Juvenile Justice and
Delinquency Prevention
NC DEPARTMENT OF PUBLIC SAFETY

Adverse Childhood Experiences of Juveniles in North Carolina
Point in Time Survey Results – 2024

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, 2024. 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 3.4 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 **18% of juvenile were female, while 82% were male. Among these juveniles, 93% were aged between 12 and 20. Additionally, 59% of them were identified as Black or African American, whereas 26% were identified as White or Caucasian**.
- o **The sample consists of 151 juveniles from CRP and 173 juveniles from YDC.** Among YDC juveniles, 47% resided in Edgecombe and Lenoir, while 62% of CRP juveniles were in Ecker Candor, Ecker Boomer, Eckerd Kerr Lake, and Eckerd Yanceyville.
- o **Only 13% of juveniles in YDC or CRP had an ACEs score of 0**. **The average ACEs score was 3.4**. **CRP and YDC youth are statistically different in terms of their mean ACEs scores (CRP: 3.1 and YDC: 3.7)**. Even though the proportion of female youths is much lower than male youths, **females have statistically significant higher ACEs scores than males on average (5.6 versus 2.9)**. **Average ACEs score is significantly different between White (4.6) and non-White (3.0) 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 95.4% of youth in CRPs or YDCs. While 69% of the sample has at least one internalizing disorder, 83% 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 1.4 and 1.9, 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 Bipolar and related disorders, Disruptive Mood, Posttraumatic Stress Disorder and Posttraumatic Stress Symptoms.
- o Most juveniles diagnosed with externalizing disorders (82.7%), whether YDC or CRP youths, were primarily **diagnosed with 1 or 2 distinct externalizing disorders (53%)**. Oppositional Defiant Disorder, Intermittent Explosive Disorder, Conduct Disorder, Antisocial Personality Disorder/Traits, Substance-Related and Addictive Disorders: Alcohol and Cannabis Related are the diagnoses associated with facility type among externalizing disorders.
- o Among internalizing disorders, **Major Depressive** and **Posttraumatic Stress Disorder affect female juveniles more than male juveniles, with females more likely to experience Posttraumatic Stress Disorder. Anxiety** and **Major Depressive disorders affect White or Caucasian juveniles more than Black or African American juveniles**.
- o **Sex at birth is associated with having Conduct Disorder and Cannabis use among externalizing disorders. A statistically significant association was found between being Black/AA or White juvenile and Attention-Deficit/Hyperactivity Disorder, Conduct Disorder**

and **Alcohol-Related and Addictive Disorders**.

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 4.5, which is 1.8 point higher than the score for youth who are not prescribed this class of medication**. **Among Black/AA juveniles, average ACEs scores statistically significantly differed between those who use psychotropic medications (4) and those who do not (2.3)**.

o About 39% of the sample consists of Raise the Age (RtA) population and 89% 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, **72% were committed to YDCs while 28% were placed in CRPs as of December 31, 2024**. **The average number of total mental health diagnoses for juveniles is approximately 3.2 for non-RtA and 3.7 for 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, 2024**. 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 324 juveniles were gathered. A quick description of the survey data is given below.

PITS 2024 Data by Sex at Birth

18.2%, **59**

81.8%, **265**
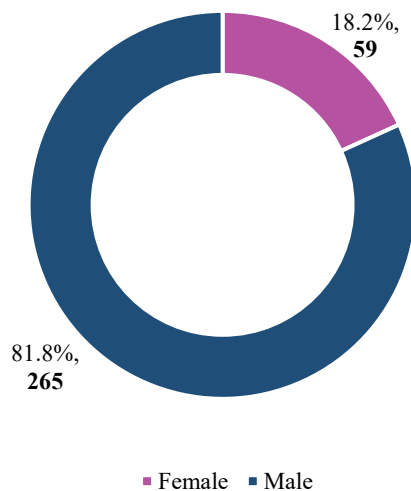
- Female - Male

PITS 2024 Data by Current Age

27.6%, **89**

24.8%, **80**

18.0%, **58**

12.1%, **39**

10.8%, **35**

1.2%, **4**   2.5%, **8**   2.5%, **8**   0.6%, **2**

12 13 14 15 16 17 18 19 20

PITS 2024 Data by Race

Race	Percentage, Count
Black or African American	59.3%, **192**
White or Caucasian	26.2%, **85**
Multiracial or Biracial	8.0%, **26**
Hispanic or Latino	5.6%, **18**
Asian or Pacific Islander	0.6%, **2**
Native American or Alaskan Native	0.3%, **1**
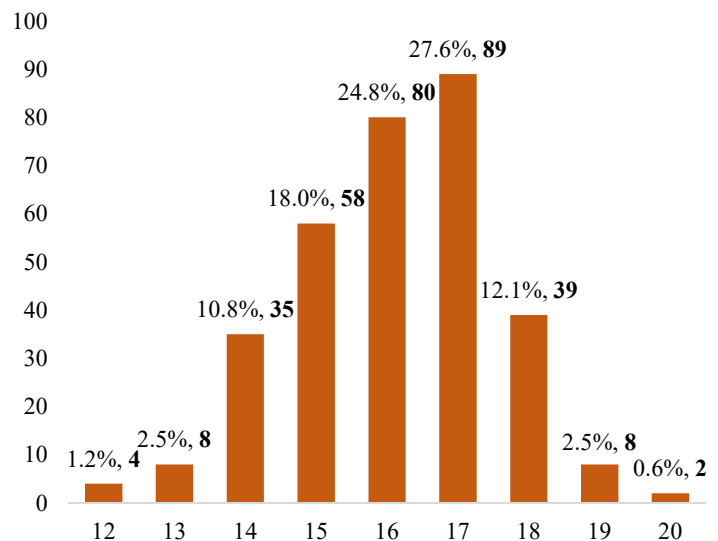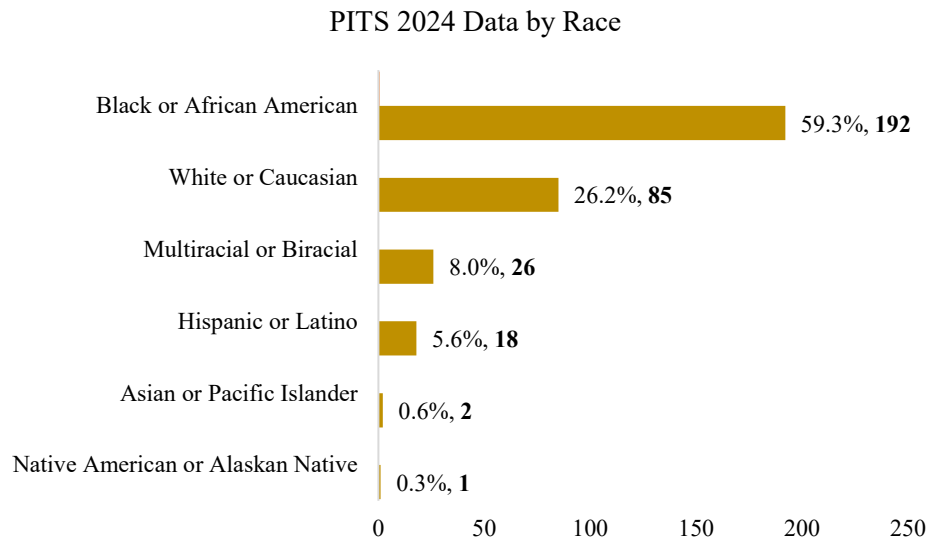
Figure 1. Distribution of PITS 2024 Data by Sex at Birth, Race and Current Age

18% of juvenile delinquents were female, while 82% were male. Among these juveniles, 93% were aged between 14 and 18. Additionally, 59% of them were identified as Black or African American, whereas 26% were identified as White or Caucasian (Figure 1).

Distribution of PITS 2024 Data by Facility

- 46.6%, 151 — Contracted Residential Site
- 53.4%, 173 — Youth Development Center

Distribution of PITS 2024 Data by YDC Facilities

Facility	Percentage, Count
Cabarrus YDC	31.2%, **54**
Chatham YDC	16.2%, **28**
Edgecombe YDC	23.1%, **40**
Lenoir YDC	23.7%, **41**
Rockingam YDC	10
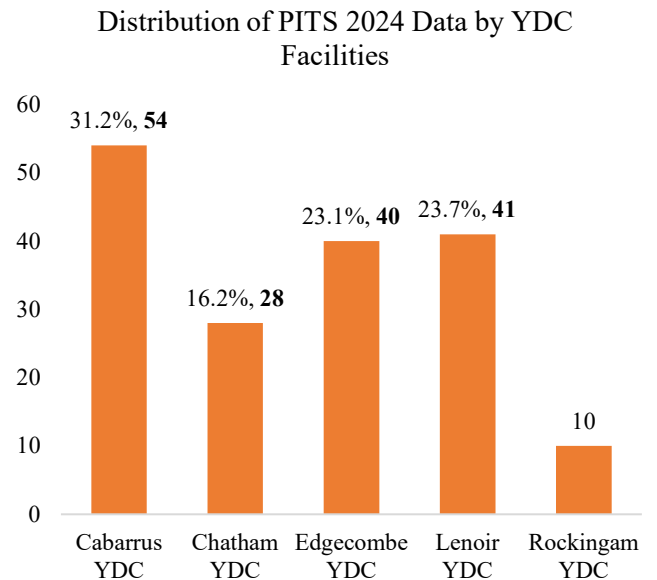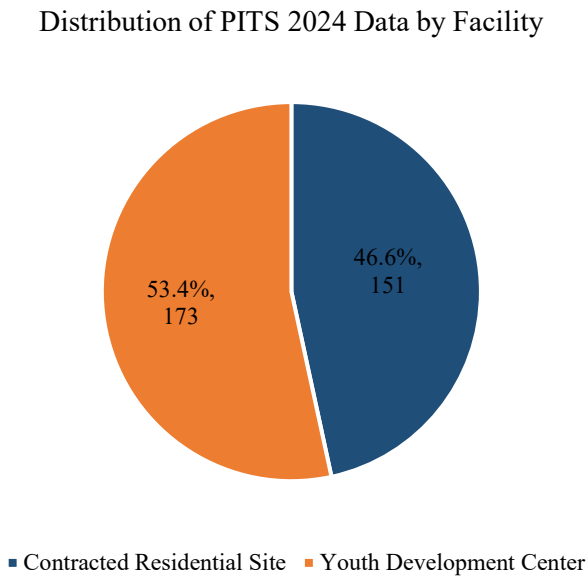
Distribution of PITS 2024 Data by CRP Facilities

Facility	Percent, Count
Eckerd Candor	19.9%, **30**
Eckerd Boomer	19.2%, **29**
Eckerd Kerr Lake	12.6%, **19**
Eckerd Yanceyville	9.9%, **15**
Macon Multi-Purpose Juvenile Home	5.3%, **8**
Wayne Multi-Purpose Juvenile Home	4.0%, **6**
Eastern Area Crisis and Assessment Center	4.0%, **6**
Craven Transitional Living	4.0%, **6**
Insight Crisis and Assessment Center	3.3%, **5**
Chowan Multi-Purpose Juvenile Home	3.3%, **5**
The Farm Transitional Living Home	2.6%, **4**
North Hills Transitional Living	2.6%, **4**
Hertford Multi-Purpose Juvenile Home	2.6%, **4**
Bridges Crisis and Assessment Center	2.6%, **4**
Western Area Crisis and Assessment Center	2.0%, **3**
Robeson Multi-Purpose Juvenile Home	2.0%, **3**

Figure 2. Distribution of PITS 2024 Data by Facilities

The sample consists of 151 juveniles from CRP and 173 juveniles from YDC. Among the YDC juveniles, 31% lived in Cabarrus YDC, while approximately 47% resided in Edgecombe and Lenoir YDCs. On the survey day, Chatham YDC accommodated 28 juveniles. Among CRP facilities, 62% of juveniles accommodated by Ecker Candor, Ecker Boomer, Eckerd Kerr Lake and Eckerd Yanceyville (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 reports the frequency distribution of ACEs scores while Figure 3 visualizes this distribution for all 324-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 3.4 average value. Median and mode values of ACEs scores are 3 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

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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.

40.4%, 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 3 and 3.5, there is a group of juveniles who have high-risk on health, social and emotional challenges that cannot be neglected.**

Table 1. Frequency Distribution of ACEs Scores

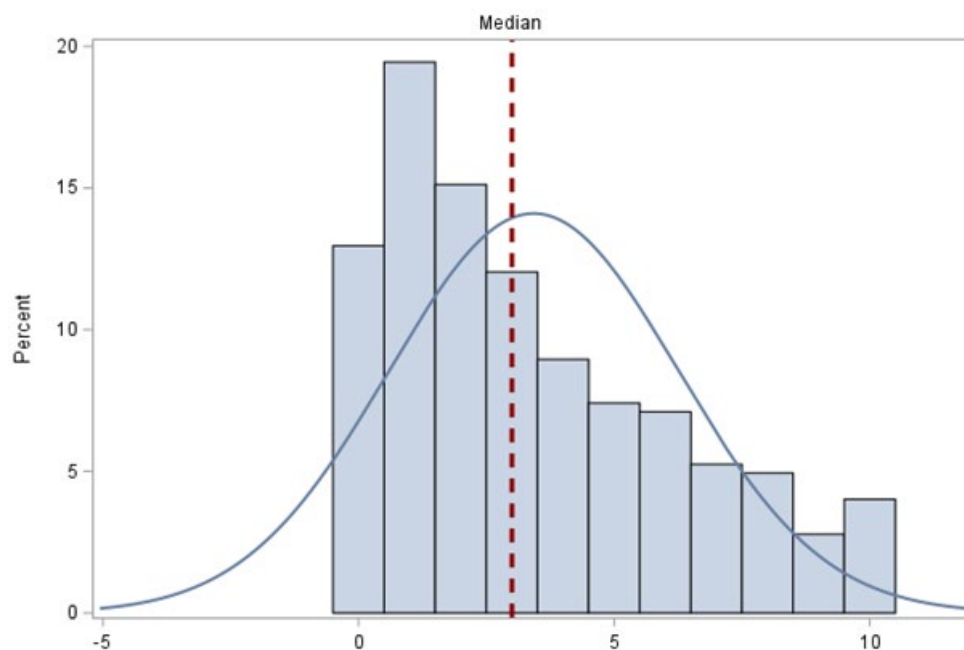| ACEs Scores	Frequency	%	Cum. %
0	42	13.0	13.0
1	63	19.4	32.4
2	49	15.1	47.5
3	39	12.0	59.6
4	29	9.0	68.5
5	24	7.4	75.9
6	23	7.1	83.0
7	17	5.2	88.3
8	16	4.9	93.2
9	9	2.8	96.0
10	13	4.0	100.0
Total	**324**		

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 47% of the juveniles were in CRPs, 53% were committed to YDCs on December 31, 2024. The mode of ACEs scores – the most repeated ACEs score – is 1 for juveniles placed in CRPs that is 20.5% of the sample population. The mode of ACEs scores for YDC juveniles is 1. **Arithmetic average of ACEs scores is 3.7 for juveniles at YDCs and 3.1 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 about mean difference between these two juvenile populations. The sample standard deviations of the ACEs scores between facilities were found to be 3.02 points for CRPs and 2.63 points for YDCs. The coefficient of variation highlights a higher relative variability for ACEs scores among CRP youth (0.96 vs 0.72).[2]
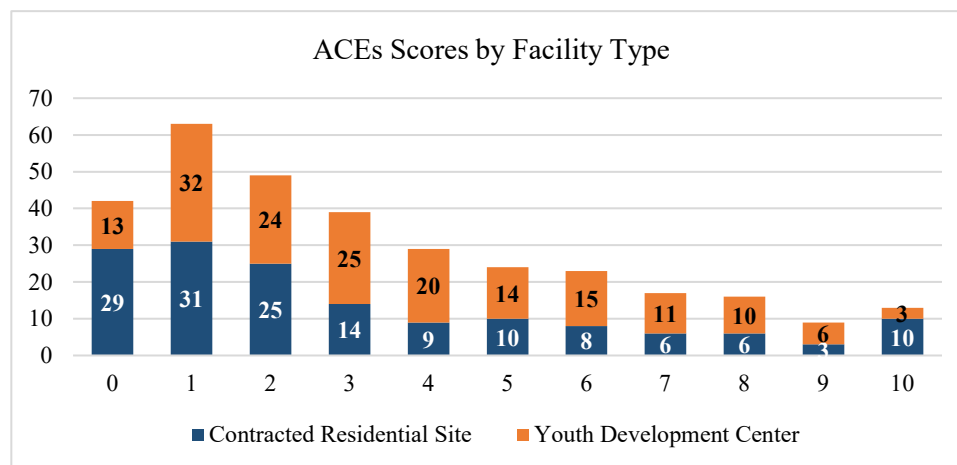
Figure 4. Distribution of ACEs Scores by Facility Type

ACEs Scores by Sex at Birth

Regarding demographics, there are 59 females surveyed compared to 264 males and 1 transsexual youth – (about 18% females to 82% males). **It is clear that females scored higher on average than males, with a mean score of 5.6 (which is higher than last year's average) compared to 2.9 (the same as in PITS 2023). This difference is statistically significant at the 1% level and aligns with the trends observed in the data from December 2020, 2021, 2022, and 2023.**

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

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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. In PITS 2023 survey, we found that ACEs scores of juveniles committed to YDCs, and CRPs were significantly different between these two populations.

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	2	3.4	40	15.1	42
1	3	5.1	60	22.6	63
2	5	8.5	44	16.6	49
3	10	16.9	29	10.9	39
4	4	6.8	25	9.4	29
5	4	6.8	20	7.5	24
6	5	8.5	18	6.8	23
7	7	11.9	10	3.8	17
8	6	10.2	10	3.8	16
9	3	5.1	6	2.3	9
10	10	16.9	3	1.1	13
Total	59	**18.2**	265	**81.8**	324

ACEs Scores by Race/Ethnicity

Frequency distribution of ACEs scores by race is summarized in Table 3. As the table shows, approximately 59% and 26% of the sample is Black or African American and White or Caucasian, respectively. The mode of ACEs scores for both Black or African American and White or Caucasian juveniles is 1 while it is 2 for Hispanic or Latino youth. Juveniles who Asian or Pacific Islander, Multiracial or Biracial, and Native American or Alaskan Native cover approximately 9% of 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 White or Caucasian juveniles. White/Caucasian juveniles had a mean score of 4.6 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. Average ACEs scores between White and non-White juveniles are found to be statistically significant. However, when we split the samples into Black or African American and White juveniles versus others, there is no statistically significant differences in average ACEs scores between these two groups. Notably, average ACEs scores are higher for juveniles who are White or Caucasian.

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	33	17.2	2	11.1	4	15.4	0	0.0	3	3.5	42
1	1	50.0	45	23.4	2	11.1	3	11.5	0	0.0	12	14.1	63
2	0	0.0	31	16.1	3	16.7	3	11.5	0	0.0	12	14.1	49
3	0	0.0	25	13.0	1	5.6	4	15.4	1	100.0	8	9.4	39
4	0	0.0	15	7.8	3	16.7	3	11.5	0	0.0	8	9.4	29
5	1	50.0	9	4.7	2	11.1	1	3.8	0	0.0	11	12.9	24
6	0	0.0	11	5.7	3	16.7	3	11.5	0	0.0	6	7.1	23
7	0	0.0	9	4.7	0	0.0	1	3.8	0	0.0	7	8.2	17
8	0	0.0	5	2.6	2	11.1	1	3.8	0	0.0	8	9.4	16
9	0	0.0	3	1.6	0	0.0	2	7.7	0	0.0	4	4.7	9
10	0	0.0	6	3.1	0	0.0	1	3.8	0	0.0	6	7.1	13
Total	2		192		18		26		1		85		
%[b]	0.6%		59.3%		5.6%		8.0%		0.3%		26.2%		**324**

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

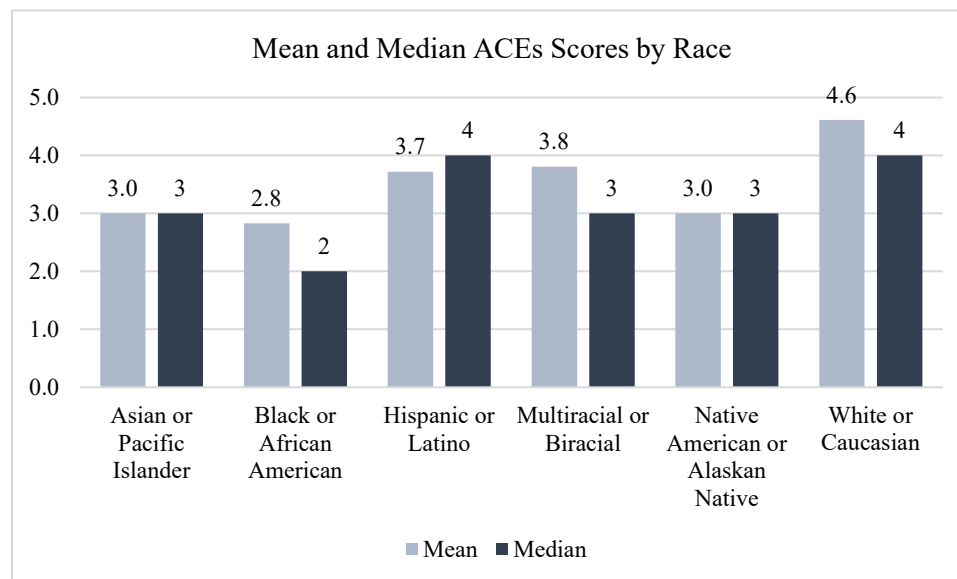Figure 5. Graph of Central Tendency Measures of ACEs Scores by Race

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[3]),
- 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 2024 data, 14% of juveniles were diagnosed with only one mental health disorder. Additionally, approximately 20% of youths, equating to 64 individuals, were diagnosed with two distinct disorders. Furthermore, almost 60% of the youth population received diagnoses for three to eight disorders. Instances of juveniles presenting with nine or more distinct mental health disorders are relatively uncommon (please see Figure 6). In sum, **95.4 % of the juveniles were diagnosed with 1 or more mental health disorders.**

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 3.4. The maximum count observed is 23 disorders (see footnote #3).

YDCs have a higher average total diagnosis count (4.2) compared to CRPs (2.6). The range of diagnosis counts is wider in CRPs, ranging from 0 to 23 diagnoses, compared to 0 to 11 diagnoses in YDCs.

There is a difference in the average total diagnosis count between females (4.0) and males (3.3). The range of diagnosis counts is wider among females, with counts ranging from 0 to 23 disorders, compared to males with counts ranging from 0 to 11 diagnoses.

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[3] In PITS 2024, respondents were allowed to select multiple Specific Learning Disorders options (reading, written expression, mathematics, or none of the above). As a result, if a juvenile has one or more Specific Learning Disorders, it impacts the total count of internal disorders or diagnoses for that juvenile.
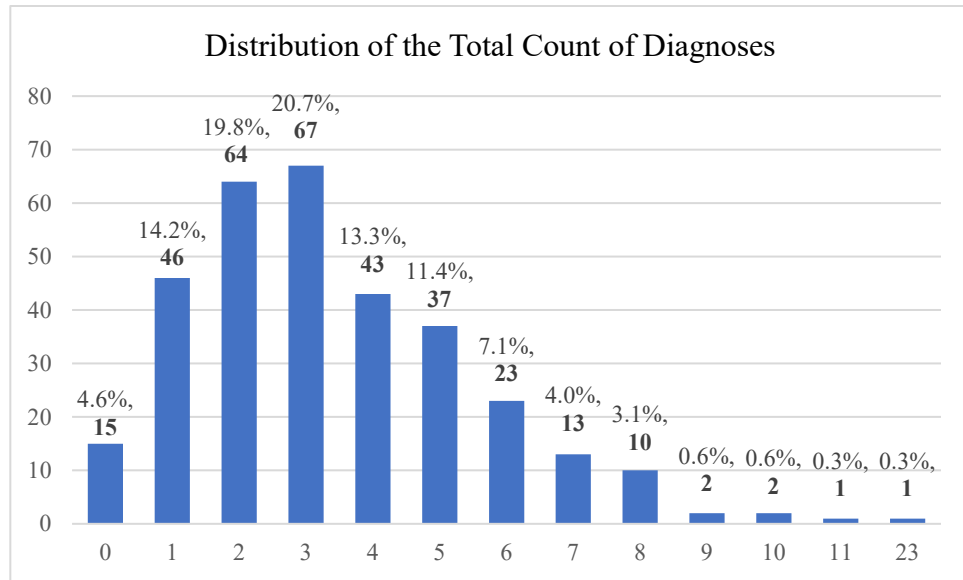
Figure 6. Frequency Distribution of the Total Count of Diagnoses

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

Statistics	# of Obs	Mean	Median	Std Dev	Minimum	Maximum
Total Diagnosis	324	3.4	3	2.4	0	23
Facility Type						
Contracted Residential Site	151	2.6	2	2.2	0	23
Youth Development Center	173	4.2	4	2.3	0	11
Sex at Birth						
Female	59	4.0	3	3.3	0	23
Male	265	3.3	3	2.1	0	11
Race						
Black or African American	192	3.3	3	2.1	0	10
Hispanic/Latino	18	2.8	2	1.6	1	6
Other	3	2.7	2	2.1	1	5
Two + Races	26	4.2	3	4.5	0	23
White	85	3.7	3	2.2	0	10

Black or African American juveniles have an average total diagnosis count of 3.3, ranging from 0 to 10. Hispanic/Latino juveniles have an average total diagnosis count of 2.8, with a norrow range of diagnoses counts (ranging from 1 to 6). Two + Races category youths have the highest average total diagnosis count (4.2), with counts ranging from 0 to 23 diagnoses. Juveniles identified under other races have an average total diagnosis count of 2.7, with counts ranging from 1 to 5 diagnoses. White individuals have an average total diagnosis count of 3.7, with counts ranging from 0 to 10 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. The test did not yield significant results for sex at birth or binary race categories (white/non-white, black/non-black, black or white/others).

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, **224 out of 324 juveniles had at least one type of internalizing disorder diagnosed**. 81.5% of those juveniles, diagnosed with an internalizing disorder, were committed to YDCs while 55% were in a CRPs. **82.7% of juveniles were diagnosed with at least 1 externalizing disorder.** Juveniles with externalizing disorders make up about 82.1% of those in CRPs and 83.2% 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.**

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

Facility Type	Internalizing Sources	%	Externalizing Sources	%	Total
CRPs	83	55.0%	124	82.1%	151
YDCs	141	81.5%	144	83.2%	173
Total	224	69.1%	268	82.7%	324

When looking at the specific counts for internalizing diagnoses, **31% of the youth – 100 out of 324 juveniles – had no diagnosed internalizing disorder** (see Table 6 below). Within CRPs, about 35% of juveniles were diagnosed with 1 internalizing disorder, compared to 18.5% of YDC youth who meet that same criterion and 12% of CRP youth have 2 internalizing disorders, while this rate is 20.2% among YDC youth. The ratio of juveniles who are diagnosed with 3 or more unique internalizing disorders is 7.9% for CRP youth and 27.2% for YDC youth. **Juveniles who have 3 or more different internalizing disorders were mostly committed to YDCs.**

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 3. However, out of a possible 8 different externalizing disorders, **having a juvenile who was diagnosed with any 2 of the externalizing disorders is higher among CRP youth**.

Table 6. Internalizing and Externalizing Diagnosis Counts by Facility Type

Internalizing Diagnoses Count	CRPs	%	YDCs	%	Total	Externalizing Diagnoses Count	CRPs	%	YDCs	%	Total
0	68	45.0%	32	18.5%	100	0	27	17.9%	29	16.8%	56
1	53	35.1%	59	34.1%	112	1	44	29.1%	30	17.3%	74
2	18	11.9%	35	20.2%	53	2	56	37.1%	42	24.3%	98
3	9	6.0%	18	10.4%	27	3	22	14.6%	36	20.8%	58
4	2	1.3%	17	9.8%	19	4	1	0.7%	23	13.3%	24
5	0	0.0%	8	4.6%	8	5	0	0.0%	8	4.6%	8
6	0	0.0%	2	1.2%	2	6	0	0.0%	4	2.3%	4
7	0	0.0%	2	1.2%	2	7	0	0.0%	1	0.6%	1
14	1	0.7%	0	0.0%	1	9	1	0.7%	0	0.0%	1
Total	151		173		324	**Total**	151		173		324

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 (265) compared to number of females surveyed (59). That said, there is a noticeable difference between the distribution of number of diagnoses for the two sexes. For internalizing diagnoses, 85% of females and 66 of males had at least 1 internalizing diagnosis. The number of male juveniles who had at least 1 externalizing diagnosis is 219, or 83% of the male sample. This ratio is 83% 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	50	84.7%	49	83.1%	59
Male	174	65.7%	219	82.6%	265
Total	224	69.1%	268	82.7%	324

The survey findings regarding the diversity of diagnoses that juveniles received are shown in Table 8. 100 out of 324 youths – 91 male and 9 female juveniles – were not diagnosed with any specific internalizing disorders. While 34% of male juveniles were diagnosed with 1 type of internalizing disorder, approximately 16% of them had 2 different individual internalizing disorders. 17% 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 (10 females and 46 males). Mode of the counts for externalizing and externalizing disorders is 1 for females and it is 1 and to for male youth, respectively. **Having more than 4 different internalizing and externalizing disorders is less likely among male juveniles compared to female 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	9	15.3%	91	34.3%	100	0	10	16.9%	46	17.4%	56
1	23	39.0%	89	33.6%	112	1	20	33.9%	54	20.4%	74
2	10	16.9%	43	16.2%	53	2	9	15.3%	89	33.6%	98
3	8	13.6%	19	7.2%	27	3	11	18.6%	47	17.7%	58
4	7	11.9%	12	4.5%	19	4	6	10.2%	18	6.8%	24
5	1	1.7%	7	2.6%	8	5	2	3.4%	6	2.3%	8
6	0	0.0%	2	0.8%	2	6	0	0.0%	4	1.5%	4
7	0	0.0%	2	0.8%	2	7	0	0.0%	1	0.4%	1
14	1	1.7%	0	0.0%	1	9	1	1.7%	0	0.0%	1
Total	**59**		**265**		**324**	**Total**	**59**		**265**		**324**

Race/Ethnicity

As mentioned above, it is important to note the difference in the number of juveniles per each race in the sample of 324. 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. Black/AA has the highest percentage of both internalizing (57.6%) and externalizing (59.3%) diagnoses, representing the largest group in the dataset. Hispanic/Latino and Other groups make up the smallest proportions of both diagnosis categories. Overall, there are more individuals with externalizing diagnoses (268) compared to internalizing diagnoses (224), across all race groups.

Table 9. Internalizing and Externalizing Diagnosis Counts by Race

Race Group	Internalizing Diagnoses	%	Externalizing Diagnoses	%	Total
Black/AA	129	57.6%	159	59.3%	192
Hispanic/Latino	11	4.9%	15	5.6%	18
Two + Races	20	8.9%	20	7.5%	26
White	62	27.7%	71	26.5%	85
Other	2	0.9%	3	1.1%	3
Total	**224**		**268**		**324**

Table 10 show the distribution of individual internalizing and externalizing disorder diagnoses counts by race. This table shows that it is likely to have a juvenile who has 1 internalizing disorder diagnose for Black/AA and White juveniles. Black/AA had mostly 2 different externalizing diagnosis with 33%. 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**.

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	63	32.8%	7	38.9%	6	23.1%	23	27.1%	1	33.3%	100
1	68	35.4%	7	38.9%	9	34.6%	26	30.6%	2	66.7%	112
2	28	14.6%	2	11.1%	5	19.2%	18	21.2%	0	0.0%	53
3	18	9.4%	0	0.0%	2	7.7%	7	8.2%	0	0.0%	27
4	10	5.2%	1	5.6%	2	7.7%	6	7.1%	0	0.0%	19
5	2	1.0%	1	5.6%	1	3.8%	4	4.7%	0	0.0%	8
6	2	1.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2
7	1	0.5%	0	0.0%	0	0.0%	1	1.2%	0	0.0%	2
14	0	0.0%	0	0.0%	1	3.8%	0	0.0%	0	0.0%	1
Total	192		18		26		85		3		324

Externalizing Diagnoses Count	Panel B: Externalizing										
	Black/AA	%	Hispanic/ Latino	%	Two + Races	%	White	%	Other	%	Total
0	33	17.2%	3	16.7%	6	23.1%	14	16.5%	0	0.0%	56
1	37	19.3%	6	33.3%	5	19.2%	24	28.2%	2	66.7%	74
2	63	32.8%	6	33.3%	7	26.9%	22	25.9%	0	0.0%	98
3	37	19.3%	3	16.7%	4	15.4%	14	16.5%	0	0.0%	58
4	14	7.3%	0	0.0%	2	7.7%	7	8.2%	1	33.3%	24
5	7	3.6%	0	0.0%	0	0.0%	1	1.2%	0	0.0%	8
6	1	0.5%	0	0.0%	1	3.8%	2	2.4%	0	0.0%	4
7	0	0.0%	0	0.0%	0	0.0%	1	1.2%	0	0.0%	1
9	0	0.0%	0	0.0%	1	3.8%	0	0.0%	0	0.0%	1
Total	192		18		26		85		3		324

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" [4]; 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".

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[4] 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.

Internalizing Resources Disorders by Facility Type

Table 11 reports frequencies of internalizing disorders by facility type. According to decision rule (please see Appendix), Bipolar and related disorders, Disruptive Mood Disorder (DMD), Major Depressive Disorder (MDD), Anxiety Disorders (AD), Obsessive-Compulsive and Related Disorders (OCD), Posttraumatic Stress Disorder (PTSD), Acute Stress (AS), and Posttraumatic Stress Symptoms (PTSS) have adequacy to check the relationship of them with the facility type. Both chi-square test and Fisher's exact test statistics show that facility type is statistically significantly associated with only four types of internal disorders. Thus, Table 11 solely illustrates the frequency distributions for these four internal disorders. In other words, having bipolar disorder and related conditions, disruptive mood, PTSD, and PTSS is associated with being placed in a YDC or CRP.

Table 11. Internalizing Disorders by Facility Type

	Bipolar and Related Disorders				
	No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
CRPs	147	4	151	4.977** (0.026)	0.009* (0.020)
YDCs	157	16	173		
Total	304	20	324		
	Disruptive Mood				
	No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
CRPs	143	8	151	3.828* (0.050)	0.016** (0.013)
YDCs	152	21	173		
Total	295	29	324		
	Posttraumatic Stress Disorders (PTSD)				
	No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
CRPs	128	23	151	11.208*** (0.000)	0.0002*** (0.000)
YDCs	118	55	173		
Total	246	78	324		
	Posttraumatic Stress Symptoms (PTSS)				
	No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
CRPs	149	2	151	11.780*** (0.000)	0.0001** (0.000)
YDCs	153	20	173		
Total	302	22	324		

(.) 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).

Juveniles committed to YDCs were diagnosed mostly with Bipolar (16 or 5%), DMD (21 or 6%), PTSD (55 or 17%) and PTSS (20 or 6%). **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 CRPs, as well as the varying levels of supervision and control within these settings.

The question on Specific Learning Disorder with impairments in Reading, Writing, and Mathematics in PITS 2024 allowed respondents to select multiple options. In other words, a juvenile could have one disorder or any combination of them. We aggregated the responses to this question and conducted the same categorical analysis. No association was found between facility type and specific learning disorders.

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 DMD, MDD, Anxiety, PTSD, PTSS and Specific Learning 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.[5] In brief, among these six types of internalizing disorders, only two of them were found to be associated with sex at birth as summarized in Table 12.

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	43	16	59	17.736*** (0.000)	0.0002*** (0.000)
Male	243	22	265		
Total	286	38	324		
	Posttraumatic Stress Disorder (PTSD)				
	No	Yes	Total	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
Female	32	27	59	17.142*** (0.000)	0.0001*** (0.000)
Male	214	51	265		
Total	246	78	324		

Note to Table 11.

The condition of being male and female juvenile is given, approximately 8% of male juveniles were diagnosed with MDD while 27% of female juveniles had MDD. The condition of being male and female juvenile is given, with around 19% of young males being identified with PTSD, whereas 46% of young females were found to have PTSD.

The table showed that there is a statistically significant association between sex at birth and being diagnosed with MDD and PTSD. 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 delinquent juveniles regarding their mental health, along with an exploration of potential socio-cultural influences that could impact the development of MDD and PTSD across sexes, may be essential*.

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[5] Within the sample, 63 of 265 male (24%) and 19 of 59 female (32%) juveniles were diagnosed with AD.

Internalizing Resources Disorders by Race Group

According to Cochran's Rule, Bipolar and related Disorders, Disruptive Mood Dysregulation, Major Depressive Disorder (MDD), Anxiety Disorder (AD), PTSD, Acute Stress, Adjustment Disorder, PTSS and aggregated Specific Learning Disorder 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	157	35	192	8.627*** (0.000)	0.0001*** (0.0001)
White	55	30	85		
Total	212	65	277		
Race Group	Major Depressive Disorder (MDD)				
	No	Yes	Total	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
Black/AA	179	13	192	7.890*** (0.003)	0.001*** (0.003)
White	69	16	85		
Total	248	29	277		

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 being Black/AA or White youth (**Table 13**).**

Externalizing Resources Disorders by Facility Type

According to Cochran's Rule, Attention-Deficit/Hyperactivity Disorder (ADHD), Oppositional Defiant Disorder (ODD), Intermittent Explosive Disorder (IED), Conduct Disorder (CD), Antisocial Personality Disorder/Traits (APDT), and Alcohol (AR), Cannabis (CR), and Opioid (OR) related disorders have adequacy to check the relationship of them with facility type. There is statistically significant association between being placed in a YDC or in a CPR and ODD, IED, CD, Antisocial, Alcohol and Cannabis use at the traditional significance levels (see Table 14).

Conduct Disorder with Cannabis use is the most commonly observed Disruptive, Impulse-Control, and Conduct Disorder (DICCD) as well as substance-related and addictive disorder (SRAD). Association tests show a strong correlation between being placed in a YDC or CRP and externalizing disorders.

Juveniles placed in YDCs or CRPs may exhibit higher rates of externalizing behaviors and substance use disorders compared to those not in these settings. This suggests that these environments may either attract or exacerbate such issues. The strong relationship between these

disorders and placement in YDCs and CRPs highlights the importance of implementing targeted, evidence-based treatment programs for ODD, IED, CD, APDT and substance use disorders within YDCs and CRPs. Specialized mental health and substance abuse services should be available to address these needs effectively. **The presence of externalizing disorders and substance use may increase the likelihood of reoffending, as untreated behavioral and addiction issues can contribute to ongoing criminal behavior. This emphasizes the need for rehabilitation strategies that focus on managing these conditions to reduce recidivism.**

Table 14. Externalizing Disorders by Facility Type

Facility Type	No	Yes	Total	Chi-sq. Stat.	Fisher's Exact Test Stat.
Oppositional Defiant Disorder (ODD)					
CRPs	118	33	151	4.409** (0.036)	0.008** (0.034)
YDCs	116	57	173		
Total	234	90	324		
Intermittent Explosive Disorder (IED)					
No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*	
CRPs	149	2	151	4.860** (0.026)	0.001** (0.014)
YDCs	161	12	173		
Total	310	14	324		
Conduct Disorder (CD)					
No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*	
CRPs	85	66	151	3.613* (0.057)	0.012** (0.046)
YDCs	78	95	173		
Total	163	161	324		
Antisocial Personality Disorder/Traits (APDT)					
No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*	
CRPs	147	4	151	7.274*** (0.000)	0.0002*** (0.004)
YDCs	154	19	173		
Total	301	23	324		
Substance-Related and Addictive Disorders: Alcohol Related (AR)					
No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*	
CRPs	146	5	151	3.761* (0.053)	0.017** (0.040)
YDCs	157	16	173		
Total	303	21	324		
Substance-Related and Addictive Disorders: Cannabis Related (CR)					
No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*	
CRPs	89	62	151	6.680*** (0.009)	0.002*** (0.007)
YDCs	76	97	173		
Total	165	159	324		

Note Table 11.

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 CD and Cannabis use. Males exhibit higher ratios for CD (53%), The ratio of cannabis use among female juveniles is higher than the ratio of male juveniles (66% vs 45%). As it was noted in the previous sub-sections, the sample is not balanced by sex at birth. Male juveniles were mostly diagnosed with conduct disorder (141 juveniles, 53%) while females use cannabis (39 juveniles, 66%).

The results suggest that CD may be more prevalent or more easily identified in males, which could be important when considering treatment or interventions. We need to pay attention to substance use patterns in females. The unbalanced sample by sex at birth also raises important considerations in understanding these trends. The differences observed might be influenced by the sex distribution, and further research could help determine if these trends are consistent across a more balanced sample. It's crucial to tailor interventions and prevention strategies to address these specific gender differences in behavior, particularly when it comes to mental health disorders like Conduct Disorder and substance use issues like cannabis use.

Table 15. Externalizing Disorders by Sex at Birth

Sex at Birth	Conduct Disorder (CD)				
	No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
Female	39	20	59	6.446** (0.011)	0.003*** (0.009)
Male	124	141	265		
Total	163	161	324		
Sex at Birth	Substance-Related and Addictive Disorders: Cannabis Related (CR)				
	No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
Female	20	39	59	7.557*** (0.006)	0.002*** (0.004)
Male	145	120	265		
Total	165	159	324		

Note to Table 11.

Externalizing Resources Disorders by Race Group

According to Cochran's Rule, Attention-Deficit/Hyperactivity Disorder (ADHD), Oppositional Defiant Disorder (ODD), Conduct Disorder (CD), Antisocial Personality Disorder/Traits (APDT), and Alcohol and Cannabis-related disorders (AR and CR) are relevant for examining their relationship with race. A statistically significant association was found between being Black/AA or White juvenile and ADHD, CD and AR (see Table 16). The racial disparities in diagnoses like ADHD, CD and AR substance use may impact the treatment and legal outcomes of juveniles in the justice system. Addressing these issues could lead to more equitable practices, better mental health support, and more effective interventions.

Table 16. Internalizing Disorders by Race Group

Race	Attention-Deficit/Hyperactivity Disorder (ADHD)				
	No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
Black or African American	119	73	192	2.697[*] (0.100)	0.022[*] (0.086)
White or Caucasian	43	42	85		
Total	162	115	277		
Race	Conduct Disorder (CD)				
	No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
Black or African American	88	104	192	4.952[**] (0.026)	0.007[**] (0.020)
White or Caucasian	52	33	85		
Total	140	137	277		
Race	Substance-Related and Addictive Disorders: Alcohol Related (AR)				
	No	*Yes*	*Total*	*Chi-sq. Stat.*	*Fisher's Exact Test Stat.*
Black or African American	186	6	192	8.225[***] (0.000)	0.002[***] (0.005)
White or Caucasian	74	11	85		
Total	260	17	277		

Note to Table 11.

Correlations between ACE Scores and Individual Internalizing/Externalizing Diagnoses

We simply looked at the correlation (point-biserial due to the nature of the variables) between ACEs scores and individual internalizing and externalizing disorders.

Correlation analysis reveals that ACEs scores are significantly and positively correlated with most internal disorders (such as Schizophrenia, Bipolar, Disruptive Mood, Major Depressive and Anxiety Disorders, Obsessive-Compulsive and Related Disorders, Posttraumatic Stress Disorder, Acute Stress, Adjustment Disorder, Posttraumatic Stress Symptoms, and Intellectual Disability). ACEs scores are also positively linked to several external disorders, including Alcohol-, Cannabis-, and Opioid-Related Substance Use Disorders.

When the sample is divided into CRP and YDC juveniles, significantly positive correlations for YDC youth were maintained for Bipolar, Major Depressive, Anxiety, PTSD, Adjustment Disorder, PTSS, and Intellectual Disability. Alcohol-, Cannabis-, and Opioid-Related Substance Use Disorders significantly increase ACEs scores for YDC youth. PTSD also shows a stronger positive correlation with ACEs scores for CRP youth. For CRP youth, all substance use types contribute to higher ACEs scores.

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. 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 disorder among CRP juveniles.

Being a male juvenile is associated with a significantly positive relationship between ACEs scores and both internal and external disorders, particularly for PTSD. Additionally, **for male juveniles, Conduct Disorder shows a negative and significant correlation with ACEs scores**.

PTSD and PTSS are positively correlated with ACEs scores for Black/AA and White or Caucasian 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 17. 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	114	75.5%	37	24.5%	151		
YDCs	85	49.1%	88	50.9%	173	22.550***	< 0.0001***
Total	199	61.4%	125	38.6%	324		

Sex at Birth	Psychotropic Medications Use					Association Tests	
	No	%	Yes	%	Total	Chi-sq. Stat.	Fisher's Exact Test Stat.
Female	24	40.7%	35	59.3%	59		
Male	175	66.0%	90	34.0%	265	12.049***	0.0005***
Total	199	61.4%	125	38.6%	324		

Race	Psychotropic Medications Use					Association Tests	
	No	%	Yes	%	Total	Chi-sq. Stat.	Fisher's Exact Test Stat.
Black/AA	130	67.7%	62	32.3%	192		
White	41	48.2%	44	51.8%	85	8.651***	0.001***
Total	171	61.7%	106	38.3%	277		

Note 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 17). From our sample, 88 (approximately 51%) of the youth committed to YDC at the time of the survey were prescribed with Psychotropic Medications, whereas only 37 (about 25%) 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.

Regarding Psychotropic Medications use and sex at birth, females have a higher rate of using Psychotropic Medications (about 59%) than males (about 34%).[6] However, **the ratio of male juveniles who are on the use of medication is higher than female juveniles within the whole**

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[6] In PITS 2021, 2022 and 2023, the ratio of females was also higher than males who used Psychotropic Medications.

sample. Both association test statistics provide strong evidence that Psychotropic Medications use is associated to sex at birth.

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 18.

Table 18. Psychotropic Medications Use by Sex at Birth across Facilities

Facility Type	Sex at Birth		
	Female	Male	Total
Contracted Residential Site	17	20	37
Youth Development Center	18	70	88
Total	35	90	125

A total of 125 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. A comparable pattern was seen in PITS 2023. Association tests indicated a significant link between being male and being placed in a YDC and CRP among juveniles who were prescribed psychotropic medications. Psychotropic medications are often prescribed to juveniles with mental health conditions such as ADHD, anxiety, depression, or conduct disorders. The association between male juveniles, psychotropic medication prescriptions, and placement in a YDC could suggest that mental health issues are influencing both behavior and legal outcomes, with males possibly being more likely to exhibit behaviors that lead to detention or program involvement.

Regarding Psychotropic Medications use and race, White juveniles have a higher rate of using Psychotropic Medications (about 52%) than Black/AA juveniles (about 32%). **Both test statistics provide strong evidence that Psychotropic Medications use is associated to being Black/AA and White juveniles**.

Distribution of ACEs score by medication use was also examined. **The mean ACEs score for youth not on Psychotropic Medications is 2.7, whereas the youth who are prescribed Psychotropic Medications have a mean ACE Score of 4.5.** 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 found that the ACEs scores of juveniles who are prescribed psychotropic medications and committed to CRP differ significantly from those who are not taking the medication. A similar trend was observed among YDC youth.

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 6.4. However, despite an average ACEs score of 4.6 for female juveniles not using Psychotropic Medications, there was weak evidence for statistically significant difference. **Among male juveniles, the average ACEs scores differed between those who use psychotropic medications (3.8 or 4) and those who do not (2.5)**.

Analyses were repeated between Black//AA and White or Caucasian juveniles. 2% of Black/AA juveniles and 52% of White or Caucasian juveniles were on Psychotropic Medications on the day

of survey. Among Black/AA juveniles, average ACEs scores **statistically significantly differed between those who use psychotropic medications (4) and those who do not (2.3)**. There were also no statistically significant differences among 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 324 youth whose ACEs scores and diagnoses information were recorded, 319 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, 2024).[7]

For youth who is in the non-RtA ($n = 195$):

- 43 (22.1%) were female
- 152 (77.9%) were male
- 112 (57.4%) were in CRPs
- 83 (42.6%) were in YDCs

For individuals who is in the RtA ($n = 124$):

- 14 (or 11.3%) were female
- 110 (or 88.7%) were male
- 35 (or 28.2%) were in CRPs
- 89 (or 71.8%) were in YDCs

Frequency distribution of ACEs scores was given in Figure 6. Mean, median and mode values of ACEs scores for non-RtA juveniles are 3.2 (with 2.8 standard deviation), 3 and 1, respectively. The same central tendency measures are 3.7 (with 2.8 standard deviation), 3 and 1, respectively for RtA juveniles. The average ACEs scores in PITS 2024 are higher for both groups compared to PITS 2023. In PITS 2024, the coefficient of variation was measured at 0.76 for RtA, which is lower than the 0.86 calculated for non-RtA juveniles, unlike in PITS 2023. This indicates that the ACEs scores of both RtA and non-RtA juveniles show a similar range of diverse experiences. This means that juveniles who were at YDCs and CRPs on the survey day have similar ranges of ACEs. In other words, the juveniles in both groups have faced a comparable spectrum of difficult or traumatic experiences in their early lives. **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.**

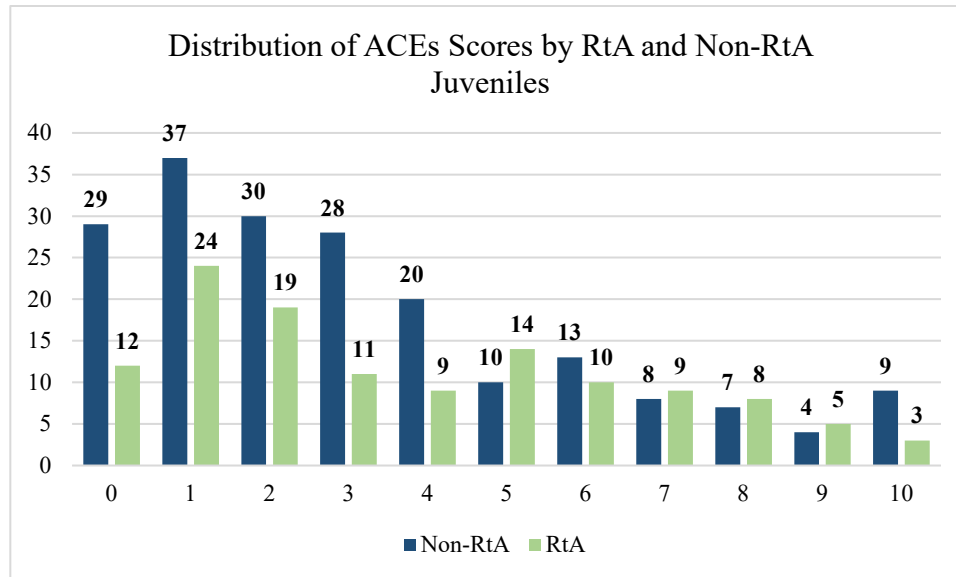[7] Due to errors occurred in entering juvenile ID numbers in the survey.

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 11, with an average of 3.2 diagnoses for non-RtA and 3.7 for 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, 2024 were collected by the Point in Time Survey 2024. The survey offered information on the demographics 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 324 juveniles follows.

- o 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 1 and 3, there are juveniles who have higher ACEs scores (approximately 40%) that cannot be neglected.**
- o **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: 3.1 and YDC: 3.7).**
- o The average ACEs scores of females significantly differs from the average ACEs scores of males. **Females' ACEs score (5.6 points) is on average higher than males' score (2.9 points).**
- o **Average ACEs scores of White/Caucasians juveniles (4.6 points) is greater than average ACEs scores of Black/African Americans juveniles (2.8 points).**
- o **The percentage of youth in a YDC with at least one mental health diagnosis is 98%.** For those with at least two or more diagnoses, the percentage is 85%. Moreover, 73.4% 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 93%.** For those with at least two or more diagnoses, the percentage is 77%. Moreover, 47.7% of CRP 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 69% of juveniles were diagnosed with at least one type of internalizing disorders, 83% 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 internal disorders. 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 (being Black/AA or White) affects their diagnoses for **Anxiety** and **Major Depressive disorders.**
- o When externalizing disorders were analyzed individually, ODD, IED, CD, APDT, AR and CR have a significant relationship with facility type. **YDC facilities are likely to have juveniles diagnosed with one of these external disorders.**

- **Conduct Disorder (CD) and Cannabis use are associated with the sex of juveniles, and it is significantly observed among male juveniles.**
- There is association between two-level race group externalizing disorders (ADHD, CD, and AR).
- **Psychotropic Medications use differs between female and male and CRP and YDC juveniles.** It also differs between Black and White juveniles**.**
- **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%).

Point-biserial Correlation: It is a statistical measure used to assess the strength and direction of the relationship between one continuous variable and one binary (dichotomous) variable. It is a special case of the Pearson correlation, specifically designed for situations where one variable is continuous and the other has only two categories.