1.000	76 (14.3)	119 (15.9)	0.471
Full PTSD	101 (7.9)	41 (8.4)	60 (7.5)	0.649	42 (7.9)	59 (7.9)	1.000
Partial PTSD	94 (7.3)	33 (6.8)	61 (7.7)	0.626	34 (6.4)	60 (8.0)	0.319
PTSD Score	11.90 (14.50)	11.75 (14.87)	11.99 (14.28)	0.771	11.52 (14.55)	12.17 (14.47)	0.428
Depression				0.444			
Absent/Mild	1103 (86.0)	418 (85.8)	685 (86.2)		458 (85.9)	645 (86.1)	
Moderate	119 (9.3)	42 (8.6)	77 (9.7)		47 (8.8)	72 (9.6)	
Severe	60 (4.7)	27 (5.5)	33 (4.2)		28 (5.3)	32 (4.3)	
Substance Abuse	581 (45.3)	210 (43.1)	371 (46.7)	0.238	226 (42.4)	355 (47.4)	0.087
Any Comorbidity	156 (12.2)	60 (12.3)	96 (12.1)	0.966	62 (11.6)	94 (12.6)	0.683

Table includes the results of the first screening in time period (2013–2016) per individual

[a]PI = Pacific Islander

[b]PA = Physical Abuse

[c]SA = Sexual Abuse

Results

The majority of youth screened were male (72.9%) and Black and/or Hispanic (94%), with an age range between 11 and 15 years old.The median length of stay in detention during the study period was 35 days (Min: 1; Max: 529). Additional demographic characteristics for the study sample can be found in Table 1.

Of the 1282 youth in the current study sample, 62% ($N = 795$) were readmitted to detention at some point during

Table 2 Univariate and multivariate cox regression analysis of time to readmission

Variables		Readmission				Readmission within a year			
		Univariate analysis		Multivariate analysis		Univariate analysis		Multivariate analysis	
		Hazard Ratio	P-value	Hazard Ratio	P-value	Hazard Ratio	P-value	Hazard Ratio	P-value
Age		0.79	**< 0.001**	0.78	**< 0.001**	0.85	**< 0.001**	0.82	**< 0.001**
Sex	Male	1.03	0.723			1.04	0.631		
	Transgender	53.05	**< 0.001**			53.49	**< 0.001**		
Race	Hispanic	1.05	0.524			1.05	0.54		
	White	0.99	0.978			1.05	0.825		
	Asian/Pacfc Islandr	1.09	0.753			1.15	0.613		
	American Indian	4.68	0.124			4.68	0.124		
	Other	1.27	0.561			0.87	0.787		
Number of Traumas	1–3	0.95	0.552			0.97	0.754		
	4–5	0.92	0.44			0.96	0.747		
	6+	1.01	0.917			1.06	0.7		
Accident disaster		0.94	0.417			0.94	0.441		
Physical abuse of assault		0.92	0.275			0.92	0.258		
Assault witnessing		1.000	0.977			1.05	0.53		
Community violence		1.02	0.79			1.04	0.678		
Sexual abuse or assault		1.27	0.099	1.37	**0.032**	1.31	0.07		
Polyvictimization		0.98	0.826			1.000	0.953		
Any PTSD		1.03	0.747			1.1	0.325		
Full PTSD		0.98	0.875			1.04	0.768		
Partial PTSD		1.09	0.542			1.15	0.292		
UCLA PTSD Score		1.000	0.655			1.000	0.942		
Depression	Moderate	1.02	0.885			1.02	0.851		
	Severe	0.84	0.328			0.89	0.518		
Substance Abuse		1.11	0.161			1.13	0.09	1.22	**0.007**
Any Comorbidity		0.98	0.872						

Factors with P-value less than 0.1 in the univariate analysis were entered into the multivariate analysis. After variable selection, P-values in the multivariate analysis are less than 0.05

the study period (2013–2016). For those 795 youth who were readmitted, 94.2% ($N = 749$) were readmitted within one year of initial release. Multiple readmissions were more common among those youth who were readmitted within a year following their initial release as compared to those youth readmitted beyond a year (61.5% vs. 39.1% respectively). The average time to initial readmission for the entire sample was 131.9 days (Min = 1; Max = 1128). There were no significant gender or race/ethnicity differences in youth who were readmitted versus those who were not readmitted. However, younger youth were significantly more likely to be readmitted as compared to those not readmitted ($p < 0.001$).

Youth who were readmitted, either within one year or otherwise, did not differ significantly from non-readmitted youth in number of traumatic events experienced or type of traumatic event experienced, with the exception of sexual abuse (Table 2). Here, youth readmitted during the study period were significantly more likely than non-readmitted youth to identify that they experienced a history of sexual abuse. Youth with a history of polyvictimization were not significantly more likely to be readmitted as compared to those with no polyvictimization history and there were also no significant differences between readmitted and non-readmitted youth with regard to full or partial PTSD, number of reported PTSD symptoms, trauma-related diagnoses of depression or co-morbid diagnoses. However, youth who were readmitted within one year of release were more likely to endorse problematic substance use duing the initial screening as compared to youth who were not readmitted within one year of release. Length of stay in detention was not significantly related to number of traumatic experiences ($p = 0.356$), PTSD ($p = 0.427$) or the presence of any comorbidity ($p = 0.912$).

Discussion

Over the past decade, many states have invested in evidence-based programs and alternatives to detention to divert youth away from the JJ system (Love et al., 2018; Sullivan et al., 2007). These efforts have led to decreases in the number of youth who are arrested, detained, and formally prosecuted, but rates of recidivism for youth who ultimately end up in the JJ system remain elevated. Although the findings from multiple studies have established a link between trauma exposure and juvenile offending overall, it is still unclear to what extent a history of trauma exposure and/or trauma-related symptoms increase the risk for recidivism following initial contact with the system. A multitude of federal, state, and local resources are being used to implement trauma-informed practices in JJ settings, so it is important to know whether trauma exposure and traumatic stress are related to repeat offending and readmission to detention.

In the current study, more than half of the youth initially released from juvenile detention were readmitted at some point during the study period. This rate of readmission (62%) is similar to existing national statistics on juvenile recidivism (Annie E. Casey Foundation, 2011). This suggests that for the majority of youth, being detained does not necessarily decrease the risk for continued JJ involvement.

Notably, in our study, readmissions were most likely to occur within one year following a youth's initial release and those who returned to detention within one year were also at increased risk for multiple readmissions. These findings suggest that the 12 months following a youth's initial release are a critical timeframe for intervention, highlighting the importance of implementing timely and responsive reentry services during the months immediately following release. Youth who end up returning to detention within a year are also at particularly elevated risk for continued involvement in the justice system. In line with the RNR approach to service delivery, which stresses the importance of diverting more intensive services to youth with the highest risk of reoffending (Brogan et al., 2015), youth returning within one year should be prioritized for more intensive treatment following readmission.

Youth who were readmitted at any time within the study period were significantly more likely to have a history of sexual abuse than non-readmitted youth. Previous findings on the link between sexual abuse and recidivism have been mixed (Conrad et al., 2014; Van der Put & de Ruiter, 2016). However, some prior studies have found that childhood sexual abuse places youth at greater risk for juvenile offending (Swanston et al., 2003). Morever, in a recent meta-analysis exploring the link between childhood maltreatment and delinquency, Braga and colleagues (2017) found a relationship between childhood sexual abuse and subsequent delinquent behavior, with sexual abuse having a stronger relationship to aggressive as opposed to general delinquent behaviors. The authors posited a traumatic stress explanation for this difference, suggesting that aggressive behaviors here may be related to increased hyperreactivity and hyperarousal. Extending this to the risk for readmission in the current study, aggressive behaviors would be more likely to result in a readmission to detention following a subsequent arrest as judges must consider the impact on public safety when making detention decisions. Although this hypothesis could not be confirmed in the current study, it warrants further exploration. Additionally, if youth reporting a history of sexual abuse were released back to the environment where the abuse occurred, or even to a child welfare placement, this could impact the risk for future offending and readmission as well.

Surprisingly, no other trauma exposure variables were significantly related to the risk for readmission to juvenile detention for the youth in our sample. Although prior studies have indicated that a history of child abuse and neglect increases the risk for reoffending and rearrest among youth (Huang et al., 2012; Ryan et al., 2013), the current study did not find this relationship. This unexpected finding is more in line with Kingree and colleagues (2003), finding that self-reported histories of abuse and physical neglect did not increase the likelihood of recidivism among youth in detention.

Similarly, in the current study, youth who were readmitted to detention did not differ in rates of PTSD and/or depression. This suggests that overt traumatic stress-related symptoms are not necessarily distinguishing youth who are at risk for readmission versus those who are not. This speaks to the importance of identifying and addressing other factors that have been associated with recidivism when treating youth in detention and upon discharge. However, youth readmitted within one year of release were more likely to endorse problematic substance use. This finding is not surprising given the plethora of literature linking adolescent substance use to juvenile justice involvement (Mulvey et al., 2010), including re-offending (D'Amico et al., 2008; Stoolmiller & Blechman, 2005; Weber & Lynch, 2021). It also speaks to the importance of using evidence-based treatment in juvenile detention that effectively address escalating substance use among youth, with particular attention paid to use that is related to traumatic stress. Alternatively, this finding could also be driven by system-level factors, as judges may be more likely to detain youth who report higher levels of substance use.

In the jurisdiction where the current study took place, there has been a significant focus on diverting youth from detention and into community-based programs whenever possible. Consequently, detention is often the last resort for youth with more serious charges and a greater number of psychosocial risk factors. As such, trauma-related variables may have been more indirectly related to readmission, with other risk factors,

such as age of first offense, number of prior arrests, and family factors possible playing a more direct role. We were unable to include these variables, but they warrant further investigation. Our findings are also more consistent with those of Craig and colleagues (2020), which used a more similar population of youth released from a period of incarceration, lending further evidence to this hypothesis.

Sample and instrumentation differences could account for this departure from previous findings. For example, although Wolff et al. (2017) found that trauma exposure increases the likelihood of re-arrest for justice-involved youth, their sample included all youth in the state of Florida, including a larger proportion of white youth (38%), who completed a community-based JJ program. In contrast, our study was confined to detained youth in one urban location, and white youth comprised less than 10% of our sample. In Wolff et al. (2017), trauma exposure was also assessed using a risk assessment instrument, whereas the current study utilized the UCLA PTSD-RI for DSM-IV, which was specifically designed and validated to assess for trauma exposure and PTSD symptoms among youth. Notably, in Becker et al. (2012), where an identical tool was used, there was no main effect of PTSD on risk for recidivism. However, in that study, there were significant interactions between PTSD and ethnicity in risk for recidivism, but the racial/ethnic makeup of the sample in that study was vastly different than in the current study (72% white youth vs. less than 10% white youth).

A few additional factors should also be considered within the context of these findings. First, although the rates of overall PTSD in this sample were within the range found in previous studies of youth in detention settings (Abram et al., 2004; Dierkhising et al., 2013; Ford et al., 2008), the assessment for PTSD took place immediately after youth were admitted to detention and included questions of a sensitive nature. Since the assessment occurred before youth had the opportunity to build a trusting relationship with the mental health team, youth may have felt hesitant or even ashamed to disclose information about prior trauma exposure and current traumatic stress symptoms. The responses may therefore represent an underestimation of experiences and symptoms. Additionally, the method of administration for the UCLA PTSD-RI (questions asked by clinician vs. completed by the youth in writing) could have impacted youths' willingness to disclose. Similarly, although clinicians were trained to administer the measure and explained the purpose of each screening to youth, it is possible that some youth had varied understanding of the questions being asked, thereby impacting their answers. If youth in this sample underreported or misreported traumatic experiences and symptoms, then it would be more difficult to detect differences in readmission rates that are due to traumatic stress variables. Second, in this jurisdiction, a youth may be readmitted to detention for reasons other than a re-arrest or re-offense. For example, a youth may be readmitted if they violate a condition of probation or run away from a placement facility, and these behaviors may be less related to trauma than the commission of another offense. We did not have access to the reasons for readmission in the current study, thereby limiting our ability to distinguish between readmissions for new arrests versus other violations.

The focus of this study was on the link between trauma and readmission at the individual level, but if known to the court, the presence of a trauma-related mental health disorder or even trauma-related behavioral symptoms could have an impact on a judge's decision to remand a youth to detention. Unfortunately we did not have access to court-level information to investigate this as a possible confounding factor. Additionally, prior research has found that youth of color are significantly more likely to be detained than white youth charged with similar crimes (Leiber, 2013; Thomas et al. 2013). Given that the racial/ethnic makeup of the current study sample was overwhelmingly Black and Latinx, systemic biases may have overridden any influence of trauma-related factors on rates of readmission to detention for this group of youth. Future studies should consider such system-level factors within the context of the trauma and recidivism link.

There is also some evidence that intensity and dose of treatment may be linked to a decreased risk for recidivism among youth in placement facilities. For example, in one prior study of justice-involved youth residing in a long-term facility, higher doses of more intensive treatment were related to a 25% decrease in recidivism in the following three years (Haerle, 2016). However, "dose of treatment" in this context refers to the therapeutic intervention being delivered and not simply the length of stay in placement. There is evidence to suggest that longer stays in residential JJ settings, even those with a therapeutic focus, do not necessarily decrease recidivism (Loughran et al., 2009; Walker & Bishop, 2016).

Limitations and Future Directions

As noted above, trauma history and symptoms of PTSD, depression and substance use were assessed at one time point at youths' entry into detention, and underreporting of trauma exposure and symptoms may have influenced our ability to find a significant relationship between trauma and readmission. Additionally, this particular jurisdiction has made extensive efforts to reduce the number of youth being detained and incarcerated, and lower risk youth charged with more minor crimes are less likely to be in a secure detention facility than in previous years (Moore & Hobbs, 2017). As a result, our sample may be skewed toward higher risk youth with more significant behaviors and more serious charges, which is a group that may already be at higher risk of reoffending and readmission, irrespective of trauma history.

Readmission to detention was the only available indicator of recidivism in the current study and this represents a significant limitation for several reasons. First, although readmission to detention may indicate that a youth has re-offended following his or her initial release, there are also several other possible reasons for readmission that are not necessarily indicative of subsequent offending. These include a violation of the terms of probation (e.g., truancy from school, failure to attend mandated services), running away from a placement facility, failing to comply with court-imposed conditions of release pending the resolution of the case, or lack of a stable home environment. Additionally, even when readmission to detention is the result of a subsequent arrest, this is still not conclusive evidence that a youth has committed a subsequent offense. There are multiple factors, including biased treatment of youth of color in the JJ system, that may increase the unreliability of arrest variables as markers for offending (Claus et al., 2018; Tapia, 2010). Second, although prior admission to detention is a factor that increases the likelihood of readmission (Holman & Ziedenberg, 2006), not all youth who re-offend are detained. Consequently, using readmission as a marker of recidivism may miss youth who re-offend but remain in the community or are diverted to alternative programs. Third, due to the laws of this particular jurisdiction at the time of this study, only youth aged 15 and under at the time of the alleged offense were prosecuted in Family Court and detained in juvenile facilities. We only had access to data that reflects readmissions to juvenile detention, and not re-arrest or detention in an adult facility. As a result, youth who were released from the juvenile detention facility during the course of our study and subsequently detained for a new offense allegedly committed at age 16 or older would not be reflected in our readmission data.

We had limited information about youths' dispositions or the services they received between their initial release and readmission. Consequently, we were unable to control for certain factors that may have influenced whether a youth returned to detention. It is therefore possible that youth who continued to receive effective services tailored to their needs were those who were less likely to return. Similarly, we did not have access to other variables that may have impacted a youth's likelihood of returning to detention, such as the home environment or community environment they were released to following their initial period of detention.

Future studies should include multiple indicators of recidivism and multiple timepoints for post-release assessment. The type and intensity of reentry services following a period of detention are also critical areas for future study, as knowing which services are effective for which youth would enable treatment providers to use targeted services to reduce the likelihood of readmission. Although multiple studies have been done to determine the most effective treatments for reducing offending among youth overall, a more specific focus on the experience of reentry to the community within the context of service delivery is needed. Additionally, studies should consider how systemic factors, such as racial/ethnic bias, overpolicing in lower income neighborhoods, and judicial decisionmaking impact the risk for readmission to detention among youth of color with histories of trauma.

Future studies should also consider the impact of other factors, including thepost-discharge environment, adverse events experienced between discharge and readmission, and mediating factors such as the role of worry and perception of support (Ardino et al., 2013). Cross-country comparisons could also shed additional light on the relationship between trauma exposure and recidivism and alternative options for reducing readmission among this population. Finally, this study used quantitative data to measure and evaluate the impact of trauma exposure amd traumatic stress symptoms on readmission to detention. However, given that youth may be differentially impacted by trauma exposure, and may also experience different levels of symptom intensity, future studies should consider a mixed methods approach to add more context to, and individualized understanding of, the link between trauma and juvenile recidivism.

Conclusion

In light of the elevated rates of readmission found here, more targeted, immediate, and consistent reentry efforts are clearly needed to address the risk for recidivism following an initial stay in juvenile detention. Timely, evidence-based services implemented immediately upon a youth's release may reduce the likelihood of readmission, which highlights the importance of diverting more resources to this method of service delivery post-release. Youth who return within a year should also be prioritized, as they are at highest risk for subsequent readmission. Despite the established link between trauma and juvenile offending, focusing solely on trauma exposure and traumatic stress symptoms without considering the impact of other risk factors may not be enough to decrease the likelihood of readmission for youth of color in a large urban setting. Future studies need to disentangle the impact of types of trauma exposure, traumatic stress symptoms, and other variables known to impact recidivism, including systemic factors related to racial and ethnic biases.

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Data Availability Due to the nature of the research, supporting data is not available.

Declarations

Conflict of Interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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