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Racial/Ethnic Differences in Substance Abuse Treatment Initiation and Engagement

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Abstract

This study examined variations by race/ethnicity in initiation and engagement, two performance measures of treatment for substance use disorders, which focus on the timely receipt of services during the early stage of treatment. Administrative data from the Oklahoma Department of Mental Health and Substance Abuse Services were linked with facility-level information from the National Survey of Substance Abuse Treatment Services. We found that Black clients were less likely to initiate treatment, but we found no differences in treatment engagement by race/ethnicity. Most client and facility characteristics' association with initiation or engagement did not differ across racial/ethnic groups. Increased attention is needed to understand what may contribute to the differences found and how to address them. This study also offers an approach that state agencies may implement for monitoring treatment quality and examining racial/ethnic disparities in substance abuse treatment services.

Keywords

Substance abuse treatment; race/ethnicity; performance measures; treatment initiation; treatment engagement

Introduction

The measurement and monitoring of quality in the delivery of treatment services for substance use disorders has received increased attention in the last few years, as calls for accountability of addiction treatment programs have grown (McLellan, Chalk, and Bartlett 2007). Among the aims of the 2006 IOM report, *Improving the Quality of Health Care for Mental and Substance-Use Conditions*, is that high quality care for substance use disorders should be equitable and should not vary based on individuals' personal characteristics, such as race/ethnicity (Horgan, and Garnick 2005; Institute of Medicine 2006). Equitable quality of treatment is particularly relevant for substance use disorders given that racial/ethnic minorities suffer more severe consequences from substance use/abuse than Whites, including higher incarceration rates, higher alcohol-related problems, and higher drug overdose mortality (Galea et al. 2003; Iguchi et al. 2005; Schmidt et al. 2007; Shore et al. 2006). However, differences among racial/ethnic groups in the quality of treatment for

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substance use disorders have not been extensively studied (Schmidt, Greenfield, and Mulia 2006).

Recent studies suggest that disparities may exist in the quality of treatment for substance use disorders. Quality of care has not been directly measured, but a national representative survey on use of behavioral health services showed that Hispanic respondents reported lower satisfaction with treatment for substance use disorders compared to Whites (Wells et al. 2001). Lower satisfaction with psychosocial therapies for alcohol treatment was also reported by Hispanics and African Americans compared to Whites in a randomized clinical trial (Tonigan 2003). Additionally, several studies have found that racial/ethnic minorities tend to have lower treatment retention rates than Whites (Agosti, Nunes, and Ocepeck-Welikson 1996; Bluthenthal, Jacobson, and Robinson 2007; Brady, and Ashley 2005; Brower, and Carey 2003; Campbell, Weisner, and Sterling 2006; Evans et al. 2006; Hser et al. 2001; Jacobson, Robinson, and Bluthenthal 2007; Milligan, Nich, and Carroll 2004). Treatment retention and completion rates are often used as indicators of treatment quality because they are associated with better treatment outcomes (McLellan et al. 2007).

The Washington Circle (WC) performance measures provide a useful tool for exploring racial/ethnic differences in the quality of treatment for substance use disorders. The measures, developed for the purposes of accountability and monitoring quality of care, are now used by the National Committee for Quality Assurance, the Veteran's Health Administration, as well as several state substance abuse agencies (Garnick, Horgan, and Chalk 2006; Garnick et al. 2002; Garnick et al. 2009; Harris, Humphreys, and Finney 2007; McCorry et al. 2000; National Committee for Quality Assurance 2007, 2008). The WC measures for treatment of substance use disorders are process measures, and as such, they can be acted upon by treatment agencies and/or treatment systems. The measures for outpatient care, treatment initiation and treatment engagement, focus on the early stages of treatment and provide an assessment of the minimum services that should be provided in a timely basis. Briefly, the treatment initiation criteria are met if clients receive at least one service within the first 14 days after their initial treatment visit, and the engagement criteria are met if clients receive at least two additional services in the month after the initiation visit. The WC measure of treatment engagement has been found to be associated with lower post-treatment criminal justice involvement, suggesting a role for these process measures in longer-range treatment outcomes (Garnick et al. 2007).

To the best of our knowledge, no previous studies have focused on racial/ethnic differences in the early stage of treatment for substance use disorders. Because there is increasing attention to both the accountability of substance abuse treatment systems and racial/ethnic disparities in substance abuse services, it is important to understand whether differences in these quality indicators exist and whether these indicators are influenced by similar factors across various racial/ethnic groups. Finally, given that most (over 75%) of substance abuse treatment is publicly funded, it is particularly important to know whether racial/ethnic disparities exist in this sector (Levit et al. 2008). The present study was designed to address these gaps in knowledge by examining racial/ethnic differences in treatment initiation and engagement rates, and their predictors, among clients whose treatment is funded through state allocations.

The conceptual framework for this study is based on the Texas Christian University (TCU) Treatment Model (Simpson 2004). This model was created specifically to understand the processes of substance abuse treatment and how these processes are associated with positive treatment outcomes. In the TCU model, both client and program attributes at treatment entry influence the steps toward treatment recovery. Early engagement, the first of these steps, occurs as the client begins participating in treatment, both through attendance (for outpatient

settings) as well as through the formation of the therapeutic relationship. The WC measures of treatment initiation and engagement, with their focus on ensuring a minimum number of services that should be provided in the early stage of treatment, match the TCU treatment model's concept of early engagement. In this study, we focus on race/ethnicity as the client attribute and its association with early engagement. We include additional client attributes as well as facility attributes as factors that may interact with race/ethnicity in their association with treatment processes.

Methods

Data Source

Clients in this study consisted of adults (ages 18 and over) beginning treatment in Oklahoma's publicly-funded substance abuse outpatient treatment programs in 2001, as identified in the Oklahoma Department of Mental Health and Substance Abuse Services' (ODMHSAS) administrative data system. ODMHSAS provides non-emergency services mostly to low income individuals, with few having Medicaid benefits (Coffey et al. 2001). Information on the client's socio-demographics, referral source, prior substance abuse, and treatment services were extracted from the ODMHSAS's database systems. These data were linked to data from the state's Employment Security Commission (employment) and state agencies involved in criminal justice, including the Department of Corrections (incarcerations), the Oklahoma State Bureau of Investigation (arrests), and the Department of Public Safety (driving under the influence [DUI] convictions). Data on treatment facility characteristics were obtained from the National Survey of Substance Abuse Treatment Services (N-SSATS) and linked to the ODMHSAS data.

The initial data set for the study consisted of 6,682 adults admitted to Oklahoma outpatient treatment programs in 2001 with an index service that year. An index service is defined as a service that is preceded by a 60-day period without a substance abuse service and denotes the start of a new treatment episode. This definition of a new episode of treatment is used to preclude misidentifying the middle or end of a treatment episode as a new episode. A client's frequency of service visits may be appropriately scaled back by the middle or near the end of treatment, and misidentification of this service pattern as a new episode would lead to a miscalculation of initiation or engagement. We excluded 1,354 clients whose information on demographic and health characteristics were not recorded within one month of the index service date and thus would not be current. Since our methods take into account clustering within facilities, we excluded 27 clients who had received services from treatment facilities serving fewer than five clients in 2001 because of the additional uncertainty they might produce in our estimates. Lastly, we focused this study on three racial/ethnic groups: White, Black, and Native American. ODMHSAS clients self-report their race/ethnicity using the following categories, with the option of marking all that apply: White, Black/African American, Asian, American Indian, and Hispanic/Latino. A total of 347 clients were excluded because they belonged to racial/ethnic groups that were too small to analyze separately: Latinos (N=151), Asians (N=11), and clients who identified themselves as belonging to more than one racial/ethnic category (N=185). The final analytical sample consisted of 4,927 adult clients treated at 53 substance abuse treatment facilities.

Client Attributes

Analyses examined two models: the first predicting treatment initiation and the second predicting treatment engagement. Besides race/ethnicity, client-level characteristics used in both models include: 1) *demographics* — gender (female/male), age (18–30, 31–44, and ≥45), education (less than high school graduate/high school graduate or more), marital status (married/not married), and homelessness (yes/no); 2) *Prior-year characteristics*—any

employment in the year prior to index (yes/no), any DUI conviction in the year prior to index (yes/no), and any arrest or incarceration in the year prior to index (yes/no); 3) *Substance use prior to intake*—use of alcohol (none/<3 times per week/ ≥3 times per week), marijuana (none/<3 times per week/≥3 times per week), amphetamine (yes/no to use in past month), methamphetamine (yes/no to use in past month), cocaine, (yes/no to use in past month), heroin (yes/no to use in past month), and other-drug use (yes/no to use in past month); and 4) *referral source*—source of referral to treatment (self or significant other/ criminal justice/school, employer, social services/health services). Except for alcohol and marijuana, the variables associated with type and frequency of substances used were collapsed into "any use in past month" or "no use in past month" due to small numbers of clients reporting use of those substances. These variables were chosen based on previous research showing that they are associated with length of stay in substance abuse treatment (Brecht, von Mayrhauser, and Anglin 2000; Joe, Simpson, and Broome 1999; Lundgren, Amaro, and Ben-Ami 2005; Mertens, and Weisner 2000; Simpson 2004).

Two additional variables related to the treatment process were added to the model predicting engagement: 1) number of days that elapsed between the client's index service and the subsequent initiation service; and 2) type of treatment service received at the initiation visit (individual counseling only, group counseling, service other than individual or group counseling). "Other services" provided at the initiation visit consisted mostly of evaluation and treatment planning types of services. In a study of adolescents, both of these treatment process variables were found to be associated with engagement (Lee et al. 2007).

Facility Attributes

We included three facility attributes in the models that previous research has shown to be associated with treatment retention/service utilization (Brady & Ashley, 2005; Broome et al. 2007; Deck, and Carlson 2005): 1) primary service focus (substance abuse/mental health/ mix of substance abuse and mental health); 2) agreements or contracts with managed care organizations for substance abuse treatment (yes/no); and 3) facility size based on number of individuals served during the year (small - less than 150/medium - 150–360/large - more than 360). For facility size, the facilities were divided into three equally sized groups according to the number of adults served.

Calculating Performance Measures

Individuals with new episodes during the year form the denominator when calculating the initiation and engagement rates. A new treatment episode was defined as an outpatient treatment service preceded by a 60-day period without a substance abuse service, and the first outpatient visit of a new episode is called the **index.**

> The treatment **initiation rate** was calculated as: Individuals with an outpatient index service during the year who received a second substance abuse service (other than detoxification or crisis service) within 14 days after the index outpatient service among all individuals with an outpatient index service during the year.
>
> The **engagement rate** is calculated as: Individuals who initiated outpatient treatment during the year who also received two additional services (other than detoxification or crisis service) within 30 days after the initiation service among all individuals with an outpatient index service during the year.

For both initiation and engagement, two or more services on the same day count as one service.

For the multilevel analysis predicting the likelihood of initiation and engagement, dichotomous variables for initiation and engagement status were created as the dependent variable.

Analysis

Using chi-square tests, we tested whether the three racial/ethnic groups differed on client or facility characteristics. When these overall tests identified overall significance, follow-up pairwise comparisons were conducted to determine which differences between racial/ethnic groups were significant. We set the significance level at $p < 0.001$ so that only larger differences could be detected as significant. For each variable with overall significance, we used a Bonferroni correction in the follow-up pairwise comparisons to protect against spurious findings between category differences.

Our main analyses consisted of multilevel regression models fitted by a generalized estimating equations (GEE) method to determine client and facility level characteristics that predict treatment initiation and engagement. GEE was chosen as the modeling method to account for potentially strong within-facility outcome correlations, which would undermine the more common, maximum likelihood method of logistic modeling (Liang, and Zeger 1986). To begin analysis of initiation, we constructed GEE models for each of the three racial/ethnic groups separately. These results suggested variables which might have a differential effect on treatment initiation among racial/ethnic groups: health service referral, marijuana and heroin use, DUI in the prior year, and primary focus of facility being mental health (results not shown). All these variables except for marijuana and heroin use, which were judged to be too infrequent to have a significant effect, were interacted with the race/ethnicity variable in follow-up overall GEE models, which used clients in the race/ethnicity groups combined as their sample. Estimates from these follow-up GEE models with interaction are reported as our primary results. These models are able to determine both the overall effects of race and ethnicity on initiation, and also whether such effects are moderated by other client and/or facility characteristics.

GEE models predicting engagement were constructed by the same two step process. The engagement models had treatment engagement status as the outcome and included only clients who had met the treatment initiation criteria. In the three initial models the following variables appeared to have a greater effect on treatment engagement for at least one racial/ethnic group compared to others: type of service provided at initiation visit; number of days from the index to the initiation visit; gender; marital status; homelessness; some substance use variables; DUI in the prior year; criminal justice, health, and employer/school/social service referral sources; primary focus of the facility; whether the facility had agreements/contracts with managed care organizations; and size of the facility where services were received (results not shown). These variables, except for substance use variables, were interacted with the race/ethnicity variables in the engagement model.

Results

Racial/Ethnic Differences at Intake

Table 1 shows the individual and facility attributes of clients by race/ethnicity. Clients were primarily White (N = 3,585; 72.8%), followed by Blacks (N = 677; 13.7%) and Native Americans (N = 665; 13.5%). At intake, the three racial/ethnic groups differed in various individual attributes, including demographics, prior-year characteristics, and treatment referral source. For example, Black clients were less likely to be married than clients from the other two racial/ethnic groups, and had higher rates of arrests and incarcerations in the year prior to intake than Native American clients had.

There were also racial/ethnic differences in the attributes of the facilities where clients started their substance abuse treatment episode. For instance, Black clients were significantly less likely than their White and Native American counterparts to begin their treatment episode in a facility whose primary focus was substance abuse, and more likely to do so in facilities that had mixed substance abuse and mental health focus.

Treatment Initiation and Engagement Rates by Race/Ethnicity

Table 2 shows the unadjusted treatment initiation and engagement rates for all clients and for each of the three racial/ethnic groups separately. Native American clients had a significantly higher rate of treatment initiation than Black clients, while differences in the three racial/ethnic groups' engagement rates were not statistically significant.

Client and Facility Predictors of Initiation

Results of the model predicting treatment initiation are shown in Table 3. Black clients were significantly less likely to initiate treatment than White clients; however, Native Americans' likelihood of initiating treatment did not differ from White clients. Health service and criminal justice system referrals showed significant interactions with race/ethnicity. Native American clients who had been referred to treatment by the criminal justice system were significantly more likely to initiate treatment than White clients who had also been referred by the criminal justice system. Also, Black and Native American clients who had been referred by a health service provider were significantly more likely to initiate treatment than Whites who had the same referral source. Some individual factors, other than race/ethnicity, and a facility level factor were found to be associated with treatment initiation. Older age, being referred from an employer, school, or social service agency, and receiving treatment in a small treatment facility were all positively associated with a higher likelihood of meeting the treatment initiation criteria.

Client and Facility Predictors of Engagement

Only clients who initiated treatment were included in the second model predicting treatment engagement. Race/ethnicity was not associated with the likelihood of meeting the treatment engagement criteria. However, the interaction of marital status and race/ethnicity did show a significant effect on engagement. Unmarried Black clients were significantly more likely to engage in treatment than unmarried White clients. In addition, other attributes that were positively associated with the likelihood of engaging in treatment include: receiving group therapy in the initiation visit, having been referred to treatment by the criminal justice system, and receiving treatment in a small facility. Other attributes that were negatively associated with the likelihood of engaging in treatment include: being a woman, being homeless, having a greater number of days between the index visit and the initiation visit, not receiving individual or group therapy at the initiation visit, and receiving substance abuse treatment in a facility at which the primary focus is mental health.

Discussion

Among clients receiving state-funded, outpatient substance abuse treatment in Oklahoma, our results found some differences in the quality of treatment by race/ethnicity. Black clients were less likely to initiate treatment than White clients. After adjusting other covariates to their means, the marginal probability of Black clients initiating treatment is an estimated 14% lower compared to other clients. This difference suggests that outpatient treatment facilities may want to examine and address possible barriers to Black clients' timely initiation of treatment.

With respect to treatment engagement, our adjusted results found no significant differences among our three race/ethnicity groups. However, Blacks and Native Americans did have lower adjusted likelihoods of engagement than Whites, and this non-signficance may have been due to inadequate sample size. Numerous studies report that minority clients have lower long-term retention and completion rates than White clients. Since our engagement indicator focuses on the early stage of treatment and retention involves a later stage, race/ethnicity may interact with other treatment processes to increase the likelihood of attrition later during the course of treatment. In the TCU treatment model, the progression from early engagement to treatment retention or completion requires a positive therapeutic relationship between the client and the treatment counselor, and this relationship may not develop as strongly for minority clients. Black clients, for instance, may have historical mistrust of government agencies and/or medical care providers, which may lead to lower long-term treatment retention (Armstrong et al. 2007; U.S. Department of Health and Human Services 2001; Doescher et al. 2000; Simpson 2004; Whetten et al. 2006). Providers may also want to assess whether they provide culturally competent care and/or adapt their programs to include cultural values of the population they serve to ensure that minority clients' engagement in treatment in the early stage translates to long-term retention and treatment completion (Amaro et al. 2006; González Castro, and Garfinkle 2003; Howard 2003; Siegel, Haugland, and Chambers 2003).

Some differences in the factors that influence initiation and engagement, specifically referral source and marital status, were found across racial/ethnic groups. Treatment referrals from the criminal justice system had a stronger impact on the likelihood of initiating treatment for Native Americans than for White clients. The criminal justice system can provide coercion for participating in treatment since doing otherwise may mean a return to prison or jail, though it is unclear why this referral source may be more positively associated with initiation for Native Americans than Whites. A referral from medical service providers was more strongly associated with treatment initiation for Native American and Black clients compared with White clients demonstrating marginal probability increases of 21% and 22% respectively. Medical providers have been increasingly encouraged to assess patients for alcohol problems and illicit drug use and to refer patients who may have a substance use disorder to specialty treatment (Babor et al. 2007; Madras et al. 2009). Substance abuse screening in medical settings should continue to be promoted for all patients, and this may play an especially strong role in increasing access to treatment in minority patients with substance use disorders.

For treatment engagement, being unmarried had a significantly more positive effect for Black clients compared with White clients. Studies that have examined gender differences in predictors of treatment retention have found that being married was associated with longer lengths of stay or higher service utilization in treatment for women, but not for men (Green et al. 2002; Mertens, and Weisner 2000). Results from the current study and those examining gender differences call for attention from providers to carefully assess whether clients' spouses may be supportive of treatment or whether the additional ties and responsibilities of marriage may pose a barrier to treatment service utilization.

Despite these differences, it is important to note that for the most part, we did not find many differences in the predictors of initiation or engagement by race/ethnicity. We did find, however, that some characteristics of the treatment process were associated with initiation and engagement in general. Shorter time between the first treatment service and the subsequent service of a new episode was associated with the likelihood of engaging in treatment. This is consistent with previous research showing that a reduction in wait time between the request for services and the intake appointment significantly reduces the "no-show" rate. As a result of these findings, some quality improvement efforts have focused on

improving timeliness of access to treatment (Capoccia et al. 2007; Festinger et al. 1995; Festinger et al. 2002; McCarty et al. 2007). Also, our finding that providing group therapy at the initiation visit was associated with increased likelihood of treatment engagement is similar to that of a previous study using administrative data from Massachusetts' publicly funded substance abuse treatment services which found that group therapy was associated with treatment completion (Panas et al. 2003). Receiving a service other than therapy (individual or group) in the initiation visit seems to be detrimental for achieving engagement. Together, these findings suggest that treatment providers should ensure that the first service is followed-up quickly with another service and that, whenever possible, should consider including group therapy.

Some caution is suggested in interpreting our results. This study was conducted using data from only one state, so these findings may not be generalizable to other states. Additionally, findings may be specific to the racial/ethnic groups studied. Sufficient data on some racial/ethnic groups was not available. For example, we did not include Latino clients because they made up too small a proportion of clients served. Differences in treatment initiation and engagement may exist between Latinos and Whites due to language barriers, high rates of being uninsured (in states where insurance is important for accessing specialty treatment), and acculturation levels which have been found to impact mental health care utilization, and are likely to impact utilization of substance abuse treatment services, as well (Alegría et al. 2002; Alegría et al. 2007; U.S. Census Bureau 2008). Finally, due to reliance in administrative data, data were not available for other factors that may be associated with treatment initiation and engagement, such as individual motivation.

Despite these limitations, our study has several strengths. We were able to assess racial/ethnic differences in treatment performance using measures that have been tested and are becoming more broadly adopted (Harris et al. 2007; National Committee for Quality Assurance 2007, 2008; North Carolina Department of Health and Human Services 2008; Oklahoma Department of Mental Health and Substance Abuse Services 2006). The fact that we were able to test for these differences using encounter data from publicly funded services is important given that the majority of substance abuse treatment in this country is publicly funded (Levit et al. 2008). We were also able to assess treatment processes among Native Americans, who have higher rates of substance abuse disorders and disproportionately suffer some of the consequences of substance abuse, but are often overlooked in studies due to limited sample size (Booth et al. 1992; Compton et al. 2007; Hasin et al. 2007; Shore et al. 2006).

Furthermore, this study provides an approach for examining racial/ethnic disparities in substance abuse treatment quality. Over the last decade, several states and local health departments have taken steps to assess and work towards the elimination of racial/ethnic disparities in medical care in their jurisdictions (Exworthy et al. 2006; Ladenheim, and Groman 2006; McDonough et al. 2004; Weinick et al. 2007). Yet, to the best of our knowledge, these efforts have not yet included substance abuse treatment.

Future research is needed to extend analyses of racial/ethnic differences in treatment performance indicators to additional states to ensure generalizability and also to facilitate more in-depth analyses of other racial/ethnic groups that we were not able to include in our study because they did not comprise a substantial proportion of clients in the state of Oklahoma (e.g., Latinos, Asians). It is also important to explore what may be contributing to the lower likelihood of treatment initiation rates for Black clients. Some studies in medical care disparities have found that disparities in medical care quality between White and minority patients occur, at least in part, because lower-performing hospitals tend to serve higher proportion of minority patients than top-performing hospitals (Gaskin et al. 2008;

Hasnain-Wynia et al. 2007). Future studies in the area of disparities in substance abuse treatment should consider including program/facility-level performance measures and examining the client populations that top and low performing treatment facilities serve. Finally, future studies should examine whether meeting the criteria for performance measures is associated with better outcomes for all racial/ethnic groups. If so, then these results offer powerful impetus for providers to use performance measures for monitoring quality of care and to pay attention to factors that are of particular importance to specific racial/ethnic groups for improving treatment. Targeted approaches could ultimately be fruitful in improving quality of care for all populations.

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Table 1

Client and facility attributes of outpatient analytic sample by race/ethnicity

Variables	Full Sample (N = 4,927) % (s.e.)	Race/ethnicity			Overall Effect of Race/Eth (Chi- Square Statistic)	Between- group differences
		Whites (a) (N = 3,585) % (s.e.)	Blacks (b) (N = 677) % (s.e.)	Native Americans (c) (N = 665) % (s.e.)		
Individual Attributes						
Female Gender	39.76 (0.70)	39.97 (0.82)	37.67 (1.86)	40.75 (1.91)	1.58	N/A
Age						
18–30	46.70 (0.71)	46.86 (0.83)	41.80 (1.90)	50.83 (1.94)	11.11	N/A
31–44	39.98 (0.70)	40.78 (0.82)	38.85 (1.87)	36.84 (1.87)	4.05	N/A
≥ 45	13.31 (0.48)	12.36 (0.55)	19.35 (1.52)	12.36 (1.28)	24.77***	b > a***
High School Graduate	65.52 (0.68)	65.61 (0.79)	67.80 (1.80)	62.71 (1.88)	3.90	N/A
Married	27.85 (0.64)	29.04 (0.76)	19.35 (1.52)	30.08 (1.78)	28.50***	b < a*** b < c***
Homeless	2.52 (0.22)	2.54 (0.26)	2.81 (0.64)	2.11 (0.56)	0.70	N/A
Employed in the prior year	69.74 (0.65)	68.87 (0.77)	70.16 (1.76)	73.98 (1.70)	7.02	N/A
DUI conviction in the prior year	14.47 (0.50)	13.84 (0.58)	12.41 (1.27)	20.00 (1.55)	19.92***	c > a*** c > b***
Arrest/incarceration in the prior year	28.41 (0.64)	28.34 (0.75)	34.86 (1.83)	22.26 (1.61)	26.24***	b > c***
Substance use in past month						
Alcohol						
None	63.26 (0.69)	64.27 (0.80)	62.63 (1.86)	58.50 (1.91)	8.18	N/A
< 3 times in past week	21.09 (0.58)	20.25 (0.67)	22.16 (1.60)	24.51 (1.67)	6.66	N/A
≥3 times in past week	15.65 (0.52)	15.48 (0.60)	15.21 (1.38)	16.99 (1.46)	1.08	N/A
Marihuana						
None in past month	74.28 (0.62)	74.14 (0.73)	69.42 (1.77)	80.00 (1.55)	19.78***	b < c***
< 3 times in past week	11.73 (0.46)	11.63 (0.54)	14.48 (1.35)	9.47 (1.14)	8.23	N/A
≥3 times in past week	13.98 (0.49)	14.23 (0.58)	16.10 (1.41)	10.53 (1.19)	9.31	N/A
Amphetamine	3.23 (0.25)	3.60 (0.31)	1.33 (0.44)	3.16 (0.68)	9.40	N/A
Methamphetamine	10.80 (0.44)	12.83 (0.56)	1.48 (0.46)	9.32 (1.13)	77.95***	a > b*** c > b***

Variables	Full Sample (N = 4,927) % (s.e.)	Race/ethnicity			Overall Effect of Race/Eth (Chi- Square Statistic)	Between- group differences
		Whites (a) (N = 3,585) % (s.e.)	Blacks (b) (N = 677) % (s.e.)	Native Americans (c) (N = 665) % (s.e.)		
Cocaine	7.14 (0.37)	4.94 (0.36)	23.04 (1.62)	2.86 (0.65)	302.70***	b > a*** b > c***
Heroin	3.92 (0.28)	4.35 (0.34)	2.22 (0.57)	3.31 (0.69)	7.66	N/A
Other drugs	2.27 (0.21)	2.62 (0.27)	1.48 (0.46)	1.20 (0.42)	7.32	N/A
Referral Source						
Self or significant other	31.62 (0.66)	33.86 (0.79)	22.16 (1.60)	29.17 (1.76)	38.23***	b < a***
Criminal justice	46.64 (0.71)	45.30 (0.83)	57.16 (1.90)	43.16 (1.92)	35.96***	b > a*** b > c***
Employer/ School/ Social Service	14.45 (0.50)	13.64 (0.57)	16.10 (1.41)	17.14 (1.46)	7.29	N/A
Health service	7.29 (0.37)	7.20 (0.43)	4.58 (0.80)	10.53 (1.19)	17.72***	c > a*** c > b***
Facility Attributes						
Primary Focus of Facility						
SA primary focus	72.99 (0.63)	74.64 (0.73)	61.30 (1.87)	75.94 (1.66)	54.84***	b < a*** b < c***
MH primary focus	9.28 (0.41)	9.54 (0.49)	8.86 (1.09)	8.27 (1.07)	1.23	N/A
Mix SA/MH	17.74 (0.54)	15.82 (0.61)	29.84 (1.76)	15.79 (1.42)	78.73***	b > a*** b > c***
Agreement/ contracts with managed care orgs	32.62 (0.67)	35.43 (0.80)	20.68 (1.56)	29.62 (1.77)	59.47***	a > b*** c > b***
Facility size						
Small (<150 served by facility in 2001)	11.08 (0.45)	11.02 (0.52)	10.78 (1.19)	11.73 (1.25)	0.36	N/A
Medium (150– 360 served by facility in 2001)	17.60 (0.54)	17.91 (0.64)	13.88 (1.33)	19.70 (1.54)	8.70	N/A
Large (> 360 served by facility in 2001)	71.32 (0.64)	71.07 (0.76)	75.33 (1.66)	68.57 (1.80)	7.89	N/A

*** p<.001

Abbreviations: s.e. = standard error; N/A = Not Applicable; SA = substance abuse; MH = Mental Health

Table 2

Treatment initiation and engagement rates by race/ethnicity

Variables	Full Sample (N = 4,927) % (s.e.)	Race/Ethnicity			Overall Effect of Race/Eth (Chi- Square Statistic)	Between- group differences
		Whites (a) (N = 3,585) % (s.e.)	Blacks (b) (N = 677) % (s.e.)	Native Americans (c) (N = 665) % (s.e.)		
Initiation Rate	67.51 (0.67)	67.64 (0.78)	63.96 (1.85)	70.38 (1.77)	6.41 *	b < c *
Engagement Rate	50.58 (0.71)	50.66 (0.84)	48.74 (1.92)	52.03 (1.94)	1.48	N/A

* p < .05

Table 3

Outpatient Treatment Initiation and Engagement Predictors

	Initiation O.R. (95% CI) (N = 4,927)	Engagement O.R. (95% CI) (N=3,326)
Predictors		
Race/ethnicity ***(referent: White)***		
Black	0.55 ** (0.37 – 0.83)	0.78 (0.52– 1.17)
Native American	0.76 (0.55 – 1.06)	0.75 (0.49–1.13)
Treatment Processes		
Number of days from index to initiation		0.93 *** (0.90 – 0.95)
Service provided at initiation visit (referent: individual therapy)		
Some group therapy		1.86 *** (1.48–2.34)
Service other than group or individual		0.62 ** (0.44– 0.88)
Demographics		
Gender (referent: male)		
Female	0.99 (0.86 – 1.13)	0.85 * (0.72–0.99)
Age (referent: 31–44 years)		
18–30	0.94 (0.84 – 1.05)	0.84 (0.71–1.01)
45+	1.28 ** (1.07 – 1.53)	1.21 (0.97– 1.53)
Marital status (referent: married)		
Not Married	0.93 (0.78 – 1.11)	0.93 (0.77 – 1.11)
Homelessness (referent: not homeless)		
Homeless	1.02 (0.80–1.29)	0.58 * (0.35– 0.96)
Referral Source (referent = self/significant other)		
Criminal justice	1.08 (0.88 – 1.32)	1.32 ** (1.08– 1.61)
Employer/School/Social service	1.24 * (1.01–1.52)	1.22 (0.90–1.66)
Health service	0.82 (0.50 – 1.33)	1.18 (0.64– 2.16)
Facility Characteristics		
Primary Focus of Facility (referent = SA primary focus)		
MH primary focus	0.45 (0.19–1.05)	0.38 ** (0.20–0.74)
Mix MH/SA	0.94 (0.62–1.42)	0.77 (0.52– 1.13)
Agreement/contracts with managed care orgs (referent = none)	1.16 (0.77 – 1.74)	1.45 (0.96– 2.18)
Facility Size (referent = large)		
Small	2.63 ** (1.36 – 5.12)	1.90 ** (1.17– 3.07)
Medium size	1.34 (0.83–2.17)	1.37 (0.86– 2.20)
INTERACTIONS		
Unmarried—Native Americans	0.88 (0.61 – 1.27)	1.13 (0.72 – 1.79)
Unmarried—Blacks	1.35 (0.90 – 2.00)	1.60 * (1.07 – 2.41)
Employer/School/Social Service Referral—Native Americans	1.19 (0.75 – 1.89)	1.76 (0.90 – 3.47)

	Initiation O.R. (95% CI) (N = 4,927)	Engagement O.R. (95% CI) (N=3,326)
Predictors		
Employer/School/Social Service Referral—Blacks	0.97 (0.59 – 1.60)	0.55 (0.22 – 1.35)
Criminal Justice Referral—Native Americans	1.57** (1.12 – 2.21)	1.27 (0.79 – 2.05)
Criminal Justice Referral—Blacks	1.29 (0.85 – 1.97)	1.09 (0.72–1.66)
Health Service Referral—Native Americans	3.72*** (2.11 – 6.56)	1.24 (0.58 – 2.65)
Health Service Referral—Blacks	4.21* (1.22 – 14.48)	0.89 (0.38 – 2.10)

* p<0.05;

** p<0.01;

*** p<0.001

Note: The following variables were not significant in either model and are not shown: high school graduate, the various substance use variables, and prior year DUI, arrest/incarceration, or employment.

Abbreviations: SA = substance abuse; MH = Mental Health