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## Further Evidence of Racial Disparities in Drug Court Outcomes: Enhancing Service-Delivery to Reduce Criminal Recidivism Rates for Non-White Participants

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### ABSTRACT

The first drug court began in 1989, and since their inception, they have expanded to over 3,000 in the United States and United States territories. The long-term goal of drug courts is to reduce criminal recidivism rates for nonviolent offenders who have substance use disorders. This study adds to the literature by using secondary data to compare criminal recidivism rates between drug court participants ( $n = 163$ ) and probationers who had diagnosed substance use disorders and arrests that were eligible for drug court but they did probation instead ( $n = 185$ ). Criminal recidivism was measured up to 36 months post drug court/probation discharge, which provides a more accurate assessment of the long-term effectiveness of drug court. Furthermore, this study identified which drug court participants were most likely to recidivate. Drug court participants were less likely to recidivate than the probation group. However, differences between the two groups may have contributed to the difference in criminal recidivism rates and also suggest that screening criteria may exclude some non-White participants from drug court. Non-white participants were more likely to recidivate than their White counterparts. Implications for future research and drug court practice are discussed, focusing on enhancing the service-delivery of education and employment opportunities to non-White drug court participants.

### KEYWORDS

Criminal recidivism; drug court; education; employment; racial disparities; substance use disorders

### Introduction

In 2016, the United States Department of Health and Human Services (HHS) Office of the Surgeon General (2016) released a report highlighting various aspects of addiction in America, such as the prevalence of substance use disorders, the neurological and other biological factors associated with substance use disorders, the economic impact of substance use disorders, 13 principles of effective treatment for both adults and adolescents, and recommendations on how to incorporate medication-assisted treatment (MAT), and other evidence-based interventions, into treatment planning. The report also described barriers individuals face in trying to access treatment and how the majority of individuals receive inappropriate treatment or no treatment at all (HHS, Office of the Surgeon General, 2016). Without receiving the appropriate level of treatment, or

any treatment at all, for a substance use disorder, it is logical that individuals get involved in the criminal justice system and much (estimates at 50%) of the United States prison population has a substance use disorder (HHS, Office of the Surgeon General, 2016). Drug courts are a promising intervention in the criminal justice system used to treat individuals who have substance use disorders and evidence has suggested they are effective at reducing incarceration, drug use, and criminal recidivism (HHS, Office of the Surgeon General, 2016).

Drug courts began in 1989 in Dade County (Miami), Florida and have seen tremendous growth throughout the United States, as well as internationally. According to the National Association of Drug Court Professionals (NADCP) (2017), there are 3,057 drug courts throughout the United States and United States

territories, and each drug court operates within 10 key components. Drug courts are conceptualized through the 10 key components, summarized as: (a) mandated alcohol and drug treatment; (b) nonadversarial approach to criminal justice; (c) prompt admission into drug court following arrest; (d) referral to ancillary services (e.g. healthcare, vocational training); (e) frequent and random drug testing; (f) delivering incentives and sanctions; (g) frequent contact with the judge; (h) program evaluation; (i) training for the drug court team; and (j) collaboration with community agencies to promote drug court's mission (NADCP, 2004).

### Literature Review

According to Gallagher (2013b) in his drug court logic model, the 10 key components are implemented to help achieve short (e.g. increased motivation to change), medium (e.g. reduced drug and alcohol use), and long-term goals (e.g. reduced criminal recidivism rates). As noted in the logic model, the long-term goal of drug courts is to reduce the criminal recidivism rate for individuals who are involved in the criminal justice system and have substance use disorders. Therefore, it is important to assess whether or not drug court are more effective than other criminal justice interventions, such as traditional probation, at reducing criminal recidivism and to identify which drug court participants are most and least likely to recidivate. Drug courts are, perhaps, the most evaluated criminal justice program ever, and nearly three decades of evidence have found them to be more effective at reducing criminal recidivism than other criminal justice interventions, such as traditional probation (Mitchell, Wilson, Eggers, & MacKenzie, 2012; Shaffer, 2011). Specifically, meta-analyses of drug court evaluations found that the recidivism rate for drug court participants was lower to that of a comparison group; 38% for drug court participants and 50% for the comparison group (Mitchell et al., 2012) and 45.5% for drug court participants and 54.5% for the comparison group (Shaffer, 2011).

The meta-analyses provide strong evidence of drug courts effectiveness at reducing criminal

recidivism, although most evaluations are of single drug courts. In a Wisconsin drug court, for example, Brown (2011) found that the drug court group was less likely to recidivate than the non-drug court group (30% vs. 46%), and for those that did recidivate, the average jail time (44 days vs. 126 days) was less for the drug court group and the length to being convicted of a new crime (614 days vs. 463 days) was longer for the drug court group. A drug court in Indiana had similar findings. Gallagher et al. (2015) found that 47% of drug court participants recidivated, compared to 69% for the comparison group, which was probationers who had an arrest that made them eligible for drug court but they enrolled in probation instead.

There is a consistent pattern in the literature demonstrating that drug courts are effective at reducing criminal recidivism. However, more information is needed on the predictors of criminal recidivism so drug courts can enhance their service-delivery and further promote their long-term goal of reducing criminal recidivism rates. There are multiple studies that have predicted who is most likely to complete drug court (Dannerbeck, Harris, Sundet, & Lloyd, 2006; Gallagher, 2013b; Gill, 2016; Hickert, Boyle, & Tollefson, 2009; Mendoza, Trinidad, Nochajski, & Farrell, 2013; Wu, Altshuler, Short, & Roll, 2012). Studies predicting criminal recidivism, however, are less common, perhaps because it requires a longer time period to track recidivism rates. The studies that have predicted criminal recidivism have found that younger drug court participants are more likely to recidivate than older participants (Gallagher, Ivory, Carlton, & Woodward Miller, 2014; Krebs, Lindquist, Koetse, & Lattimore, 2007; Shaffer, Hartman, Listwan, Howell, & Latessa, 2011), participants who did not complete drug court were more likely to recidivate than graduates (Gallagher, 2014; Gallagher et al., 2014; Wolfe, Guydish, & Termondt, 2002), and participants who were unemployed (Shaffer et al., 2011) and Hispanic, as compared to white, were most likely to recidivate (Krebs et al., 2007).

The present study contributes to the existing literature by testing logistic regression models to predict criminal recidivism in a sample of drug court participants. In addition to demographics,

such as gender and age, the key variables of mental health and primary drug are included in the analysis. Quantitative research has suggested that participants who have opioid use disorders are less likely to graduate drug court than participants who have other substance use disorders (Gallagher et al., 2018a) and qualitative research has suggested that mental health may impact drug court outcomes (Gallagher, Nordberg, & Gallagher, 2018b). The variable of race/ethnicity did not have enough variation in responses; therefore, it was dichotomized as White versus non-White. It is important to note that this dichotomization is consistent with recent drug court research (Shannon, Jones, Nash, Newell, & Payne, 2018). The present study also contributes to the existing literature methodologically. A common limitation with drug court evaluations is that the follow-up period to measure recidivism is too short, typically 24 months or less (Mitchell et al., 2012). By extending the follow-up period to 36 months, which the present study does, a more accurate assessment can be made on the long-term impact of drug courts on criminal recidivism.

The drug court for this study was located in a metropolitan area in Indiana (United States) and the county population was approximately 270,000. The drug court has been operating since 1997 and employs a multidisciplinary judicial team consisting of a judge, drug coordinator, chief probation officer, case managers, prosecuting and defense attorneys, researcher, social workers, recovery coaches, and addiction and mental health treatment providers. To be eligible for the drug court, participants must have a substance use disorder and arrest for a nonviolent offense where there is evidence that the offense was associated with the individuals drug use. The drug court most commonly serves participants who have opioid, cannabis, and stimulant use disorders. Common criminal offenses in the drug court are possession of a controlled substance, possession of drug paraphernalia, acquiring possession of a controlled substance by fraud (e.g. forging prescriptions), and even theft, if there is evidence that the theft was associated with the individuals drug use (e.g. stole money or property to pawn to buy drugs). The length

of the program ranges from 12 to 24 months, and if a participant graduates drug court, her or his criminal case is dismissed. During the program, participants do interventions consistent with the key components of a drug court (NADCP, 2004), such as attending treatment for their substance use disorders, submitting random urine drug tests approximately one to three times a week, attending status hearings with the drug court judge approximately one to four times a month, and other individualized interventions, such as vocational training and GED preparation courses. The research questions are as follows:

1. Which drug court participants are most likely to recidivate?
2. Is drug court or probation more effective at reducing criminal recidivism?

## Methodology

### *Data Collection and Sample Size*

This study was approved by an Institutional Review Board (IRB). To answer the first research question, secondary data were collected on all drug court participants ( $n = 163$ ) who started the program from 2010 to 2012. Data were collected through the electronic charts of each participant. The sample size of 163 is justified for this study. Orme and Combs-Orme (2009), for example, suggest that a sample size of at least 100 be used when doing hierarchical binary logistic regression that has ten or fewer independent variables. This study had nine independent variables, and the dependent variable was recidivism (0 = did not reoffend, 1 = reoffended). See Table 1 for coding scheme and descriptive statistics for the drug court sample and model variables.

To answer the second research question, secondary data were collected on probationers ( $n = 185$ ) who started probation from 2010 to 2012. Probationers were matched to the drug court group ( $n = 163$ ) by having a diagnosed substance use disorder and by type of arrest. Specifically, all probationers had a diagnosed substance use disorder and arrest that made them eligible for drug court but they did probation

instead. Recidivism data were collected through Odyssey, which is a software used to manage and track criminal justice data, such as recidivism. Recidivism was defined as any new local arrest (within the county) for a felony or misdemeanor offense that resulted in charges being filed during drug court/probation and up to 36 months post drug court/probation discharge. The definition of recidivism was provided by the Indiana Office of Court Services, which is the agency that certifies Indiana problem-solving courts. The recidivism data were collected in 2016 to allow for the 36-month follow-up period.

**Approach to Analysis**

Before multivariate analysis was completed to answer the first research question, data were screened to check for missing data and potential violations of assumptions. All variables met assumptions for binary logistic regression. *t*-Tests and chi-square analyses were then utilized to examine bivariate relationships between recidivism group (reoffended vs. did not reoffend) for all model variables (see Table 2). The primary analysis was then conducted using hierarchical binary logistic regression. The first model

**Table 1.** Coding scheme and descriptive statistics for drug court sample and model variables.

Predictor	Range	Key	M(SD)	%
Recidivism	0–1	0—Did not reoffend 1—Reoffended		66.3 33.7
Gender	0–1	0—Female 1—Male		22.1 77.9
Race/ethnicity	0–1	0—White 1—Non-White		62.0 38.0
Age	18–60	Age at admission (in years)	30.46(10.05)	
Education	0–1	0—No high school diploma 1—High school diploma		26.4 73.6
Employment status	0–1	0—Not employed or student at admission 1—Employed or student at admission		44.8 55.2
Primary Drug	0–1	0—Not opiates 1—Opiates		87.1 12.9
Mental Health	0–1	0—No mental health diagnosis 1—Mental health diagnosis		83.4 16.6
Criminal History	0–1	0—No previous criminal case prior to current charge 1—Previous criminal case prior to current charge		90.2 9.8
Outcome	0–1	0—Terminated 1—Graduated		35.6 64.4

**Table 2.** Baseline characteristics by recidivism group.

Demographic category	N	Recidivism Group (% or M)		$\chi^2$ or <i>t</i>
		Reoffended ( <i>n</i> = 55)	Did not reoffend ( <i>n</i> = 108)	
Gender				
Female	36	16.7	83.3	6.03**
Male	127	38.6	61.4	
Race/ethnicity				
White	101	21.8	78.2	16.99***
Non-White	62	53.2	46.8	
Age		28.87	31.27	1.44
Education				
No HS diploma	43	51.2	48.8	7.93**
HS diploma employment status	120	27.5	72.5	
Not employed or student	73	35.6	64.4	.21
Employed or student	90	32.2	67.8	
Primary drug				
Not opiates	142	33.1	66.9	.20
Opiates	21	38.1	61.9	
Mental health				
No MH diagnosis	136	33.1	66.9	.16
MH diagnosis	27	37.0	63.0	
Criminal history				
No previous criminal case	147	32.7	67.3	.80
Previous criminal case	16	43.7	56.3	
Outcome				
Terminated	58	37.9	62.1	.71
Graduated	105	31.4	68.6	

\**p* ≤ .05, \*\**p* ≤ .01, \*\*\**p* ≤ .001.



examined how individual characteristics, including gender, race/ethnicity, age, education, and employment status predicted recidivism for the drug court sample. The second model examined how the addition of other clinically relevant variables, including primary drug (not opiates vs. opiates), mental health (no mental health diagnosis vs. mental health diagnosis), and criminal history (no previous criminal case [e.g. misdemeanor or felony] prior to the current charge or previous criminal case prior to current charge) increased the ability to predict recidivism. Whether participants were terminated from or graduated drug court was added to the third model to determine whether program outcome was able to predict recidivism. To answer the second research question, bivariate analyses were conducted to determine which program, drug court or probation, was more effective at reducing criminal recidivism and to examine potential differences between the two groups. Consistent with previous research (Brown, 2011), potential demographic differences, such as gender, race/ethnicity, age, and criminal history, between the two groups were assessed. All statistical analyses were performed using SPSS 24.0.

## Findings

### Bivariate Relationships

Approximately one-third of the drug court sample recidivated (33.7%) and two-thirds had not recidivated by the time these data were collected (66.3%). Bivariate relationships between recidivism group (participants who reoffended vs. participants who did not reoffend) and all other

model variables were examined using *t*-tests and chi-square analyses. Variables significantly associated with recidivism were gender, race/ethnicity, and education. Female participants were less likely to reoffend than males (16.7% vs. 38.6%,  $\chi^2 = 6.03$ ,  $p = 0.01$ ). White participants were less likely to reoffend than non-White participants (21.8% vs. 53.2%,  $\chi^2 = 16.99$ ,  $p \leq 0.001$ ). Lastly, participants with a high school diploma were less likely to reoffend than participants without a high school diploma (27.5% vs. 51.2%,  $\chi^2 = 7.93$ ,  $p = 0.01$ ).

### Model Fit

Statistics demonstrating model fit were examined before interpreting coefficients (see Table 3) and indicated that the demographic variables predicted recidivism more than any of the other variables, including primary drug, mental health, criminal history, or drug court outcome. The -2 Log Likelihood values decreased marginally from 181.84 in the first model to 176.76 in the third model, indicating minimal improvement of fit with each subsequent model tested. Similarly, the Omnibus  $\chi^2$  was significant, but the Block  $\chi^2$  was not significant for the second and third models. The Nagelkerke pseudo- $R^2$  value increased slightly with each subsequent model and indicated that the final model accounted for approximately one-fourth of the variance in the dependent variable (Nagelkerke  $R^2 = 0.25$ ). Although the hit rate improved minimally with each subsequent model, increasing from 69.3% to 74.2% with all variables included in the final model, the final model was better able to predict

**Table 3.** Hierarchical logistic regression results predicting recidivism.

	Model 1				Model 2				Model 3			
	<i>B</i>	Wald	Exp( <i>B</i> )	95% CI	<i>B</i>	Wald	Exp( <i>B</i> )	95% CI	<i>B</i>	Wald	Exp( <i>B</i> )	95% CI
Gender	0.97	3.41	2.63	0.94–7.32	0.98	3.43	2.67	0.95–7.52	1.00	3.54	2.73	0.96–7.75
Race/ethnicity	-1.29	11.50***	3.62	1.72–7.62	1.55	14.00***	4.71	2.09–10.59	1.54	13.88***	4.68	2.01–10.53
Age	-0.03	2.54	0.97	0.94–1.01	-0.03	1.75	0.98	0.94–1.01	-0.03	1.68	0.98	0.94–1.01
Education	-0.54	1.78	0.58	0.26–1.29	-0.70	2.70	0.50	0.22–1.14	-0.69	2.65	0.50	0.22–1.15
Employment status	-0.10	0.07	0.90	0.43–1.89	-0.04	0.01	0.96	0.45–2.05	-0.01	0.00	1.00	0.46–2.15
Primary drug					0.91	2.33	2.49	0.77–8.07	0.87	2.04	2.38	0.72–7.80
Mental health					0.68	1.79	1.97	0.73–5.33	0.68	1.79	1.98	0.73–5.35
Criminal history					0.15	.06	1.16	0.35–3.86	0.15	0.06	1.16	0.35–3.85
Outcome									-0.21	2.7	0.81	0.37–1.77
Block $\chi^2$	26.58***				4.81				0.27			
Model $\chi^2$	26.58***				31.39***				31.66***			
Nagelkerke $R^2$	0.21				0.24				0.25			
-2LL	181.84				177.03				176.76			

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

individuals who did not reoffend versus those who did (86.1% of participants who did not reoffend correctly classified vs. 50.9% of participants who recidivated).

### Summary of Model Variables

Demographic characteristics, including gender, race/ethnicity, age, education, and employment status, were entered in the first model (see Table 3) and resulted in a Nagelkerke  $R^2$  of 0.21. Race/ethnicity was the only variable that significantly predicted recidivism. Non-white participants were 3.6 times more likely to reoffend than White participants ( $\text{Exp}(B) = 3.62$ , Wald  $\chi^2 = 11.50$ ,  $p \leq 0.001$ ).

Primary drug (not opiates vs. opiates), mental health, and criminal history were added in the second model. Again, the only significant predictor of recidivism was race/ethnicity ( $\text{Exp}(B) = 4.71$ , Wald  $\chi^2 = 14.00$ ,  $p \leq 0.001$ ), and non-White participants were 4.7 times as likely to reoffend than White participants, even after controlling for criminal history, mental health, and primary drug. With the addition of these variables in the model, the Nagelkerke  $R^2$  increased from 0.21 to 0.24.

Finally, drug court outcome was added in the third model to determine whether being terminated from or graduating drug court predicted later recidivism. This variable did not significantly predict recidivism ( $\text{Exp}(B) = 0.81$ , Wald  $\chi^2 = 0.27$ ,  $p = 0.60$ ). However, race/ethnicity retained significance in this model ( $\text{Exp}(B) = 4.68$ , Wald  $\chi^2 = 13.88$ ,  $p \leq 0.001$ ). After accounting for the influence of all other model variables, non-White participants were still 4.68 times more likely to reoffend than White participants. The final Nagelkerke  $R^2$  was 0.25.

Because race/ethnicity was such a strong predictor of recidivism in these analyses, further analysis was conducted to examine potential group differences between White and non-White participants in this sample. Notably, the only significant differences between these groups were for education and employment status. At the beginning of drug court, White participants were more likely to have a high school diploma and be employed or in school than non-White participants (83.2% vs.

58.1%,  $\chi^2 = 12.47$ ,  $p \leq 0.001$  and 61.4% vs. 45.2%,  $\chi^2 = 4.09$ ,  $p = 0.05$ , respectively).

### Comparison between Drug Court and Probation Recidivism Rates

Drug court recidivism rate was then compared to a probation sample. The samples were initially matched for timeline of program entry (2010–2012), having a diagnosed substance use disorder, and type of arrest. All probationers had a diagnosed substance use disorder and arrest that made them eligible for drug court but they did probation instead. Drug court participants were less likely to recidivate than probation participants (33.7% vs. 55.7%). However, bivariate analyses were conducted to examine potential differences between these two groups (see Table 4). Although matched on some key demographics (e.g. gender and age), there were significant differences in these two groups for race/ethnicity, education, employment status, criminal history, and outcome of their required program. The outcome for the probation sample was revoked versus completed and the outcome for the drug court sample was terminated versus graduated. Drug court participants were more likely to be White (62.0% vs. 49.7%,  $\chi^2 = 5.25$ ,  $p = 0.02$ ), have a high school diploma (73.6% vs. 52.4%,  $\chi^2 = 16.57$ ,  $p \leq 0.001$ ), be employed or a student at the time of program entry (55.2% vs. 35.1%,  $\chi^2 = 14.14$ ,  $p \leq 0.001$ ), and have successfully completed their required program (64.4% vs. 41.1%,  $\chi^2 = 18.91$ ,  $p \leq 0.001$ ) than probation participants. They were also less likely to have a criminal history than probation participants (9.8% vs. 89.2%,  $\chi^2 = 218.72$ ,  $p \leq 0.001$ ). Thus, it is important to mention that differences in recidivism rate between the two samples could be because of these key differences in participants upon entry into drug court or probation.

### Discussion

The finding that drug court participants were less likely to recidivate than the probation group is consistent with previous research (Mitchell et al., 2012; Shaffer, 2011). It is important to

**Table 4.** Comparison of drug court and probation samples.

Demographic category	Program status (% or M)		$\chi^2$ or <i>t</i>
	Probation ( <i>n</i> = 185)	Drug court ( <i>n</i> = 163)	
Gender			
Female	18.4	22.1	0.74
Male	81.6	77.9	
Race/ethnicity			
White	49.7	62.0	5.25*
Non-White	50.3	38.0	
Age	30.82	30.46	0.33
Education			
No HS Diploma	47.6	26.4	16.57***
HS Diploma Employment Status	52.4	73.6	
Not employed or student	64.9	44.8	14.14***
Employed or student	35.1	55.2	
Criminal history			
No previous criminal case	10.8	90.2	218.72***
Previous criminal case	89.2	9.8	
Outcome			
Revoked/terminated	58.9	35.6	18.91***
Completed/graduated	41.1	64.4	
Recidivism			
Did not reoffend	44.3	66.3	16.82***
Reoffended	55.7	33.7	

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

mention, however, that there were noticeable differences between the two groups. As a result, the recidivism outcomes may be unrelated to the interventions and more associated with who was referred to drug court versus who was not. This speaks to another common issue with drug courts. From a policy lens, nonwhite participants in this study seemed to be underrepresented in the drug court, and previous research has suggested that eligibility criteria may inadvertently exclude racial and ethnic minorities from the program (Marlowe, 2013; NADCP, 2013). For example, in this study, despite the two groups being matched by having a diagnosed substance use disorder and arrests that were eligible for drug court, the drug court group was significantly more likely to be White and have no criminal history. The exclusion of nonwhite participants from drug courts, although it may be inadvertent, is most likely a result of institutional bias. Eliminating institutional bias through research and policy advocacy is a priority for social work and consistent with the social work grand challenge of *Promote Smart Decarceration* (Pettus-Davis & Epperson, 2015).

It is important to consider how oppressive criminal justice policies can negatively impact racial and ethnic minorities. For instance, when drug courts evaluate whether or not individuals are eligible for the program, the norm is to

review potential participants' criminal histories, and past felony convictions may disqualify some from being admitted into drug court. This seems to be the case in this study. Probationers were significantly more likely than drug court participants to have a criminal history and more likely to be non-White. Drug courts, however, are designed to treat individuals who are considered high risk, which may include having a criminal history, substance use disorder, or other risk factors for criminal recidivism. Therefore, it is important for drug courts to assess their eligibility criteria to assure they are treating the appropriate populations and not excluding racial and ethnic minorities from the program. Actually, high risk participants seem to respond equally as well, if not better in some circumstances, to drug court as participants who are at lower risk of criminal recidivism, and this can result in greater cost savings to the community (Carey, Mackin, & Finigan, 2012).

Furthermore, the underrepresentation of non-White participants in drug courts is particularly alarming because both qualitative (Gallagher, 2013a) and quantitative (Gallagher et al., 2014) research has suggested that when non-White participants are underrepresented in drug courts, this may be a factor that contributes to racial disparities in graduation and recidivism outcomes. As a key component of the drug court model



(NADCP, 2004), it is recommended that drug courts complete program evaluations, but also evaluate their screening procedures for admission to assess whether or not there are criterion, such as having a previous criminal case, that may exclude non-White participants from the program.

The finding that non-White participants were 4.68 times more likely to recidivate than White participants is part of a larger issue related to racial disparities in drug court outcomes, both graduation and recidivism outcomes. Although not universal, there is a trend in the literature where, in some drug courts, non-White participants graduate drug court at a lower rate (Marlowe, 2013) and recidivate at a higher rate (Krebs et al., 2007), as compared to their White counterparts. This is a trend that dates back to over a decade-and-a-half (Brewster, 2001). However, the majority of evidence is related to racial disparities in graduation outcomes (Dannerbeck et al., 2006; Gallagher, 2013b; McKean & Warren-Gordon, 2011) because, as mentioned previously, studies predicting criminal recidivism are less common.

This study adds to the literature and to the knowledgebase on drug court practice by identifying two factors that seem to be associated with racial disparities in criminal recidivism rates. White participants were more likely than non-White participants at the beginning of drug court to have a high school education and be employed or in school. This suggests that drug courts can improve their service-delivery, particularly to non-White participants, by enhancing opportunities for vocational training, education, and employment. This suggestion is supported by a recent qualitative study where African American participants of a Midwestern drug court felt that the drug court could better support them in finding employment, sustaining employment they already had, and developing vocational skills (Gallagher, Nordberg, & Dibley, 2017).

A key component of the drug court model is to collaborate with community agencies to provide comprehensive services to participants (NADCP, 2004). For instance, drug courts may refer participants to agencies that do HIV/AIDS testing, provide mental health treatment, or offer

dental and medical care. Similarly, it is important that drug courts collaborate with local community colleges, universities, and employers to be an avenue to increase education and employment opportunities throughout the program. As education and employment increases, drug court outcomes improve (Gill, 2016; Shaffer et al., 2011; Wu et al., 2012). It is important to mention, however, that understanding the phenomenon of racial disparities in criminal recidivism rates is complex. Enhancing education and employment opportunities is only part of the solution to this problem. There are some factors that impact recidivism rates that drug courts have little, if any, control over. For example, in their recent qualitative study, Gallagher and Wahler (2018) found that environment negatively impacted drug court outcomes for some African American participants. The majority (65%) of African American participants in their study discussed various risk factors associated with their families, neighborhoods, and peers that were barriers to graduating drug court and not recidivating. Some of the risk factors included family members and peers who were using drugs, committing crimes (e.g. selling drugs), and living in a neighborhood that was viewed as unsafe. The impact of families, neighborhoods, and peers on drug court are examples of the complexities surrounding racial disparities in criminal recidivism rates. It is only through ongoing evaluation that an in-depth understanding of drug court programing and participants' experiences in the program will be achieved.

The findings should be interpreted within the limitations of the study. First, although the two groups had arrests that were eligible for drug court and all members of each group had a diagnosed substance use disorder, there were significant differences, particularly with race/ethnicity and criminal history, between the drug court and probation groups, and these differences may explain the variation in criminal recidivism rates, as compared to the interventions themselves. It is recommended that future research explore the screening criteria used for drug court admission, as some criterion may inadvertently exclude non-White participants. Second, the variables of education and employment status were only

measured, due to availability, at admission into drug court or probation, hence they did not account for those who earned a high school diploma or became employed or a student throughout their program. Therefore, because education and employment status seem to be strong predictors of successful drug court outcomes, it is recommended that future research track participants' education and employment throughout drug court to assess their ongoing impact on outcomes.

Third, important variables, such as primary drug and mental health, did not have enough variation in responses; therefore, they had to be dichotomized. This approach, unfortunately, does not provide a comprehensive understanding on how different mental health diagnoses (e.g. major depressive disorder, bipolar disorder, generalized anxiety disorder) and primary drugs of choice (e.g. cocaine, marijuana, methamphetamine) impact drug court outcomes. Future research should use matched sampling to test hypotheses related to how specific mental health diagnoses and primary drugs of choice impact graduation and criminal recidivism outcomes. Fourth, the definition for criminal recidivism was provided by the Indiana Office of Court Services, which is the agency that certifies Indiana problem-solving courts. The definition, however, only measures rearrests within the county that the drug court was located. Therefore, it is possible that drug court and probation participants recidivated outside of the data collection area and these data were not accounted for. It would be beneficial if future research tracked criminal recidivism nationally, perhaps by using data provided by the National Crime Information Center (NCIC).

## Conclusion

The findings from this study that used a 36-month follow-up period to measure criminal recidivism is consistent with previous research that found drug courts to be effective at reducing recidivism rates for individuals who have substance use disorders. The benefits of drug court, however, do not appear to be equal across race/ethnicity in some programs. In some drug courts, for instance, non-White participants are

underrepresented, have lower graduation rates, and higher recidivism rates than their White counterparts. As drug courts continue to expand throughout the United States, as well as internationally, future research should focus on identifying and rectifying barriers to accessing the program and exploring factors that may contribute to racial disparities in drug court outcomes. Consistent with the findings from this study, improving their service-delivery of education and employment opportunities to non-White participants may be a step in eliminating racial disparities in drug court outcomes.

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