

## Mental Health Needs of Detained Adolescents: Predictors of Mental Health Treatment Utilization and Recidivism

Laura M. White, Katherine S. L. Lau and Matthew C. Aalsma

### Abstract

**Objective:** Although approximately 60%-70% of detained adolescents meet criteria for a mental disorder, few receive treatment upon community reentry. Given that mental health treatment can potentially reduce recidivism, the study examined detained adolescents' mental health needs and their post-detention mental health treatment and recidivism. **Method:** Altogether, 1574 adolescents (<18 years) completed a mental health screener at a detention center. Scores on the screener, mental health treatment utilization (60-days post-detention), and recidivism (6-months post-detention) were measured. **Results:** About 82.2% of adolescents earned elevated scores on the mental health screener, but only 16.4% utilized treatment and 37.2% recidivated. Logistic regression models revealed adolescents with insurance and higher Angry-Irritable scores were significantly more likely to obtain treatment, whereas males, Black adolescents, older adolescents, and adolescents endorsing a trauma history were less likely. Black adolescents, insured adolescents, and adolescents with higher Alcohol/Drug Use scores were significantly more likely to recidivate. Mental health treatment increased the likelihood of recidivism. **Discussion:** The prevalence of mental health needs among DAs was high, but treatment utilization was low, with notable treatment disparities across race, gender, and age. The use of mental health treatment predicted recidivism, suggesting treatment may act as a proxy measure of mental health problems. Future research should assess the impact of timely and continuous mental health services on recidivism. **Keywords:** Detained adolescents, juvenile justice system, mental health, mental health treatment, recidivism

Of the approximately 1.65 million adolescents ( $\leq 18$  years) who are arrested in the United States each year,<sup>1</sup> about 20%, or 330,000 adolescents, are placed in short-term detention centers or long-term prison facilities.<sup>2</sup> These detained adolescents (DAs) represent an especially vulnerable population, with prominent mental health problems and treatment needs.<sup>3-7</sup> In fact, epidemiological studies of the DA population indicate about 40%-55% of DAs meet criteria for a disruptive behavior disorder (e.g., Conduct Disorder, Oppositional Defiant Disorder),<sup>5,11</sup> about 60%-70% of DAs meet criteria for a non-behavioral mental disorder (e.g., Anxiety Disorder, Major Depressive Disorder),<sup>5,8-10</sup> and about 45%-50% meet criteria for a substance-related disorder (e.g., Alcohol Use Disorder, Cannabis-Related Disorder),<sup>5,12,13</sup> whereas only about 10%-20% of adolescents in the general population have a mental disorder.<sup>6,14</sup>

The high rates of mental disorders and substance-related disorders among DAs are quite problematic, given that mental health problems are associated with criminal activity.<sup>15-17</sup> Longitudinal studies<sup>13,17-20</sup> have linked mental health problems, particularly behavior/conduct problems, substance-related issues, Attention Deficit-Hyperactivity Disorder, and comorbidity of disorders to an elevated risk of recidivism, or repetition of criminal activity. Recidivism is already quite common among DAs; approximately 30-50% of these youth recidivate within 6-months of release from detention.<sup>16,21,22</sup> Thus, detained youth with mental health problems may struggle to achieve successful rehabilitation and community re-integration because they face elevated risks of recidivism<sup>19,23,24,25</sup> and getting stuck in the “revolving door” of the juvenile justice system, in which they are repeatedly arrested, detained, released, re-arrested, and re-detained.<sup>26,27</sup> Unfortunately, frequent contact with the juvenile justice system, marked by multiple stays in detention, has been identified as one of the biggest risk factors for incarceration

as an adult,<sup>28</sup> so DAs with mental health problems who are stuck in the revolving door are likely to experience long-term incarceration in the adult prison system.

One way to potentially stop the revolving door is to have DAs participate in intensive, community-based mental health treatment upon release from detention.<sup>22,29,30</sup> Some community-based mental health interventions have been shown to produce positive outcomes for DAs, with regards to their mental health concerns and criminal activity.<sup>31-34</sup> Specifically, in a review of over 600 interventions aimed at addressing delinquency, drug, and violence among juvenile offenders, Henggeler and Schoenwald (2011) identified three effective interventions: multi-systemic therapy (MST), functional family therapy (FFT), and multidimensional treatment foster care. Meta-analyses show these interventions yield small to moderate ( $d = 0.08-0.24$ ) effect sizes for recidivism (i.e., reduced recidivism by 16% to 46%)<sup>35</sup> moderate effect sizes ( $d = 0.28-0.52$ ) for improved symptomology (i.e., fewer symptoms, behavior problems, and hospitalizations),<sup>36</sup> have been successfully replicated at multiple sites,<sup>30,36</sup> and sustain good outcomes related to criminal behavior and drug use for at least one year post-detention.<sup>30,32,34</sup> Although such interventions can help DAs, the estimated prevalence of detained youth who utilize mental health services upon community reentry is quite low,<sup>24,37,38</sup> ranging from about 8%<sup>39</sup> to 40%.<sup>21</sup> More importantly, evidence-based interventions for juvenile offenders (i.e., MST, FFT) are not widely available and only about 5% of DAs participate in these comprehensive interventions each year.<sup>30</sup>

Though research is limited, several demographic factors have been suggested to explain the disparity between mental health needs and actual treatment utilization by DAs.<sup>5,40-42</sup> First, gender is strongly related to mental health service utilization,<sup>40,43</sup> with higher rates of treatment referrals, treatment seeking, and service use post-detention among females than males.<sup>39,44</sup> Race is also strongly associated with service utilization.<sup>7,10,42,45,46</sup> DAs from racial minority groups are

significantly less likely than White DAs to receive treatment referrals, placements in mental health treatment facilities upon release from detention, and actual treatment services in detention and/or in the community.<sup>14,45-48</sup> In fact, one study estimated White DAs are four times more likely to receive a mental health treatment placement rather than incarceration,<sup>47</sup> whereas Black DAs with mental illness are six times more likely to be detained than similarly-aged White DAs with mental illness.<sup>49</sup> When considering both gender and race together, White female DAs are most likely to obtain mental health treatment in the community and Black male DAs are least likely to obtain treatment.<sup>40,42</sup> Besides race and gender, age is related to service use among DAs.<sup>37,41,50</sup> The likelihood of service utilization post-detention decreases as age increases; younger DAs are more likely to obtain a mental health treatment referrals,<sup>47</sup> receive a treatment placement, and utilize a variety of treatment types than older DAs of similar gender and/or racial background.<sup>37,50</sup>

Despite the high prevalence of psychiatric disorders among DAs,<sup>5,9,11,42</sup> and evidence that such problems increase the risk of recidivism and interfere with community re-integration,<sup>15,20,24</sup> a disproportionately small number of DAs receive mental health treatment after being released from detention.<sup>21,37,39</sup> The large discrepancy between the number of DAs experiencing significant mental health problems and the number of DAs actually receiving mental health treatment services points to significant treatment barriers and service gaps that need to be identified and addressed. Accordingly, we examined these issues via a longitudinal study. The primary aims of the study were: 1) Identify the mental health needs of detained adolescents; 2) Determine rates of mental health service utilization post-detention and significant predictors of service utilization; 3) Determine rates of recidivism post-detention and significant predictors of recidivism; and 4) Determine if mental health treatment utilization is associated with lowered recidivism.

## Method

### Sample

All consecutive adolescent intakes between April 2006 and March 2008 within a large juvenile detention facility in a Midwestern city were included in the study. Adolescents were excluded if they had a cognitive disability that precluded them from completing the primary study measure and/or were placed in the adult prison system during the study timeframe. Altogether, the sample consisted of 1574 DAs (80.9% males) between 11 and 18 years ( $M = 15.5$ ) of age upon admission to detention center. In terms of race/ethnicity, 62.9% were Black, 30.0% were White non-Hispanic, 4.4% were Hispanic, 2.7% were Other races. Altogether, 1511 DAs (96.0%) had contact with the juvenile justice system prior to first detention. The average age of first contact with the juvenile justice system was 13.8 years ( $SD = 1.99$ , range = 6-18) and the average number of contacts prior to detention was 3.79 ( $SD = 3.02$ , range = 0-44). Males had significantly more contacts with the juvenile justice system ( $M = 4.70$ ,  $SD = 3.85$ , range = 0-44) than females ( $M = 3.93$ ,  $SD = 3.22$ , range = 0-21); race/ethnicity and age were not related to prior contact or number of prior contacts with the juvenile justice system upon detention entry. The sample averaged 1.76 charges ( $SD = 1.10$ , range = 1-9), with the most severe charge including felonies (14.7%), misdemeanors (21.0%), probation violations (21.3%), warrant arrests (34.2%), status offenses (3.0%), or unknown charges (5.6%). Number of charges did not differ across gender, race/ethnicity, or age. During the study timeframe, 515 (24.7%) DAs had multiple detention stays ( $M = 1.33$  stays,  $SD = 0.63$ , range = 1-6), with an average length of stay at 15.6 days ( $SD = 16.42$ , range = 0-141).

Due to the small number of Hispanic and Other race DAs ( $N = 111$ , 7.1%), these adolescents were dropped from data analysis to allow for examination of White versus Black

adolescents. DAs with missing data at follow-up ( $N = 8$ , 0.5%) were also dropped from the sample, resulting in a final sample of 1455 DAs (80.7% male, 67.6% Black) across 1942 detention admissions.

The sample represents one cohort of a larger sample of detained adolescents ( $N = 7,137$ , 74.1% male, 56.9% Black, 34.6% White), used in a study that examined the implementation of a mental health screening and referral program at the juvenile detention facility.<sup>37</sup> To determine the impact of implementing a mental health screening, a pre-implementation cohort was compared to a post-implementation cohort, with results showing no significant differences between cohorts in post-detention mental health treatment utilization.<sup>37</sup> The current study focuses on the cohort of adolescents detained during the post-implementation period (April 1, 2006 to March 31, 2008) and expands upon prior work by directly examining the relationships between mental health screening data and two key outcomes: mental health treatment utilization and recidivism.

## **Procedure**

The study was conducted during the 24-month post-implementation period (April 1, 2006 to March 31, 2008) of a mental health screening and referral program at the juvenile detention facility. Data were collected from two primary electronic sources. First, juvenile court records for all detained adolescents (ages 11-18) were extracted from the justice system's electronic database. Second, electronic outpatient records from Indiana Medicaid and one of the primary hospital systems (i.e., hospital and all affiliated clinics) within the city of the study were extracted from the Regenstrief Medical Record System of the Indiana Network for Patient Care. The electronic juvenile court and mental health care records were linked using the software program RecMatch, which matched records based on individual participant identifiers (e.g., Last Name, First Name, Date of Birth, Last 4 Digits of Social Security Number) and a probabilistic

matching algorithm.<sup>51</sup> Linked records were de-identified for data analysis. The Institutional Review Board at [name] University approved the study, and the [name] Superior Court, Juvenile Division provided permission to access data without obtaining assent from participants or consent from participants' parents/guardians.

## **Measures**

*Demographics.* Data regarding age at detention entry, gender, and self-reported race and ethnicity were extracted from juvenile court records.

*Mental Health Needs.* Mental health needs were defined as scores on the Massachusetts Youth Screening Instrument Second Version (MAYSI-2). All participants completed an electronic version of the MAYSI-2 upon intake at the detention facility, and these results were extracted from juvenile court records. The MAYSI-2 is a 52-item self-report questionnaire designed to identify juvenile-justice involved youths at-risk for cognitive, emotional, and behavioral disorders and in need of mental health services.<sup>3</sup> Adolescents answer “yes” or “no” to whether items have been true for them “within the past few months.” The measure is divided into seven scales: Alcohol/Drug Use (8 items), Angry-Irritable (9 items), Depressed-Anxious (9 items), Suicidal Ideation (5 items), Somatic Complaints (6 items), Traumatic Experiences (5 items), and Thought Disturbance (5 items). Scale scores are summed based on the number of “yes” responses. With the exception of Traumatic Experiences, total scores are interpreted as falling in normal, caution, or warning ranges.<sup>3,6</sup> Scores in the “caution” or “warning” range are considered clinically significant and indicative of mental health needs. The Traumatic Experience scale does not have cut-offs for the caution and warning ranges; endorsement of at least one traumatic event (e.g., sexual abuse, life in danger, witness to violence) served as the caution cut-off for this study. At the detention center used in the study, adolescents were

considered to have screened positively on the MAYSI-2 if they scored within the caution or warning range for suicidal ideation, or within the caution or warning range on two or more scales.

The MAYSI-2 has been normed and validated for juvenile-justice involved youths,<sup>6,52,53</sup> and has shown good internal consistency ( $\alpha = 0.61-0.86$  for scales)<sup>3</sup> and discriminant validity,<sup>52</sup> convergent validity with the Millon Adolescent Clinical Inventory and Child Behavior Checklist-Youth Self-Report,<sup>6,54</sup> and predictive validity for mental disorders<sup>55</sup> and recidivism.<sup>18,53</sup>

*Mental Health Treatment Utilization.* Mental health treatment utilization was defined as any post-detention mental health treatment service received within 60-days of release from detention. Utilization data were limited to whether an adolescent received any service (yes/no), rather than the number of services. Treatment services included individual, group, or family services obtained as outpatient or home-based treatment. Data were collected from Indiana Medicaid claims and the medical records of a large hospital system (i.e., main hospital and its affiliated clinics) in [city]. This hospital system is the largest provider of mental health care for individuals without insurance in the county, making it the predominant provider of indigent care.

*Insurance.* Insurance was defined as the type of insurance listed on the medical health records documenting mental health treatment utilization within 60-days of release from detention. Insurance status included Medicaid, Private Insurance (e.g., Anthem, Aetna), Self-Pay/No Insurance, or Unknown insurance status.

*Recidivism.* Recidivism was defined as any new arrest charge within 6-months of release from detention.<sup>28</sup> New arrest charges included felonies, misdemeanors, status offenses, warrant arrests, or probation violations. Data were abstracted from juvenile court records and limited to whether a youth had a new arrest (yes/no) and not the number of arrests.



## Data Analysis

Descriptive statistics were calculated at baseline and follow-up time points. For MAYSI-2 results, mean scale scores and the prevalence of adolescents scoring within the caution and warning ranges for each scale were calculated. Two-tailed independent *t*-tests were conducted to determine if mean scale scores differed significantly by gender or race (i.e., White vs. Black). A series of 2 x 2 chi-square analyses were conducted to determine if the proportion of DAs scoring within the caution range on MAYSI-2 scales, and the proportion scoring within the warning range on MAYSI-2 scales, differed significantly by gender or race.

Two binary logistic regression analyses were conducted to identify predictors for mental health treatment within 60-days and recidivism within 6-months post-detention at the first detention in the study period. For these models, predictors included age, male (yes/no), Black (yes/no), insurance (yes/no), and the seven individual MAYSI-2 scales scores. Expanding on these models, one additional binary logistic regression analyses was conducted for the following dichotomous outcome: recidivism within 6-months. The same predictors were entered into the model, with the addition of service utilization within 60-days. For all models, predictors were entered using backward elimination, in which all predictors were initially considered in a full model; the predictor with the highest non-significant *p*-value ( $p > .10$ ) was eliminated in a continual process until all remaining predictor variables were significant ( $p \leq .05$ ).<sup>59</sup> To test for multicollinearity impacting regression analyses, bivariate correlations between predictor variables and an inverse inflation factor were examined.<sup>56,57</sup> Strong correlations ( $r \geq 0.65$ ) and a significant inverse inflation factor ( $p \leq .10$ ) were considered indicators of multicollinearity.<sup>58</sup> Analyses were conducted in SPSS Version 22.0.

## Results

### Mental Health Needs

Table 1 shows the means and standard deviations of the seven MAYSI-2 scales, grouped by gender and racial status. On average, the sample scored highest on the Angry-Irritable and Somatic Complaints scale, endorsing about half the items within each scale. Females earned significantly higher mean scores than males on all scales, except Thought Disturbances. White DAs earned significantly higher mean scores than Black DAs on Alcohol/Drug Use, Somatic Complaints, Suicidal Ideation, and Traumatic Experiences. As shown in Table 2, approximately 82.2% of the sample scored within the caution range on at least one scale, 43.5% scored within the warning range on at least one scale, 82.3% of DAs endorsed at least one traumatic experience, and 66.2% had a positive screen. The chi-square analyses revealed that a significantly higher percentage of females than males scored within the caution and warning ranges for all scales, except Thought Disturbances and Traumatic Experiences. In terms of race, a significantly higher percentage of White DAs than Black DAs scored in the caution range for Alcohol/Drug Use, Somatic Complaints, Suicidal Ideations, and Traumatic Experiences. When looking at scores within the warning range, a higher percentage of White DAs earned warning scores for all scales, except Thought Disturbances.

### Mental Health Insurance and Treatment Utilization

About half (49.7%) the sample had insurance coverage for mental health treatment. Specifically, 37.8% of DAs had Medicaid and 11.9% had private insurance, whereas 39.5% were self-pay and 10.8% had no insurance information listed in their medical records. The prevalence of insurance was significantly higher among male DAs (49.6%) than female DAs (44.7%,  $\chi^2 = 3.01, p = .047$ ), but not White DAs (46.3%) versus Black DAs (29.7%,  $\chi^2 = 2.05, p = .08$ ).

A total of 16.4% of DAs utilized mental health treatment within 60-days post-detention, including 20.8% of DAs with Medicaid, 10.4% with private insurance, 16.7% of DAs with no insurance/self-pay, and 3.2% with unknown insurance status. In terms of gender and race, 24.9% of females, 14.5% of males, 19.1% of White DAs, and 15.3% of Black DAs obtained treatment. For these DAs who obtained treatment, 46.4% had Medicaid, 6.0% had private insurance, 45.2% were self-pay, and 2.4% had unknown insurance status.

Results showed no signs of significant multicollinearity among predictor variables, so all predictors were individually entered into the binary logistic regression models for mental health treatment utilization within 60-days of leaving detention. As shown in Table 3, males, Black adolescents, older adolescents, insured adolescents, and DAs who endorsed Traumatic Experiences were significantly less likely to utilize treatment. In contrast, those with higher scores on the Angry-Irritable scale were more likely to utilize treatment. The remaining MAYSI-2 scales failed to significantly predict treatment utilization.

### **Recidivism**

Following release from detention, 37.1% of adolescents experienced at least one recidivism event within 6-months of release from detention. Specifically, 37.0% of females, 37.2% of males, 34.5% of White DAs, and 38.4% of Black DAs. The most severe recidivism charge at 6-months included felonies (33.0%), misdemeanors (31.8%), status offenses (16.1%), warrant arrests (16.8%), and probation violations (2.1%). Results showed no signs of significant multicollinearity among predictor variables, so all predictors were entered into the regression models for recidivism within 6-months. Black adolescents ( $OR = 1.23$ ,  $CI = 1.0-1.52$ ), insured adolescents ( $OR = 1.64$ ,  $CI = 1.37-1.97$ ), and adolescents with higher Alcohol/Drug Use ( $OR = 1.10$ ,  $CI = 1.05-1.15$ ) were significantly more likely to recidivate within 6-months. Higher scores

on the Traumatic Experiences scale ( $OR = 0.88$ ,  $CI = 0.81-0.94$ ) and Somatic Complaints scale ( $OR = 0.94$ ,  $CI = 0.88-1.0$ ) were associated with a decreased likelihood of recidivism.

As displayed in Table 4, after including treatment utilization as a predictor, the final logistic regression analysis showed a significant relationship between mental health treatment services and recidivism. Adolescents who utilized treatment within 60-days were significantly more likely to recidivate at 6-month follow-up. Altogether, the same set of predictors as the previous model (without treatment utilization) were significant. Specifically, Black adolescents, insured adolescents, mental health treatment, and higher Alcohol/Drug Use scores were associated with an increased likelihood of recidivism; higher Traumatic Experiences and Somatic Complains were associated with a decreased likelihood of recidivism.

## **Discussion**

Despite evidence that the majority of detained adolescents (DAs) experience serious mental health concerns,<sup>3,6,40,42</sup> this study marks one of the few longitudinal studies to examine the relationship between mental health needs of DAs and post-detention mental health treatment utilization and recidivism.<sup>27</sup> By accessing the juvenile court records and health records of a large sample DAs, we were able to achieve the primary aims of the study and identify several key findings.

### **Mental Health Needs**

Consistent with previous research of detained youth completing the MAYSI-2,<sup>3,6,10,54</sup> this study found high rates of mental health needs. More than 80% of the total sample endorsed mental health or substance use needs that warrant clinical attention and follow-up. Clearly, DAs are a very vulnerable group at high-risk for mental health problems.<sup>6,9,37</sup> Of note, the detained females in this study reported significantly higher mental health needs than the detained males.

Such results are consistent with previous findings of greater severity and frequency of mental illness symptoms,<sup>6,10,60</sup> higher rates of psychiatric disorders,<sup>4,11,39</sup> and lower overall functioning among detained females than males.<sup>43,61</sup> Such gender discrepancies may be due to females being more likely than males to identify and endorse mental health problems.<sup>10</sup> In addition, the differential treatment of males and females within the legal system may also contribute to the gender differences found in this study.<sup>6</sup> Specifically, females are less likely to be arrested than males;<sup>61</sup> about 3 in 100 adolescent females were arrested in 2010, compared to about 8 in 100 adolescent males.<sup>1</sup> Judges are also less likely to incarcerate females and more likely to assign them to probation or other diversion programs.<sup>6,61</sup> Thus, the females that end up in detention tend to be the most problematic females involved in the juvenile justice system, with the most severe mental health problems,<sup>6,60</sup> whereas detained males are not necessarily the most deviant males involved in the juvenile justice system.

Interestingly, White DAs in this study reported significantly higher mental health concerns than Black DAs on four of the seven MAYSI-2 scales. Additionally, the prevalence of White DAs who scored within the warning range on most scales was notably higher than Black DAs. These results replicate some prior studies, which indicate that White DAs report significantly higher mental health needs<sup>40,10</sup> and are more likely than Black or Hispanic DAs to meet criteria for one or more mental disorders.<sup>48,62</sup> However, not all studies of incarcerated youth support these conclusions; some studies show that racial/ethnic minorities have higher mental health needs<sup>45,63</sup> and others have failed to find significant racial differences in mental health concerns.<sup>7</sup> Though current results may reflect true racial differences in mental health status among White DAs and Black DAs, it is also likely that racial differences are due to systematic biases in the legal system, in which minority youths are disproportionately involved in the

juvenile justice system,<sup>7,12,14</sup> as well as biases in the self-report of mental health needs. Just as males are less likely to endorse mental health concerns than females,<sup>3,10</sup> Black adolescents may be less aware or willing to endorse mental health problems,<sup>10,25,64</sup> perhaps due to a fear of being stigmatized or labeled as having a mental health problem. Thus, the minority DAs in the current study may have been experiencing similar mental health concerns as White DAs, but were less likely to endorse these concerns.

### **Mental Health Treatment Utilization**

Despite current findings that the majority of DAs had elevated mental health needs, only about 16% of the sample used mental health services after leaving detention. This prevalence rate is quite low, suggesting that DAs represent a poorly served population with unmet treatment needs.<sup>14,25,37,40,42</sup> Unfortunately, this service utilization rate is fairly consistent with prior work; it is slightly higher than some study estimates that approximately 8.1%,<sup>39</sup> 13.6%,<sup>37</sup> and 14.1%<sup>24</sup> of DAs obtain services post-detention, although lower than other study estimates that approximately 20.5%<sup>21</sup> to 45.5%<sup>41</sup> of DAs engage in services post-detention. Given that over 80% of the sample scored in the Caution range for at least one MAYSI-2 scale, current findings highlight a large discrepancy between mental health concerns and actual treatment use for this population. Moreover, the study found that higher self-reported mental health needs did not consistently predict the use of mental health treatment, except for Angry-Irritability. Theoretically, greater mental health needs should have been associated with higher likelihood of treatment use, but results failed to support this relationship.

In trying to understand study findings, it should be noted that many mental health providers are available in the city of this study and about half the DAs who obtained services did not have insurance coverage, so lack of available services and/or lack of providers who accept

non-insured youth do not appear to explain current findings. At the same time, insurance status emerged as a particularly strong predictor of treatment use, in that DAs covered by Medicaid or private insurance were significantly more likely to obtain mental health treatment than DAs with no insurance. Such findings make sense, given the low socioeconomic status within the DA population<sup>8,42</sup> and evidence that the financial costs of treatment and/or lack of insurance often serve as treatment barriers that prevent adolescents from obtaining needed treatment.<sup>42,65</sup>

In addition to insurance status, findings indicate that service use may be strongly tied to demographic variables. As found in prior epidemiological work,<sup>37,40,42,45</sup> males, minorities, and older youths were significantly less likely to obtain services, regardless of mental health needs. Such results highlight treatment disparities related to gender, race, and age, which may be due to several factors, including males, minorities, and older DAs engaging in less treatment seeking,<sup>25,42</sup> lacking financial resources and/or transportation to obtain treatment,<sup>42,46</sup> being less likely to be referred and/or connected to services by providers,<sup>7,40</sup> and/or being more likely to be re-arrested and detained in correctional facilities instead of mental health facilities.<sup>27,47</sup> In considering insurance status and demographic variables together, this study shows a strong bias against male DAs; males were significantly more likely than females to have insurance but still less likely to obtain treatment. Overall, findings suggest a two-tiered approach within the juvenile justice system, in which female, White, and younger offenders are more often placed on a rehabilitation-focused track, whereas male, Black, and older offenders are more often placed on a punitive incarceration track.<sup>47</sup>

Across the seven MAYSI-2 scales, the Angry-Irritable scale had the highest mean scale score. Such results seem reasonable, since anger and irritability are characteristics of behavior disorders like Conduct Disorder, Oppositional Defiant Disorder, and Attention-

Deficit/Hyperactivity Disorder,<sup>66</sup> which are commonly found among juvenile offenders.<sup>5,9,11</sup> Interestingly, the proportion of DAs falling in the caution and warning ranges for Angry-Irritable was not notably larger than other scales, yet the scale emerged as one of only two significant mental health predictors of service utilization, with higher scores linked to higher likelihood of treatment utilization. This scale has been associated with impulsivity and sensation seeking,<sup>52</sup> as well as rule violations, aggression towards peers and staff, and intensive supervision.<sup>67</sup> Thus, DAs with high scores on the Angry-Irritable scale tend to exhibit increased behavioral problems and infractions, which may result in heightened attention of providers/staff, probation officers, and court officials who refer and/or court-order these youths to obtain treatment, thereby resulting in a relationship between higher Angry-Irritability and higher likelihood of treatment utilization.

### **Recidivism**

More than one-third of the sample had at least one recidivism event within six months of leaving detention, meaning that twice as many adolescents recidivated than received mental health treatment. Higher scores on the Alcohol/Drug Use scale were associated with an increased likelihood of recidivism. Several factors may be contributing to this relationship, including the fact that adolescents with substance-related problems are more likely to commit antisocial behaviors while under the influence, be arrested for possession of drugs or drug paraphernalia, and/or be involved in drug-related activity (e.g., theft, gang involvement),<sup>15,28,68-70</sup> resulting in more opportunities and risks for recidivism. In addition to alcohol/drug use, race was also related to recidivism. As found in prior research,<sup>12,15,16</sup> Black DAs were significantly more likely than White DAs to recidivate upon community reentry. Though it is difficult to determine the exact reason for such findings, discrimination among law enforcement officers who disproportionately



target Black youth may partially account for the higher likelihood of Black adolescents being arrested in the community.<sup>48,49,71</sup> In fact, the bias against Black adolescents is quite apparent when considering Alcohol/Drug Use and race together. White DAs reported higher Alcohol/Drug Use than Black DAs and higher Alcohol/drug Use was associated with an increased risk of recidivism, but Black DAs still faced a higher risk of recidivism than White DAs.

### **Traumatic Experiences**

Consistent with other studies of juvenile justice-involved youth<sup>54,72-74</sup> traumatic experiences were common among the study sample, with more than 80% of DAs reporting at least one traumatic event. DAs who reported higher number of Trauma Experiences were less likely to obtain mental health treatment within 60-days and to recidivate within 6-months. Several reasons may explain such findings. First, compared to youth with no trauma history, adolescents who experience trauma exhibit higher rates of both externalizing and internalizing problems after the occurrence of the traumatic event.<sup>72</sup> Thus, adolescents with severe trauma histories may present with numerous problems, including delinquent and aggressive behaviors, emotional dysregulation, abnormal eating, and lack of coping resources.<sup>72,74</sup> Given such concerns, it is possible these adolescents are more likely to be placed in long-term residential treatment facilities after release from detention, thereby eliminating any opportunities for outpatient treatment (as measured in this study) and/or recidivism in the community.

Alternatively, youth with traumatic experiences often develop psychological disorders like Post-Traumatic Stress Disorder, Major Depressive Depression, and Anxiety Disorder.<sup>73,74</sup> Common symptoms and coping strategies associated with these disorders include behavioral inhibition, social withdrawal, and avoidance of others, places, situations, etc.,<sup>66</sup> which may decrease the

likelihood that these adolescents actively seek treatment and/or spend time with delinquent peers who engage in delinquent acts in the community, resulting in a reduced likelihood of treatment utilization and recidivism.

### **Effectiveness of Mental Health Treatment Utilization**

Lastly, the final regression model for this study indicated mental health treatment services were associated with an increased likelihood of recidivism. Given studies demonstrating that mental health services can successfully improve psychiatric symptoms, decrease delinquent behavior, and teach coping skills to prevent recidivism,<sup>29,30,75</sup> the results are somewhat discouraging and counter to the purpose of mental health treatment. Several possibilities may explain the relationship between treatment utilization and higher likelihood of recidivism. First, treatment utilization may serve as a proxy measure of mental health needs, particularly Alcohol/Drug Use. As mentioned previously, detained youth with serious substance-related problems are more likely to experience a recidivism event (e.g., drug-related arrests, drug-related probation violations)<sup>13,20,28,70</sup> and may also be more likely to be court-ordered to utilize treatment. Hence, adolescents' Alcohol/Drug Use may be moderating the relationship between mental health treatment and recidivism, but an examination of moderation was outside the scope of this study. Alternatively, DAs may have experienced treatment barriers,<sup>22,40-42</sup> such as lack of transportation, poor family/social support, negative beliefs about treatment, disinterest in treatment, or social stigma of seeking care, which prompted early termination of treatment. Unfortunately, due to limitations with data collection, we were unable to specifically examine the impact of treatment dropout on recidivism, or compare recidivism outcomes for DAs who attended one treatment session versus multiple sessions. Additional research is needed to test the relationship between treatment quantity/duration and recidivism.

Several other factors may also partially explain the positive relationship between treatment utilization and recidivism. Specifically, the study only measured treatment utilization within 60-days, which may not have been enough time for DAs to experience significant treatment benefits, such as improved behavior and reduced risk of recidivism. In addition, findings may be due to DAs using low-quality, non-evidence based treatment. Reviews of different treatments for juvenile justice-involved youth indicate that non-evidence based treatment (e.g., poorly implemented, low fidelity) can fail to impact recidivism and even result in negative outcomes.<sup>13,29,33</sup> The DAs in this present study were unlikely to have participated in high-quality, evidence-based treatments like MST or FFT; instead, they probably received low-quality treatment and therefore did not experience reduced recidivism. Unfortunately, such conclusions are difficult to make because we only examined the use of mental health treatment and not key treatment elements (e.g., treatment strategies, family involvement, multiple services, duration of services, treatment implementation/model fidelity) that influence the effectiveness of mental health treatment.<sup>30,35,75</sup> Future research should examine how these elements impact the effectiveness of mental health services on reducing recidivism.

### **Limitations**

Several limitations of the study should be acknowledged. First, all data were abstracted from electronic records, so the rates of treatment utilization and/or recidivism may be inaccurate due to missing or inaccurately reported data. Further, treatment utilization rates are limited to Medicaid claims and medical records from one hospital and its affiliated clinics. The number of adolescents who received services outside of Medicaid and/or this hospital system, participated in informal, non-documented treatment (e.g., religious counseling, support groups), and/or moved out of state is not known, so treatment utilization rates may underestimate true rates.

However, the hospital in which medical records were gathered is the primary care provider for indigent care and the largest provider of mental health services to individuals without insurance in the city. Provided that most non-insured adolescents in the sample would have utilized services at this hospital, and treatment data for all adolescents with Medicaid was collected, treatment estimates are likely to be generally accurate. Another potential limitation is that the study only assessed whether adolescents used mental health services. Future research with more detailed treatment information, particularly receipt of referrals, frequency of treatment sessions and dropouts, treatment type, treatment quality, is needed. These details are crucial to drawing firm conclusions about post-detention treatment services, treatment gaps and disparities, and the impact of treatment on recidivism. However, despite the study's limitations in the measurement of mental health treatment, findings are important in showing that mere contact or connection with mental health services is not enough in terms of reducing recidivism. Further, the study highlights the gap between youth who demonstrate treatment need and who actually connect with services, and emphasizes the need for effective mental health screening in the juvenile justice system.

As a final limitation, the sample consisted of adolescents detained in one detention facility in Indiana, so there is potential for generalizability concerns. This limitation is minimal, given that the sample was large and the demographic distribution matches the overall detained adolescent population.<sup>1,76</sup> Thus, results should have good generalizability and applicability to juvenile justice-involved youth in other states.

### **Implications and Recommendations for Future**

Based on the literature and current study findings, the authors offer the following recommendations.

- Programs are needed within the juvenile justice system that identify DAs with mental health concerns and treatment needs, so these adolescents can be connected to appropriate, evidence-based treatment services upon community reentry. Specifically, we recommend that juvenile justice facilities employ validated, reliable mental health screenings for all adolescents during intake.<sup>4,10,13</sup> Ideally, the results of an adolescent's mental health screening should help determine whether a comprehensive psychological evaluation is needed, and serve as a guide for assessing mental health treatment needs, and appropriate mental health services.<sup>12,43</sup>
- Consistent with the literature, the current study found prominent mental health and substance-related concerns among DAs, but low rates of service utilization in the community. Research examining the use of mental health treatment upon community reentry is limited,<sup>24,39,41</sup> so future research should focus on identifying and understanding post-detention treatment utilization, particularly prevalence rates, types of services being used, quantity/duration of services, facilitators and barriers to treatment utilization, and the discrepancy between low rates of service use and high rates of mental health problems. We recommend that future research also examine why demographic factors (e.g., race, gender, age) appear to be more strongly tied to mental health treatment utilization than actual mental health concerns and treatment needs.
- Reviews of different mental health treatments for juvenile offenders indicate that certain interventions (e.g., MST, FFT) are quite effective in reducing recidivism,<sup>32,34,36</sup> while other treatments yield mixed support.<sup>29,33,35</sup> The current study found that basic treatment use was associated with increased likelihood of recidivism, which calls into question the types of services that DAs are receiving. Researchers are advised to advance the development,

implementation, and dissemination of evidenced-based treatments that not only address the mental health concerns of DAs, but also promote reductions in recidivism.

### **Acknowledgements**

This study was funded by grants HRSA/MCHB R40MC08721 and HRSA/MCHB T7100008, provided through the U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Research Program. The authors wish to thank Judge Marilyn Moores and staff from the Marion County Juvenile Court for granting permission to conduct the study and access case records.

## References

1. Statistical briefing book. Office of Juvenile Justice and Delinquency Prevention Web Site. 2013. Available at: <http://ojjdp.gov/ojstatbb/>. Updated 2013. Accessed March 12, 2013.
2. Yazzie RA: Availability of treatment to youth offenders: Comparison of public versus private programs from a national census. *Child Youth Serv Rev* 33:804-9, 2011.
3. Grisso T, Barnum R, Fletcher KE, *et al*: Massachusetts youth screening instrument for mental health needs of juvenile justice youths. *J Am Acad Child Adolesc Psychiatry* 30:541-48, 2001.
4. Shufelt JL, Cocozza, JJ: Youth with mental health disorders in the juvenile justice system: Results from a multi-state prevalence study. National Center for Mental Health and Juvenile Justice Public Health Report: 1-6, 2006.
5. Teplin LA, Abram KM, McClelland GM, *et al*: Psychiatric disorders of youth in detention. *Juvenile Justice Bulletin: Office of Juvenile Justice and Delinquency Prevention*: 1-16, 2006.
6. Vincent GM, Grisso T, Terry A, *et al*: Sex and race differences in mental health symptoms in juvenile justice: the MAYSI-2 national meta-analysis. *J Am Acad Child Adolesc Psychiatry* 47:282-90, 2008.
7. Dalton RF, Evans LJ, Cruise KR, *et al*: Race differences in mental health service access in a secure male juvenile justice facility. *J Offender Rehabil* 48:194-209, 2009.
8. Sedlak AJ: Surveying youths in custody. *Corrections Today* 71:92-104, 2009.
9. Teplin LA, Welty LJ, Abram KM, *et al*: Prevalence and persistence of psychiatric disorders in youth after detention: a prospective longitudinal study. *Arch Gen Psychiatry* 69:1031-43, 2012.



10. Cauffman E: A statewide screening of mental health symptoms among juvenile offenders in detention. *J Am Acad Child Adolesc Psychiatry* 43:430-39, 2004.
11. Fazel S, Doll H, Långström N: Mental disorders among adolescents in juvenile detention and correctional facilities: A systematic review and metaregression analysis of 25 surveys. *J Am Acad Child Adolesc Psychiatry* 47:1010-19, 2009.
12. Aarons GA, Brown SA, Garland AF, *et al*: Race/ethnic disparity and correlates of substance abuse service utilization and juvenile justice involvement among adolescents with substance use disorders. *J Ethn Subst Abuse* 3:47-64, 2004.
13. Bath E, Clark LO, Low JY: Treatment issues for youths with substance abuse in juvenile detention, in *Clinical Handbook of Adolescent Addiction*. Edited by Rosner R. Hoboken, NJ: John Wiley & Sons, Ltd., 2013, pp 405-415.
14. Kates E, Gerber EB, Casey S: Prior service utilization in detained youth with mental health needs. *Adm Policy Ment Health Serv Res* 41:86-92, 2014.
15. Cottle CC, Lee RJ, Heilbrun K: The prediction of criminal recidivism in juveniles: A meta-analysis. *Crim Justice Behav* 28:367-94, 2001.
16. Ryan JP, Williams AB, Courtney ME: Adolescent neglect, juvenile delinquency and the risk of recidivism. *J Youth Adolesc* 42:454-65, 2013.
17. McReynolds LS, Schwalbe CS, Wasserman GA: The contribution of psychiatric disorder to juvenile recidivism. *Crim Justice Behav* 37:204-16, 2010.
18. Marczyk G, Heilbrun K, Lander T, *et al*: Predicting juvenile recidivism with the PCL:YV, MAYSI, and YLS/CMI; *Int J Forensic Ment Health* 2:7-18, 2003.

19. Gordon J, Diehl R, Anderson L: Does ADHD matter? Examining attention deficit and hyperactivity disorder on the likelihood of recidivism among detained youth. *J Offender Rehabil* 51:497-518, 2012.
20. Colins O, Vermeiren R, Vahl P, *et al*: T. Psychiatric disorder in detained male adolescents as risk factor for serious recidivism. *Canadian J Psychiatry Rev* 56:44-50, 2011.
21. Trupin EW, Turner AP, Stewart D, *et al*: Transition planning and recidivism among mentally ill juvenile offenders. *Behav Sci Law* 22:599-610, 2004.
22. Lyons JS, Griffin G, Quintenz S, *et al*: Clinical and forensic outcomes from the Illinois Mental Health Juvenile Justice Initiative. *Psychiatr Ser* 54:1629-34, 2003.
23. Grunwald HE, Lockwood B, Harris PW, *et al*: Influences of neighborhood context, individual history and parenting behavior on recidivism among juvenile offenders. *J Youth and Adolesc* 39:1067-1079, 2010.
24. Bullis M, Yovanoff P, Havel E: The importance of getting started right: Further examination of the facility-to-community transition of formerly incarcerated youth. *J Spec Educ* 38:80-94, 2004.
25. Braverman PK, Murray, PJ: Health care for youth in the juvenile justice system. *Pediatrics* 128:1219-35, 2011.
26. Harrison LD: The revolving prison door for drug-involved offenders: Challenges and opportunities. *Crime Delinq* 47:462-9, 2001.
27. Maschi T, Hatcher SS, Schwalbe CS, *et al*: Mapping the social service pathways of youth to and through the juvenile justice system: A comprehensive review. *Child Youth Serv Rev* 30:1376-1385, 2008.

28. Myner J, Santman J, Cappelletty GG, *et al*: Variables related to recidivism among juvenile offenders. *Int J Offender Ther Comp Criminol* 42:65-80, 1998.
29. Lipsey MW: Effective interventions for juvenile offenders. Using meta-analysis to bridge from research to Practice, in *Antisocial behavior and crime: Contributions of developmental and evaluation research to prevention and intervention*. Edited by Bliesener T, Stemmler M. Cambridge, MA: Hogrefe Publishing, 2011, pp 181-198.
30. Henggeler SW, Schoenwald SK: Evidence-based interventions for juvenile offenders and juvenile justice policies that support them. *Soc Policy Rep* 25:1-20, 2011.
31. Cuellar AE, McReynolds LS, Wasserman GA: A cure for crime: Can mental health treatment diversion reduce crime among youth? *J Policy Anal Manage* 25:197-214, 2006.
32. Henggeler SW, Clingempeel WG, Brondino MJ, *et al*: Four-year follow-up of multisystemic therapy with substance-abusing and substance-dependent juvenile offenders. *J Am Acad Child Adolesc Psychiatry* 41:868-74, 2002.
33. Schwalbe CS, Gearing RE, MacKenzie MJ, *et al*: A meta-analysis of experimental studies of diversion programs for juvenile offenders. *Clin Psych Rev* 32:26-33, 2012.
34. Chamberlain P, Leve LD, DeGarmo DS. Multidimensional treatment foster care for girls in the juvenile justice system: 2-year follow-up of a randomized clinical trial. *J Consult Clin Psych* 75:187-93, 2007.
35. Lipsey MW, Cullen FT: The effectiveness of correctional rehabilitation: A review of systematic reviews. *Annual Rev Law Soc Sci* 3:297-320, 2007.
36. Curtis NM, Ronan KR, Borduin CM: Multisystemic treatment: A meta-analysis of outcome studies. *Journal of Family Psychology* 18:411-19, 2004.

37. Aalsma MC, Tong Y, Lane K, *et al*: Use of outpatient care by juvenile detainees upon community reentry: effects of mental health screening and referral. *Psychiatr Ser* 63:997-1003, 2012.
38. Bullis M, Yovanoff P, Mueller G, *et al*: Life on the "out." Examination of the facility-to-community transition of incarcerated youth. *Exceptional Child* 69:7-22, 2002.
39. Teplin LA, Abram KM, McClelland GM, *et al*: Detecting mental disorder in juvenile detainees: Who receives services. *Am J Public Health* 95:1773-80, 2005.
40. Lopez-Williams A, Stoep AV, Kuo E, *et al*: Predictors of mental health service enrollment among juvenile offenders. *Youth Violence Juv Justice* 4:266-80, 2006.
41. Paskar LD: Utilization and effectiveness of mental health services for delinquent youth with substance use disorders: A longitudinal study. Doctoral dissertation, Northwestern University, Evanston, IL, 2008.
42. Abram KM, Paskar LD, Washburn JJ, *et al*: Perceived barriers to mental health services among youths in detention. *J Am Acad Child Adolesc Psychiatry* 47:301-8, 2008.
43. Kataoka SH, Zima BT, Dupre DA, *et al*: Mental health problems and service use among female juvenile offenders: their relationship to criminal history. *J Am Acad Child Adolesc Psychiatry* 40:549-55, 2001.
44. Thomas WJ, Stubbe DE: A comparison of correctional and mental health referrals in the juvenile court. *J Psychiatry Law* 24:379-400, 1996.
45. Rawal P, Romansky J, Jenuwine M, *et al*: Racial differences in the mental health needs and service utilization of youth in the juvenile justice system. *J Behav Health Serv Res* 31:242-54, 2004.

46. Garland AF, Lau AS, Yeh M, *et al*: Racial and ethnic differences in utilization of mental health services among high-risk youths. *Amer J Psychiatry* 162:1336-43, 2005.
47. Herz DC: Understanding the use of mental health placements by the juvenile justice system. *J Emot Behav Disord* 9:172-81, 2001.
48. Towberman DB: Racial bias in the criminal justice system: shifting the focus from outcome to underlying causes. *Juv Fam Court J* 45:15-26, 1994.
49. Isaacs MR: Violence: The impact of community violence on African American children and families: Collaborative approaches to prevention and intervention: Workshop summary. Presented at National Center for Education in Maternal and Child Health, Arlington, VA, 1992.
50. Feinstein RA, Lampkin A, Lorish CD, *et al*: Medical status of adolescents at time of admission to a juvenile detention center. *J Adolesc Health* 22:190-96, 1998.
51. Grannis SJ, Overhage JM, Hui S, *et al*: Analysis of a probabilistic record linkage technique without human review. *AMIA Annual Symposium Proceedings*. 259-63, 2003.
52. Archer RP, Simonds-Bisbee EC, Spiegel DR, *et al*: Validity of the massachusetts youth screening instrument-2 (MAYSI-2) scales in juvenile justice settings. *J Pers Assess*. 92:337-48, 2010.
53. Bisbee E: Massachusetts youth screening instrument long-term outcomes and scale stability. *Dissertation Abs Int: Section B*:71:650, 2010.
54. Stathis S, Doolan I, Fleming R, *et al*: Use of the massachusetts youth screening instrument to assess mental health problems in young people within an Australian youth detention centre. *J Pediatrics Child Health* 44:438-43, 2008.

55. Shaffer D, Fisher P, Lucas CP, *et al*: NIMH diagnostic interview schedule for children version IV (NIMH DISC-IV): Description, differences from previous versions, and reliability of some common diagnoses. *J Am Acad Child Adolesc Psychiatry* 39:28-38, 2000.
56. Mela CF, Kopalle PK: The impact of collinearity on regression analysis: the asymmetric effect of negative and positive correlations. *App Econ* 34:667-77, 2002.
57. O'Brien RM: A caution regarding rules of thumb for variance inflation factors. *Qual Quan* 41:673-90, 2007.
58. Boesky LM: Mentally ill youths and the juvenile justice system: A primer on mental health disorders. *Juv Family Justice Tod* 11:17-22, 2003.
59. Wiegand RE: Performance of using multiple stepwise algorithms for variable selection. *Stat Med* 29:1647-59, 2010.
60. Baerger DR, Lyons JS, Quigley P, *et al*: Mental health service needs of male and female juvenile detainees. *J Cen Families Child Court* 2:21-29, 2001.
61. Bostwick L, Ashley J: Examining at-risk and delinquent girls in Illinois. *Illinois Criminal Justice Information Authority Public Health Report* 240446:1-94, 2009.
62. Teplin LA, Abram KM, McClelland GM, *et al*: Psychiatric disorders in youth in juvenile detention. *Arch Gen Psychiatry* 59:1133-43, 2002.
63. Johnson TP, Cho YI, Fendrich M, *et al*: Treatment need and utilization among youth entering the juvenile corrections system. *J Subst Abuse Treat* 26:117-28, 2004.
64. Lo C, Howell R, Cheng T: Disparities in whites' versus blacks' self-rated health: Social status, health-care services, and health behaviors. *J Com Health* 38:727-33, 2003.

65. Gupta, RA, Kelleher, KJ, Pajer, K, *et al*: Delinquent youth in corrections: Medicaid and reentry into the community. *Pediatrics*, 115:1077-83, 2005.
66. American Psychiatric Association: *The Diagnostic and Statistical Manual of Mental Disorders*. 5<sup>th</sup> Edition. Washington, DC: American Psychiatric Association, 2013.
67. Butler MA, Loney BR, Kistner J: The massachusetts youth screening instrument as a predictor of institutional maladjustment in severe male juvenile offenders. *Crim Justice Behav* 34:476-92, 2007.
68. Dembo R, Williams L, Berry E, *et al*: Examination of the relationships among drug use, emotional/psychological problems, and crime among youths entering a juvenile detention center. *Int J Addict* 25:1301-40, 1990.
69. Dembo R, Williams L, La Voie L, *et al*: A longitudinal study of the relationships among alcohol use, marijuana/hashish use, cocaine use, and emotional/psychological functioning problems in a cohort of high-risk youths. *Int J Addict* 25:1341-82, 1990.
70. Calley NG: Juvenile offender recidivism: An examination of risk factors. *J Child Sex Abus*. 21:257-72, 2012.
71. Wolf RV: Race, bias, and problem-solving courts. *Nat Black Law J* 21:27-52 2008.
72. Maschi T, MacMillan T, Morgen K *et al*: Trauma, world assumptions, and coping resources among youthful offenders: Social work, mental health, and criminal justice implications. *Child Adolesc Soc Work J* 27:377-93, 2010.
73. Dixon A, Howie P, Starling J: Trauma exposure, posttraumatic stress, and psychiatric comorbidity in female juvenile offenders. *J Am Acad Child Adolesc Psychiatry* 44:798-806, 2005.

74. Ariga M, Uehara T, Takeuchi K, *et al*: Trauma exposure and posttraumatic stress disorder in delinquent female adolescents. *J Child Psych Psychiatry* 49:79-87, 2008.
75. Lipsey MW: The primary factors that characterize effective interventions with juvenile offenders: A meta-analytic overview. *Vict Offenders* 4:124-47, 2009.
76. Sedlak A, Bruce C: Youth's characteristics and backgrounds: Findings from the survey of youth in residential placement. US Department of Justice. Office of Juvenile Justice and Delinquency Prevention Public Health Report: 1-11, 2010.



## TABLES

Table 1 Mean (Standard Deviation) Scale Scores on the MAYSI-2

	Total ( <i>N</i> = 1942) <sup>a</sup>	Females ( <i>n</i> = 357)	Males ( <i>n</i> = 1585)	<i>t</i> -test <sup>b</sup>	White ( <i>n</i> = 605)	Black ( <i>n</i> = 1337)	<i>t</i> -test <sup>b</sup>
Alcohol/Drug Use (8 items)	2.10 (2.33)	2.35 (2.43)	2.04 (2.30)	2.16*	2.96 (2.61)	1.71 (2.07)	10.43***
Angry-Irritable (9 items)	4.29 (2.83)	5.01 (2.68)	4.13 (2.84)	5.52***	4.44 (2.86)	4.23 (2.83)	1.52
Depressed-Anxious (9 items)	2.74 (2.33)	3.68 (2.45)	2.53 (2.25)	8.16***	2.89 (2.44)	2.68 (2.28)	1.82
Somatic Complaints (6 items)	2.97 (1.88)	3.57 (1.75)	2.83 (1.88)	6.79***	3.36 (1.88)	2.79 (1.85)	6.29***
Suicidal Ideation (5 items)	0.81 (1.42)	1.41 (1.72)	0.68 (1.30)	7.64***	1.02 (1.60)	0.72 (1.32)	4.04***
Thought Disturbances (5 items)	0.81 (1.42)	0.90 (1.11)	0.79 (1.04)	1.82	0.76 (1.03)	0.83 (1.06)	-1.28
Traumatic Experiences (5 items)	2.21 (1.58)	2.44 (1.65)	2.13 (1.56)	2.16*	2.32 (1.59)	2.16 (1.57)	2.19*

*Note:* MAYSI-2 = Massachusetts Youth Screening Instrument-Version 2.

<sup>a</sup> Total number of MAYSI-2 administrations, based on 1455 unique participants. <sup>b</sup> Two-tailed *t*-test

\* $p \leq .05$ ; \*\* $p \leq .01$ ; \*\*\* $p \leq .001$ .

Table 2 Number (%) of Adolescents Scoring within Caution and Warning Ranges on the MAYSI-2 Scales

		Total (n=1942) <sup>a</sup>	Females (n = 357)	Males (n = 1585)	$\chi^2$	White (n = 605)	Black (n = 1337)	$\chi^2$
Alcohol/ Drug Use	Caution	534 (27.5%)	115 (32.2%)	419 (26.4%)	4.88*	255 (42.1%)	279 (20.9%)	94.62**
	Warning	244 (12.7%)	57 (15.9%)	187 (11.8%)	18.00**	138 (22.8%)	106 (7.9%)	89.25***
Angry-Irritable	Caution	947 (48.8%)	217 (60.8%)	730 (46.1%)	25.30***	314 (51.9%)	633 (47.3%)	3.46
	Warning	309 (15.9%)	73 (20.4%)	236 (14.9%)	6.73**	111 (18.3%)	198 (14.8%)	3.90*
Depressed- Anxious	Caution	919 (47.3%)	234 (65.5%)	685 (43.2%)	58.27***	290 (47.9%)	629 (47.0%)	0.13
	Warning	272 (14.0%)	85 (23.8%)	187 (11.8%)	32.90***	102 (16.9%)	170 (12.7%)	5.94*
Somatic Complaints	Caution	1118 (57.6%)	256 (71.7%)	862 (54.4%)	35.80***	408 (67.4%)	710 (53.1%)	35.04***
	Warning	213 (11.0%)	53 (14.8%)	160 (10.1%)	6.74**	92 (15.2%)	121 (9.1%)	16.16***
Suicidal Ideation	Caution	405 (20.9%)	134 (37.5%)	271 (17.1%)	73.73***	159 (26.3%)	246 (18.4%)	15.68***
	Warning	275 (14.2%)	98 (27.5%)	177 (11.2%)	63.56***	113 (18.7%)	162 (12.1%)	14.75***
Thought Disturbances	Caution	971 (50.0%)	193 (54.1%)	778 (49.1%)	2.81	282 (46.6%)	689 (51.5%)	3.77
	Warning	364 (18.7%)	74 (20.7%)	290 (18.3%)	1.13	107 (17.7%)	257 (19.2%)	0.65
Any Scale Above	Caution	1596 (82.2%)	317 (88.8%)	1279 (65.9%)	13.06***	523 (86.4%)	1073 (80.3%)	10.91**
	Warning	844 (43.5%)	209 (58.5%)	635 (40.1%)	40.50***	321 (53.1%)	523 (39.1%)	32.94***
Traumatic Experiences <sup>b</sup>	Caution	1599 (82.3%)	304 (85.2%) <sup>a</sup>	1295 (81.7%)	2.51	512 (84.6%) <sup>a</sup>	1087 (81.3%)	3.17*
Positive Screen <sup>c</sup>	-	1286 (66.2%)	284 (79.6%)	1002 (63.2%)	34.75***	437 (72.2%)	829 (63.5%)	14.20***

Note: MAYSI-2 = Massachusetts Youth Screening Instrument-Version 2.

<sup>a</sup> Total number of MAYSI-2 administrations, based on 1455 unique participants; <sup>b</sup> Scale does not have warning range.

<sup>c</sup> Defined as Warning or Caution range for Suicidal Ideation, or at least two scales within the caution or warning range.

\* $p \leq .05$ ; \*\* $p \leq .01$ ; \*\*\* $p \leq .001$ .

Table 3 Binary Logistic Regression Predicting Treatment Utilization <sup>a</sup>

Treatment Utilization within 60-days			
	Odds Ratio	95% Confidence Interval	<i>p</i> value
Male (vs. Female)	0.55***	0.42-0.72	<.001
Black (vs. White)	0.74*	0.58-0.96	.02
Age	0.80***	0.73-0.87	<.001
Insurance	1.49***	1.17-1.89	.001
Angry-Irritable	1.10***	1.05-1.16	<.001
Traumatic Experiences	0.92*	0.84-1.0	.04
Eliminated Predictors <sup>b</sup>			
Alcohol/Drug Use	1.03	0.97-1.09	.37
Thought Disturbances	0.95	0.84-1.08	.44
Depressed-Anxious	1.01	0.94-1.09	.80
Somatic Complaints	0.99	0.92-1.07	.85
Suicidal Ideation	1.01	0.91-1.11	.90

*Note:* Male is the referent category for gender. Black is the reference category for race.

<sup>a</sup> Calculated for each individual at first detention in study period (N=1455 participants).

<sup>b</sup> Values for eliminated predictors based on last step before eliminated from model.

\* $p \leq .05$ ; \*\* $p \leq .01$ ; \*\*\* $p \leq .001$ .

Table 4 Binary Logistic Regression Predicting Recidivism, Final Model with All Predictors<sup>a</sup>

Recidivism within 6-months			
	Odds Ratio	95% Confidence Interval	<i>p</i> value
Treatment (60-days)	3.04***	2.37-3.90	<.001
Black (vs. White)	1.29*	1.04-1.60	.02
Insurance	1.58***	1.31-1.91	<.001
Alcohol/Drug Use	1.10***	1.05-1.16	<.001
Traumatic Experiences	0.88***	0.82-0.95	<.001
Somatic Complaints	0.94*	0.88-1.00	.04
Eliminated Predictors <sup>b</sup>			
Age	1.0	0.93-1.07	.97
Male (vs. Female)	1.0	0.78-1.29	.99
Angry-Irritable	1.01	0.96-1.05	.83
Thought Disturbances	0.97	0.86-1.08	.53
Depressed-Anxious	1.00	0.93-1.07	.89
Suicidal Ideation	0.98	0.90-1.07	.66

*Note:* Male is the referent category for gender. Black is the reference category for race.

<sup>a</sup> Calculated for each individual at first detention in study period (N=1455 participants).

<sup>b</sup> Values for eliminated predictors based on last step before eliminated from model.

\* $p \leq .05$ ; \*\* $p \leq .01$ ; \*\*\* $p \leq .001$ .