Employment after beginning treatment for substance use disorders: The impact of race/ethnicity and client community of residence

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Abstract

Employment is an important substance use treatment outcome, frequently used to assess individual progress during and after treatment. This study examined whether racial/ethnic disparities exist in employment after beginning treatment. It also examined the extent to which characteristics of clients' communities account for such disparities. Analyses are based on data that linked individual treatment information from Washington State's Behavioral Health Administration with employment data from the state's Employment Security Department. Analyses subsequently incorporated community-level data from the U.S. Census Bureau. The sample includes 10,636 adult clients (Whites, 68%; American Indians, 13%, Latinos, 10%; and Blacks, 8%) who had a new outpatient treatment admission to state-funded specialty treatment. Heckman models were used to test whether racial/ethnic disparities existed in the likelihood of post-admission employment, as well as employment duration and wages earned. Results indicated that there were no racial/ethnic disparities in the likelihood of employment in the year following treatment admission. However, compared to White clients, American Indian and Black clients had significantly shorter lengths of employment and Black clients had significantly lower wages. With few exceptions, residential community characteristics were associated with being employed after initiating treatment, but not with maintaining employment or with wages. After accounting for community-level variables, disparities in length of employment and earned wages persisted. These findings highlight the importance of considering the race/ethnicity of a client when examining

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post-treatment employment alongside community characteristics, and suggest that the effect of race/ethnicity and community characteristics on post-treatment employment may differ based on the stage of the employment process.

Keywords

treatment outcomes; employment; disparities; community

1. Introduction

Employment is an important outcome of substance use treatment and frequently is used to assess individual progress during and after treatment (Institute of Medicine, 1990). Employment is also one of the domains of the National Outcomes Measures used for national performance monitoring (Substance Abuse and Mental Health Services Administration, 2015). Individuals with problematic substance use are more likely to be unemployed (Terza, 2002). Additionally, lost productivity is one of the major drivers of the societal costs associated with excessive alcohol use (Bouchery, Harwood, Sacks, Simon, & Brewer, 2011) and illicit substance use (National Drug Intelligence Center, 2011). To date, it is unknown whether post-treatment employment outcomes are similar across racial/ethnic groups. Nevertheless, assessing whether disparities exist is an important step in ensuring equity in treatment. The detection of disparities can lead to the development and implementation of interventions that address the specific needs of groups who experience difficulty in their attempts to obtain and maintain employment. Ultimately, detection also may contribute to the elimination of these disparities. Furthermore, research increasingly demonstrates that place plays a role in health care services disparities (White, Haas, & Williams, 2012), although this relationship has not been explored with substance use services. This study examined whether racial/ethnic disparities exist in post-treatment employment and the extent to which characteristics of clients' communities account for such disparities.

Data from facilities that receive state funding reveal that, nationally, only about a quarter of clients entering substance use treatment services were employed at treatment admission (Substance Abuse and Mental Health Services Administration, 2017b). Thus, vocational training and employment assistance often are included as part of comprehensive treatment, particularly among programs providing publicly-funded services (Cao, Marsh, Shin, & Andrews, 2011; Evans, Hser, & Huang, 2010; Magura, Staines, Blankertz, & Madison, 2004; Webster, Staton-Tindall, Dickson, Wilson, & Leukefeld, 2014). Therefore, employment measures often are used as an additional treatment outcome for clients, in addition to reduction in substance use.

Research has shown that clients who experience substance use disorders have better employment-related outcomes when they participate in treatment for lengthier durations, or when they complete treatment, altogether (Arria & TOPPS-II Interstate Cooperative Study Group, 2003; Dunigan et al., 2014; Kim, Leierer, Atherton, Toriello, & Sligar, 2015; Luchansky, Brown, Longhi, Stark, & Krupski, 2000; Sung & Chu, 2011). However, because

in the general population Blacks, American Indians, and Latinos experience higher unemployment rates and lower wages than Whites, it is possible that racial/ethnic disparities in employment outcomes exist (Bureau of Labor Statistics, 2016; U.S. Census Bureau, 2016). Thus, while in or after treatment, some groups may face different barriers when attempting to locate employment, regardless of treatment effectiveness. Research in this area is limited, but one study found that, although the likelihood of employment did not differ by race/ethnicity, post-treatment employment earnings were significantly higher for Whites compared to non-Whites in one of three states examined (Arria & TOPPS-II Interstate Cooperative Study Group, 2003). Despite the study's significance, all clients who were not White were grouped together into one category, which means that the heterogeneity within the "non-White" group may have masked various disparities between Whites and some specific racial/ethnic minority groups.

In general medical care, there is growing recognition that where patients or clients live can have a strong influence on health care quality (White et al., 2012). For example, areas that experience higher residential segregation and greater economic disadvantage have more difficulty attracting physicians to practice in these areas (Auchincloss, Van Nostrand, & Ronsaville, 2001). Residential segregation may affect segregation at the facility level, which also is associated with racial/ethnic disparities. For instance, hospitals that treat a higher proportion of Black patients for acute myocardial infarction (AMI) had an 18% higher mortality rate that those that treat fewer Black patients (Skinner, Chandra, Staiger, Lee, & McClellan, 2005); and there is a high correlation between residential and nursing home segregation, both of which are associated with disparities in nursing home care (Smith, Feng, Fennell, Zinn, & Mor, 2007).

Characteristics of the community in which clients reside also can have important implications on substance use treatment outcomes, including employment. Consequences related to alcohol consumption, including employment consequences, have been observed to be greater for individuals residing in disadvantaged areas compared to affluent neighborhoods (Jones-Webb & Karriker-Jaffe, 2013; Karriker-Jaffe, Liu, & Kaplan, 2016; Karriker-Jaffe et al., 2012). For example, there was a strong positive association between neighborhood disadvantage and individuals having negative drinking consequences, and a strong negative association between neighborhood affluence and negative drinking consequences (Jones-Webb & Karriker-Jaffe, 2013; Karriker-Jaffe, Liu, & Kaplan, 2016). Residential location also may impact employment opportunities. Community economic factors, such as concentrated poverty, can hinder access to jobs in general, and limit access to higher paying jobs or to more stable employment. Additionally, some aspects of the community where individuals reside may influence substance use relapse, which in turn could impact employment. Residents of communities with low resources or high poverty rates are at an increased risk of substance use and substance use disorders (Karriker-Jaffe, 2011, 2013; Karriker-Jaffe, Liu, & Johnson, 2016; Latkin, Curry, Hua, & Davey, 2007; Molina, Alegria, & Chen, 2012). This may potentially be due to higher stress, more marketing and availability of substances, and neighborhood cultural norms regarding the use of substances (Chartier et al., 2014). Additionally, the racial/ethnic composition of communities, such as minority population percentages, have been associated with substance use disorders. For example, with regard to alcohol consumption, in neighborhoods that

include a higher proportion of African Americans, residents report more severe consequences. (Jones-Webb & Karriker-Jaffe, 2013).

Little research has been conducted that examines the effects of community characteristics on employment-related treatment outcomes among individuals with a substance use disorder. However, a recent study found that, compared to those living in more affluent communities, individuals who possess a history of injection drug use, and who also reside in neighborhoods characterized by concentrated disadvantage, were significantly less likely to secure stable employment. (Richardson, Wood, & Kerr, 2013). Given the existing continuing racial residential segregation in the U.S. (Lichter, Parisi, & Taquino, 2015), it is likely that community-level concentrated disadvantage may produce racial/ethnic disparities in employment among clients in treatment.

Using data from Washington State's publicly-funded treatment system, the purpose of this study was to assess whether racial/ethnic disparities in post-treatment employment outcomes exist, and to examine the extent to which the characteristics of clients' residential communities account for these disparities. We define racial/ethnic disparities in employment in a similar way as Healthy People 2020 defines health disparities: disparities are not just differences between groups, but are differences that adversely affect groups of people who have systematically experienced greater obstacles based on their racial or ethnic group; and are differences that are considered unjust and historically linked to discrimination or exclusion (U.S. Department of Health and Human Services, 2017).

Data from Washington State were chosen to answer this question primarily because Washington has extensive experience linking its state-funded treatment data to state employment agency data, and these data have previously been used to examine several research questions related to employment-related outcomes among SUD treatment participants (Dunigan et al., 2014; Luchansky et al., 2000; Wickizer, Campbell, Krupski, & Stark, 2000). Washington also has a well-established treatment data collection system, which has demonstrated high standards for data completeness and accuracy. The system also provides the opportunity to convert client addresses to census tracts, which allows for the examination of community characteristics, as well. To the best of our knowledge, this study will be the first to include community factors in a study of racial/ethnic disparities in substance use treatment outcomes.

2. Materials and methods

2.1 Data Sources

Analyses were based on linked client treatment and employment data from Washington State, which were then merged with community-level data from the U.S. Census Bureau. Data on client characteristics and treatment services (dates and types of SUD services received) were obtained from Washington State's Behavioral Health Administration (BHA). At the time of this study, BHA maintained the Treatment Activity Report Generation Tool (TARGET) a comprehensive data collection system that captures information on individuals receiving publicly-funded substance use treatment reported by SUD treatment providers (now replaced with an even more comprehensive system that also includes mental health

services). This tool is used by both state administrators and researchers, due to its high standards of accuracy and integrity (Campbell, 2009; Luchansky, Krupski, & Stark, 2007). Employment data were obtained from Washington State's Employment Security Department (ESD), which records formal employment and employee wages as reported by employers. Data were linked using an integrated probabilistic and deterministic matching algorithm with the Link King software (Camelot Consulting, 2017; Campbell, 2009). Matching was done based on name, social security number, date of birth, and sex. For more detailed information on the linkage rules, please see Appendix D of the Link King manual (Camelot Consulting, 2017).

Prior to releasing the data for this study, BHA removed all direct client identifiers. As a final step in dataset construction, the linked treatment and employment data were merged via census tract with community level-data from the 2010 U.S. Census and the American Community Survey (5-year averages from 2009–2013).

2.2 Sample

The sample consisted of 12,257 adult clients between the ages of 18–64 who received publicly-funded treatment, who had a new outpatient (OP) treatment admission in Washington State in 2012, and who were part of the four largest racial/ethnic groups in the treatment sample: Latinos, Non-Latino Whites, Non-Latino American Indians, and Non-Latino Blacks. In creating this sample, we excluded clients who were not part of these four racial/ethnic groups (N = 781), who had missing race/ethnicity data (N=211), or who had died (N=7). If a client had more than one admission during the year, we included only their first admission. From this sample, we further excluded clients who had missing information within the client treatment data (N=153). We also excluded clients who had with residential treatment stays following their outpatient admissions long enough to affect their employment outcomes in the follow-up study period[1] (N = 469). These last two exclusions represented seven percent of White clients and three to five percent of other racial/ethnic groups. Such differences in exclusion rates were sufficiently minor and did not significantly increase the likelihood of selection bias in the final sample of 10,636 clients.

2.3 Dependent Variables

This study had three employment-related outcomes: a dichotomous variable indicating *any employment* in the year after the quarter when the client began treatment; and two variables that quantified the level of employment, or *number of quarters worked* and *wages earned* in the year following treatment. The distribution of wages earned was positively skewed, and thus we transformed wages using the natural logarithm.

2.4 Independent Variables

2.4.1 Race/ethnicity—Our main factor of interest was client race/ethnicity, represented by a set of self-reported indicators. The BHA admission form asks about Latino origin and 16 subgroups, along with national origins for race/ethnicity categories. Clients could respond positively to all categories that applied, and we restricted the analyses in this study to the

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[1]Stays of 30 days or more were considered long enough to affect one or more of the employment outcomes.

four largest groups that made up the client population: Latinos, non-Latino Whites, non-Latino American Indian, and non-Latino Blacks.

Clients who responded positively to any Latino category were categorized as Latino, regardless of their race response. Among clients who reported not being Latino, those who reported being White and no other race/ethnicity were considered White; and those who reported being Black and no other race/ethnicity were considered Black. Non-Latino clients who reported being both American Indian and White were considered American Indian. As a note, nation-wide, nearly half of American Indians report multiple races; yet, among the various multiracial groups in the U.S., they are the least likely to consider themselves multiracial (Cohn, 2015; Norris, Vines, & Hoeffel, 2012). Clients who were from other racial/ethnic groups and those who were multiracial (with the above exception) were excluded from the sample, as they were too small in numbers to be analyzed separately.

2.4.2 Community characteristics—We defined community and calculated community characteristics at the census tract level. Census tracts are small and stable geographic units, and have been recommended as the geographic unit for monitoring disparities in health outcomes (Krieger, Chen, Waterman, Rehkopf, & Subramanian, 2003; U.S. Census Bureau, 2012). In total, four community characteristics were included in our analyses. Three of the community characteristics denoted the percentage representation of specific racial/ethnicity groups within the census tract: Latino, non-Latino American Indian, or non-Latino Black. These three characteristics constituted other key variables in our study. The fourth community characteristic resulted from factor analysis, a procedure used to reduce a large set of available covariates to a smaller, more manageable number. In our particular case, the community level covariates subjected to factor analysis denoted census tract percentages of the following: residents who are unemployed, residents living in poverty, residents in management/professional occupations (recoded; for employed civilian population, ages 16+), female-headed households with children, households with annual income >$75,000 (recoded). Previous studies demonstrated that these variables might affect the outcomes of substance abuse treatment (Jacobson, Robinson, & Bluthenthal, 2007; Karriker-Jaffe, 2013; Karriker-Jaffe et al., 2012; Mennis, Stahler, & Baron, 2012; Molina et al., 2012). However, in our factor analysis, the Kaiser criterion (Kaiser, 1960) led us to retain one factor, which loaded most heavily on income and occupation variables and more modestly on education and female head of household variables. From our factor analysis results, the weighted version of the one retained factor was deemed a measure of "community economic disadvantage" and included as an additional community characteristic in our modeling.

2.4.3. Client-covariates—Client-level covariates were chosen for our analyses based on prior research findings of their association with employment outcomes and/or because they varied by race/ethnicity. The client-level variables included demographic characteristics (gender, age), socioeconomic background at admission (education, homeless status at admission), receipt of Social Security Income (SSI), substance use (drug use during the past month for alcohol, cocaine, heroin, methamphetamines, opioids, and other substances, and age of first use of any substance), and criminal justice system referral. This self-reported information was collected by treatment staff at admission. Substance use variables were

created based on clients having reported their primary, secondary, and tertiary substance of abuse. For each of those substances, clients were asked about the frequency of use in the past month (none, 1–3 times, 4–12 times, 13 or more times, daily), and a dichotomous variable was created to indicate any use in the last month. Clients were also asked to indicate the age they first used any of the three substances reported. A variable was created that indicated the earliest age of first use, categorized as less than 10, 11–14, 15–17, 18–20, or 21 and older. Using ESD data, we also created covariates to control whether clients were employed (yes/no) during the year prior to the admission quarter, along with the number of quarters employed and wages earned in the year prior. Like wages post-treatment, wages earned prior to treatment admission were positively skewed and thus transformed using the natural logarithm.

2.5 Analyses

Descriptive analyses were performed to examine variation by race/ethnicity with respect to clients' socio-demographics, substance use, referral source, pre-treatment employment, community characteristics, and study outcomes. Differences by race/ethnicity were tested using Chi-Squares for categorical variables, or one-way ANOVAs for continuous variables. Using a Bonferroni correction for multiple comparisons, these tests were followed with pairwise comparisons. In testing for multicollinearity in our model specifications, we found three pairs of variables with correlations higher than $r = 0.40$. The individual-level indicator for American Indian race/ethnicity and the community level variable for the percentage of residents who were American Indians had a correlation of $r=0.55$; the individual-level indicator for Black race/ethnicity and the community level percentage of residents who were Black had a correlation of $r= 0.41$; and the % of residents in a community who were Latino and the community factor for economic disadvantage had a correlation of $r= 0.48$. Since none of these correlations were higher than our exclusion threshold of .60, all of these variables were retained in our model. However, due to these positive correlations, we expect that the estimates for the effects represented by these variables might be more conservative, as compared to if only one in the pair were included in our models.

Following these preliminary analyses, Heckman models were used to examine whether disparities existed in employment outcomes and, if so, the extent to which these disparities were due to a client's community characteristics versus individual characteristics (Stata Corp, 2015; Wooldridge, 2005). Our Heckman models consisted of two stages, with employment post-admission representing the first stage outcome, and either number of quarters employed or wages earned as the second stage outcome. Heckman models were chosen for these analyses primarily because a client's number of quarters employed and wages earned are only observed among clients who were employed. There would be selection bias in models of these outcomes if they were based only on the group of clients employed without the adjustment provided by the Heckman procedure. For added protection against within-community correlations, our Heckman models also adjusted for clustering within census tract. We did so by using the cluster version of the Huber-White sandwich estimator to obtain sample variances.

To avoid a specification issue, Heckman models must include some variables in the first stage that subsequently are not included in the second stage (Briggs, 2004). Accordingly, we included all client-covariates in the first ("any employment") stage of our study models. However, we excluded variables in the second stage (e.g., quarters worked or wages earned) which potentially might have had a lower impact on length of employment or wages earned than on being employed. These criteria led to the exclusion of the substance use and criminal justice referral variables in the second stage of the models. The model of each employment outcome also included its matched pre-treatment employment variable (e.g., pre-treatment wages was used in the analysis when wages was the outcome).

Our analytic plan called for two model specifications to examine racial/ethnic disparities in employment-related outcomes. Model 1 focused on the examination of racial/ethnic disparities in employment outcomes, controlling only for client-level covariates. Model 2 included both client client-level and community-level characteristics, along with client covariates. This model indicated the extent to which the addition of community characteristics affected Model 1 estimates of the client-level characteristics, including the key variables of interest concerning race/ethnicity.

2.5.1 Sensitivity Analyses—We conducted sensitivity analyses to examine: 1) the indirect effect of race/ethnicity acting through other pre-treatment factors, and 2) the impact of our method for classifying the race/ethnicity of clients. Given that the goal of our analyses was to identify disparities in post-treatment employment associated with race/ethnicity, our main models adjusted for many other individual characteristics that could impact such employment. However, in doing so, we recognized that racial/ethnic discrimination prior to current treatment could be associated with some of these other individual characteristics and, as a result, have an additional indirect effect on post treatment outcomes. Specifically, pre-treatment racial/ethnic inequalities in educational opportunities and attainment, housing, the criminal justice system, and, particularly, prior employment are likely to impact post-treatment employment. Therefore, we conducted sensitivity analyses to examine the effects of race/ethnicity on other pre-treatment factors and how these effects might then indirectly impact post treatment employment. Increases in the estimated effects of race/ethnicity, when another factor such as prior employment is excluded from a model, might represent another indirect form of racial/ethnic disparity.

We also conducted a sensitivity analysis that re-classified as Black all clients who identified as Black, regardless of Latino ethnicity or other racial identities. Some research suggests that Black Latinos or clients who are Black and multiracial report discrimination at higher rates and report lower health status than White Latinos (Borrell, 2005; Cuevas, Dawson, & Williams, 2016; LaVeist-Ramos, Galarraga, Thorpe, Bell, & Austin, 2011), and this may impact employment outcomes. In the sensitivity analysis, Latino Blacks (N=29) who had been considered Latinos were included in the Black racial/ethnic group. Also, 118 multiracial individuals who had reported Black as one of their racial identities, and who had been previously excluded, were included in the Black racial/ethnic group.

2.5.2 Human Subjects Protection—This study was approved by the Brandeis University and the Washington State Institutional Review Boards.

3. Results

3.1 Client Characteristics at Treatment Admission

The majority of clients, or 68%, were White, while American Indians represented 13%, Latinos represented 10%, and Blacks represented 8% of the analytic sample. Descriptions of the client characteristics for the overall analytic sample and each of the four racial/ethnic groups are included in Table 1. Racial/ethnic groups differed in almost all client characteristics at treatment admission. The White and American Indian client groups had a higher proportion of women, while Latino clients tended to be younger than clients from the other three racial/ethnic groups and had lower levels of education. Additionally, Black clients were more likely to be homeless at treatment admission and to have SSI as their primary source of income. Differences also existed in terms of substance use. Black clients reported higher rates of past month use of alcohol, marijuana, and cocaine, while White clients had higher rates of past month use of methamphetamines. Past month use of opiates was highest among White and American Indian clients. Latinos tended to be older at substance use initiation. A higher proportion of American Indian and Latino clients had been referred to treatment by the criminal justice system.

Racial/ethnic groups also differed with regard to employment in the year prior to beginning treatment. Black clients had lower employment rates than the other three racial/ethnic groups, and they had lower income among those who had been employed. American Indian clients had the highest income prior to treatment. There were no significant differences in the mean number of quarters worked by race/ethnicity prior to treatment.

3.2 Community Characteristics

Clients in our sample resided in a total of 1,346 census tracts. The community variable % of residents who were American Indians ranged from 0.4% to 87.1% (Mean=6.4, s.d. = 12.3). The community variable % of residents who were Latinos ranged from 1.1% to 87.8% (Mean = 13.5, s.d. = 15.0), and % of residents who were Black ranged from 0.0% to 39.3% (mean = 4.1, s.d.= 6.1). The derived community economic disadvantage variable was higher for clients in rural areas (Mean = 0.81, s.d. = 0.55, N = 1,141), than for clients in non-rural areas (Mean = 0.36, s.d. = 0.86, N = 8,973). Community characteristics varied significantly by client race/ethnicity (see Table 1).

Compared with White and Black clients, American Indian and Latino clients lived in communities with higher economic disadvantage. Clients also were likely to reside in communities with higher concentrations of individuals of the same race/ethnicity. For example, compared with Latino, White, and Black clients, American Indian clients lived in communities characterized by a higher concentration of American Indians This trend was similar for each racial/ethnic minority group.

3.3 Unadjusted Employment Outcomes

Table 2 shows unadjusted client outcomes in the year following treatment admission. Only 38.7% of clients were employed at any point in that period, although employment rates varied somewhat by race/ethnicity. Latinos (42.2%) and American Indians (41.7%) were

more likely to be employed than Black clients (34.5%). Among those employed, Black clients had the lowest mean wages earned (Mean = $7,261, sd = 9,612) and American Indians had the highest (Mean = $12,613, sd = 14,861). There were no significant differences by race/ethnicity in the mean number of quarters when clients were employed.

3.4 Multivariate Results

3.4.1 Any employment in year following treatment admission—Table 3 shows the results of the two Heckman model specifications (with and without community characteristics), which are used to predict any employment in the year following treatment admission. After controlling for other client characteristics, when compared to White clients (Model 1), American Indian (coef= 0.032, 95% CI: −0.053, 0.116), Latino (coef= 0.008, 95% CI: −0.082, 0.097) and Black (coef= −0.052, 95% CI: −0.050, 0.153) clients did not differ significantly from White clients in their likelihood of being employed in the year after starting outpatient treatment. When community characteristics were added to the models (Model 2), the client level variable for being Black becomes significantly positive in the first stage of the model (coef= 0.110, 95% CI: 0.001, 0.220). In addition, several community characteristics were associated with likelihood of employment. Clients living in communities characterized by higher economic disadvantage (coef= −0.077, 95% CI: −0.118, −0.036) and in communities with a higher proportion of Black residents (coef= −0.007, 95% CI: −0.012, −0.002) were significantly less likely to be employed after beginning treatment. Using marginal effects for ease of interpretation (results not shown), a one-unit increase in the economic disadvantage variable decreases the probability of employment by 2.9 percentage points, and a one unit increase in the percent Black variable, decreases the probability of employment by 0.26 percentage points. On the other hand, clients residing in communities with a higher percentage of Latino residents were significantly more likely to be employed in the year following outpatient treatment admission (coef= 0.004, 95% CI: 0.002, 0.006). The marginal effects revealed that a one-unit increase in the variable for percent Latinos in a census tract decreased increases the probability of any employment following treatment admission by .1 percentage points.

3.4.2 Quarters Employed—Table 4 presents results on the number of quarters employed in the year after beginning treatment, an outcome of the second stage of our Heckman models. The models indicate that, compared to White clients (Model 1), Black (coef= −0.154, 95% CI: −0.290, −0.018) and American Indian (coef= −0.187, 95% CI: −0.284, −0.089) clients experienced significantly lower mean quarters employed, and this disparity persisted, even after controlling for the characteristics of where clients resided (Model 2). None of the community characteristics in our models were associated with quarters employed.

3.4.3 Wages earned—Table 5 presents the results of predicting wages earned (transformed to the natural log) by clients employed in the year after treatment admission, another outcome of the second stage of our Heckman models. When controlling only for other client characteristics (Model 1), Black clients had significantly lower wages when compared to White clients (coef= −0.505, 95% CI: −0.694, −0.306). However, there were no significant differences for American Indian or Latino clients when compared to White

clients. When also including community level variables in our analyses (Model 2), the disparity in wages earned for Black clients remained significant (coef= −0.433, 95% CI: −0.636, −0.230). Clients residing in communities with a higher percentage of Latino residents had significantly higher wages (coef= 0.003, 95% CI: 0.000, 0.007), but none of the other community characteristics were significantly associated with wages.

3.4.4 Sensitivity Analyses—Our sensitivity analyses found that, for the most part, the inclusion of other individual characteristics in our models did not have a significant effect on our race/ethnicity estimates. In no case did the exclusion of an individual characteristic from our model change the significance of an individual race/ethnicity estimate, and in only three cases did any exclusion lead to a change in the significance of a variable for community race/ethnicity percentage--that is, for the outcome of quarters employed (a second stage outcome in our Heckman models), the community variable that indicated the percent of residents who were Latino became significant when the prior employment indicator was excluded; and the community variable for the percentage of Black residents became significant when the homelessness variable was excluded. Additionally, for the log wages earned (another second stage outcome in our Heckman models) the variable for the percentage of Latino residents became significant when the prior employment factor was excluded. Therefore, it appears that the client-level race/ethnicity effects determined by our models after adjusting for other individual and community characteristics, are the important effects worth noting. The concern that the effects of race/ethnicity may be underestimated because they functioned indirectly through other pre-treatment factors in our models does not appear to have had too large an impact.

Our other sensitivity analysis related to the identification of a client's race/ethnicity noted a similarly limited impact. For this sensitivity analysis, we classified as Black any client who identified as Black regardless of his/her Latino ethnicity or if multi-racial. Model results using this alternative identification of Black did not change, except in one instance: the coefficient for Black race/ethnicity was no longer a significant predictor of any employment after treatment admission when community characteristics were included.

4. Discussion

We encountered evidence of racial/ethnic disparities in employment-related outcomes of clients who received substance use treatment services in Washington State, although a consistent pattern did not emerge. For example, while controlling only for pre-treatment employment and other individual characteristics, we did not find disparities by race/ethnicity in the likelihood of being employed in the year following an outpatient treatment admission. This lack of evidence of disparities in employment was contrary to expectations, given the higher unemployment rates for minority groups in the U.S. general population and in Washington, specifically, where unemployment for Black, Latino, and American Indian adults is substantially higher than for White adults (Bureau of Labor Statistics, 2016, 2017b). The difference might be attributed to the fact that, in this study, our population is made up of individuals with substance use disorders, who generally have difficulty getting and maintaining a job. This was reflected in the relatively low percentage (about 40%) of our sample being employed before or after treatment.

Disparities did exist in consistency of employment and wages earned. Compared with White clients, American Indian and Black clients had fewer quarters in the next year with any employment. Meanwhile, Black clients had lower wages post-treatment admission, even when controlling for other individual covariates. Between Latino and White clients, there were no significant differences in the two employment outcomes. Few studies have examined disparities in treatment employment outcomes, although several studies examining employment have included race/ethnicity as a predictor variable. In a study using older data from Washington, Oklahoma, and Baltimore City, similar to the present study, there were no disparities in the likelihood of employment, but clients of color in Oklahoma did experience significantly lower wages than Whites in that state (Arria & TOPPS-II Interstate Cooperative Study Group, 2003). All clients of color in the TOPPS-II sample were combined into one category (non-White), and the heterogeneity in the sample potentially masked disparities experienced by some groups in Washington and Baltimore.

The lack of evidence of a disparity in obtaining employment among Latinos in this study is consistent with prior research. In studies conducted in California, Latinos have had similar (Niv & Hser, 2006) or better (Evans et al., 2010) employment-related outcomes after treatment than White clients (although these studies focused on clients who used a specific drug or on the impact of a policy change). Similarly, that there was a Black-White wage gap is consistent with the well-documented wage-gap among the general U.S. population, where Black full-time employees earn only about 73% of White full-time employees, and this gap may be increasing (Bureau of Labor Statistics, 2017c; Patten, 2016; Wilson & Rogers, 2016). Reasons for the wage gap have been attributed to differences in education and occupational experience (Grodsky & Pager, 2001). Although we controlled for education and pre-treatment wages in our study, there is also evidence that even among those with similar educational level a wage gap persists (Wilson, 2016). Additionally, studies suggest evidence of discrimination, such that Blacks are offered less in wages by a new employer than Whites with similar qualifications (Fryer, Pager, & Spenkuch, 2013).

Less consistent employment and lower wages result not only in significant negative economic impacts, but also in negative health ramifications, particularly for clients who are trying to recover from substance use disorders. Compared to those who were unemployed, individuals with a substance use disorder, and who obtained either paid or volunteer work, were more likely to reduce their substance use (Aklin et al., 2014; Griep et al., 2015; McHugo, Drake, Xie, & Bond, 2012). Conversely, unemployment is associated with declining health and excess mortality (Korpi, 2001; Lundin, Lundberg, Hallsten, Ottosson, & Hemmingsson, 2010; Montgomery, Cook, Bartley, & Wadsworth, 1999; Roelfs, Shor, Davidson, & Schwartz, 2011), as the possible result of increased stress (Janlert, 1992). Being unemployed can be especially detrimental for those with a substance use disorder, as unemployment is associated with increased alcohol and drug use, as well as higher risk of substance use disorders (Boden, Lee, Horwood, Grest, & McLeod, 2017; Compton, Gfroerer, Conway, & Finger, 2014; Meyer & Mutambudzi, 2014). Thus, experiencing unemployment may undermine the positive effects of treatment. This may impact minority groups more. For example, compared with Whites, rates of problem drinking during periods of unemployment increased for minority groups disproportionately (Jones-Webb, Karriker-Jaffe, Zemore, & Mulia, 2016; Lo & Cheng, 2015).

Community characteristics did not appear to mitigate the racial/ethnic disparities found in consistency of employment or wages. However, community characteristics were independently associated with some of our employment outcomes. Living in communities with higher economic disadvantage and a higher proportion of Black residents was associated with lower likelihood of employment after treatment admission, whereas living in communities with a higher proportion of Latino residents was associated with a higher likelihood of employment and higher wages. Unfortunately, the finding that clients living in areas with higher concentration of Black residents is not unexpected, as segregated Black neighborhoods and cities across the U.S. also tend to suffer from lower employment opportunities (Lewin-Epstein, 1986; Vonlockette, 2010; Weinberg, 2000). Clients living in these communities may have a harder time finding employment, regardless of how well they have been doing in treatment, and these structural barriers could make it more difficult to remain in recovery. Conversely, living in communities with a higher proportion of Latino residents was associated with higher likelihood of employment and higher wages after treatment began. This may be because, in Washington State, the census tracts with the highest proportion of Latino residents are in the agricultural areas of the State, where unemployment tends to be lower or around the state average, and agricultural employment increased by almost 13 % between 2012 and 2013 (Employment Security Department, 2013; Office of Financial Management, 2017; Washington State Department of Agriculture, 2012). This might also explain why there was no significant difference in any of our employment outcomes between Latino and White clients at the individual client level, since a large proportion of agricultural workers are Latino (Bureau of Labor Statistics, 2015). That census tracts with the highest proportion of Latino residents are in agricultural areas of the State may also explain why no community characteristics were associated with length of employment. Agricultural work is seasonal, so while clients living in census tracts with the highest proportion of Latino residents are more likely to work at some time during the year, they may not work in enough distinct quarters to determine a significant difference. Community characteristics did not appear to mitigate the racial/ethnic disparities found in consistency of employment or wages.

Perhaps the most surprising result in this study emerged in the model predicting employment, which controlled for community disadvantage and racial/ethnic make-up of the clients' community of residence, whereby the positive coefficient for Black clients doubled and became significant. However, since being Black and living in a community with a higher proportion of Blacks are correlated characteristics, it is not obvious whether the estimates on these two variables should be accepted independently versus taken together to imply that the likelihood of post treatment employment for most Black clients is not significantly different from White clients.

In addition, while the post-treatment employment of Black clients may or may not be different than White clients when controlling for community characteristics, it is clear they had shorter lengths of employment and lower wages regardless of whether community characteristics were adjusted for or not. Given that we also controlled for a wide array of individual level characteristics that were likely to influence employment outcomes (such as employment and wages variables prior to treatment, education, and indicators of substance use severity), the reasons behind this disparity might be due to external factors, and perhaps

could be associated with unmeasured factors between facilities or within the larger society. For example, it is likely that discrimination contributes to disparities in employment outcomes, such as lower wages offered by employers based on race/ethnicity (Fryer et al., 2013), and higher rates of workplace discrimination Blacks may experience, which also may impact length of employment (Pew Research Center, 2016). Unfortunately, with regard to research on employment opportunities and workplace experiences, few studies include American Indians at all which makes it more difficult to determine whether discrimination also impacts employment outcomes among this group.

It is also possible that some groups may be less likely to receive employment services as part of treatment. Only about a third of treatment facilities in Washington State provide employment counseling or training (Substance Abuse and Mental Health Services Administration, 2017a), although data referring to which clients received such services are not available in this dataset. Additionally, some groups receive lower quality of care in treatment and this may translate to declining employment outcomes. American Indian and Black clients in outpatient treatment are less likely to meet a performance measure on timeliness of services and treatment engagement, and this might contribute to differences in employment outcomes (Acevedo et al., 2015; Dunigan et al., 2014). Black and American Indians may also enjoy fewer opportunities for accessing higher paying jobs or jobs with long-term stability. For example, Black clients in outpatient treatment are more likely to be arrested after initiating treatment than Whites (Acevedo et al., 2015). This could result in disruptions in employment, as well as in increased barriers for gaining employment in higher paying jobs, especially as a result of having a criminal record.

Several limitations are notable. First, the merging of clients' treatment records with employment outcomes required matching that was based on various identifiers, and missing fields and errors in data entry in those identifiers could have resulted in unmatched records. Data from the state employment agency did not include income in the informal sector, such as work paid in cash and not reported by the employer. These two data issues may lead to the underestimation of employment outcomes, particularly for some groups that are overrepresented in occupations where they often are paid in cash (e.g., Latinas are overrepresented in childcare and housecleaning occupations, which may be more likely to be underreported by the employer) (Bureau of Labor Statistics, 2017a). Second, for some clients, particularly those in the younger age groups, attending school full-time may be a positive outcome, even when not employed, and we were not able to take this into account. Third, we focused on census tracts as our unit of analysis for communities, given that they are the geographic unit recommended for monitoring disparities in health outcomes. However, if clients look for employment opportunities outside of their own census tracts, it is possible that unemployment rates in the nearby areas could also impact employment outcomes. We used information on the client's residential census tract at the time of treatment admission. However after beginning treatment, some clients may have relocated to an area with different characteristics. Finally, the findings may be specific to Washington State and generalizability is limited. To the extent that decisions about treatment service organization and financing are made at the state level, and that the treatment population, community characteristics, and types of industries vary by state, it is important to examine treatment outcomes at the state level. This study offers a model for examining disparities in

employment outcomes both at the individual and community level, and can be used to examine these questions in other states and provide information on whether the relationships between individual and community factors and employment are similar across states.

Despite these study limitations, this study contributes to the literature on employment as an outcome of treatment. Although the importance of clients gaining and maintaining employment has been recognized for some time, to the best of our knowledge, this may be the first study that focuses on the examination and understanding of racial/ethnic disparities in these outcomes. At a time when the U.S. population is becoming increasingly racially/ethnically diverse, it is critical that treatment providers, state substance use agencies, and policymakers pay attention to whether all clients achieve similar positive outcomes. Furthermore, the research on employment outcomes has focused mostly on individual factors and on the impact of ancillary services on employment. This study expands this research by considering how "place" might also impact treatment outcomes. Although studies that consider the impact of neighborhood or community on outcomes after hospitalizations or medical care for other conditions is expanding, less attention has been paid on the impact of place on treatment outcomes for substance use disorders. Additionally, we focus on several employment outcomes which allowed us to examine nuances associated with employment after treatment. Had the focus exclusively been on any employment as an outcome, we might have missed important information on disparities related to the "extent" of employment as measured by wages and time employed.

5. Conclusions

Although Black, American Indian, and Latino clients are similar in that they are likely to be employed after a treatment admission as White clients, differences exist by race/ethnicity in time employed and wages. Community characteristics are associated with employment independently of individual client characteristics, although the characteristics we examined do not appear to be driving client-level disparities in employment outcomes. Given that employment is a desired outcome for many treatment participants and that employment has an impact on substance use and well-being in general, treatment programs, state agencies, and policy-makers must invest more resources in assisting clients in gaining and maintaining employment. They also must acknowledge the degree to which structural barriers may render clients vulnerable in accomplishing this goal, especially some minority groups.

Acknowledgments

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Highlights

- Racial/ethnic disparities in employment stability and wages among Black and American Indian clients post treatment admission

- Community economic disadvantage and community racial/ethnic composition are associated with employment outcomes

- Community characteristics do not account for disparities in employment outcomes

Table 1

Client and Community Characteristics at Treatment Admission

	Entire Sample (N =10,636)	White (W) (N= 7,246)	American Indian (AI) (N= 1,397)	Latino (L) (N= 1,096)	Black (B) (N= 897)	Differences between groups[e]
	%	%	%	%	%	
Client demographics						
Female	39.1	41.2	44.1	27.4	27.9	W, AI > L, B
Age						
18–20	7.7	6.5	8.0	17.2	5.2	L > W, AI, B
21–25	16.9	16.8	18.5	19.6	12.7	W, AI, L > B
26–30	17.1	18.1	15.1	17.2	11.9	W > AI; W, L > B
31–44	33.3	33.3	35.2	32.1	31.8	n.s.
45+	24.9	25.2	23.2	13.9	38.4	B > W, AI > L
Education						
Less than High school (H.S.)	29.2	25.3	33.3	48.3	30.6	L > AI, B > W
H.S. Grad	56.2	58.2	57.5	41.3	56.4	W, AI, B > L
More than H.S.	8.1	9.2	5.6	5.4	6.5	W > AI, L, B
Vocational training	6.5	7.3	3.7	5.0	6.6	W, B > AI; W > L
Homeless	16.8	17.6	9.1	11.0	28.8	B > W, L, AI
Primary Income Source- Supplemental Security Income	9.0	9.6	4.7	4.9	15.6	B > W > L, AI
Employment in Year Prior to Treatment Admission						
Employed in year prior to treatment admission % (N)	36.9	37.1	39.0	38.6	30.5	W, L, AI > B
	(3,929)	(2,691)	(540)	(424)	(274)	
Mean number of quarters worked among those employed (sd) [c]	2.51 (1.19)	2.49 (1.18)	2.60 (1.25)	2.59 (1.16)	2.40 (1.16)	n.s.
Mean wages in U.S. dollars among those employed (sd) [c,d]	9,703	9,134	13,992	9,933	6,478	AI > W, L > B
	(12,842)	(11,995)	(16,862)	(13,009)	(9,026)	
Treatment Referral and Substance Use Severity						
Referral to treatment by criminal justice system	57.3	54.0	69.1	65.2	56.4	L, AI > W, B
Age of first use [b]						

	Entire Sample (N =10,636)	White (W) (N= 7,246)	American Indian (AI) (N= 1,397)	Latino (L) (N= 1,096)	Black (B) (N= 897)	Differences between groups[e]
	%	%	%	%	%	
< 10	12.5	12.6	13.0	9.7	14.1	W, B > L
11–14	36.7	36.7	37.1	32.9	32.3	n.s.
15–17	31.3	31.2	30.4	34.9	30.0	n.s.
18–20	10.9	10.3	12.0	13.1	11.5	L > W
21+	8.6	9.2	7.5	9.4	12.1	B > W, AI
Past month use[a]						
Alcohol	27.5	26.0	29.1	27.7	36.6	B > W, AI, L
Marijuana	19.9	19.9	19.0	17.8	27.2	B > W, AI, L
Cocaine	3.5	2.6	2.2	2.3	15.1	B > W, AI, L
Methamphetamines	8.5	10.3	4.9	6.3	2.2	W > L, AI > B
Opiates	12.4	13.9	12.8	7.5	5.9	W, AI > B, L
Other substance	2.8	3.2	1.7	1.9	2.2	W > AI
Community Characteristics (mean, sd)						
Economic Disadvantage	0.41 (0.84)	0.34 (0.84)	0.64 (0.73)	0.58 (0.90)	0.37 (0.83)	AI, L > W, B
% American Indian	6.37 (12.30)	3.64 (4.14)	23.89 (25.53)	4.60 (8.23)	3.29 (2.76)	AI > L > W, B
% Latino	13.51 (15.03)	11.24 (11.37)	17.55 (19.01)	24.89 (24.72)	11.68 (9.58)	L > AI > B, W
% Black	4.07 (6.08)	3.45 (4.97)	2.49 (4.75)	3.49 (5.48)	12.28 (9.58)	B > L, W > AI

NOTES:

[a] Substance was listed as a primary, secondary, or tertiary drug, and frequency of use was one or more times in the past month.

[b] Earliest age of first use of any of the substances reported as primary, secondary, or tertiary substance of abuse.

[c] Comparisons by race/ethnicity were done using ANOVA, followed by adhoc pairwise comparisons.

[d] Wages were reported for the four quarters (or year) after the index visit.

[e] Differences at the overall p<.05 level, using a Bonferroni correction for multiple comparisons (*p* < .008).

Table 2

Unadjusted Employment Outcomes by Race/Ethnicity

Employment Outcome	Entire Sample	White (W)	American Indian (AI)	Latino (L)	Black (B)	Differences Between Groups[a]
Employed in year after treatment admission (N, %)	4,120 (38.7)	2,766 (38.1)	582 (41.7)	463 (42.2)	309 (34.5)	L, AI > B
Mean number of quarters worked (sd)	2.66 (1.18)	2.68 (1.18)	2.56 (1.19)	2.75 (1.20)	2.50 (1.18)	L > B
Mean wages (sd)[b]	10,733 (12,637)	10,613 (12,268)	12,613 (14,861)	11,410 (13,061)	7,261 (9,612)	W, L, AI > B AI > W

[a]Differences at the overall p<.05 level, using a Bonferroni correction for multiple comparisons (*p* <.008).

[b]Wages were reported for the four quarters (or year) after the quarter of the index visit.

Table 3

Results of Heckman regression. Stage 1: Predicting Employment at any time in year post-index

Variable	Model 1 Race/ethnicity and other individual characteristics		Model 2 Race/ethnicity, other individual characteristics, and community characteristics	
	Coeff.	(95% CI)	Coeff.	(95% CI)
Individual Characteristics				
Race/Ethnicity (ref: White)				
American Indian	0.032	(−0.053, 0.116)	0.029	(−0.072, 0.130)
Latino	0.008	(−0.082, 0.097)	−0.022	(−0.111, 0.067)
Black	0.052	(−0.050, 0.153)	0.110 *	(0.001, 0.220)
Female	−0.086 **	(−0.143, −0.028)	−0.083 **	(−0.141, −0.026)
Age (Ref: 45+)				
18–20	0.584 **	(0.471, 0.697)	0.571 **	(0.457, 0.685)
21–25	0.546 **	(0.458, 0.635)	0.544 **	(0.455, 0.633)
26–30	0.461 **	(0.381, 0.542)	0.460 **	(0.379, 0.541)
31–44	0.310 **	(0.238, 0.382)	0.309 **	(0.237, 0.381)
Education (Ref: Less than high school)				
High School	0.198 **	(0.136, 0.260)	0.200 **	(0.138, 0.263)
> High School	0.274 **	(0.169, 0.380)	0.275 **	(0.168, 0.382)
Vocational	0.253 **	(0.136, 0.370)	0.255 **	(0.138, 0.373)
Homeless	−0.148 **	(−0.227, −0.070)	−0.131 **	(−0.211, −0.051)
Primary Income SSI	−0.641 **	(−0.764, −0.517)	−0.630 **	(−0.755, −0.504)
Pre-Treatment Employment	1.173 **	(1.114, 1.231)	1.168 **	(1.110, 1.226)
Referred to treatment by criminal justice system	0.120 **	(0.061, 0.180)	0.118 **	(0.058, 0.178)
Age of first use (Ref: 21+)				
<10	−0.070	(−0.186, 0.047)	−0.058	(−0.174, 0.059)
11–14	0.003	(−0.092, 0.099)	0.010	(−0.085, 0.105)
15–17	−0.002	(−0.098, 0.093)	−0.001	(−0.096, 0.094)
18–20	−0.038	(−0.153, 0.077)	−0.036	(−0.151, 0.080)

Variable	Model 1 Race/ethnicity and other individual characteristics		Model 2 Race/ethnicity, other individual characteristics, and community characteristics	
	Coeff.	(95% CI)	Coeff.	(95% CI)
Past Month Use				
Alcohol	−0.028	(−0.092, 0.036)	−0.028	(−0.093, 0.036)
Marijuana	−0.073	(−0.147, 0.001)	−0.070	(−0.144, 0.005)
Cocaine	−0.047	(−0.205, 0.111)	−0.041	(−0.198, 0.116)
Opiates	−0.220**	(−0.312, −0.128)	−0.219**	(−0.311, −0.127)
Methamphetamine	−0.285**	(−0.394, −0.176)	−0.275**	(−0.384, −0.165)
Other	−0.057	(−0.224, 0.110)	−0.061	(−0.229, 0.107)
Community Variables				
Economic Disadvantage	---	---	−0.077**	(−0.118, −0.036)
% American Indian	---	---	0.000	(−0.003, 0.003)
% Latino	---	---	0.004**	(0.002, 0.006)
% Black	---	---	−0.007*	(−0.012, −0.002)

Notes: SSI= Social Security Income;

*
= p< .05;

**
= p< .01

Table 4

Results of Heckman regression. Stage 2: Predicting Quarters employed in year post-index among those employed

Variable	Model 1 Race/ethnicity and other individual characteristics		Model 2 Race/ethnicity, other individual characteristics, and community characteristics	
	Coeff.	(95% CI)	Coeff.	(95% CI)
Individual Characteristics				
Race/Ethnicity (ref: White)				
American Indian	−0.187 **	(−0.284, −0.089)	−0.202 **	(−0.328, −0.076)
Latino	0.016	(−0.099, 0.132)	−0.015	(−0.137, 0.107)
Black	−0.154 *	(−0.290, −0.018)	−0.168 *	(−0.318, −0.019)
Female	−0.035	(−0.109, 0.039)	−0.035	(−0.109, 0.039)
Age (Ref: 45+)				
18–20	−0.150 *	(−0.296, 0.004)	−0.145	(−0.291, 0.000)
21–25	−0.109	(−0.231, 0.013)	−0.102	(−0.223, 0.019)
26–30	−0.011	(−0.135, 0.113)	−0.008	(−0.132, 0.116)
31–44	−0.079	(−0.183, 0.025)	−0.077	(−0.182, 0.028)
Education (Ref: Less than high school)				
High School	0.074	(−0.010, 0.158)	0.076	(−0.008, 0.160)
> High School	0.135	(0.005, 0.276)	0.142	(0.000, 0.283)
Vocational	0.126	(−0.030, 0.282)	0.131	(−0.025, 0.287)
Homeless	−0.135 **	(−0.229, −0.040)	−0.133 **	(−0.231, −0.036)
Primary Income Source SSI	−0.380 **	(−0.617, −0.142)	−0.384 **	(−0.621, −0.147)
Pre-Treatment Quarters Employed	0.221 **	(0.185, 0.257)	0.222 **	(0.187, 0.258)
Age of first use (Ref: 21+)				
<10	−0.110	(−0.273, 0.053)	−0.112	(−0.275, 0.051)
11–14	−0.116	(−0.249, 0.017)	−0.117	(−0.249, 0.016)
15–17	−0.007	(−0.138, 0.124)	−0.010	(−0.141, 0.120)
18–20	0.127	(−0.024, 0.279)	0.124	(−0.027, 0.275)
Community Variables				
Economic Disadvantage	---	---	−0.004	(−0.054, 0.045)

Variable	Model 1 Race/ethnicity and other individual characteristics		Model 2 Race/ethnicity, other individual characteristics, and community characteristics	
	Coeff.	(95% CI)	Coeff.	(95% CI)
% American Indian	---	---	0.000	(−0.004, 0.004)
% Latino	---	---	0.002	(0.000, 0.005)
% Black	---	---	0.002	(−0.006, 0.010)

Notes: : SSI= Social Security Income;

*
= p< .05;

**
= p< .01

Table 5

Results of Heckman regression. Stage 2: Predicting Income[1] in year post admission among those employed

Variable	Model 1 Race/ethnicity and other individual characteristics		Model 2 Race/ethnicity, other individual characteristics, and community characteristics	
	Coeff.	(95% CI)	Coeff.	(95% CI)
Individual Characteristics				
Race/Ethnicity (ref: White)				
American Indian	0.004	(−0.125, 0.133)	−0.018	(−0.181, 0.146)
Latino	0.069	(−0.076, 0.215)	0.036	(−0.119, 0.191)
Black	−0.505 **	(−0.694, −0.316)	−0.433 **	(−0.636, −0.230)
Female	−0.291 **	(−0.385, −0.197)	−0.291 **	(−0.385, −0.197)
Age (Ref: 45+)				
18–20	−0.214 *	(−0.393, −0.035)	−0.229 *	(−0.408, −0.050)
21–25	−0.094	(−0.241, 0.053)	−0.099	(−0.246, 0.048)
26–30	0.105	(−0.061, 0.272)	0.100	(−0.066, 0.267)
31–44	−0.050	(−0.187, 0.087)	−0.052	(−0.190, 0.086)
Education				
High School	0.239 **	(0.123, 0.355)	0.243 **	(0.126, 0.359)
> High School	0.445 **	(0.253, 0.636)	0.448 **	(0.256, 0.640)
Vocational	0.515 **	(0.307, 0.723)	0.520 **	(0.311, 0.729)
Homeless	−0.354 **	(−0.492, −0.216)	−0.328 **	(−0.470, −0.186)
Primary Income Source SSI	−1.131 **	(−1.479, −0.783)	−1.109 **	(−1.459, −0.759)
Pre-Treatment income[1]	0.148 **	(0.135, 0.161)	0.146 **	(0.134, 0.159)
Age of first use (Ref: 21+)				
<10	−0.374 **	(−0.589, −0.160)	−0.366 **	(−0.580, −0.152)
11–14	−0.324 **	(−0.499, −0.149)	−0.320 **	(−0.494, −0.146)
15–17	−0.205 *	(−0.375, −0.034)	−0.204 *	(−0.374, −0.035)
18–20	−0.024	(−0.216, 0.168)	−0.026	(−0.218, 0.167)
Community Variables				

Variable	Model 1		Model 2	
	Race/ethnicity and other individual characteristics		Race/ethnicity, other individual characteristics, and community characteristics	
	Coeff.	**(95% CI)**	**Coeff.**	**(95% CI)**
Economic Disadvantage	---	---	−0.051	(−0.120, 0.017)
% American Indian	---	---	0.000	(−0.004, 0.004)
% Latino	---	---	0.003[*]	(0.000, 0.007)
% Black	---	---	−0.010	(−0.022, 0.003)

Notes:: SSI = Social Security Income

[1]Transformed using natural log.

[*]
p< .05;

[**]
p< .01