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Juvenile substance use and effects of substance use disorder on incarceration and grade retention in a sample referred for court clinic mental health evaluation

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Thesis

**JUVENILE SUBSTANCE USE AND EFFECTS OF SUBSTANCE USE
DISORDER ON INCARCERATION AND GRADE RETENTION IN A SAMPLE
REFERRED FOR COURT CLINIC MENTAL HEALTH EVALUATION**

by

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B.S., Brown University, 2008

Submitted in partial fulfillment of the
requirements for the degree of
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ABSTRACT

A significant amount of adolescents are involved in the drug court system. Within a few of the systems are mental health clinics providing more specific services to youth introduced into the courts. At the Rhode Island Family Court, juveniles are referred for full mental health evaluations in the court mental health clinic. They are then referred for other services depending on the outcome of the evaluation. The purpose of this study is to provide a descriptive analysis of the drug use of these youth referred to the mental health clinic. Because little is known about the about the affects of a substance use disorder diagnosis on incarceration and grade repetition, an analysis was done to determine if any associations were present. After accounting for mental health diagnosis and demographic variables, an association between substance use disorder and incarceration within 3 months of the mental health evaluation was found. There was no significant association between a substance use disorder diagnosis and grade repetition in school.

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INTRODUCTION

A significant amount of adolescents across the country are often involved in the drug court system. These courts aim to identify troubled youth and provide proper sentencing in order to improve life outcomes and reduce risk of future incarceration. Within a few of these drug courts are mental health clinics that provide more specific services to youth introduced into the system. Specific mental health clinics within juvenile drug courts exist due to the overrepresentation of people with mental health disorders in the criminal justice system. In the juvenile drug court at the Rhode Island Family Court, judges and magistrates are able to refer juveniles for full mental health evaluations within the court mental health clinic. These youth are then referred for other services depending on the outcome of evaluation. The goal of this study was to analyze drug use among a sample of juveniles referred to the Rhode Island juvenile drug court's mental health clinic for a mental health evaluation and evaluate whether there is an association between those diagnosed with substance use disorder and future incarceration and grade retention. By looking at these behaviors, more informative conclusions can be made concerning what causes these individuals to become involved in the court system.

BACKGROUND AND SIGNIFICANCE

Juvenile Justice System

Adolescents are becoming increasingly involved in the justice system. Over 2.11 million youths under 18 are arrested every year (Puzzanchera, 2009). Many of these youth are

involved in juvenile drug court programs at their local courthouses. These courts are expanding and becoming available to more youth throughout the United States and have become a popular option for providing treatment to court-involved juveniles. There are 1,600 drug court programs nationally and 476 operating juvenile drug court programs (McCollister, French, Sheidow, Henggeler, & Halliday-Boykins, 2009).

The juvenile courts are founded on the same principles as adult courts. The goals are to provide therapy for drug and alcohol problems as opposed to punishment. These courts are available to eligible adolescents, usually between the ages of 10 to 18 years old. Substance use cannot be the sole reason for entering the courts. Instead, these individuals are court-involved for other reasons including truancy or delinquency. Every court has its own set of requirements regarding which juveniles are allowed to enter into treatment. The treatment options at these courts vary depending on available resources and funding. It is common for judges to offer the juveniles an option to complete the drug court diversion program in order to avoid charges. The charges are dropped as a result of program completion (Asmus & Colombini, 2007).

The Rhode Island Juvenile Drug Court is unique in that it offers a mental health clinic within the court offering court-ordered evaluations. According to the literature, a substantial proportion of juveniles involved within the drug court have co-existing mental health diseases (Abram, Teplin, McClelland, & Dulcan, 2003; Lyons, Royce Baerger, Quigley, Erlich, & Griffin, 2001). The mental health clinic was founded to address these issues. Mental health clinicians are employed to evaluate juveniles referred by the judge and determine proper treatment regimens.

Once involved in the court for separate reasons leading to a hearing, juveniles are assessed and diagnosed based on criteria from the *Diagnostic and Statistical Manual of Mental Disorders*. With the assistance of these standardized criteria, juveniles may be diagnosed with substance use disorder or may be categorized as experimenters and screened out (Asmus & Colombini, 2007). This information combined with a social history, parent and child interview, and mental health evaluation will determine what tools are used to help the juvenile treat the problem instead of facing punishment for it.

Mental Health in the Juvenile Court System

Psychiatric diagnoses in the court-involved youth are prevalent enough that certain states like Rhode Island, created mental health clinics within their juvenile drug court systems. Mentioned in more recent literature are studies supporting hypotheses of increased mental health disorders in juvenile delinquents, putting them at higher risk for negative outcomes (McGowan et al., 2007). In one study, it was found that after controlling for conduct disorder and accounting for delinquent behaviors, 60% of males and 70% of females had a psychiatric disorder (Abram, McClelland, Dulcan, & Mericle, 2002). In addition to psychiatric diagnoses, a comorbid diagnosis of substance use disorder has been proven to be a major health problem in detained youth. This consists of having a substance use disorder in addition to a major mental health disorder (i.e. major depressive, manic, psychotic, and panic disorder) (Linda A. Teplin, Abram, McClelland, Washburn, & Pikus, 2005). The evidence of increased prevalence of psychiatric disorders in the court-involved population further supports the need for intervention and support

services.

It is estimated that 65% to 80% of youths who need mental health treatment in the general population do not receive it (Services., 2000). When it comes to juvenile justice youths, they receive even fewer services because they are disproportionately poor and uneducated. This in addition to the fact that they also substance use disorders complicated any detention or treatment programs they could receive (Abram et al., 2003; McKay, McCadam, & Gonzales, 1996). The existing public health system does not adequately address these disparities within the youth. As a result, they are usually rearrested instead of treated. The goals of the mental health clinics in the court are to address these issues before the problematic behavior leads to incarceration. This includes co-occurring psychiatric diagnosis and substance use disorders (Cauffman, 2004).

Substance Use and Incarceration

Since there is a high prevalence of substance use in court involved individuals with mental health disorders, it is important to analyze the extent to which substance use disorders may affect individuals and their outcomes. The factors leading to substance use and the effects of use in adolescents are exacerbated in juvenile offenders (Aarons, Brown, Hough, Garland, & Wood, 2001; Linda A Teplin et al., 2007) Literature portrays how substance use leads to delinquent behaviors. Almost 80% of arrested juveniles report problems with substance use (Dembo et al., 1990). This includes testing positive for drugs at time of arrest, arrest for drug violation, or being under the influence during time of arrest (Copeland, Miller-Johnson, Keeler, Angold, & Costello, 2007).

Over the years, an increased number of substance related arrests have occurred among juveniles. Between the years of 1989 and 1998 there was a 44% growth in the number of overall juvenile delinquency cases (Snyder & Sickmund, 2006). In the 1997 Arrestee Drug Abuse Monitoring Program, it was reported that 75% of those detained reported either drug or alcohol involvement (National Center on Addiction and Substance Use., 2002). These statistics exemplify an increase in general court involvement and a simultaneous drug and alcohol use problem within the new cases presented. Being involved with substances is also indicative of continued involvement with the court system. This is why it is important to identify those with substance use disorder in order to prevent recidivism following a mental health evaluation.

Substance Use & Grade Retention

Although there is not a significant amount of data analyzing grade retention in juvenile offenders, it is important to identify the extent of this association in order to guarantee long-term success in juveniles involved in the court system. Not only are educational success and substance use negatively correlated, but studies show how problem behaviors in general may result in school disengagement and poor grades (Henry, Knight, & Thornberry, 2012). Among many studies taking into account all high school students (not specifically juvenile offenders), results are consistent in finding a relationship between dropping out of high school and substance use (Townsend, Flisher, & King, 2007). Associated with adolescent substance use were a low level of commitment to education and higher truancy rates (Hawkins, Catalano, & Miller, 1992). The idea is that

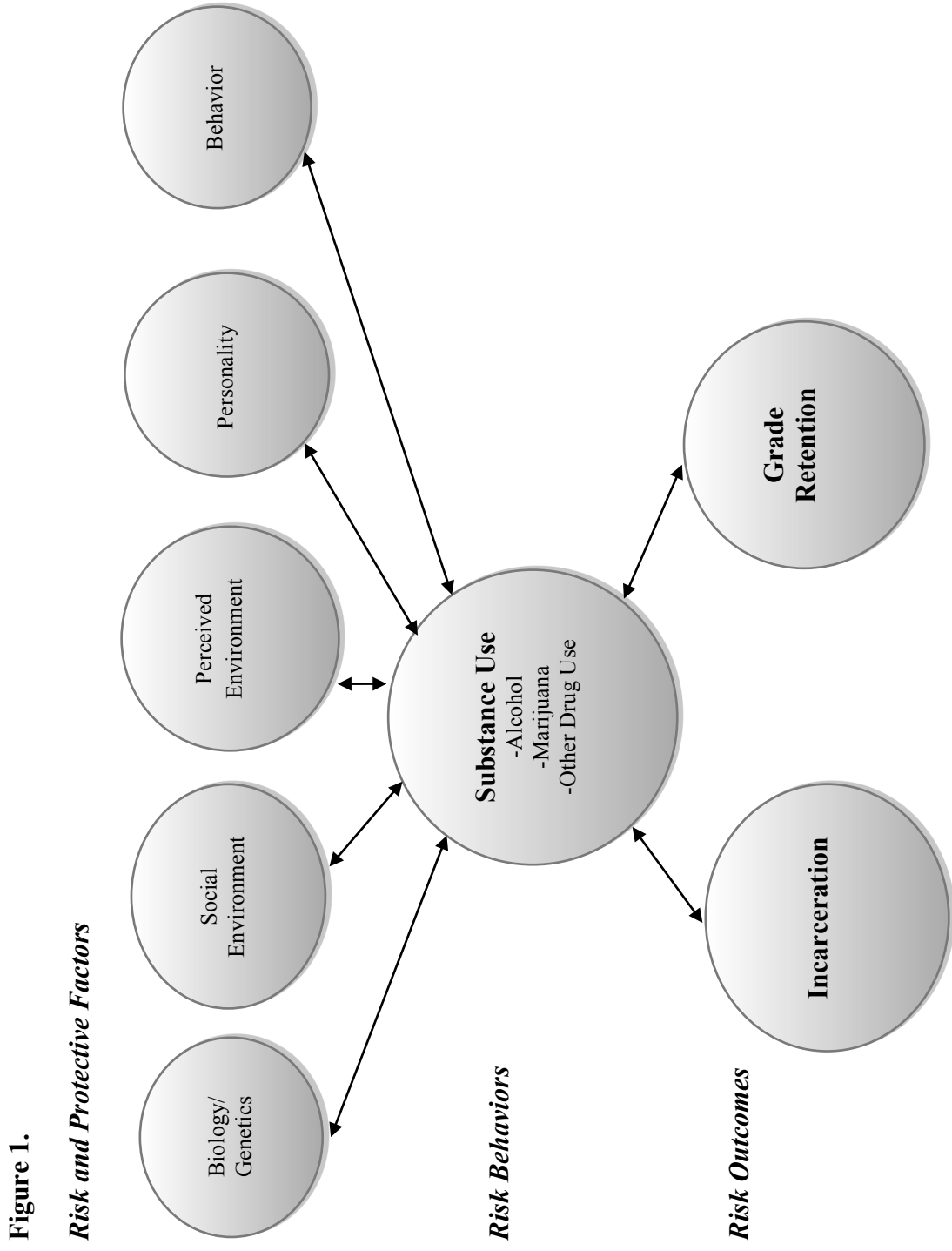
early substance use interrupts adolescent behavior resulting in lower success rates in the school environment. The exact reason of the connection between these two behaviors is uncertain (Gasper, 2011; McCluskey, Krohn, Lizotte, & Rodriguez, 2002).

CONCEPTUAL MODEL

The conceptual model being used for this study is the Problem-Behavior Theory developed by Richard Jessor. This theory is a social-psychological framework focused on explaining adolescent behavior that is against societal norms and therefore seen as “problematic” and undesirable (Donovan, 1996.) It is a model that has been reconstructed over time. The version of the Problem-Behavior Theory model used in this study is the most recent model that includes risk factors and protective factors that are composed of various constructs in addition to biological effects that are being controlled for in the analyses of this study. These factors all play a role in whether or not an adolescent will partake in a problem behavior (in this case substance use). The original model suggests that substance use behaviors cluster with one another and with other health risk behaviors, including unprotected sex (Donovan & Jessor, 1985.). It aims to explain the development of alcohol and drug use along with other problem behaviors. In this study we will focus on substance use as the problem behavior being analyzed.

Overall, Jessor’s goal was to explain how risk factors (i.e. drug use and delinquency) can compromise successful youth development. The focus is on psychosocial outcomes and consequences of risk factors when they are behaviors. In the

model, the five domains listed are described as a “web of causation” intending to explain risk behavior which in turn, leads to potential outcomes resulting from the risk (Jessor, 1991). The consequences within the original model include everything from school failure and legal trouble to depression and suicide. In this study we will focus on incarceration and grade retention as the negative outcomes resulting from the risk behavior of substance use (see Figure 1).



PROJECT GOAL

The goal of this study is to analyze the association between substance use disorder and negative outcomes in juvenile court clinic involved youth. The specific negative outcomes in question are arrest following their mental health evaluation as well as grade retention. Description of those using substances within the juvenile mental health clinic sample will also be explored so that proper interventions can be put in place in future programs. In adult populations, drug court models have increased in number and have proven effective in providing services for offenders while reducing drug use and problematic behavior (Belenko & Logan, 2003). By implementing similar programs in the youth through regulatory interventions aimed at specific problem behaviors, future incarceration could be prevented and better outcomes in school may result. This would regulate costs of the juvenile justice system and reduce the amount of adolescents requiring more intense correction at a later time at a point where they are re-entering the system, especially since they are being targeted during an earlier period where risks can be reduced

The specific aims and hypotheses of this project are:

AIM 1:

Describe the pattern of drug and alcohol use among juveniles referred for a mental health evaluation.

HYPOTHESIS 1:

Adolescents will report higher rates of alcohol than drug use.

AIM 2:

Examine the association between diagnosed substance use disorder and incarceration rates 3 months following a court ordered mental health evaluation.

HYPOTHESIS 2:

Adolescents with a diagnosed substance use disorder will be more likely to be incarcerated within 3 months followed their court ordered mental health evaluation.

AIM 3:

Examine the association between diagnosed substance use disorder and grade repetition in school.

HYPOTHESIS 3:

Adolescents diagnosed with substance use disorder will be more likely to repeat grades in school.

METHODOLOGY

Study Sample

This study was a retrospective chart review of 404 juvenile offenders who were referred for a forensic mental health evaluation at a juvenile court clinic in the Providence, RI

between 2006–2008. Juveniles are involved with the family court for various reasons. There are multiple specialty courts within this family court system including truancy and juvenile court (diversion and post-adjudication) hearings and delinquency hearings. The adolescents included in the study sample were juvenile offenders between the ages of 13–17 are court ordered for a mental health evaluation in the mental health clinic within the court based on their history. The evaluations are given by licensed mental health professionals and last 3–4 hours. Each evaluation included a forensic interview of the child and parent separately as well as self-report psychological assessment measures inquiring about the juvenile’s symptoms and behavior. The evaluations also included review of relevant records such as school records and those provided by outside providers. Participants were excluded from the study if they did not complete a mental health evaluation. Fifty juveniles missed their appointment and are therefore not included in the chart analysis. The remaining 404 participant charts were reviewed. At the Rhode Island Family Court, mental health clinicians conduct evaluations using standardized diagnostic measures and clinical psychiatric interviews. The clinic conducts an average of 5 mental health evaluations per week. Adolescents can become involved in the court system for various reasons. The majority of referrals come from Truancy Court (70%) while the rest of the come from those with a substance involved charge (21%) or the juvenile calendar (8%). The juvenile calendar includes those with delinquency charges as well as individuals who are present due to parent involvement in the court system (Figure 2).

In the court clinic in which sample data were drawn, as noted above, over 454

juveniles were referred for mental health evaluation. Also as noted above, fifty of these juveniles missed appointments and were not evaluated. There were no statistically significant differences between those that missed the appointment in any of the demographic variables ($p > .05$ for every variable). As part of the evaluation, demographics, substance use diagnosis (determined by the forensic clinician), involvement in specialty court (i.e. drug court) and incarceration rates were some of the variables determined. The data found in the evaluations were collected from parents and adolescents in clinical interviews, which were done by licensed mental health professionals along with the use of standardized measures. The court clinic maintains a database of legal information, which is explained further in the mentioned measures.

Procedures

In this retrospective chart study, all information about juveniles was entered into a court clinic database. This information included the data from standardized measures, from legal information in the court database, and from school records. The two trained individuals assigned to this task first double-coded twenty percent of the data and were therefore able to determine inter-rater reliability. The rest of the files were then searched and information needed for analysis was pulled. Variables included psychiatric and educational data, grade retention, DCYF involvement, and frequency of substance use. For the purposes of this study, all personal health and identifiable information were stripped prior to data analysis. All of the data collected were stored as a password protected file on an encrypted storage drive at Rhode Island Hospital. The retrospective

chart review done for this study was approved by the Rhode Island Hospital Institutional Review Board and the Rhode Island Family Court. Informed consent was waived because the research could not be conducted without it and most of the juveniles involved in the review are no longer involved in the juvenile justice system.

Chart Data

Demographics. Demographic information including age, gender, race/ethnicity, and health insurance status were collected using a standard intake form. This form was completed by parent/guardian(s) prior to the mental health assessment.

Legal. The court clinic maintains a database of legal information relevant to each juvenile referred for evaluation that is extracted from a larger court database of all juveniles processed through the Family Court. Data include source of referral (e.g. truancy, drug, delinquency petition), number and type of charges (criminal vs. status), and history of social service involvement.

Psychiatric: Forensic interviews. Mental health professionals (i.e. psychologists, psychiatrists, social workers) conducted interviews with the parent/guardian(s) and adolescent. Information coming from these interviews included type and number of diagnosis, comorbidity, history of out-of-home placement, and mental health treatment.

Psychiatric: Standardized measures. Standardized measures were also used to collect data on each individual involved in the evaluations. Some of the standardized assessments that informed the interviews included the following. Juveniles completed the Diagnostic Interview Schedule for Children: Present State Voice Version (Wasserman,

McReynolds, Fisher, & Lucas, 2005) and/or the Youth Inventory-4 (Gadow & Sprafkin, 1999) and parents completed the Adolescent Symptom Inventory-4 (Gadow & Sprafkin, 1998).

Diagnostic Interview Schedule for Children: Present State Voice Version (Wasserman, McReynolds, Fisher, & Lucas, 2005). The Voice DISC (VDISC) allows adolescents to answer questions about their own symptoms and behaviors. It includes computerized scoring informing clinicians about health needs.

Youth Inventory-4 (YI-4; Gadow & Sprafkin, 1999). The YI-4 is a 128-item scale for adolescents aged 12 to 18 years. This measure screens for symptoms indicative of psychiatric disorders. The YI-4 has satisfactory internal consistency ($\alpha = .66 - .87$), test-retest reliability ($r = 0.54-0.92$), and convergent and discriminant validity (Gadow & Sprafkin, 1999; Gadow, Sprafkin, Carlson, et al., 2002).

Detention. Detention rates were also calculated using the computerized legal records. As with recidivism, a juvenile detention outcome score (yes/no) was calculated for being detained at least once over the 12-month follow-up period. For the purposes of this study we analyzed detention rates 3 months after evaluation.

Data Analysis

All data used in analysis were stripped of subject identifiers for use in the research. Based on the quantitative data collected from the 404 adolescents in the study, analyses were done to test the hypotheses presented. All analyses were conducted using SPSS statistical programming software. Preliminary analysis was done to calculate demographics

followed by descriptive analysis of substance use in the sample. Frequencies and percentages were calculated for categorical variables while means and standard deviations were calculated for continuous variables. The demographic variables were used as covariates in the model used for the study. Bivariate analysis compared those who received a mental health evaluation versus those who did not receive the evaluation due to a missed appointment. There were no differences in demographic characteristics between these two groups. A multivariate logistic regression used to determine an association between diagnosed substance use disorder with incarceration and grade retention.

RESULTS

Demographics

Of the 404 individuals included in this study sample (Table 2), 241 were male and 163 were female. Most self-identified as Caucasian (64%). The rest of the sample was Hispanic (14.9%), African American (5.5%), Asian/Pacific (2%), American Indian (1%), and other (8.5%). The average age of the sample was 15 years old. The majority of the adolescents were insured by private insurance (42%), with the rest being either publicly insured (36.6%), or uninsured (9.2%). When measuring DCYF involvement, 46% of the sample endorsed being involved with DCYF at some point in their lifetime, while 47.0% reported not being currently involved.

At the time of evaluation, the adolescent grade in school varied from 4th grade to

12th grade, with some having dropped out of school (3%) or obtained a GED (1%). Most were in the 9th grade (28.1%). Also, 44.5% of the sample had repeated a grade and 30.8% were enrolled in an IEP program at their school aimed at providing more specialized education needs. During the clinical assessment, 26.1% had been diagnosed with a substance use disorder (Table 3). At their 3-month follow-up appointment, 10.2% of the adolescents had been incarcerated. 86.1% of the sample had complete evaluations, while the rest constitute a group that only participated in intake interviews, emergency evaluations, or educational testing only. These designations were dependent on individual cases and judge referral. Seventy percent of referred adolescents came from the truancy court (non-delinquent offenses), 19% came from the juvenile drug court (substance involved charge), while 11% came from a delinquency case (e.g. larceny, breaking and entering.)

Descriptive Data

In the sample, drug and alcohol use frequency was analyzed (see Table 3). Marijuana use was endorsed by 53% of the sample with 28.6% using at least monthly. Of these individuals, 36% were daily users. Alcohol use was endorsed by 45.3 % of the sample with highest frequency of use being at least once a month (13.7%). All other drug use was put into one category. 10.4% of the sample endorsed other drug use at least once with highest frequency being less than once a month (2%) since approximately 40% of these individuals did not say how often they were using and the data was missing.

The mean age of first time marijuana use was 12 years (SD 0.2). The mean age

for first time use of other drugs was also 12 years (SD 1.2). The mean age for first time alcohol use was 13 years old (SD 0.3).

Baseline Bivariate Analyses

In analyzing bivariate associations between a substance use disorder and the outcome variables listed, those diagnosed with substance use disorder were more likely to be incarcerated at 3 months ($p < 0.0001$), but were not more likely to have repeated a grade ($p = 0.286$). Also, those who had been incarcerated within 3 months of their evaluation were more likely to have repeated a grade ($p = 0.032$) (see Table 4).

Logistic Regression

A multiple logistic regression analysis was run to determine the associations between substance use disorder with incarceration at 3 months and grade repetition while accounting for demographics, court designation, mental health diagnosis, insurance status, and DCYF involvement. Those with a substance use disorder were approximately 5 times more likely to become incarcerated 3 months following their mental health evaluation (odds ratio (OR) 5.33, $p < 0.0001$). This means that those with substance use disorder were five times more likely than their non-diagnosed peers to have been incarcerated 3 months post their evaluation at the court. Also taking into account these same factors, a regression was done to determine the associations between substance use disorder and grade repetition in school. There was a significant association (odds ratio (OR) 3.5, $p = .043$). This means that those with substance use disorder were

approximately three and a half times more likely than their non-diagnosed peers to have repeated a grade in school in their lifetime.

As can be seen in the results, there are significant associations between substance use disorder diagnosis and the two outcomes of incarceration at 3 months following evaluation as well as grade repetition in school. The association between substance use disorder and incarceration seems to have a more significant association than grade repetition does. Despite mental health diagnosis, and other demographic variables, it seems that there is still a significant association between substance use diagnosis and these outcome variables.

DISCUSSION

Key Findings

In this sample, marijuana was used most frequently, followed by alcohol use. More than half of these adolescents used marijuana with almost 20% being daily users. National data surveying teen drug use in 2014 reported that 35% of 12th graders have used marijuana at some point and 6% use daily (Health, 2014). Almost half of the adolescents also notably used alcohol. Within this group, the highest frequency was monthly as opposed to the daily use of a large percentage of the marijuana users in the court-involved sample. This is consistent with the fact that the more risk an adolescent is exposed to, the higher the likelihood this individual is to abuse substances (McClelland, Elkington, & Abram, 2004).

The existence of the drug-crime cycle among juveniles is broadly recognized and accepted. Considering the daily use of marijuana and monthly use of alcohol in these adolescents, negative outcomes are inevitable. As a result of the increased substance use, important milestones in development, including integration into society, are impeded. In a sample of male juvenile offenders, alcohol and drug use was shown to suppress psychosocial maturity. It was then further explained how these effects are not necessarily permanent since a decrease in use also increases maturity levels (Chassin et al., 2010). It is for this reason, that a decrease of substance use disorder diagnosis in the sample of juvenile offenders is an integral part of keeping them out of the court system and allowing them to develop healthy attitudes and relationships throughout their lives. There are also negative implications to family life, the community, and society in general. In addition to the mentioned outcomes, adolescents can have other issues when dealing with substance use. Among these are health related consequences, possible overdoses, the danger of contracted HIV and other diseases, and traffic fatalities.

The importance of analyzing such data manifests in the need to develop viable interventions to address the issues of court involvement in adolescents. As previously mentioned, the patterns of drug use in these adolescents are one of the first aspects to be addressed. Because a substance use disorder diagnosis is significantly associated with negative outcomes, addressing the problems with alcohol and drug use may in theory, prevent these youth from future court involvement and incarceration. Court systems throughout the country would benefit from following the model used by the Rhode Island Family Court in implementing a system where court involved adolescents may complete

programs within the court clinic to avoid sentencing. Seeing as there is a substantial amount of substance use upon entering the system, it would be useful to develop a more extensive program focused on further prevention. Integrative programs would also be beneficial to a specific population such as the one used for this study. Psychiatric disorders are prevalent in the court system among juveniles and addressing this along with the substance use that accompanies it will further improve the program provided. The interventions could cater to reduction of substance use while considering various psychiatric disorders and how they may affect this behavior. Every intervention will vary depending on its audience, and in this case the most successful intervention will take into account mental health disorders that are so commonly found in potential juvenile offenders. If proved successful through future research, a decrease in substance use disorder diagnoses will result in a diversion of incarcerated juveniles and cost saving implications for society. With less individuals incarcerated, less money is spent on the prison system.

Limitations

A major limitation of this study is that the data included was not collected for the purposes of this research. For this reason, the database contained gaps and missing data within certain variables. The data was taken from a court clinic database that was entered by personnel at the court and was not completely consistent throughout each individual's chart. Some files were complete, while others were not. The measures used to arrive at a substance use disorder diagnosis as well as psychiatric diagnoses were not consistent and

were finalized by a clinician. To overcome these limitations, a thorough chart review was done by two researchers collecting data for the purpose of this study, including this author. Proper training and review was done to guarantee reliability. Also, all of the data was coded multiple times to ensure completeness.

Another limitation of this study was its lack of generalizability. The juvenile offenders represented in the data set only represent one court system. They are also targeted by judges and referred due to their existing problems. This means that a large number of these offenders have mental health disorders and were viewed as likely to benefit from additional resources. For this reason, the research lacks the ability to be generalized to the larger population of youth within the court system.

Strengths

This study was unique in the population that it aimed to define and analyze. The ability to target young adolescents involved in the court system before incarceration is a strength of the study. Also, as previously mentioned, these adolescents have co-existing mental health disorders and substance use disorders making them a sample that have gave judges a reason for concern and referral for evaluation. In addition to this, the large sample size is an additional strength of the study.

Future Research

There are various implications of the results of this study that can be looked into further in future studies. First, studies should be done to replicate the results of the study and

make it generalizable to a larger population of multiple court clinics across the country. There is a significant amount of existing data on incarcerated individuals and their characteristics. Identifying problems before incarceration happens will prevent incarceration. This is the time point where more studies should focus their attention. Mental health courts have the potential to reduce recidivism and more studies should be initiated in order to support this theory. The existing studies on mental health court populations involve juveniles who are already in the system. More detailed looks into the mechanisms of involvement that prevent negative outcomes will be beneficial in prevention. The information provided by the data in this study is just the beginning of a greater depth of knowledge that can be reached. Prevention is essential to the most positive outcomes possible in this population of juvenile offenders.

Since substance use disorder is a significant predictor of incarceration following evaluation in the mental health clinic, a substance use intervention should be developed and put in place in similar clinics. A study looking into the effectiveness of such an intervention would be a valuable contribution to the existing data. In addition to this, other variables that affect these adolescents should be considered if available. These could include factors such as previous exposure to violence or trauma, family involvement in daily activities, or previous psychiatric treatment if a diagnosis is made.

APPENDIX

Table 1. Dependent, Independent, Confounding, Variables

Variable	Operationalization/Measurement
Outcomes/Dependent Variables	
Incarceration	
Incarceration within 3 months following mental health evaluation	Categorical: Yes/No
Grade Retention	
Grade Retention	Categorical: Yes/No
Amount of Grades repeated	Continuous: number of grades
Exposure (Independent Variable)	
Highest Frequency Drug/Alcohol Use	
Ever used marijuana?	Categorical: Yes/No
Highest frequency of marijuana in past year?	Categorical: less than once a month, less than once a week, once a week, daily
Ever used other drugs besides marijuana?	Categorical: Yes/No
Highest frequency of other drugs in past year?	Categorical: less than once a month, less than once a week, once a week, daily
Every used alcohol?	Categorical: Yes/No
Highest frequency of alcohol in past year?	Categorical: less than once a month, less than once a week, once a week, daily
Age of Alcohol/Drug Use Onset	
Age of alcohol use onset	Continuous: Years
Age of Marijuana use onset	Continuous: Years
Substance Use Disorder Diagnosis	
Diagnosed with substance use Disorder?	Categorical: Yes/No
Covariates/Potential Confounders	
Age	Continuous: Years
Race/Ethnicity	Categorical: African American, Caucasian, Hispanic, American Indian or Alaskan Native, Asian, Native Hawaiian or Pacific Islander, Other
Gender	Categorical: Male/Female
Insurance Status	Categorical: Private Insurance/Public Insurance/Uninsured
DCYF Involvement	Categorical: Yes/No
Mental Health Diagnosis	Categorical: Yes/No
Court Designation	Categorical

Table 2. Demographics (n=404)

DEMOGRAPHICS	N	%
Gender		
Male	241	59.6
Race/Ethnicity		
Hispanic	60	14.9
African American	20	5.5
Caucasian	257	64
Other	67	17
Insurance Status		
Uninsured	37	9.2
Public Insurance	148	36.6
Private insurance	169	42
DCYF involved	185	46
Grade in School		
4th-8th grade	148	38.5
9th grade	113	29.3
10th grade	56	14.6
11th grade	38	9.9
12th grade	10	2.6
Dropped out of school	12	3.1
Graduate/GED	9	2.0
Repeated a Grade	179	44.5
IEP/504 Plan	124	30.8

Table 3. Descriptives of Drug/Alcohol Use (n=404)

Variable	N	%
Diagnosed with Substance Use	105	26.1
Incarcerated at 3 months	41	10.2
Marijuana use		
Yes	213	53
Highest Frequency-less than once a month	24	11
Highest Frequency-2-3 times a month	14	7
Highest Frequency-once per week	24	11
Highest Frequency-Daily	77	36
Alcohol Use		
Yes	182	45.3
Highest Frequency-less than once a month	30	7.2
Highest Frequency-2-3 times a month	25	13.7
Highest Frequency-once per week	22	12
Highest Frequency-Daily	7	4
Other Drug Use		
Yes	42	10.4
Highest Frequency-less than once a month	8	19
Highest Frequency-2-3 times a month	2	5
Highest Frequency-once per week	0	0
Highest Frequency-Daily	2	5

Table 4. Bivariate Associations

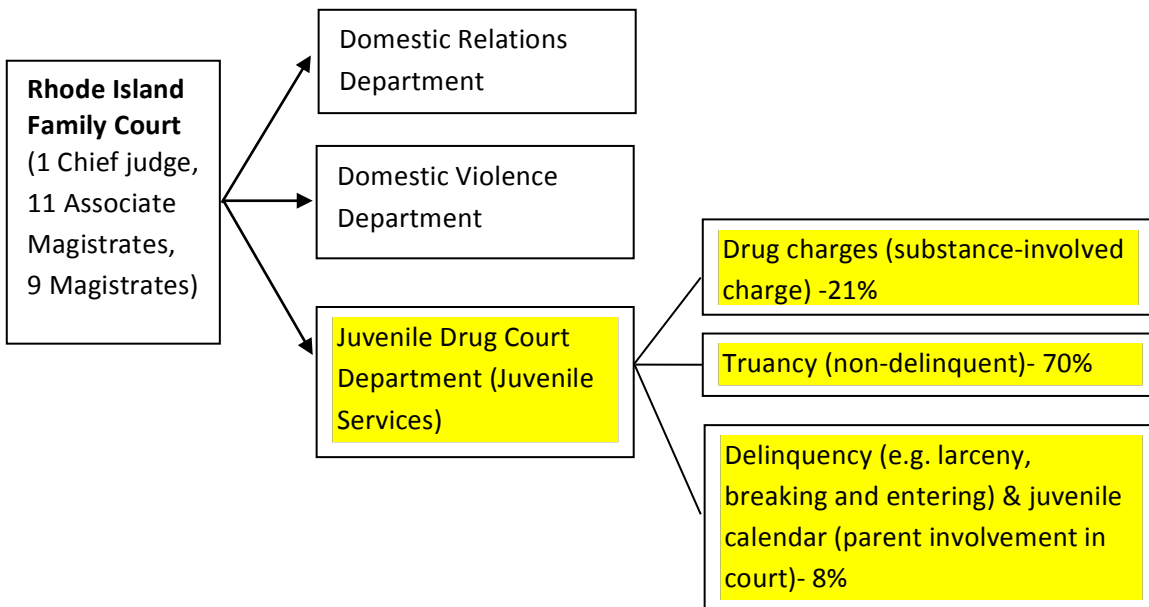
	Substance Use Disorder		P-Value
	Yes (n=101) n(%)	No (n=303) n(%)	
Incarceration @ 3 months	23 (22.8)	58(19)	<0.0001
Repeated a Grade	52 (51)	150 (50)	0.032

Table 5. Logistic Regression Results (n=404; substance use disorder, n=101, no substance use disorder, n=303)

Variable	Odds Ratio	95% Confidence Interval	P-value
Demographics			
Age	1.04	0.03–0.82	<.0001
Gender	2.42	0.32–0.54	<.0001
Race and ethnicity	1.37	0.23–5.06	.55
DCYF involvement	2.00	0.05–0.76	<.0001
Mental Health Diagnosis	1.31	0.25–3.23	.20
Insurance Status (yes)	.81	0.09–5.10	.5
Incarceration at 3 months	5.33	0.12–0.92	<.001
Grade repetition	3.5	1.51–3.55	.043

*p<0.05

Figure 2



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