Adverse Childhood Experiences of Juveniles in North Carolina
Point in Time Survey Results – 2023

ANALYSIS, RESEARCH, AND EXTERNAL AFFAIRS

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Executive Summary

Empirical evidence shows that Adverse Childhood Experiences (ACEs) has increased risk for delinquency, fighting, dating violence, and carrying a weapon, as well as mental health issues, and suicidal ideation and attempts. The Division of Juvenile Justice and Delinquency Prevention (DJJDP) Research Team conducted the third Point-in-Time Survey in early 2024 with the collaboration of Juvenile Clinical Services to provide an analysis of the ACEs of youth in North Carolina. The survey covered juveniles who were residing in a Contracted Residential Placement (CRP) or Youth Development Center (YDC) on December 31, 2023. The goal of the division is to provide an explanation of the findings of ACEs scores for youth in CRPs versus YDCs and demographic variables such as sex at birth and race/ethnicity. Beyond that, the aim is to identify potential relationships between demographics and diagnosed mental health disorders.

According to the survey data, average ACEs score is 3.2 suggesting that youths have experienced 3 childhood experiences. Generally, the higher the ACEs score, the greater the risk for negative outcomes in areas such as physical and mental health, substance abuse, and social functioning.

o **CRP and YDC youth are statistically different in terms of their mean ACEs scores (CRP: 2.7 and YDC: 3.5)**. Even though the proportion of female youths is much lower than male youths, **females have statistically significant higher ACEs scores than males on average (4.3 versus 2.9)**. **Average ACEs score is significantly different between White (3.9) and non- White (2.9) juveniles. Even though the proportion of Black or African American juveniles is higher within the sample these juveniles have a lower ACEs score on average (2.8).**

o **At least one sort of mental health disorder affects 95.7% of youth in CRPs or YDCs.** While 67% of the sample has at least one internalizing disorder, 88% of the sample has at least one externalizing disorder, showing a contrast between internalizing and externalizing disorders. Internalizing and externalizing mental health disorders were observed among juveniles on average at frequencies of 1.2 and 1.8, respectively.

o **Juveniles committed to YDCs or CRPs are more likely to be diagnosed with 1 individual internalizing disorder on average**. YDC youth are generally diagnosed with Anxiety, Posttraumatic Stress Disorder and Posttraumatic Stress Symptoms.

o Most juveniles diagnosed with externalizing disorders, whether YDC or CRP youths, were primarily **diagnosed with 2 distinct externalizing disorders**. Conduct Disorder, Antisocial Personality Disorder/Traits, Substance-Related and Addictive Disorders: Alcohol, Cannabis and Stimulant Related are the diagnoses associated with facility type among externalizing disorders.

o Among internalizing disorders, **Posttraumatic Stress Disorder affects female juveniles more than male juveniles, with females more likely to experience Posttraumatic Stress Symptoms.** Among internalizing disorders, **our sample shows that male youths are more likely to be diagnosed with ADHD and Conduct Disorder than female youths.**

o **The use of psychotropic medications** – antidepressants, anti-anxiety medications, stimulants, antipsychotics, and mood stabilizers – **is higher for YDC youth**. Females tend to be prescribed psychotropic medications at a rate higher than males. **The average ACEs score for juveniles who are prescribed psychotropic medicines is about 4, which is 1 point higher than the score for youth who are not prescribed this class of medication**.

o About 45% of the sample consists of Raise the Age (RtA) population and 87% of them are male. **The RtA population is not significantly different from the non-RtA population in terms of average ACEs scores**.

o Of the sample population who were 16 or older at the time of offense, **68% were committed to YDCs while 32% were placed in CRPs as of December 31, 2023**. **The average number of total mental health diagnoses for juveniles is approximately 3 for both non-RtA and RtA juvenile.**

Introduction

Understanding the nexus between adverse childhood experiences (ACEs) and the diagnosis of externalizing and internalizing disorders among delinquent juveniles is paramount to addressing the multifaceted complexities of youth offending. ACEs represent a critical framework for understanding the profound impact of early-life stressors on mental health outcomes. These experiences, ranging from abuse and neglect to household dysfunction, have been extensively linked to the development of both externalizing and internalizing disorders in individuals across the lifespan. Externalizing disorders, such as conduct disorder and substance abuse, manifest in behaviors directed outwardly, often disrupting social interactions and violating societal norms. Conversely, internalizing disorders, including depression and anxiety, are characterized by inward-directed symptoms such as pervasive sadness or excessive worry.

Baglivio et al. (2015) – based on the existing studies in the related literature – reported that a higher percentage of juvenile offenders (75%-93%) than the general population (25%-34%) has experienced some form of early childhood trauma. These statistics have led to describing the concept of Adverse Childhood Experiences (ACEs) which are potentially traumatic events that occur in childhood (0-17 years; Centers for Disease Control and Prevention, 2021)1. Studies indicated that chronic health problems, mental illness, and substance use problems in adolescence and adulthood are linked to ACEs (Felitti et al., 1998; Campbell et al., 2016, Chang et al., 2019). Therefore, it is important to examine their effects on involvement in serious offending and/or violence among the others (education, job opportunities, etc.). ACEs are scored as the sum of the ten exposures and each of them are measured dichotomously. For example, sexual abuse is counted as 1 point regardless of the number of incidents of the exposure or severity of exposure. The ACE score takes its value between 0 and 10 reflecting adverse childhood events. In brief, an ACE score is a tally of different types of abuse, neglect, and other ACEs. A higher ACE score indicates a higher risk for health, social and emotional problems later in life.

The North Carolina Division of Juvenile Justice and Delinquency Prevention (DJJDP) Research Team has been working with Juvenile Clinical Services to provide an analysis of the ACE scores of youths in North Carolina since 2020 by collecting the related data. The Division's goal is to provide an explanation of the findings of ACEs Scores for youth in CRPs versus YDCs and demographic variables such as sex assigned at birth, and race/ethnicity. Beyond that, the aim is to identify potential relationships between the demographics and mental health diagnoses.

This report presents the findings obtained from Point in Time Survey 2023 and composed of 4 sections. The second section describes the survey and data collection method. The third section reports the findings obtained from the survey. The report ends with the Conclusion section.

The Survey and Data

The Point-in-Time Survey (PITS) is a one-day snapshot of Contracted Residential Placement (CRP) and Youth Development Center (YDC) juveniles and their mental health information of their status on **December 31, 2023**. It uses a survey questionnaire consisting of 34 questions for each juvenile regarding their birth sex, age, and race, mental health information (internalizing and externalizing disorders) and ACEs scores. The ACEs Survey is completed separately; only the ACEs Scores are entered into the PITS. The survey data were entered into an online survey tool called Cvent by staff at the facilities.

With the survey, data on 304 juveniles were gathered. A quick description of the survey data is given below.

PITS 2023 Data by Sex at Birth

15.8%, **48**

84.2%, **256**

■ Female ■ Male

PITS 2023 Data by Current Age

31.3%, 95

25.3%, 77

17.4%, 53

12.2%, 37

8.6%, 26

2.6%, 8

0.3%, 1

2.3%, 7

12 13 14 15 16 17 18 19

PITS 2023 Data by Race

Race	Percentage, Count
White or Caucasian	23.0%, **70**
Native American or Alaskan Native	1.3%, **4**
Multiracial or Biracial	6.9%, **21**
Hispanic or Latino	4.3%, **13**
Black or African American	63.8%, **194**
Asian or Pacific Islander	0.7%, **2**

Figure 1. Distribution of PITS 2023 Data by Sex at Birth, Race and Current Age

16% of juvenile delinquents were female, while 84% were male. Among these juveniles, 74% were aged between 15 and 17. Additionally, 64% of them were identified as Black or African American, whereas 23% were identified as White (Figure 1).

PITS 2023 Data by Facility

- Contracted Residential Site
- Youth Development Center

PITS 2023 Data by YDC Facilities

Cabarrus YDC	37.0%, **61**
Chatham YDC	19.4%, **32**
Edgecombe YDC	22.4%, **37**
Lenoir YDC	21.2%, **35**

PITS 2023 Data by CRP Facilities

Facility	Value
Western Area Crisis and Assessment Center	2.9%, **4**
Wayne Multi-Purpose Juvenile Home	2.9%, **4**
The Farm Transitional Living Home	2.2%, **3**
Robeson Multi-Purpose Juvenile Home	5.8%, **8**
North Hills Transitional Living	3.6%, **5**
Macon Multi-Purpose Juvenile Home	5.8%, **8**
Insight Crisis and Assessment Center	7.2%, **10**
Hertford Multi-Purpose Juvenile Home	6.5%, **9**
Eckerd Kerr Lake	7.9%, **11**
Eckerd Candor	24.5%, **34**
Eckerd Boomer	21.6%, **30**
Craven Transitional Living	2.9%, **4**
Chowan Multi-Purpose Juvenile Home	4.3%, **6**
Bridges Crisis and Assessment Center	2.2%, **3**

Figure 2. Distribution of PITS 2023 Data by Facilities

The sample consists of 139 juveniles from CRP and 165 juveniles from YDC. Among the YDC juveniles, 37% lived in Cabarrus YDC, while approximately 44% resided in Edgecombe and Lenoir YDCs. On the survey day, Chatham YDC accommodated 32 juveniles. Among CRP facilities, 46% of juveniles accommodated by Ecker Candor and Craven Transitional Living (Figure 2).

Adverse Childhood Experiences

Findings obtained from the survey focus on ACEs scores and their distributions by the type of facility, birth sex, and race/ethnicity.

Table 1. Frequency Distribution of ACEs Scores

ACEs Scores	Frequency	%	Cum. %
0	44	14.5	14.5
1	57	18.8	33.2
2	52	17.1	50.3
3	32	10.5	60.9
4	35	11.5	72.4
5	27	8.9	81.3
6	15	4.9	86.2
7	11	3.6	89.8
8	20	6.6	96.4
9	7	2.3	98.7
10	4	1.3	100.0
Total	**304**		

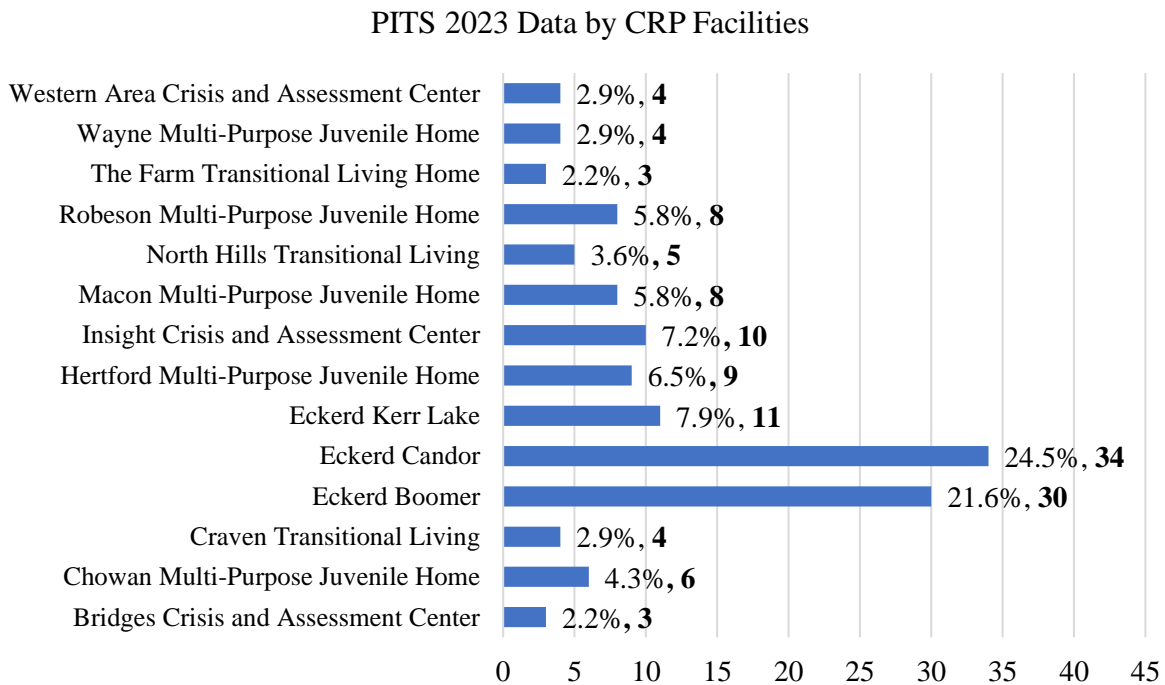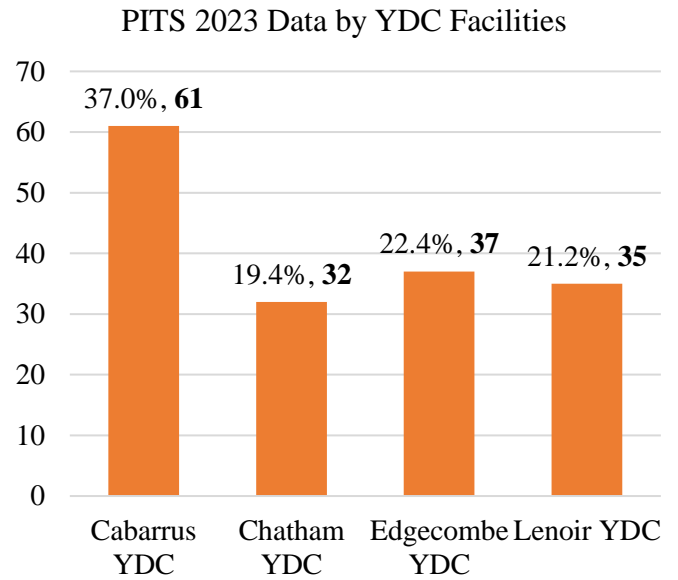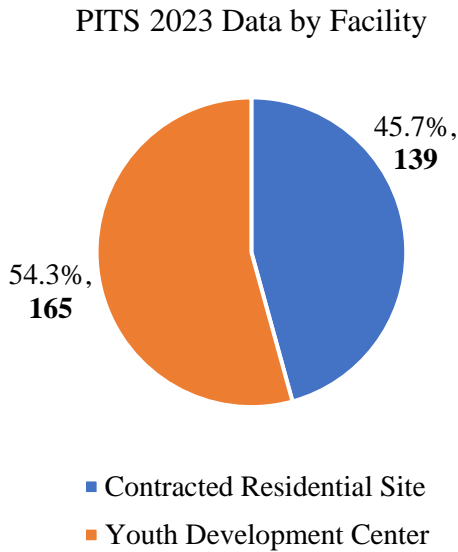Table 1 reports the frequency distribution of ACEs scores with their summary statistics while Figure 3 visualizes this distribution for all 304-youth surveyed with normal curve that is created based on the sample mean and standard deviation. The graph also shows the median value of ACEs score (dashed red line).

The ACEs scores are distributed between 0 and 10 with a 3.2 average value. Median and mode values of ACEs scores are 2 and 1, respectively. According to these measures of central tendency of ACEs scores, as shown in Figure 3 they are not exactly normally distributed and ACEs scores of 1 is the most repeated score among the juveniles.[1] Even though ACEs scores tend to distribute around their mean value, the percentage of juveniles who have ACEs scores greater than 3 is 39.1%, meaning that almost more than 1 of 3 juveniles have higher ACEs scores. **Frequency distribution of ACEs scores implies that even though the sample average is between 2 and 3, there is a group of juveniles who have high-risk on health, social and emotional challenges that cannot be neglected.**

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[1] Normality tests such as Shapiro-Wilk, Kolmogorov-Smirnov show that the null hypothesis of "ACEs scores are normally distributed in the population" cannot be accepted at the 1% and 5%significance levels.
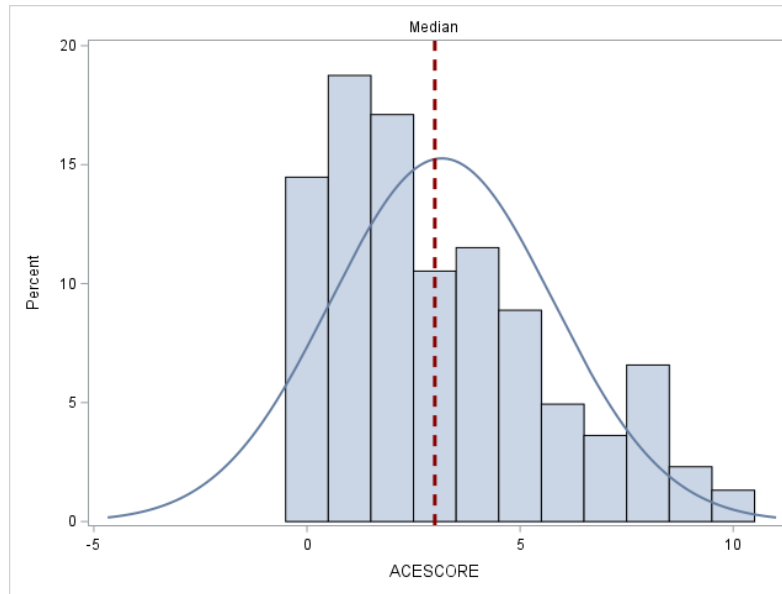
Figure 3. Histogram of ACEs Scores with Normal Distribution

ACEs Scores by Facility Type

Frequency distribution of ACEs scores by facility types is given in Figure *4*. While 46% of the juveniles were in CRPs, 54% were committed to YDCs on December 31, 2023. The mode of ACEs scores – the most repeated ACEs score – is 1 for juveniles placed in CRPs that is 24.5% of the sample population. The mode of ACEs scores for YDC juveniles is 2. **Arithmetic average of ACEs scores is 3.5 for juveniles at YDCs and 2.7 for juveniles at CRPs.** Figure 4 shows that there might be an observable difference between ACEs scores of juveniles at these two facility types. Both *t*-statistics under the equal variance assumption and Kolmogorov-Smirnov test do provide statistically significant evidence at the traditional significance levels (1%, 5% and 10%) about mean difference between these two juvenile populations. Even though the sample standard deviations of the ACEs scores between facilities were found to be very close (2.8 points for CRPs and 2.4 points for YDCs) the coefficient of variation highlights a higher relative variability for ACEs scores among CRP youth.[2]

ACEs Scores by Sex at Birth

Regarding demographics, there are 48 females surveyed compared to 255 males and 1 transsexual youth – (about 16% females to 84% males). **It is evident that females did in fact score higher on average than males, with a mean score of 4.3 compared to 2.9, which is significantly different (at the 5% level) and follows the pattern shown in the data from December 2020, December 2021, and December 2022.**

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[2] PITS results for 2021 showed that ACEs scores of juveniles committed to YDCs, and CRPs were significantly different between these two populations. PITS 2022 reported that average ACEs scores of juveniles committed to YDCs and CRPs were statistically the identical.

ACEs Scores by Facility Type
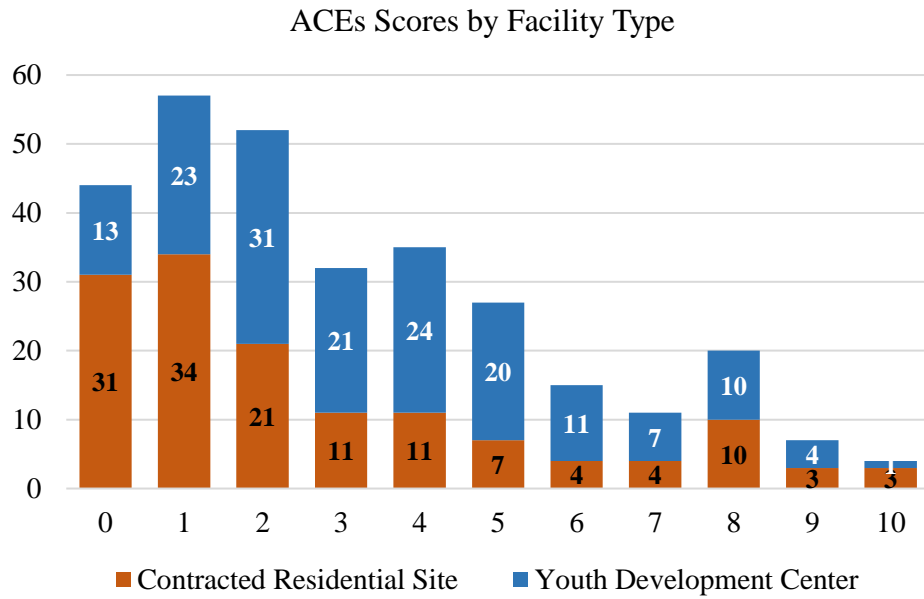
Figure 4. Distribution of ACEs Scores by Facility Type

Even though there is not balance between these two sub-samples in terms of their sizes, two tests under normality and non-normality assumption were used to test the mean difference between female and male population. Both *t*-test and Kolmogorov-Smirnov two-sample test provided strong evidence that **the average ACEs scores of females significantly differs from the average ACEs scores of males based on the studied sample**.

Table 2. Frequency Distribution of ACEs Scores by Sex at Birth

ACEs Score	Birth Sex				Total
	Female	%	Male	%	
0	5	10.4	39	15.2	44
1	5	10.4	52	20.3	57
2	8	16.7	44	17.2	52
3	6	12.5	26	10.2	32
4	1	2.1	34	13.3	35
5	6	12.5	21	8.2	27
6	3	6.3	12	4.7	15
7	2	4.2	9	3.5	11
8	8	16.7	12	4.7	20
9	2	4.2	5	2.0	7
10	2	4.2	2	0.8	4
Total	**48**	**15.8**	**256**	**84.2**	**304**

ACEs Scores by Sex at Race/Ethnicity

Frequency distribution of ACEs scores by race is summarized in Table 3. As the table shows, approximately 64% and 23% of the sample is Black or African American and White or Caucasian, respectively. The mode of ACEs scores for Black or African American juveniles is 1 while it is 1 or 2 for White or Caucasian juveniles. Juveniles who are Hispanic or Latino and Multiracial or Biracial cover approximately 11% of the sample.

Table 3. Frequency Distribution of ACEs Scores by Race

ACEs Score	Asian or Pacific Islander		Black or African American		Hispanic or Latino		Multiracial or Biracial		Native American or Alaska		White or Caucasian		Total
	Freq.	%[a]	Freq.	%[a]	Freq.	%[a]	Freq.	%[a]	Freq.	%[a]	Freq.	%[a]	
0	0	0.0	30	15.5	3	23.1	0	0.0	1	25.0	10	0	44
1	0	0.0	41	21.1	1	7.7	2	9.5	0	0.0	13	0	57
2	0	0.0	37	19.1	5	38.5	5	23.8	0	0.0	5	0	52
3	0	0.0	21	10.8	2	15.4	3	14.3	0	0.0	6	0	32
4	0	0.0	23	11.9	0	0.0	3	14.3	1	25.0	8	0	35
5	1	50.0	14	7.2	0	0.0	4	19.0	1	25.0	7	1	27
6	1	50.0	6	3.1	1	7.7	1	4.8	0	0.0	6	1	15
7	0	0.0	6	3.1	1	7.7	0	0.0	0	0.0	4	0	11
8	0	0.0	11	5.7	0	0.0	0	0.0	0	0.0	9	0	20
9	0	0.0	5	2.6	0	0.0	0	0.0	1	25.0	1	0	7
10	0	0.0	0	0.0	0	0.0	3	14.3	0	0.0	1	0	4
Total	2		194		13		21		4		70	2	304
%[b]	0.7%		63.8%		4.3%		6.9%		1.3%		23.0%		

[a] Percentages according to column totals.
[b] Percentages of each race group within the sample.

Figure 5 shows the mean and median ACEs scores by race for better visualization. Although neither racial/ethnic group's average ACEs score rose beyond 4 except Asian or Pacific Islander and Native American or Alaskan Native juveniles, White/Caucasian juveniles had a mean score of 3.8 and a median score of 4. The mean and median ACEs scores for Black/African American are nearly 3 and 2, respectively. Non-parametric tests, such as the Kolmogorov-Smirnov test, reveal differences in average ACEs scores among different racial groups. When we divide the samples into Black or African American and non-Black or African American categories, we observe variations in average ACEs scores within these groups. The evidence for equal mean ACEs scores is weak between White and non-White juveniles. However, when we split the samples into Black or African American and White juveniles versus others, there are statistically significant differences in average ACEs scores between these two groups. Notably, average ACEs scores are higher for juveniles who are non-Black or African American and non-White.

Mean and Median ACEs Scores by Race
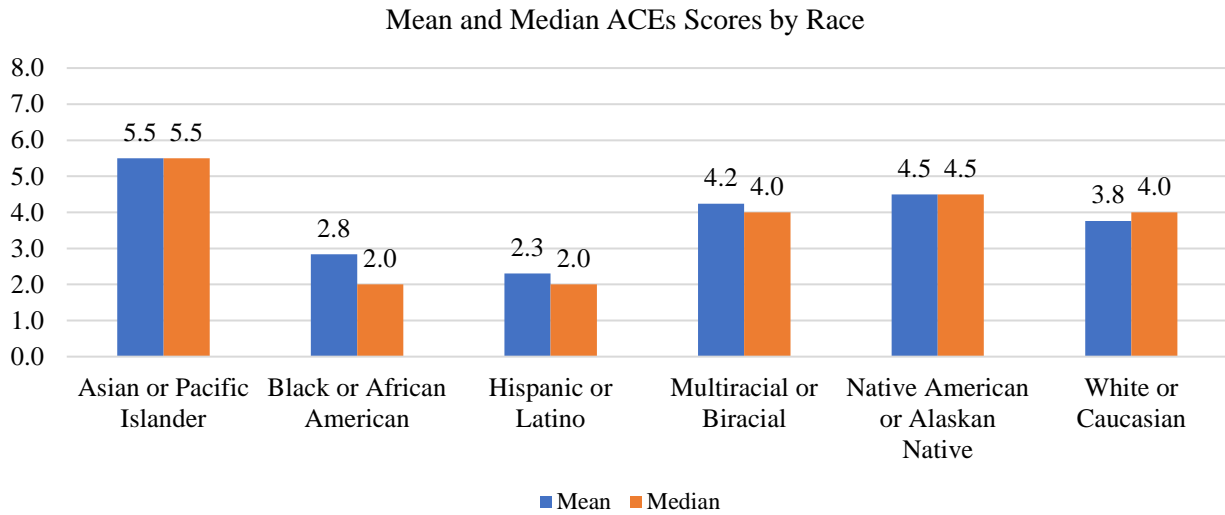
Figure 5. Graph of Central Tendency Measures of ACEs Scores by Race

Mental Health

This section focuses on the mental health diagnoses in the juvenile sample. The goal of this section is to identify associations between externalizing and internalizing disorders with these demographic characteristics of youth. Diagnoses were analyzed by the same criteria as above: facility type, birth sex, and race/ethnicity.

Internalizing diagnoses are defined as:

- o Neurodevelopmental Disorders (consisting of Autism Spectrum, Intellectual Disability [specific disability selected in the survey], and Specific Learning Disorders),
- o Schizophrenia,
- o Bipolar,
- o Defiant (consisting of Disruptive Mood Dysregulation and Major Depression),
- o Anxiety,
- o Trauma and Stress Related Disorders (consisting of Post-Traumatic Stress Disorder, Acute Stress, Adjustment Disorder, Post-Traumatic Stress Symptoms),
- o Obsessive-Compulsive Disorder, and
- o Sex Dysphoria.

The definition of externalizing diagnoses include:

- o Attention-deficit/hyperactivity disorder,
- o All Disruptive/Impulse-Control, and Conduct Disorders (which consist of Oppositional Defiant Disorder, Intermittent Explosive Disorder, Conduct Disorder, and Anti-social Personality Disorder/Traits), and
- o Substance-Related and Addictive Disorders (consisting of Alcohol-Related Disorder, Cannabis-Related Disorder, Hallucinogen-Related Disorder, Opioid-Related Disorder, and Stimulant-Related Disorders).

Descriptive findings in this section are based on counting the number of diagnosed disorders for each juvenile reported in the survey.

According to the PITS 2023 data, 10% of juveniles were diagnosed with only one mental health disorder. Additionally, 25% of youths, equating to 77 individuals, were diagnosed with two distinct disorders. Furthermore, 40% of the youth population received diagnoses for three or four disorders. Instances of juveniles presenting with eight or more distinct mental health disorders are relatively uncommon (please see Figure 6). In sum, **95.7% of the juveniles were diagnosed with 1 or more mental health disorders.**
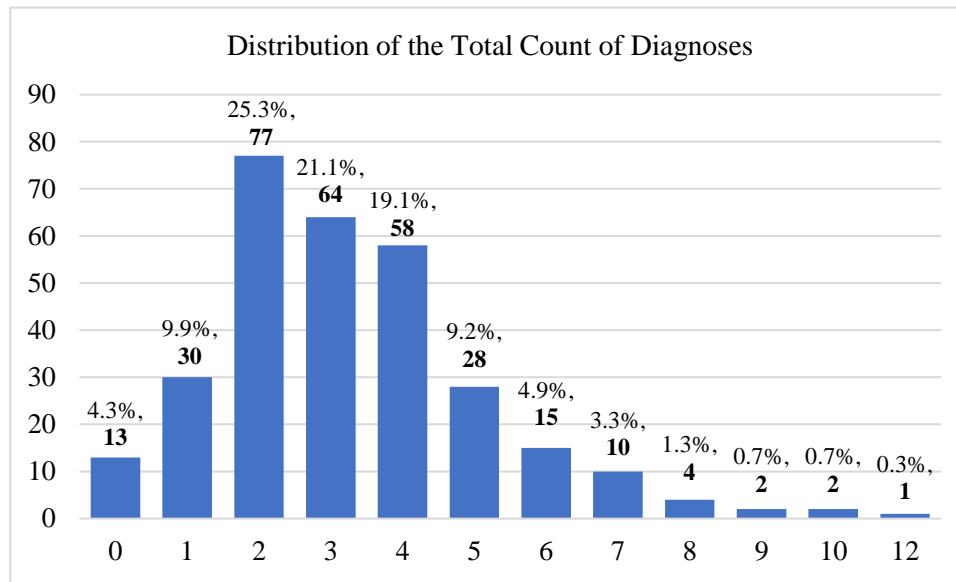
Figure 6. Frequency Distribution of the Total Count of Diagnoses

Table 4 summarizes the total count of diagnoses by facility type, sex at birth and race/ethnicity. The average total disorder count across all observations is approximately 3. The maximum count observed is 12 disorders.

YDCs have a higher average total diagnosis count (3.8) compared to CRPs (2.6). The range of diagnosis counts is wider in YDCs, ranging from 0 to 12 diagnoses, compared to 0 to 10 diagnoses in CRPs.

There is a slight difference in the average total diagnosis count between females (3.3) and males (3.2). The range of diagnosis counts is wider among males, with counts ranging from 0 to 12 disorders, compared to females with counts ranging from 0 to 7 diagnoses.

Black or African American juveniles have an average total diagnosis count of 3.1, with a narrower range of diagnosis counts (ranging from 0 to 9). Hispanic/Latino juveniles have an average total diagnosis count of 3.0, with a wider range of diagnoses counts (ranging from 0 to 9). Other race category youths have the highest average total diagnosis count (3.5), with counts ranging from 0 to 7 diagnoses. Juveniles identifying with two or more races have an average total diagnosis count of 3.8, with counts ranging from 1 to 10 diagnosis. White individuals have an average total diagnosis count of 3.6, with counts ranging from 0 to 12 diagnoses. **These insights suggest variations in the distribution of total diagnosis counts based on facility type, sex at birth, and race**. Additionally, there are differences in the range and distribution of diagnosis counts across these categories.

The Kolmogorov-Smirnov test, a non-parametric test for comparing means, indicates a statistically significant difference in the average total diagnosis count between juveniles in YDCs and CRPs.

Table 4. Summary Statistics for Total Count of Mental Health Diagnoses

Statistics	# of Obs	Mean	Median	Std Dev	Minimum	Maximum
Total Diagnosis	304	3.3	3	1.9	0	12
Facility Type						
Contracted Residential Site	139	2.6	2	1.7	0	10
Youth Development Center	165	3.8	4	1.9	0	12
Sex at Birth						
Female	48	3.3	3	2.0	0	7
Male	256	3.2	3	1.9	0	12
Race						
Black or African American	194	3.1	3	1.6	0	9
Hispanic/Latino	13	3.0	2	2.8	0	9
Other	6	3.5	3	2.3	0	7
Two + Races	21	3.8	4	2.3	1	10
White	70	3.6	3	2.3	0	12

Diagnoses: Internalizing versus Externalizing

Facility Type

Internalizing and externalizing diagnoses for juveniles by facility type is reported in Table 5. Based on one date reference population, **195 out of 304 juveniles had at least one type of internalizing disorder diagnosed**. 74% of those juveniles, diagnosed with an internalizing disorder, were committed to YDCs while 53% were in a CRPs. **88% of juveniles were diagnosed with at least 1 externalizing disorder.** Juveniles with externalizing disorders make up about 85% of those in CRPs and 90% of those committed to YDCs. Table 5 suggests that **juveniles at YDC facilities are likely be diagnosed with both internalizing and externalizing disorders compared to juveniles who were at CRPs.**

When looking at the specific counts for internalizing diagnoses, **36% of the youth – 109 out of 304 juveniles – had no diagnosed internalizing disorder** (see Table 6 below). Within CRPs, about 30% of juveniles were diagnosed with 1 internalizing disorder, compared to 29% of YDC youth who meet that same criterion and 14% of CRP youth have 2 internalizing disorders, while this rate is 23% among YDC youth. The ratio of juveniles who are diagnosed with 3 or more unique internalizing disorders is 16% for YDC youth. **Juveniles who have 3 or 4 different internalizing disorders were mostly committed to YDCs (20%).**

Table 5. Distribution of Juveniles with Internalizing and Externalizing Disorders by Facility Type

Facility Type	Internalizing Sources	%	Externalizing Sources	%	Total
CRPs	73	52.5	118	84.9	139
YDCs	122	73.9	149	90.3	165
Total	**195**	**64.1**	**267**	**87.8**	**304**

Externalizing diagnoses distributions given in Table 6 show that YDC youth tend to have a higher number of externalizing disorder diagnoses counts compared to CRP youth. The number of having at least 1 externalizing disorder among CRP and among YDC juveniles is generally distributed between 1 and 4. However, out of a possible 8 different externalizing disorders, **having a juvenile who was diagnosed with any 2 of the externalizing disorders is common for both CRP and YDC youth**.

Table 6. Internalizing and Externalizing Diagnosis Counts by Facility Type

Internalizing Diagnoses Count	CRPs	%	YDCs	%	Total	Externalizing Diagnoses Count	CRPs	%	YDCs	%	Total
0	66	47.5	43	26.1	109	0	21	15.1	16	9.7	37
1	41	29.5	48	29.1	89	1	49	35.3	34	20.6	83
2	19	13.7	38	23.0	57	2	54	38.8	59	35.8	113
3	6	4.3	24	14.5	30	3	12	8.6	37	22.4	49
4	5	3.6	9	5.5	14	4	2	1.4	12	7.3	14
5	0	0.0	2	1.2	2	5	0	0.0	4	2.4	4
6	2	1.4	0	0.0	2	6	0	0.0	2	1.2	2
7	0	0.0	0	0.0	0	7	1	0.7	0	0.0	1
8	0	0.0	1	0.6	1	8	0	0.0	1	0.6	1
Total	**139**		**165**		**304**	**Total**	**139**		**165**		**304**

Sex at Birth

Looking at the differences in counts of internalizing and externalizing disorder diagnoses between sex at birth, it is important to keep in mind the difference in total number of male juveniles surveyed (256) compared to number of females surveyed (48). That said, there is a noticeable difference between the distribution of number of diagnoses for the two sexes. For internalizing diagnoses, 77% of females and 62% of males had at least 1 internalizing diagnosis. The number of male juveniles who had at least 1 externalizing diagnosis is 231, or 87% of the male sample. This ratio is 14% among female (see Table 7) juveniles.

Table 7. Internalizing and Externalizing Disorders Count by Sex at Birth

Birth Sex	Internalizing Diagnoses	%	Externalizing Diagnoses	%	Total
Female	37	77.1	36	13.5	48
Male	158	61.7	231	86.5	256
Total	**195**	**64.1**	**267**	**87.8**	**304**

The survey findings regarding the diversity of diagnoses that juveniles received are shown in Table 8. 109 out of 304 youths – 98 male and 11 female juveniles – were not diagnosed with any specific internalizing disorders. While 31% of male juveniles were diagnosed with 1 type of internalizing disorder, approximately 31% of them had 2 or more different individual internalizing disorders. 29% of female juveniles were diagnosed with 2 different internalizing disorders. Approximately 12% of male juveniles were diagnosed with 3 and 4 different internalizing disorders.

There are juveniles who were not diagnosed with any of externalizing disorders (12 females and 25 males). Mode of the counts for externalizing disorders is 2 for both female and male youth. **Having more than 4 different externalizing disorders is less likely among female and male juveniles.**

Table 8. Internalizing and Externalizing Diagnosis Counts by Sex at Birth

Internalizing Diagnoses Count	Female	%	Male	%	Total	Externalizing Diagnoses Count	Female	%	Male	%	Total
0	11	22.9	98	38.3	109	0	12	25.0	25	9.8	37
1	9	18.8	80	31.3	89	1	13	27.1	70	27.3	83
2	14	29.2	43	16.8	57	2	17	35.4	96	37.5	113
3	9	18.8	21	8.2	30	3	4	8.3	45	17.6	49
4	4	8.3	10	3.9	14	4	1	2.1	13	5.1	14
5	0	0.0	2	0.8	2	5	1	2.1	3	1.2	4
6	1	2.1	1	0.4	2	6	0	0.0	2	0.8	2
7	0	0.0	0	0.0	0	7	0	0.0	1	0.4	1
8	0	0.0	1	0.4	1	8	0	0.0	1	0.4	1
Total	**48**		**256**		**304**	**Total**	**48**		**256**		**304**

Race/Ethnicity

As mentioned above, it is important to note the difference in the number of juveniles per each race in the sample of 304. For this part of the analysis and beyond, it was decided to group the races as White, Black/African American (Black/AA), Hispanic/Latino, Two + Races and Other. Frequencies can be seen from Table 9. 195 juveniles were diagnosed with any internalizing disorders. The number of juveniles who had a diagnosis for any externalizing disorder is 267.

Table 10 show the distribution of individual internalizing and externalizing disorder diagnoses counts by race. **Black/AA juveniles suffer from both internalizing (about 61%) and externalizing disorders (about 90%).** 71% of White juveniles were diagnosed with at least 1 type of internalizing disorders and this ratio is 90% for externalizing disorder diagnoses.

Table 9. Internalizing and Externalizing Diagnosis Counts by Race

Race Group	Internalizing Diagnoses	%	Externalizing Diagnoses	%	Total
Black/AA	118	60.8	174	89.7	194
Hispanic/Latino	6	37.5	8	50.0	16
Two + Races	21	100.0	17	81.0	21
White	50	71.4	63	90.0	70
Other	3	50.0	5	83.3	6
Total	**195**		**267**		**304**

Table 10. Internalizing and Externalizing Diagnosis Counts by Race Group

Internalizing Diagnoses Count	Panel A: Internalizing										
	Black/AA	%	Hispanic/Latino	%	Two + Races	%	White	%	Other	%	Total
0	76	39.2	7	53.8	3	14.3	20	28.6	3	50.0	109
1	61	31.4	1	7.7	6	28.6	20	28.6	1	16.7	89
2	36	18.6	2	15.4	5	23.8	14	20.0	0	0.0	57
3	14	7.2	1	7.7	5	23.8	9	12.9	1	16.7	30
4	5	2.6	1	7.7	2	9.5	5	7.1	1	16.7	14
5	0	0.0	0	0.0	0	0.0	2	2.9	0	0.0	2
6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
7	2	1.0	0	0.0	0	0.0	0	0.0	0	0.0	2
8	0	0.0	1	7.7	0	0.0	0	0.0	0	0.0	1
Total	**194**		**13**		**21**		**70**		**6**		**304**
Externalizing Diagnoses Count	**Panel A: Externalizing**										
	Black/AA	%	Hispanic/Latino	%	Two + Races	%	White	%	Other	%	Total
0	20	10.3	5	38.5	4	19.0	7	10.0	1	16.7	37
1	46	23.7	5	38.5	6	28.6	25	35.7	1	16.7	83
2	80	41.2	0	0.0	6	28.6	23	32.9	4	66.7	113
3	36	18.6	2	15.4	3	14.3	8	11.4	0	0.0	49
4	11	5.7	1	7.7	1	4.8	1	1.4	0	0.0	14
5	1	0.5	0	0.0	0	0.0	3	4.3	0	0.0	4
6	0	0.0	0	0.0	0	0.0	2	2.9	0	0.0	2
7	0	0.0	0	0.0	1	4.8	0	0.0	0	0.0	1
8	0	0.0	0	0.0	0	0.0	1	1.4	0	0.0	1
Total	**194**		**13**		**21**		**70**		**6**		**304**

100% of two + races group juveniles were diagnosed with internalizing disorders, while this ratio is almost 81% for externalizing disorders. Internalizing diagnosis counts by race groups given in Table 10 show it is likely to have a juvenile who has 1 internalizing disorder diagnose for Black/AA, Two + Races and White juveniles. Black/AA had mostly 2 different externalizing diagnosis with 41%. Having juveniles diagnosed with 4 or more different externalizing disorders are less observed which is irrespective of the race of juveniles in the sample. Finally, **it should**

be noted that though the actual counts vary across race/ethnicity, the percentages show that this variation is simply due to the sample size of each race group.

Analysis of Individual Diagnoses

This section goes into detail for each of the individual diagnoses and bring attention to significant relationships within the data for demographics and other diagnoses. It should be noted that each categorical variable has two levels: for disorders "Yes" and "No" [3]; for facility type "CRPs" and "YDCs"; for sex at birth is "Female" and "Male". The categories of the race variable are reduced into two categories because mostly Black or African American and White or Caucasian juveniles suffer from internalizing and/or externalizing diagnoses in our sample data. Therefore, the race variable has two categories: "Black/AA" and "White".

Internalizing Resources Disorders by Facility Type

Table 11 reports frequencies of internalizing disorders by facility type. According to decision rule (please see Appendix), Bipolar, Disruptive Mood Disorder (DMD), Major Depressive Disorder (MDD), Anxiety Disorder (AD), Acute Stress (AS), Adjustment Disorder (AdjD), Posttraumatic Stress Disorder (PTSD), and Posttraumatic Stress Symptoms (PTSS) have adequacy to check the relationship of them with the facility type. However, both chi-square test and Fisher's exact test statistics show that facility type is statistically significantly associated only with PTSD and PTSS. Thus, Table 11 solely illustrates the frequency distributions for these two disorders.

Table 11. Internalizing Disorders by Facility Type

	Posttraumatic Stress Disorder (PTSD)				
	No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
CRPs	125	14	139	2.910* (0.088)	0.020* (0.070)
YDCs	136	29	165		
Total	261	43	304		
	Posttraumatic Stress Symptoms (PTSS)				
	No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
CRPs	131	8	139	20.850** (0.000)	0.0001** (0.000)
YDCs	122	43	165		
Total	253	51	304		

(.) denotes *p*-values which is the smallest level of significance at which the null hypothesis (there is no relation between the disorder and facility type) would be rejected. ***, ** and * show that the null hypothesis can be rejected at 1%, 5% and 10% significance levels, respectively. *p*-values of Fisher's exact test statistics are two-sided (both facility type/sex/race and individual internalizing/externalizing disorder).

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[3] Intellectual disability has 4 levels: Borderline intellectual functioning, Mild, Moderate and None. There are 34 juveniles who were diagnosed with one of those levels. Specific learning disorder has 4 levels, Mathematics, Reading, Written expression, and None. The number of juveniles who has one of those specific learning disorder with impairment in is 39.

Juveniles committed to YDCs were diagnosed mostly with PTSD (29 or 18%) and PTSS (43 or 26%). Anxiety was the other most observed Trauma and Stress Related Disorder (TSRD), 41 or 25%. Anxiety and PTSD are the most observed internal disorders among the juveniles in CRPs (20% and 10%, respectively). **The association between facility type and the occurrence of PTSD and PTSS among delinquent juveniles may reflect differences in the environments, interventions, and support systems provided by YDCs and CPs, as well as the varying levels of supervision and control within these settings**.

Internalizing Resources Disorders by Sex at Birth

According to Cochran's rule, testing association between individual internalizing disorders and sex at birth should be tested for with MDD, PTSD and PTSS disorders (see Table 12). Anxiety disorder (AD) was among these variables, but it isn't included in the report because it lacks statistical significance in its association with sex at birth.[4]

Table 12. Internalizing Disorders by Sex at Birth

Sex at Birth	Major Depressive Disorder (MDD)				
	No	Yes	Total	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
Female	31	17	48	15.602*** (0.000)	0.0001*** (0.000)
Male	226	30	256		
Total	257	47	304		
	Posttraumatic Stress Disorder (PTSD)				
	No	Yes	Total	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
Female	30	18	48	23.370*** (0.000)	0.0001*** (0.000)
Male	231	25	256		
Total	261	43	304		
	Posttraumatic Stress Symptom (PTSS)				
	No	Yes	Total	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
Female	35	13	48	3.505* (0.061)	0.021* (0.056)
Male	218	38	256		
Total	253	51	304		

Note to Table 11.

The condition of being male and female juvenile is given, approximately 38% of male juveniles were diagnosed with MDD while 35% of female juveniles had MDD. The condition of being male and female juvenile is given, with around 10% of young males being identified with PTSD, whereas 38% of young females were found to have PTSD. These ratios are 27% and 15% for females and males, respectively.

The table showed that there is a statistically significant association between sex at birth and being diagnosed with MDD, PTSD and PTSS. It implies that individuals of different sexes may experience these mental health conditions at varying rates or with differing severity levels within this population. *Qualitative research aimed at understanding the firsthand experiences of*

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[4] Within the sample, 54 of 256 male (21%) and 15 of 48 female (31%) juveniles were diagnosed with AD.

delinquent juveniles regarding their mental health, along with an exploration of potential socio-cultural influences that could impact the development of MDD, PTSD, and PTSS across sexes, may be essential.

Internalizing Resources Disorders by Race Group

According to Cochran's Rule, AD, DMD, MDD, PTSD, and PTSS have adequacy to check the relationship of them with race/ethnicity. Chi-square test results show that there is a statistically significant relationship between AD and race group, and MDD and race group (Table 13). *Exploring the factors behind these associations, like socio-economic gaps, cultural distinctions, or availability of mental health resources across various racial groups, can guide the development of tailored interventions and support initiatives to address the unique needs of each racial demographic.*

Table 13. Internalizing Disorders by Race Group

Race Group	Anxiety Disorder (AD)				
	No	Yes	Total	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
Black/AA	164	30	194	16.661^{***} (0.000)	0.0001^{***} (0.0001)
White	42	28	70		
Total	206	58	264		
Race Group	Major Depressive Disorder (MDD)				
	No	Yes	Total	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
Black/AA	176	18	194	8.811^{***} (0.003)	0.002^{***} (0.003)
White	53	17	70		
Total	229	35	264		

Note to Table 11.

Lastly, it should be noted that **PTSD and PTSS are the sub-set of Trauma and Stress Related disorders, and these two disorders have an association with facility type and sex at birth. These are not associated with the race group** (Table 13)**.**

Externalizing Resources Disorders by Facility Type

According to Cochran's Rule, Attention-Deficit/Hyperactivity Disorder (ADHD), Oppositional Defiant Disorder (ODD), Conduct Disorder (CD), Antisocial Personality Disorder/Traits (APDT), and Alcohol (AR), Cannabis (CR), Opioid (OR) and Stimulant related disorders have adequacy to check the relationship of them with facility type. However, Table 14 shows that facility type is significantly associated with CD, APDT, cannabis and stimulant related disorders at 1% and 5% significance levels. Fisher's exact test has weak evidence for the association between facility type and alcohol related disorder. The frequencies corresponding to the "Yes" column, number of juveniles, are higher for CD and CR. For example, half of CRP juveniles were diagnosed with conduct disorder. The ratio is about 60% for YDC juveniles.

Cannabis use stands out as the most frequently observed substance-related and addictive disorder (SRAD). The odds ratio suggests that YDC juveniles are significantly 2.3 times more likely to

have cannabis-related issues compared to CRP juveniles. Association tests also indicate a robust relationship between being a YDC juvenile and being diagnosed with cannabis-related problems.

Externalizing Resources Disorders by Sex at Birth

Table 15 outlines the frequencies of two distinct external disorders, chosen based on Cochran's rule, and association tests categorized by sex at birth. Sex at birth demonstrates a significant relationship solely with ADHD and CD. Males exhibit higher ratios for ADHD and CD (37% and 60%, respectively), with statistical significance observed only for CD. Male juveniles have 3.3 times the odds of being diagnosed with CD compared to female juveniles. As it was noted in the previous sub-sections, the sample is not balanced by sex at birth. Female juveniles were mostly diagnosed with conduct disorder (15 juveniles, 31%).

Table 14. Externalizing Disorders by Facility Type

	Conduct Disorder (CD)				
Facility Type	*No*	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
CRPs	71	68	139	4.132** (0.042)	0.009** (0.037)
YDCs	64	101	165		
Total	135	169	304		
Facility Type	**Antisocial Personality Disorder/Traits (APDT)**				
	No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
CRPs	137	2	139	5.368** (0.021)	0.007** (0.014)
YDCs	152	13	165		
Total	289	15	304		
Facility Type	**Substance-Related and Addictive Disorders: Alcohol Related (AR)**				
	No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
CRPs	136	3	139	2.540 (0.111)	0.040* (0.097)
YDCs	154	11	165		
Total	290	14	304		
Facility Type	**Substance-Related and Addictive Disorders: Cannabis Related (CR)**				
	No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
CRPs	90	49	139	11.238*** (0.000)	0.0002*** (0.0006)
YDCs	74	91	165		
Total	164	140	304		
Facility Type	**Substance-Related and Addictive Disorders: Stimulant Related (SR)**				
	No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
CRPs	138	1	139	5.557** (0.018)	0.0006*** (0.0007)
YDCs	154	11	165		
Total	292	12	304		

Note Table 11.

Externalizing Resources Disorders by Race Group

Association tests show that externalizing resources disorders are not related to race groups. Even though a table was not provided, it should be noted that 37% (71 juveniles), 27% (53 juveniles), 63% (122 juveniles), and 46% (90 juveniles) of Black/AA juveniles were diagnosed with ADHD, ODD, CD, and CR, respectively. The ratio of White juveniles who had CR is 49%. Higher number of juveniles (140 or 46% of the sample) were tested positive for Substance-Related and Addictive Disorders: Cannabis Related (CR) as in PITS 2020 and PITS 2021. This ratio was also 46% in PITS 2022.

Table 15. Externalizing Disorders by Sex at Birth

Sex at Birth	Attention-Deficit/Hyperactivity Disorder (ADHD)				
	No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
Female	37	11	48	2.822[*] (0.093)	0.024[*] (0.070)
Male	162	94	256		
Total	199	105	304		
Sex at Birth	**Conduct Disorder (CD)**				
	No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
Female	33	15	48	12.535[***] (0.000)	0.0001[***] (0.0003)
Male	102	154	256		
Total	135	169	304		

Note to Table 11.

Correlations between ACE Scores and Individual Internalizing/Externalizing Diagnoses

We simply looked at the correlation between ACEs scores and individual internalizing/externalizing disorders.

Correlation analysis show that ACEs scores are significantly, positively correlated with Bipolar, Major Depressive Disorder, Anxiety, Posttraumatic Stress Disorder, Acute Stress, Adjustment Disorder, and Posttraumatic Stress Syndrome that are internal resources disorders.

Conduct Disorder, and Alcohol and Cannabis use that are Substance-Related and Addictive Disorders from external resources disorders were found to be correlated with ACEs scores. When the sample is divided between CRP and YDC juveniles, significantly positive correlations except for Conduct Disorder were preserved within these groups for Anxiety and Acute Stress.

Among these individual disorders, only Conduct Disorder is negatively related with ACEs scores within the whole sample. This statistically significant negative relation is also observed among CRP juveniles and YDC juveniles. Conduct Disorder is a psychiatric condition characterized by persistent patterns of behavior that violate social norms, rules, and the rights of others. ACEs refer to traumatic events or experiences that occur during childhood, such as abuse (physical, emotional, or sexual), neglect (physical or emotional), household dysfunction (e.g., substance abuse, mental illness, domestic violence), or other significant stressors. Therefore, it is expected that youths with higher ACE scores are more likely to have Conduct Disorder. This result implies that **having higher ACEs scores (a higher risk for health, social and emotional problems later in life) might trigger this type of disorders among YDC or CRP juveniles**.

Psychotropic Medications Use

This section looks specifically into the distribution of Psychotropic Medications use by facility type, sex at birth and race group.

Table 16. Psychotropic Medications Use by Facility Type, Sex at Birth and Race Group

Facility Type	Psychotropic Medications Use				Association Tests		
	No	%	Yes	%	Total	Chi-sq. Stat.	Fisher's Exact Test Stat.
CRPs	113	81.3%	26	18.7%	139	16.027***	< 0.0001***
YDCs	98	59.4%	67	40.6%	165		
Total	**211**	**69.4%**	**93**	**30.6%**	**304**		
Sex at Birth	Psychotropic Medications Use				Association Tests		
	No	%	Yes	%	Total	Chi-sq. Stat.	Fisher's Exact Test Stat.
Female	23	47.9%	25	52.1%	48	11.226***	0.0004***
Male	188	73.4%	68	26.6%	256		
Total	**211**	**69.4%**	**93**	**30.6%**	**304**		
Race	Psychotropic Medications Use				Association Tests		
	No	%	Yes	%	Total	Chi-sq. Stat.	Fisher's Exact Test Stat.
Black/AA	146	75.3%	48	24.7%	194	11.226***	0.0004***
White	40	57.1%	30	42.9%	70		
Total	**186**	**70.5%**	**78**	**29.5%**	**264**		

No to Table 11.

Two other areas of interest regarding Psychotropic Medications are with regards to facility type, specifically within a YDC, and sex at birth (Table 16). From our sample, 67 (approximately 41%) of the youth committed to YDC at the time of the survey were prescribed with Psychotropic Medications, whereas only 26 (about 19%) of youth in a contracted residential site were prescribed with the same medications. Both chi-square and Fisher's test statistics show that there is an association between facility type and Psychotropic Medications use at 1% significance level. The calculated odds ratio implies that YDC juveniles are significantly 3 times as likely to use Psychotropic Medications than CRP juveniles.

Regarding Psychotropic Medications use and sex at birth, females have a higher rate of using Psychotropic Medications (about 52%) than males (about 27%).[5] However, **the ratio of male juveniles who are on the use of medication is higher than female juveniles within the whole sample**. Even though both test statistics provide strong evidence that Psychotropic Medications use is associated to sex at birth, the calculated odds ratio implies that male juveniles are significantly 0.33 times as likely to use Psychotropic Medications than female juveniles.

The report specifically looks at the distribution of juveniles who have used Psychotropic Medications by sex at birth between facilities. Summary of the sample is given in Table 17.

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[5] In PITS 2021 and 2022, the ratio of females was also higher than males who used Psychotropic Medications.

Table 17. Psychotropic Medications Use by Sex at Birth across Facilities

	Sex at Birth		
Facility Type	Female	Male	Total
Contracted Residential Site	11	15	26
Youth Development Center	14	53	67
Total	25	68	93

A total of 93 juveniles were prescribed Psychotropic Medications. Among them, the count of male juveniles at YDCs is 3.5 times greater than the count of juveniles at CRPs.

Regarding Psychotropic Medications use and race, White juveniles have a higher rate of using Psychotropic Medications (about 43%) than Black/AA juveniles (about 25%). While both test statistics provide strong evidence that Psychotropic Medications use is associated to being Black/AA and White juveniles, the calculated odds ratio implies that **White juveniles are significantly 3 times as likely to use Psychotropic Medications than Black/AA juveniles**.

Distribution of ACEs score by medication use was also examined. **The mean ACEs score for youth not on Psychotropic Medications is 2.9, whereas the youth who are prescribed Psychotropic Medications have a mean ACE Score of 3.9.** This difference is in fact statistically significant, meaning there is enough evidence to suggest that there is a measurable difference in ACEs Scores on average for youth who are taking Psychotropic Medications compared to youth who are not, according to t-test, and Kolmogorov-Smirnov two-sample tests.

We also examined how the ACEs scores of youths using psychotropic medications varied depending on the type of facility. We observed that the ACEs scores of juveniles who are taking psychotropic medications, whether committed to CPR or YDC, do not significantly differ.

When examining the impact of Psychotropic Medications usage on ACEs scores among male and female juveniles, it was found that half of the surveyed female juveniles were using these medications, with an average ACEs score of 5.2. However, despite an average ACEs score of 3.3 for female juveniles not using Psychotropic Medications, there was no statistically significant difference. Similar results were observed among male juveniles. There were also no statistically significant differences between Black/AA and between White juveniles in terms of their ACEs scores.

Raise the Age Juveniles

As a continuation of the analysis of ACEs Scores and mental health of the juveniles sampled for this analysis, this section aims to discuss the Raise the Age distribution and how this may or may not relate to the ACEs scores. Of the 304 youth whose ACEs scores and diagnoses information were recorded, 291 were matched to their juvenile profile in NCJOIN, which was necessary in identifying which juveniles were flagged as Raise the Age juveniles (hereby RtA and non-RtA) and which were not (on the sample date of December 31, 2023).[6]

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[6] Due to errors occurred in entering juvenile ID numbers in the survey.

For youth who is in the non-RtA (*n* = 159):

- 25 (15.7%) were female
- 134 (84.3%) were male
- 88 (55.3%) were in CRPs
- 71 (44.7%) were in YDCs

For individuals who is in the RtA (*n* = 132):

- 17 (or 12.9%) were female
- 115 (or 87.1%) were male
- 42 (or 31.8%) were in CRPs
- 90 (or 68.2%) were in YDCs

Frequency distribution of ACEs scores were given in Figure 6. Mean, median and mode values of ACEs scores for non-RtA juveniles are 2.8 (with 2.6 standard deviation), 2 and 1, respectively. The same central tendency measures are 3.5 (with 2.5 standard deviation), 3 and 2, respectively for RtA juveniles. For RtA juveniles, the coefficient of variation of 0.92 indicates a high degree of variability in ACEs scores relative to the mean. This suggests that ACEs scores among RtA juveniles are widely dispersed around the average, indicating a diverse range of experiences among this group. For non-RtA juveniles, the coefficient of variation of 0.71 indicates a lower degree of variability in ACEs scores relative to the mean compared to RtA juveniles. This suggests that ACEs scores among non-RtA juveniles are less dispersed around the average, indicating a narrower range of experiences among this group. **Both *t*-test and Kolmogorov-Smirnov two-sample test did not provide evidence that the average ACEs scores of RtA juveniles significantly differ from the average ACEs scores of non-RtA juveniles.**
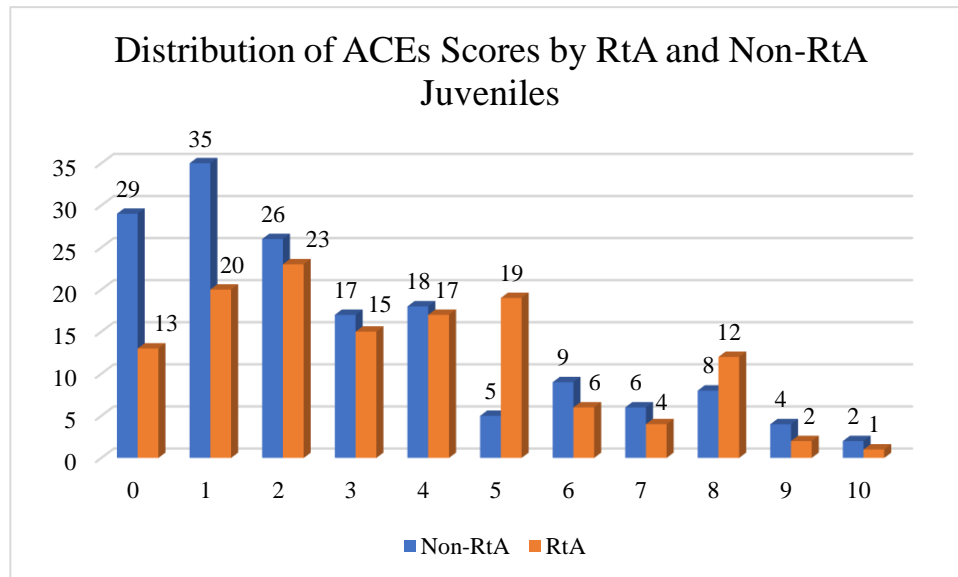

Figure 7. Distribution of ACEs Scores by RtA Flag

Below is a summary of the survey data regarding the occurrence of disorders related to internalizing and externalizing resources by age groups.

- The total number of diagnoses assigned to each juvenile ranges from 0 to 12, with an average of 3 diagnoses for both non-RtA and RtA juveniles. There is not enough

evidence that shows average number of total diagnoses between these two age groups are different in their own population.

- Average number of total internalizing diagnoses is 1.2 for both non-RtA and RtA groups. Test results show that there is no statistically significant difference between RtA and non-RtA juveniles in terms of internalizing disorder counts.
- Both RtA and non-RtA juveniles were diagnosed mostly with two different external disorders. Observing juveniles who had more than three different disorders is not likely in the studied sample. There is no statistically significant difference between the non-RtA and RtA groups regarding externalizing diagnoses.

Upon examining the utilization of Psychotropic Medications across different age groups, we noted that 51 out of 87 juveniles (59%) who are using these medications are non-RtA youth, while 36 (41%) are RtA juveniles. However, the relates tests do not indicate any statistically significant correlation between the use of Psychotropic Medications and the population affected by the Raise the Age.

In conclusion, **there does not appear to be much significance between the non-RtA and RtA populations regarding their Adverse Childhood Experiences. However, being classified as a YDC juvenile and being a female juvenile are factors associated with whether an individual is categorized as RtA or non-RtA**.

Conclusion

The Division of Juvenile Justice and Delinquency Prevention Research Team has been working with Juvenile Clinical Services to provide an analysis of the ACEs of youth in North Carolina since 2020 by collecting the related data. A recent data set of juveniles who were in CRPs and YDCs on December 31, 2023 were collected by the Point in Time Survey 2023. The survey offered information on the demographics, sex at birth, and ACEs scores of juveniles. It also focused on whether juveniles have received a diagnosis for one or more internalizing and externalizing disorders and their associations with type of facility, sex at birth and race/ethnicity.

A summary of key findings obtained from 304 juveniles follows.

- The risk of having health, social, and emotional problems increase with increasing ACEs score**. In the sample, even though ACEs scores are distributed around between 2 and 3, there are juveniles who have higher ACEs scores (approximately 39%) that cannot be neglected.**
- **Central tendency measures of ACEs scores for both YDCs and CRPs youth showed that ACEs scores of these two groups are statistically different on average (CRP: 2.7 and YDC: 3.5).**
- The average ACEs scores of females significantly differs from the average ACEs scores of males. **Females' ACEs score (4.3 points) is on average higher than males' score (2.9 points).**
- Although it is likely to observe a high average ACEs score for Black/African American juveniles, **average ACEs scores of White/Caucasians juveniles (3.8 points) is greater than average ACEs scores of Black/African Americans juveniles (2.8 points).**
- **The percentage of youth in a YDC with at least one mental health diagnosis is 98.2%.** For those with at least two or more diagnoses, the percentage is 92.7%.

Moreover, 71.5% of YDC youth have been diagnosed with at least three mental health conditions.

- o **The percentage of youth in a CRP with at least one mental health diagnosis is 92.8%.** For those with at least two or more diagnoses, the percentage is 77.7%. Moreover, 47.5% of YDC youth have been diagnosed with at least three mental health conditions.
- o **Juveniles committed to YDCs are more likely to be diagnosed by externalizing disorders than the juveniles who were in CRPs.**
- o **While 64% of juveniles were diagnosed with at least one type of internalizing disorders, 88% of them were diagnosed with at least one type of externalizing disorders.**
- o Black/AA juveniles are more likely than other juveniles to be diagnosed with both internalizing and externalizing resource disorders.
- o When internalizing disorders were analyzed individually, it was observed that **there is a significant association between facility type and being diagnosed with PTSD and PTSS. The likelihood is slightly higher for juveniles who were committed to YDCs.**
- o **The sex of juveniles may have a role in Major Depressive Disorder and PTSD development.**
- o The sample of juveniles showed that race of juveniles affects their diagnoses for **Anxiety** and **Major Depressive disorders.**
- o When externalizing disorders were analyzed individually, Conduct Disorder (CD), Antisocial Personality Disorder/Traits (APDT) with Cannabis and Stimulant use have a significant relationship with facility type. **YDC facilities are likely to have juveniles diagnosed with one of these external disorders.**
- o **Conduct Disorder (CD) is associated with the sex of juveniles, and it is significantly observed among male juveniles.**
- o There is no association between two-level race group and externalizing disorders.
- o **Psychotropic Medications use differs between female and male and CRP and YDC juveniles.**
- o **The average ACEs scores of non-RtA juveniles does not differ from the average ACEs scores of RtA juveniles.**

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APPENDIX: Glossary of Statistical Terms

This report used the basic statistical analysis tools in order to understand the PITS 2023 data. These tools can be classified under summary statistics with central tendency and distribution measures, mean equality tests, contingency tables.

Mean: The mean is the average of a set of numbers.

Median: The median is the middle value in a set of numbers when they are arranged in ascending or descending order. If there is an even number of values, the median is the average of the two middle values.

Mode: The mode is the value that appears most frequently in a dataset. A dataset may have one mode (unimodal), two modes (bimodal), or more (multimodal).

Standard Deviation: The standard deviation is the square root of the variance. It provides a measure of the dispersion or spread of the data points around the mean.

Coefficient of Variation: It measures the relative variability of a dataset compared to its mean. A higher value indicates greater variability relative to the mean, while a lower value suggests less variability.

Normality Test: These tests are statistical methods used to determine whether a given dataset follows a normal distribution, which is characterized by a bell-shaped curve. They are crucial in many statistical analyses, as they help assess the appropriateness of parametric statistical techniques that assume normality. Two commonly used normality tests are the Shapiro-Wilk test and the Kolmogorov-Smirnov test.

- o The Shapiro-Wilk calculates a test statistic based on the correlation between the observed data and the expected values under a normal distribution. The null hypothesis of the Shapiro-Wilk test is that the data are normally distributed. If the *p*-value resulting from the test is less than a chosen significance level (1%, 5% and 10%), the null hypothesis is rejected, indicating that the data are not normally distributed.
- o The Kolmogorov-Smirnov test assesses whether a dataset follows a specified distribution, such as the normal distribution. It compares the cumulative distribution function (CDF) of the dataset with the theoretical CDF of the specified distribution. The null hypothesis is that the dataset follows the specified distribution. If the resulting test statistic is greater than the critical value at a chosen significance level, the null hypothesis is rejected, suggesting that the dataset deviates significantly from the specified distribution which is normal in this case.

Mean Equality Test: It is a statistical procedure used to determine whether the means of two or more groups are statistically different from each other. These tests are commonly employed in research to assess whether there is evidence to support the claim that the population means of two or more groups are equal. There are several types of mean equality tests, each suited for different scenarios and assumptions about the data.

- o The Student's *t*-test is used to compare the means of two independent groups. It assumes that the data are normally distributed and that the variances of the two groups can be equal or not.
- o When the normality assumption is not satisfied, the Kolmogorov-Smirnov test (KS test) that is a nonparametric test can be preferred. This test compares the cumulative distribution functions of two samples. It is often employed to assess whether two datasets come from the same distribution, without making any assumptions about the underlying distribution of the data. The test calculates the maximum difference (D statistic) between the empirical distribution functions of the two samples, and then compares it to a critical value from the Kolmogorov-Smirnov distribution to determine if the observed difference is statistically significant. The null hypothesis for this test is that the two samples are drawn from the same continuous distribution. If the calculated D statistic exceeds the critical value at a specified significance level (e.g., $\alpha = 0.05$), the null hypothesis is rejected, indicating that there is evidence to suggest that the two samples come from different distributions.

Contingency Tables: They are used to examine relationships between categorical variables. In this report, they are used to examine associations between individual internal/external diagnoses and demographics. Both chi-square test statistics and Fisher's exact test statistics are the most used ones.

- o Cochran's well-known rule of thumb about the minimum expected value needed for using the chi-square distribution as an adequate approximation to that of Pearson's chi-square statistic when testing independence was used. According to Cochran's Rule, "for tables with more than a single degree of freedom (cross tables have higher dimensions than 2×2), a minimum expected frequency of 5 can be regarded as adequate. Hays (1973: 736) noted that when there is only a single degree of freedom (2×2-dimension), a minimum expected frequency of 10 is much safer. As a result, the contingency tables were not included in this report if the expected counts for more than 25% of the cells were less than 5. Cochran (1952: 334) and Cochran (1954:420) suggested that to use chi-square statistic corrected for continuity if sample size is greater than 40 (Kroonenberg and Verbeek, 2018). Due to the small sample size (304), continuity adjusted chi-square statistics were used to determine the significance of the associations between the variables and provided in the relevant tables. To check the robustness of the results for association between the variables, Fisher's exact test statistics were also reported due to having a small sample size. High chi-square values and Fisher's values close to zero lead us to reject the null hypothesis that there is no association between two categorical variables.
- o Like chi-square test statistics, odds ratios are another way of measuring the strength of an association for categorical data sets. The odds ratio is a measure of how strongly an internal/external disorder is associated with demographic factors. As can be seen from the related tables, the number of being diagnosed with one type of internal/external disorder is smaller than those of not being diagnosed. For this reason, the odds ratios were not specifically reported in the related tables. However, it was noted within the text when the 99% confidence interval calculated for the odds ratios is not wide for a specific disorder.
- o This report presents the results if the association between the variables are statistically significant. It must be noted that statistical significance of the associations between the variables were reported under the traditional significance levels (1%, 5%, and 10%).

Kendall's tau-b Test: It is a non-parametric measure of association for ordinal variables. This test is appropriate for assessing the strength and direction of the relationship between two ordinal variables, including cases where one variable is ordinal and the other is binary. Kendall's tau-b does not assume linearity and is robust to outliers and non-normality.