Treatment Retention Predictors of Drug Court Participants in a Rural State

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ABSTRACT

Factors distinguishing clients who complete drug court treatment from those who do not complete drug court have been documented, but differences between urban and rural drug court participants have not been examined. The present study focuses on examining mental health, drug use, criminal activity, and education/employment as factors that are associated with treatment retention, which is measured by graduation from a rural and urban drug court. Study findings indicate that for the urban drug court, marital status, employment, drug use, and criminal activity predicted graduation. For the rural drug court, however, graduation was only predicted by age and juvenile incarceration. Findings from this study suggest there are different factors associated

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with drug court retention/graduation between urban and rural drug court settings. It is suggested that drug court administrators and other could use this information to better assess potential participants and to target services.

Key Words: Drug court; Urban; Rural; Treatment retention; Graduation.

INTRODUCTION

According to the Bureau of Justice Statistics, the number of jail inmates who were regular drug users or were incarcerated for a drug offense increased substantially in 1998 from 261,000 eleven years earlier to over 400,000 (1). America’s ‘‘war on drugs’’ during the 1980s also increased the number of drug arrests as a result of mandatory sentencing practices for drug offenders. This dramatic increase in arrests created overcrowding in the state and federal justice system as well as correctional systems. One of the more successful attempts to reduce this overcrowding in the last two decades are drug courts.

Drug courts view the increase in drug use/arrests as a criminal justice issue as well as a public health problem that can be remedied (2). Drug courts were recognized as a way to alleviate overcrowding and provided other benefits which include: 1) reduced recidivism; 2) decreased drug use; 3) increased birth rates of drug-free babies; 4) greater access to mentor groups and community resources; 5) increased efforts by participants at long-term relapse prevention efforts; and 6) cost-effective treatment (3–5). By June 2001, a total of 226,000 individuals were enrolled in adult drug court programs in the United States with an estimated 74,000 graduates (6).

Treatment Retention and Outcomes

Successful completion of substance abuse treatment, including drug court treatment, leads to a higher likelihood of a continued drug-free lifestyle (7), as well as decreased criminal activity, greater psychological functioning (i.e., lower rates of depression), and increased employment (8,9). Clients who drop out early or are terminated from treatment are more likely to relapse and have future increased legal and employment problems (7). Furthermore, drug court clients who stay in treatment for one year or longer are five times more likely to have better outcomes than those who drop out or participate for a minimum time period (10). Treatment also can improve relationships with friends, family and employers (11) which, in turn, lead to decreased substance use and criminal involvement (12–14). In
addition, drug court graduates are less likely to recidivate and use fewer substances after treatment than nontreated offenders, and if graduates do reoffend, they do so after a longer period of time than do those who do not graduate (15).

Factors related to treatment retention have been identified. Although sometimes conflicting, distinctions have been noted between treatment completers and dropouts. For example, one study found that treatment completers were more likely than were dropouts to have better social connections, more close friends, and greater social conformity (7). In addition, completers were less likely to report having significant problems with a spouse or significant other in the 30 days prior to arrest, while having such problems with a significant other increased the odds of dropout (16). Similarly, being married predicted treatment retention (9,17–20). However, differences between completers/noncompleters in urban and rural areas, as well as those who were most likely to benefit from the drug court program, have not been fully explored (3).

While some studies indicate that females are more likely than are males to remain in treatment (21,22), other studies have reported no statistical difference between genders (23,24) or reported that women were more likely to drop out of treatment than were men (9). Race/ethnicity has also been examined as a factor in treatment retention. For example, a recent study found that only one-third (31.6%) of blacks completed treatment compared to two-third (68.9%) of whites (25), while another study reported black women had a lower chance of treatment completion than did other women (17). Conversely, other studies indicate there are no significant differences in the rates of treatment nonsuccess between races (9,23,24).

Two demographic characteristics, which are related to one another as well as to retention, are education and employment. Specifically, a low educational level and/or being unemployed have consistently predicted relapse and treatment dropout (7,16,18,20,25–27). According to Sayre, et al. (16), clients with lower education levels have more difficulty expressing their needs, completing treatment assessments, may feel inferior to those participants with more education, and are more apt to drop out. Moreover, those individuals who cannot find stable employment because of limited education are less likely to resist temptation to use drugs after treatment (8). Studies also suggest that employment stability is associated with reduced substance use, severity of relapse, improved community functioning, and community reintegration (28–32). In particular, stable employment interrupts addiction patterns and unemployment has proven to be a stronger predictor of relapse than the severity of a client’s addiction (30).

In addition to employment and education, another demographic variable that has been associated with treatment completion is age. Specifically, older clients are more likely to complete treatment with
positive outcomes than are younger clients (17,24,25,27). It is possible that older participants with a longer history of drug use are more ready for change than are younger clients who have not used as long (23). In addition, older clients may have more stable lifestyles, which prompt change; and/or they may have just ‘grown out’ of their drug use. According to the maturation hypothesis, addicts become inactive because of their lifecycle (that is, addicts stop using drugs in their 30s) or due to the number of years of their addiction. For example, Winick (1962) explained that individuals in their teens and late 20s begin using drugs to cope with social pressures, decisions, and as an expression of social needs. By their 30s, addicts feel less is expected of them. There are not as many pressures, stressors, and strains as before, thus establishing more stable emotions (33).

In addition to demographic characteristics, treatment completers and noncompleters can also differ in terms of their psychological behavior, drug use, and criminal activity. For example, several studies reported that mental health problems are associated with substance use. One study in particular reported that over one-third of those receiving mental health treatment had substance abuse problems that influenced their current mental health status (35,36). Psychiatric disorders such as anxiety and depression are among the most frequently reported problems by substance abusers (36). Although there are contradictory findings, one study reported that treatment noncompleters were four times more likely to have psychiatric disorders than were those who completed treatment (7). Psychiatric status has been related to treatment completion/noncompletion, as well as posttreatment outcomes (9).

Clients with longer and more severe drug use histories at treatment entry are less likely to complete treatment (7). There are also data that suggest that clients with both cocaine dependence and alcohol dependence may have more severe dependency issues and lower rates of treatment completion (37). Furthermore, findings from a study by Brown, Voskul, and Leyman (1977) suggest that the primary drug of choice was different for urban and rural areas. While opiates were reported to be the primary drug among urban users, rural users preferred marijuana or inhalants (38). An analysis of the data from the National Household Survey found that rural respondents reported using cocaine and marijuana less frequently than did urban respondents, which could be related to the limited availability of cocaine in rural areas (34). Another study reported that alcohol abuse was more prevalent in rural areas when compared to urban areas (39). Residents of rural areas are generally older and, therefore, treatment needs in rural areas are different than those in urban areas (34). Research has shown that, despite the substance use, there is a higher level of disapproval for drugs and alcohol use in rural areas than urban areas (40), which may account for the mental health problems rural drug users face and possibly the different drug treatment needs (34).
Studies on the relationship between treatment retention and criminal activity reveal that early involvement with the criminal justice system and having a more extensive criminal history produce less favorable treatment outcomes (27,41). In fact, it has been reported that each felony conviction increases the likelihood of dropping out of treatment (7). While the number of drug-specific charges do not seem to predict treatment dropout, clients with more charges before treatment and those with a history of violence were more likely to have negative treatment outcomes and pretreatment dropout (24,43). Other studies, however, have found that clients with a higher number of prior offenses were more likely to complete treatment or remain in treatment longer (16,19,25). Furthermore, a greater number of clients who completed treatment were involved in trafficking illegal substances (25).

The Bureau of Justice Statistics reported that almost three-fourths (74%) of offenders with 11 or more prior arrests will be rearrested within three years; however, treatment program graduates with 11 or more offenses are half as likely to reoffend when compared to noncompleters (44). In rural areas, however, activities that may be reported as being criminal in urban areas may not be considered a crime in rural areas because of the rural “culture” of keeping issues within the community, handling problems informally, or the communities’ limited resources (i.e., medical examiners in cases to death) (45). Consequently, rural clients may appear to have committed fewer crimes, but may actually have committed the same number of crimes as urban clients.

**Kentucky Drug Courts**

According to the Census Bureau, a rural area is one that has a population of less than 50,000 residents combined with its adjacent areas. Kentucky is one of 15 states in which more than half of its residents live in areas with less than 25,000 people (46). There are 108 counties in Kentucky which, based on this definition, are rural and 12 are urban. Overall, rural residents constitute one-fifth of the U.S. population and one-third of the nation’s persons in poverty (47). Kentucky’s rural areas have lower education levels (40) with the number of persons with a high school degree, well below the national average. Furthermore, Kentucky’s poverty rate is higher than the national average (16% vs. 13%) (48,49).

Kentucky introduced its first drug court in 1993 for addicted, nonviolent offenders. By January 2001, there were 10 Kentucky adult drug courts and 20 others in the planning stages (50,51). One of the largest drug courts in Kentucky is operated in Fayette County. The Fayette County Drug Court was established by the Administrative Office of the Court in 1996 and serves an urban population (51). The program includes three
phases which take 12 to 24 months to complete depending on individual progress. Participants are required to pay appropriate restitution, find court approved housing, and maintain full-time employment or be involved in school, most frequently GED coursework.

At the end of 2001, the Fayette County Drug Court had 491 participants, 146 graduates, and a 48% retention rate (6). The majority of the Fayette County Drug Court clients were male (71%) and African American (64%) with an average age of 31 (51). Those who graduated from drug court were more likely to be older; however, the difference in ages between completers and noncompleters is diminishing (51).

Drug courts in Kentucky, however, are not limited to larger, more urban areas. Several drug courts have been implemented and are being planned in rural areas. For example, the Warren County Drug Court was established in 1997 and serves a community of less than 50,000 people when compared to Fayette County, which serves a population of approximately 260,000 according to the 2000 census. Graduates of the Warren County Drug Court were more likely to be male, white, and older (51). Unlike Fayette County, which had a retention rate of 48%, the Warren County Drug Court had a retention rate of 80% (6). This difference in retention between an urban and rural drug court warrants further research.

Purpose

Research on crime, drugs, and treatment has primarily focused on urban areas (45). Because there is limited research that examines both rural and urban drug courts, the current study focuses on drug court treatment retention in rural and urban areas using data collected from the Enhancing Drug Court Retention in a Rural State project, which is supported by the National Institute on Drug Abuse. Specifically, mental health, drug use, criminal activity, and education/employment will be examined to better understand differences between rural and urban drug courts clients. This study will provide information to fill gaps in the literature on drug court treatment in rural as well as urban areas and to provide possible explanations for the differences in rural and urban drug court retention.

METHOD

Participants

The 500 participants for the current study were selected from two Kentucky drug court sites in order to provide urban and rural comparisons.
The Fayette County Drug Court program was selected as an urban setting because it is located at the crossroads of two major interstates, and the area has a reputation as a marijuana producer. The Warren County Drug Court was selected as a rural site because it is a rural county with a rising drug problem. Study eligibility was based on criteria for entry into the drug court program including nonviolent charges, a self-admitted drug problem, urine test consent, and an Addiction Severity Index classification as a drug abuser.

Most of the study participants (69.0%) were male, with an average age of 30.4 years (range 18–57). Over half of the participants were white (59.0%), with an average of 11.8 years of education. In addition, participants were more likely to have never been married (56.0%), with 1.6 children (range 0–21). Participants included 50% (N = 250) from the Fayette County Drug court (urban site) and 50% (N = 250) from the Warren County Drug Court (rural site).

**Procedure**

Participants were recruited for the Enhancing Drug Court Retention project between March 2000 and December 2002 when they appeared before a drug court judge. Project participation was voluntary and subjects interested in participating were interviewed face-to-face within two weeks of drug court program entry after receiving their informed consent. At the time of interview, participants were given a description of the project, procedures, and assurance of confidentiality following International Review Board (IRB)-approved informed consent procedures. Each question was individually asked and recorded by the interviewer. The interview lasted approximately two hours and all participants completing an interview were paid for their participation.

**Measures**

The interview instrument contained measures of lifetime, past year, and 30-day time periods focusing on the time before drug court entry. The specific measures included:

The Addiction Severity Index (ASI), which is a reliable measure of drug and alcohol abuse severity, health, and treatment change through demographic information and personal histories of health, mental status, legal status, family and social relationships, and employment (52,53). For the present study, the ASI was used to examine self-reported histories of drug use, mental health, and treatment. Drug use histories were obtained by
asking participants how many years and how often they regularly used alcohol, marijuana, cocaine, inhalants, amphetamines, methamphetamines, opiates, heroin, and multiple drugs. Pattern of drug usage was coded from 0 (never) to 7 (about 4 or more times daily).

Criminal history was measured with each consenting participant’s criminal record from their drug court file. Overall, over 95% of the total sample—97% from Fayette County and 94% from Warren County—agreed to have their criminal records included in the study. The information was categorized and summed to obtain the total number of charges, total number of convictions, and first and last dates of arrest.

The Brief Symptom Inventory was developed from the SCL-90-R instrument and was designed to evaluate psychological symptoms at intake. This inventory includes nine subscales: Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. A Global Severity Index was created by summing the responses on each subscale (54).

Analytic Plan

Variables selected for analysis, for those who had graduated or terminated drug court (N = 347), included: 1) demographics; 2) employment and income; 3) drug use; 4) criminal history. Data were analyzed in a series of analysis of variance (ANOVA) and chi-square tests with drug court status (graduated or terminated) and rural/urban as the fixed factors. Demographic variables were analyzed by comparing graduated (N = 132) vs. terminated (N = 215), and again by urban (N = 181) vs. rural (N = 166). Subjects were then categorized into one of four groups: graduated urban, graduated rural, terminated urban, and terminated rural. After the initial ANOVA test was conducted, the Tukey Honestly Significantly Different (HSD) post-hoc comparison procedure was applied to test for significant differences between the four status groups. After significance was determined, significant variables were used as predictors in a logistic regression equation to determine which factors predicted graduation or termination for the entire sample and then again on both the urban and rural samples separately.

RESULTS

Graduated vs. Terminated

The ANOVA and chi-square tests revealed significant differences between terminated and graduated groups and between urban and rural groups.
Significant effects between the graduated and terminated groups were found for age, $F(1, 345) = 10.65$, $p < .001$; marital status $\chi^2 (1, N = 346) = 3.32$, $p < .10$; employment since drug court entry $\chi^2 (2, N = 326) = 10.2$, $p < .01$; and years of education $F(1, 345) = 9.70$, $p < .01$. These differences indicated that participants who graduated from drug court were slightly older ($M = 31.80$, $SD = 9.41$), were more educated ($M = 12.17$, $SD = 1.85$), were more likely to be employed full-time, and were less likely to be married.

**Urban vs. Rural**

For urban and rural, significant main effects were found for race, $\chi^2 (1, N = 347) = 13.69$, $p < .001$, and employment since drug court entry, $\chi^2 (2, N = 326) = 16.9$, $p < .001$. Specifically, Warren County Drug Court participants were more likely to be white, while urban participants were more likely to be employed full-time. The number of children was significantly different between the urban and rural participants $F(1, 340) = 3.49$, $p < .10$, with urban participants having more children ($M = 1.7$, $SD = 1.74$) than rural participants ($M = 1.4$, $SD = 1.46$). In addition, rural participants reported slightly more legal income in the six months prior to drug court entry $F(1, 345) = 3.68$, $p < .06$ ($M = 4,518.84$, $SD = 5,344.41$) than did urban clients ($M = 3,475.68$, $SD = 4,781.85$).

**Graduation Status by Urban/Rural**

While no significant differences were found for income or mental health problems among the four groups, significant differences were found for drug use (e.g., lifetime drug use for each substance, pattern of usage; see Table 1). Terminated urban participants used cocaine and multiple substances more often ($M = 4.3$, $SD = 2.73$ for cocaine; $M = 4.2$, $SD = 2.56$ for multiple substances) and for more years ($M = 5.7$, $SD = 5.73$ for cocaine; $M = 6.4$, $SD = 6.13$ for multiple substances) than terminated rural participants ($M = 1.7$, $SD = 2.45$ for pattern of cocaine usage; $M = 2.8$, $SD = 2.71$ for pattern of multiple substances; $M = 1.9$, $SD = 3.96$ for number of years of cocaine use; $M = 3.3$, $SD = 5.11$ for number of years of multiple substance use). In addition, urban graduates used cocaine ($M = 4.5$, $SD = 6.56$) and multiple substances ($M = 5.7$, $SD = 6.06$) for a longer period of time than did rural participants who were terminated from the drug court program ($M = 1.9$, $SD = 3.96$ for cocaine use; $M = 3.3$, $SD = 5.11$ for multiple substance use). Also, terminated urban participants used cocaine more often than did urban graduates ($M = 4.3$, $SD = 2.73$ and $M = 3.0$, $SD = 2.75$, respectively).
Table 1. Demographic information as a function of graduation status and rural/urban.

<table>
<thead>
<tr>
<th></th>
<th>Graduated</th>
<th></th>
<th>Terminated</th>
<th></th>
<th>F (df)</th>
<th>$\chi^2$ (df)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban</td>
<td>Rural</td>
<td>Urban</td>
<td>Rural</td>
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<tr>
<td>Race</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>White</td>
<td>59.3%</td>
<td>68.5%</td>
<td>45.1%</td>
<td>69.9%</td>
<td>—</td>
<td>17.06 (3)</td>
</tr>
<tr>
<td>Non-white</td>
<td>40.7%</td>
<td>31.5%</td>
<td>54.9%</td>
<td>30.1%</td>
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<td>—</td>
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<tr>
<td>Age (years)</td>
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<tr>
<td></td>
<td>30.9&lt;ab</td>
<td>32.5&lt;ab</td>
<td>29.4&lt;ab</td>
<td>27.7&lt;a</td>
<td>4.63 (3, 343)</td>
<td>—</td>
</tr>
<tr>
<td>Education (years)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>12.2&lt;e</td>
<td>12.2&lt;e</td>
<td>11.6&lt;ab</td>
<td>11.3&lt;a</td>
<td>3.62 (3, 343)</td>
<td>—</td>
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<tr>
<td>Employment</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Unemployment</td>
<td>30.8%</td>
<td>34.2%</td>
<td>54.6%</td>
<td>44.1%</td>
<td>—</td>
<td>29.86 (6)</td>
</tr>
<tr>
<td>Part-time</td>
<td>3.8%</td>
<td>12.3%</td>
<td>1.9%</td>
<td>18.3%</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Full-time</td>
<td>65.4%</td>
<td>53.4%</td>
<td>43.5%</td>
<td>37.6%</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Drug use</td>
<td></td>
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<td></td>
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<td></td>
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<tr>
<td>Lifetime use (in years)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Alcohol</td>
<td>5.9</td>
<td>7.4</td>
<td>7.2</td>
<td>5.4</td>
<td>1.33 (3, 343)</td>
<td>—</td>
</tr>
<tr>
<td>Marijuana</td>
<td>7.1</td>
<td>5.4</td>
<td>7.1</td>
<td>5.8</td>
<td>1.35 (3, 342)</td>
<td>—</td>
</tr>
<tr>
<td>Cocaine&lt;g</td>
<td>4.5&lt;bc</td>
<td>2.5&lt;ab</td>
<td>5.7&lt;e</td>
<td>1.9&lt;a</td>
<td>10.51 (3, 342)</td>
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<tr>
<td>Multiple drugs&lt;g</td>
<td>5.7&lt;bc</td>
<td>3.7&lt;ab</td>
<td>6.4&lt;e</td>
<td>3.3&lt;a</td>
<td>6.56 (3, 343)</td>
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</tr>
<tr>
<td>Pattern of usage</td>
<td></td>
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<td>Alcohol&lt;d</td>
<td>3.0</td>
<td>3.1</td>
<td>3.9</td>
<td>3.0</td>
<td>3.41 (3, 343)</td>
<td>—</td>
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<tr>
<td>Marijuana</td>
<td>3.1</td>
<td>2.6</td>
<td>3.4</td>
<td>3.5</td>
<td>1.57 (3, 342)</td>
<td>—</td>
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<tr>
<td>Cocaine&lt;g</td>
<td>3.0&lt;bc</td>
<td>1.2&lt;ab</td>
<td>4.3&lt;e</td>
<td>1.7&lt;a</td>
<td>30.95 (3, 343)</td>
<td>—</td>
</tr>
<tr>
<td>Multiple drugs&lt;g</td>
<td>3.4&lt;bc</td>
<td>2.0&lt;ab</td>
<td>4.2&lt;e</td>
<td>2.8&lt;a</td>
<td>12.32 (3, 343)</td>
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<tr>
<td>Criminal activity</td>
<td></td>
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<td></td>
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<tr>
<td>Probation violations&lt;g</td>
<td>1.2&lt;b</td>
<td>.2&lt;a</td>
<td>2.0&lt;c</td>
<td>.2&lt;a</td>
<td>34.16 (3, 324)</td>
<td>—</td>
</tr>
<tr>
<td>Drug/alcohol offenses&lt;1</td>
<td>6.6&lt;bc</td>
<td>5.1&lt;ab</td>
<td>5.1&lt;ab</td>
<td>4.0&lt;e</td>
<td>3.92 (3, 324)</td>
<td>—</td>
</tr>
<tr>
<td>Violent offenses&lt;2</td>
<td>.8&lt;ab</td>
<td>.6&lt;e</td>
<td>1.3&lt;b</td>
<td>1.0&lt;ab</td>
<td>3.32 (3, 324)</td>
<td>—</td>
</tr>
<tr>
<td>Miscellaneous offenses&lt;3</td>
<td>16.8&lt;e</td>
<td>8.8&lt;e</td>
<td>12.1&lt;b</td>
<td>7.5&lt;e</td>
<td>14.72 (3, 324)</td>
<td>—</td>
</tr>
<tr>
<td>Total number of charges&lt;4</td>
<td>30.0&lt;bc</td>
<td>19.5&lt;ab</td>
<td>28.3&lt;ab</td>
<td>18.6&lt;bc</td>
<td>13.75 (3, 324)</td>
<td>—</td>
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<tr>
<td>Convictions&lt;5</td>
<td>15.7&lt;bc</td>
<td>8.1&lt;e</td>
<td>14.9&lt;bc</td>
<td>8.6&lt;e</td>
<td>8.67 (3, 324)</td>
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<tr>
<td>Juvenile incarceration&lt;6</td>
<td>30.5%</td>
<td>20.5%</td>
<td>41.8%</td>
<td>39.8%</td>
<td>—</td>
<td>10.66 (3)</td>
</tr>
</tbody>
</table>

Note: df < .10.
<5p < .05.
<4p < .01.
<3p < .001.
ab, bc, b, c, and a define homogeneous groups.
In addition to drug use, an analysis of criminal activity yielded significant differences among the four groups. Urban participants who terminated had more probation violation offenses ($M = 2.0, SD = 2.05$) than did any of the other three groups ($p < .001$) and both urban groups had more probation violations ($M = 2.0, SD = 2.05, M = 1.2, SD = 1.73$) than did the rural groups ($M = .2, SD = .54$ for rural graduates, and $M = .2, SD = .56$ for terminated rural participants). In addition, urban graduates had more miscellaneous criminal offenses (i.e., traffic, prostitution, nonsupport, miscellaneous, and weapons) ($M = 16.8, SD = 12.66$) than did any other group ($p < .001$). Overall, urban participants had more convictions than did rural participants, and urban graduates not only had more convictions ($M = 15.7, SD = 11.44$) than did rural graduates ($M = 8.1, SD = 7.76$), but they also had more convictions than terminated rural participants had ($M = 8.6, SD = 9.51$).

Logistic Regression Model

An overall logistic regression model predicting graduation and termination revealed several predicting variables for drug court termination (see Table 2). Specifically, for every year increase in a participant’s age, there was a nearly 5% greater likelihood of graduation from drug court ($b = .05, p < .001$). Also, clients employed full-time while in drug court were 2.9 times more likely to graduate ($b = .39, p < .01$). Furthermore, married clients were 57% less likely to graduate ($b = - .85, p < .01$). Results showed that for every year of education, a drug court participant was 15% more likely to graduate ($b = .14, p < .05$). Finally, nonwhite drug court participants were 37% less likely to graduate than were their white counterparts ($b = - .47, p < .05$).

Client patterns of cocaine use in the six months before drug court also emerged as a significant predictor of drug court graduation. Specifically, clients who used cocaine more often in the six months before drug court entry were 14.4% less likely to graduate ($b = - .16, p < .001$). Criminal history variables also were significant predictors for graduation. Clients more likely to graduate had drug or alcohol charges (7.2% more likely, $b = .07, p < .05$) or miscellaneous charges (4.5% more likely, $b = .04, p < .01$), while clients less likely to graduate had more probation violations (30% less likely, $b = - .35, p < .001$) and more violent charges (23.5% less likely, $b = - .27, p < .01$).

Separate logistic regression models were conducted for urban and rural subsamples to explore whether graduation/termination predictors would be different. For urban participants, those who were not married were 3.4 times more likely to graduate ($b = 1.22, p < .05$), and those who were
employed full-time after drug court entry were 3.2 times more likely to
graduate ($b = .49$, $p < .01$). For drug use, the more often participants used
cocaine, the less likely they were to graduate (16.5%) ($b = -.19$, $p < .01$).
Like the overall logistic model, participants were 30% less likely to
graduate with every probation violation received ($b = -.36$, $p < .001$) and
5.9% more likely to graduate with each miscellaneous offense ($b = .06$, $p < .01$).
For rural participants, however, age was one of the only significant
predictors of graduation or termination. Specifically, for every one year
increase in a participant’s age, graduation was 6% more likely ($b = .06$, $p < .01$).
Juvenile incarceration also predicted graduation or termination for
the rural participants with individuals who were incarcerated as a juvenile
being 61% less likely to graduate ($b = -.94$, $p < .01$) than were those not
incarcerated as a juvenile.

Table 2. Graduation/termination predictors.

<table>
<thead>
<tr>
<th>Predictor</th>
<th>b</th>
<th>SE</th>
<th>Odds ratio</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall logistic model</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.05</td>
<td>.01</td>
<td>1.05</td>
<td>.001</td>
</tr>
<tr>
<td>Race</td>
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<td>.24</td>
<td>.63</td>
<td>.051</td>
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<tr>
<td>Marital status</td>
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<td>.43</td>
<td>.010</td>
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<tr>
<td>Employment</td>
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<td>1.47</td>
<td>.002</td>
</tr>
<tr>
<td>Education</td>
<td>.14</td>
<td>.06</td>
<td>1.15</td>
<td>.027</td>
</tr>
<tr>
<td>Pattern of cocaine use</td>
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<td>.04</td>
<td>.86</td>
<td>.000</td>
</tr>
<tr>
<td>Probation offenses</td>
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<td>.001</td>
</tr>
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<td>Drug/alcohol offenses</td>
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<tr>
<td>Violent offenses</td>
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<tr>
<td>Other offenses</td>
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<td>.47</td>
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<td>Urban logistic model</td>
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<td>Pattern of cocaine use</td>
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<td>.70</td>
<td>.002</td>
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<tr>
<td>Other offenses</td>
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<td>.02</td>
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<td>.02</td>
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<td>Ever locked up before 18</td>
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<td>.36</td>
<td>.39</td>
<td>.009</td>
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</table>

Note: Race: 1 = White, 2 = Nonwhite; Employment: 0 = Unemployed, 1 = Parttime,
2 = Fulltime; Marital Status: 0 = Not Married, 1 = Married; Pattern of cocaine use:
0 = Never, 1 = Only 1–3 times, 2 = About one time per month; 3 = About 2–3 times
per month; 4 = About one time per week; 5 = About 2–6 times per week; 6 = About
one time per day; 7 = About four or more times per day.
DISCUSSION

To our knowledge, research on drug courts has not compared clients who complete to clients who do not complete drug court programs across urban and rural settings. Furthermore, previous treatment retention comparisons produced contradictory or inconclusive findings. Consequently, this study focused on comparing and describing differences between drug court graduates and those who terminated from drug court in one rural and one urban Kentucky Drug Court.

Graduated vs. Terminated

Overall, when terminated clients were compared with graduated clients, or those who completed treatment, graduates were older, not married, more educated, and more likely to be employed full-time. With the exception of marital status, these findings are supported by previous studies (7,16,18,20,25–32), which also indicate that clients who completed treatment were more likely to be older, more educated, and employed full-time. However, there were no significant findings for gender, race, and number of children in this study. As expected, this analysis found terminated drug court clients had more extensive drug use histories than did graduates. While clients who terminated had more probation violations, these clients did not have more charges or convictions when compared to graduates. However, graduates had more drug and alcohol charges, which may suggest that the drug court programs may be more focused on drugs and alcohol rather than other criminal involvement and; thus, the drug court program was more tailored to their needs. Similarly, as expected, drug court graduates were less likely to be involved in the criminal justice system. Jacoby (55) suggests that individuals who violate rules and norms in one area are likely to commit law-breaking activities in other areas (7). Consequently, those drug court clients who are more involved in criminal activity at drug court entry are more likely to maintain rule-breaking behavior and to ultimately be terminated from the drug court program.

Urban vs. Rural

When urban participants were compared to rural participants, rural participants, as expected, were more likely to be white. Urban participants had more children and were more likely to be employed full-time. Unlike previous studies, rural participants reported less education and were not older than urban participants. However, rural participants reported more
legal income and less illegal income in the 30 days before drug court. As noted in other studies, rural participants used cocaine, marijuana, and multiple substances less frequently than urban participants did. Perhaps the difference in drug use between rural and urban areas could be partially explained by differences in availability of certain substances in rural areas when compared to urban areas. Cocaine, for example, is more prevalent in urban areas because it is more accessible.

No differences in mental health problems were noted, however, when urban and rural drug courts were compared. It may be possible that mental health problems are more associated with poverty in urban rather than rural areas. Rural clients in this study reported slightly more income than did urban participants. There were no differences in mental health measures. Also, it has been thought that residing in a rural area could be a protective factor from mental health problems because rural areas are generally closer-knit communities, with greater social support systems (56). In addition, rural drug court participants had fewer charges and convictions than did urban participants, which may be explained by residents being less likely to report crimes in rural areas due to a desire to keep things within the confines of a rural community (45).

**Graduation Status by Urban/Rural**

When the four groups were compared, rural drug court graduates were older than were terminated rural clients and both rural and urban graduate groups had more years of education and more full-time employment than either terminated group. These findings are consistent with findings from other studies (28–32). Both urban graduates and rural graduates were more likely to be nonmarried when compared to the terminated clients. This finding contradicts previous ideas that having a spouse or significant other helps to provide the social support needed to complete treatment (57). While this finding does not support previous studies, perhaps clients who were not married had fewer family obligations and, therefore, more time to devote to the drug court program. Another possible explanation is that because the current study had a higher percentage of nonmarried clients participating (82.1% vs. 17.6%), nonmarried clients may be more likely to graduate because a greater number of nonmarried clients participated in this study.

When drug use was compared, there were few differences. Findings show that urban graduates used cocaine and multiple substances less frequently and for shorter periods of time than did urban clients who terminated. In addition, rural clients who terminated from drug court reported fewer years of cocaine use than either group of graduates did.

Findings from previous studies (35,36) indicate that anxiety and depression are common among substance abusers. Consequently, drug court
graduates in this study were expected to report fewer mental health problems than were those who terminated. However, this study found no significant differences between these groups on anxiety and only slightly more depression for those who terminated.

The criminal history and treatment retention literature indicates that early experiences with the criminal justice system, as well as more extensive criminal histories are associated with treatment drop-out (27,41). This was supported by the current study which found that juvenile incarceration was related to termination. In addition, both terminated groups reported juvenile incarceration and violent offenses more frequently than did graduates. However, for most offenses, both urban groups had more probation violations, drug and alcohol offenses, miscellaneous criminal offenses, total charges, and total convictions. As is consistent with the existing literature (24,43), this study found that both urban and rural terminated groups reported more violent offenses than did graduates, again potentially associated with previous rule-breaking behaviors that continued into drug court (45).

Treatment Retention

Like other studies on treatment retention (25), the current study found that being white is a predictor of drug court retention. While race/ethnicity might be associated with termination or completion from drug court, it is possible that treatment success might be more related to other variables such as less education or less income. In contrast with other studies, this study found no significant differences in treatment retention between males and females in either rural or urban drug court settings.

Findings from this study support education and employment findings from previous studies. Specifically, participants with more education and those who were employed full-time after entering drug court were more likely to complete treatment. This study also supports previous research (17,24,25,27), related to age as a predictor of treatment completion. For the overall and the rural regression models, older participants were more likely to graduate from the drug court program. Interestingly, even though rural participants were about the same age as urban participants, age was a predictor of drug court completion for rural drug court participants.

Overall, this study is consistent with the literature on treatment retention since participants with more severe drug use histories were less likely to complete treatment (7,58). Cocaine use was a significant predictor for termination across each group. Specifically, the more cocaine was used and the longer cocaine was used was related to a decreased likelihood that a drug court client would graduate from the program. For urban clients, however, the pattern of cocaine use was a significant predictor of
noncompletion (e.g., the more cocaine a client used, the less likely the client was to graduate). However, the years of cocaine use were not related to completion. Perhaps the intensity of cocaine use, rather than the duration of the addiction, is a predictor of treatment completion. In fact, research has shown that cocaine, unlike other drugs, creates a more intense addiction and can become addictive in a few weeks or months as opposed to years with other drugs. This more intense addiction may explain why cocaine users were less likely to complete treatment (59). Unlike cocaine use, while multiple drug use differed for each group, it was not a predictor of treatment completion.

This study also found no significant differences between completers and noncompleters on Brief Symptoms Index (BSI) mental health variables unlike findings from other drug treatment studies. Again, there could be something unique about drug court clients that is different from other drug treatment clients. Because the BSI measures mental health within the last seven days, it may be possible that the time focus by this instrument did not cover an adequate period of time. In addition, BSI measures are self-reported and not clinically diagnosed; therefore, a client’s mental health could be misrepresented. Also, according to the literature (36), rural participants are more likely to report psychological problems; however, there were no differences for rural clients since all four groups reported similar responses to mental health problems.

There was also a significant relationship between criminal activity and treatment retention. Specifically, drug court termination was related to more probation offenses, violent offenses, and other criminal offenses. Interestingly, prior drug or alcohol offenses increased a participant’s odds of graduating. For the urban drug court, more probation offenses were a predictor of drug court termination, while each other criminal offense made graduation more likely. Like other studies (27,41) rural participants who were incarcerated as a juvenile were less likely to graduate from drug court. While several studies (7,42) suggest that the number of charges and the number of convictions are related to treatment dropout, this study did not support the number of total charges and convictions as predictors of completing drug court. Perhaps, because previous studies involved other treatment programs, there may be some unique quality about drug court clients that warrants further research.

**CONCLUDING REMARKS**

There are limitations to this study. Participants were chosen after eligibility for drug court was determined. Thus, participants were not
randomly selected. Only drug courts from one state were chosen; therefore, findings may not be generalizable to other drug courts within the state or in other states. In addition, data were self-reported, which produces recall limitations and misrepresentation. While participants volunteered and consented to participate in the study, it is not known how truthful participants were about their self-reported behaviors.

Despite these limitations, this study adds to the literature on drug abuse treatment and drug court treatment specifically by identifying differences between treatment predictors for urban and rural drug court participants. By understanding treatment retention, drug court personnel and others could use the overall study findings as part of assessing potential participants, how a client’s background might affect treatment outcomes, and to tailor services to the needs of each client, such as targeting mental health services and family services for specific individuals. Group sessions could target the special needs of drug court clients and community resources could be focused to target these needs. Focusing on factors related to treatment retention could not only benefit drug court clients by providing a more individualistic treatment program, but it could also boost the number of graduates for the drug court program, possibly creating more funding and program acceptance. In addition, drug court programs could include lifestyle changes in addition to the current focus on no drug and alcohol use. For example, a client in drug court for trafficking may be more addicted to the money and lavish lifestyle that comes with the act rather than the drug use itself. It is also important for drug court programs to note the differences in needs between rural drug court clients and the urban drug court clients. For example, by understanding that being employed full-time, for an urban drug court client, is a factor in treatment retention, drug court administrators could make job retention a higher priority and devote more resources to finding jobs for clients. Future research on graduation/termination predictors for drug court clients could include motivation and social support as variables in order to better understand treatment outcomes. In addition, contextual factors, such as rural and urban environments, should be considered in future analysis.

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