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## American Indians/Alaska Natives and Substance Abuse Treatment Outcomes: Positive Signs and Continuing Challenges

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### Keywords

substance abuse; american indians; native americans; treatment; alcohol; illicit drugs

### INTRODUCTION

Compared to other racial/ethnic groups in the U.S., American Indians/Alaska Natives (AI/ANs) have the highest rates of alcohol, marijuana, cocaine, and hallucinogen use disorders<sup>1</sup> and the second highest methamphetamine abuse rates after Native Hawaiians<sup>2</sup>. Consequences of substance abuse in this population have been significant. For example, a more frequent association between alcohol use and suicide has been observed among AI/ANs compared to the general U.S. population<sup>3,4</sup>. In addition, high rates of traumatic exposure have been identified among AI/ANs with alcohol use disorders<sup>5</sup>. The recent rise in methamphetamine abuse in this population over the past decade has also significantly impacted AI/AN communities<sup>6</sup>. In spite of the high rate of substance abuse among AI/ANs, few studies have comprehensively analyzed the effectiveness of substance abuse treatments currently provided to this population. Due to known health-related disparities known to exist among AI/AN with substance abuse problems<sup>7</sup>, an emergent need exists among providers and policymakers to understand the effectiveness of currently provided substance abuse treatments for AI/ANs.

Studies analyzing substance abuse treatment outcomes among AI/ANs are limited. Most studies have been conducted in small, community samples and have focused primarily on alcoholism<sup>8,9</sup>. In one study comprised of 45 hospitalized alcoholic American Indians, only 7 improved 10-years post-treatment although improvements in employment rates and relationship stability were observed among participants<sup>10</sup>. In another study consisting of 642 American Indians who received outpatient and residential care, 28% demonstrated clear improvements in treatment outcomes 4-years post-treatment<sup>11</sup>. In another study conducted among a sample of urban American Indians receiving both inpatient and outpatient care, positive treatment outcomes were infrequent although most subjects spent extensive time in treatment<sup>12</sup>.

To our knowledge, only one study has been conducted analyzing treatment outcomes between AI/ANs and a matched comparison group<sup>8</sup>. A previous study conducted by our group compared alcohol and drug treatment outcomes between a sample of California American Indians and a non-American Indian comparison group utilizing the California

Treatment Outcome Project (CalTOP). In this study, results revealed that American Indians and non-American Indians demonstrated a similar level of severity before treatment in all seven domains measured by ASI (alcohol, drug, medical, psychiatric, family, legal, and employment) and demonstrated similar levels of improvement in all seven ASI domains. Our study sought to further our understanding of how AI/ANs respond to substance abuse treatment through a comparison of two additional samples of AI/ANs to a matched comparison group.

We analyzed data from a sample of 279 AI/ANs and from a 279-subject matched comparison group utilizing data from the Treatment Impact System (TSI) project and Methamphetamine Treatment Project (MTP). Our goals were to examine: 1) pre- and posttreatment psychosocial, medical, and psychiatric characteristics, 2) drug and alcohol use treatment outcomes between the AI/ANs and non-AI/ANs samples, 3) specific services received during treatment, and 4) treatment retention and completion patterns. Our hypotheses were that AI/ANs would 1) have more baseline medical and psychiatric problems due to known health-related disparities known to exist among AI/ANs, 2) have less successful substance abuse treatment outcomes due to a likelihood of not receiving specific, culturally-relevant treatment, 3) although demonstrating more medical and psychiatric problems, would receive less of these services due to less recognition of culturally specific psychosocial stressors by providers, and 4) demonstrate lower retention and completion rates due to a potential for less satisfaction in receiving substance abuse treatment services provided to the general U.S. population.

## METHOD

### Participants

Our study sample included 490 participants from the TSI study (245 AI/ANs and 245 from a comparison group) and 68 participants from the MTP study (34 AI/ANs and 34 from a comparison group). AI/AN racial status was based on self-report in both the TSI and MTP samples. The Institutional Review Boards at the University of California at Los Angeles (UCLA) approved both TSI and the MTP. In addition, the California Health and Human Services Agency approved the TSI study. After complete description of the original study to the subjects, written informed consent was obtained.

### Treatment Programs

TSI was a multi-site prospective treatment outcome study designed to assess the impact of California Proposition 36 on California's drug treatment delivery system and evaluate the effectiveness of services delivered<sup>13</sup>. California's Proposition 36, enacted as the Substance Abuse and Crime Prevention Act of 2000, allows non-violent drug offenders to receive treatment in lieu of incarceration or probation/parole without treatment. The TSI recruited a total of 1,134 participants from 2003-2006. Assessments for TSI baseline data were conducted through personal interview, and TSI follow-up data were obtained through telephone interviews. The 12-month follow-up rates for AI/ANs and the matched comparison group combined was 18.37%. Intake data for this study were collected from 36 sites in five counties (Kern, Riverside, Sacramento, San Diego, and San Francisco). Programs were community-based or county programs and offered both individual and group counseling. Only programs that have been certified or licensed by the California Department of Alcohol and Drug Programs can treat Proposition 36 patients and were included in this study. Participants were compensated for their time at each interview.

MTP was a multi-site randomized, controlled trial of psychosocial treatments for methamphetamine dependence conducted from 1999-2001<sup>14</sup>. The MTP recruited a total of

938 participants between 1999 and 2001. Assessments for MTP were conducted in-person at baseline and for each follow-up period by trained research staff. The 12-month follow-up rates for AI/ANs and the matched comparison group combined was 88.24% for the MTP. This study was designed to compare the Matrix Model of treatment with “Treatment As Usual” at eight outpatient treatment sites in California, Hawaii, and Montana. The Matrix Model is a multi element package of evidence-based practices delivered in a 16-week intensive outpatient program<sup>15</sup>. Participants who participated in the MTP were required to be current methamphetamine users and meet DSM-IV criteria for methamphetamine dependence and be current methamphetamine users (having used methamphetamine within one month prior to treatment admission unless in a constrained environment such as jail). Involved programs were mostly in community-based settings, hospitals, and independent treatment centers. Participants were compensated for their time at each interview.

## Instruments and Measures

**Pre and post-treatment problem severity**—Pretreatment and post-treatment problem severity was assessed utilizing the *Addiction Severity Index (ASI)* 16. The ASI is the most commonly used instrument used in the substance abuse field and has demonstrated validity in ethnically diverse populations<sup>16-18</sup>. The ASI assesses problem severity in seven areas: alcohol use, drug use, employment, family and social relationships, legal, medical, and psychological. A composite score was calculated for each scale with a range of 0 to 10 with higher scores indicating greater problem severity (see McGahan, Griffith, & McLellan, 1986-for details on composite score calculations)<sup>19</sup>. The ASI was administered at both intake and at 12-month follow-up for both the TSI and MTP. Frequency of alcohol/drug use was measured on a 5-point Likert scale where 1 = (*no use in the past month*) and 5 = (*daily use in the past month*).

*Legal history* was based on arrest records. Arrest records were available among TSI participants only and were obtained from the California Department of Justice.

*Treatment services received* were based on the Treatment Services Review (TSR)<sup>20</sup>. The TSR was administered at the 3-month follow-up for TSI and collected weekly for the MTP. The TSR documents the number of services received by the patient in the past week (for MTP) and 3 months (for TSR) in each of the seven problem areas of the ASI. Services included both medical services (e.g., medication, doctor’s appointment) and psychotherapy (e.g., individual or group therapy, 12-step groups).

*Treatment Retention* was based on treatment and administrative records from participating clinics. Treatment retention was defined as the number of days between treatment admission and treatment discharge and was based on treatment records provided by the state database.

## Statistical Analysis

First, group differences in treatment retention/completion and pretreatment characteristics were examined using chi-square tests for categorical variables and *t* tests for continuous variables. Then we used paired *t* tests to assess whether changes of ASI composite scores from intake to follow-up were significantly different from zero in AI/ANs or the matched comparison group. Next we examined the differences between AI/ANs and comparison subjects on ASI composite scores (by ANCOVA) and other outcome variables (by logistic regression) at follow-up while controlling for covariates which were found to be significantly different at intake. The covariates included marital status (married or not), psychiatric composite score, the number of incarceration of lifetime, psychiatric problem (yes/no), trouble in understanding (yes/no), chronic medical problem (yes/no), sex abuse

(yes/no). In these analyses, project (or 'study' from which the data came) was also included as a covariate to control for potential confounding effects.

Finally, we separately applied logistic regression analysis to examine the probability of any drug use in past 30 days at 12 month follow-up, the probability of any psychiatric problem in past 30 day at 12-month follow-up, and the probability of any arrest since last interview at 12-month follow-up. Covariates in each logistic model included group type (AI/ANs vs. comparison group), employment status at intake, treatment modality, primary drug type at intake, incarceration in the past 30 days at intake, psychiatric problems at intake, physical abuse at intake, and sexual abuse at intake. Unless otherwise indicated, the significance level (two-tailed) was set at  $p < .05$ .

## RESULTS

### Participants

As shown in Table 1, a total of 279 AI/ANs participants from TSI ( $n=245$ ) and MTP ( $n=34$ ) were included in this study. The non-AI/ANs were randomly selected from the remaining TSI and MTP patients and matched to the AI/ANs on treatment provider, primary drug problem, gender, and age ( $\pm 3$  years). Among AI/ANs, the mean age was 37.9 years, 59.1% were male, mean years of education was 11.5, and 32.6% were either employed full or part-time. Methamphetamine was reported as their primary drug of choice (59.5%) followed by marijuana (13.8%) and alcohol (10.2%). The majority of the total sample received outpatient treatment (AI/AN: 81.1%, Comparison group: 84.8%). Demographic information for the comparison group is provided in Table 1, Column 2, and was matched for all demographic variables. Attrition analysis of subjects who did and did not complete the follow-up interview revealed no significant differences in age, gender, education, treatment modality, employment, living circumstances, legal situation, or primary drug use.

### Pretreatment Characteristics

Baseline scores for the ASI individual items for the score domains are included Table 2. AI/ANs had significantly more chronic medical problems (48.4% vs. 34.0,  $p < 0.01$ ), psychiatric problems (48.4% vs. 39.0%,  $P < 0.05$ ), sexual abuse (27.0% vs. 16.6%,  $P < 0.01$ ), trouble understanding (33.3% vs. 21.3%,  $P < 0.01$ ), and number of months incarcerated in lifetime (28.8 months vs. 22.8 months) than the comparison group.

Baseline scores for the ASI composite score domains are also included in Table 2. At baseline, AI/ANs had significantly more psychiatric problems than the comparison group (0.21 vs. 0.16) and more medical problems (0.29 vs. 0.25).

### Outcomes 12 Months after Assessment

As shown in Table 3, no significant differences were observed between AI/ANs and the comparison group regarding 12-month treatment outcomes as measured by all ASI composite scores. Separately, AI/ANs demonstrated significant improvements in all areas and the matched comparison group improved in all areas except for the psychiatric measure. Also, as shown in Table 3, no significant differences were observed between AI/ANs and the comparison group 12 months post-treatment based on legal activity and arrests, employment status, living situation, conflicts with family and others, and on psychiatric measures.

As shown in Tables 4a and 4b, combining both the AI/AN sample and the matched comparison group, logistic regression showed that at 12-month follow-up, individuals incarcerated in the past 30 days at intake were less likely to have used illicit drugs or alcohol

in the past 30 days ( $p < 0.01$ ) and less likely to have any psychiatric problem in the past 30 days at 12-month follow-up ( $p < 0.01$ ). Also, individuals with a psychiatric problem in the past 30 days at intake were more likely to have used illicit drugs or alcohol in the past 30 days ( $p < 0.01$ ) and more likely to have any psychiatric problem in the past 30 days at 12-month follow-up ( $p < 0.01$ ). As shown in Table 4c, with regard to the probability of any arrest since last interview at 12-month follow-up, no significant differences were noted utilizing all covariates. Also, no interaction between AI/ANs with other independent variables were detected in all logistic regression calculations.

### Services Received and Treatment Retention and Completion

As shown in Table 5, AI/ANs received more services with regard to family related and abuse-related services compared to the comparison group (29.9% vs. 17.1%,  $P = 0.06$  and 21.3% vs. 7.6%  $P < 0.08$  respectively). Similar psychiatric, medical, and legal services were received among AI/ANs and non-AI/ANs.

As shown in Table 5, retention rates were similar between AI/ANs and the comparison group, with more than half staying in treatment 90 days or longer (51.5% vs. 49.4%,  $p > 0.05$ ). Fewer AI/ANs completed treatment compared to the comparison group (18.8% vs. 21.9%,  $p > 0.05$ ).

## DISCUSSION

Results from this study revealed significantly more psychiatric problems, higher rates of sexual and physical abuse, and more chronic medical problems among AI/ANs receiving substance abuse treatment compared to a matched comparison sample at baseline. In addition, our results revealed no significant substance abuse treatment outcome differences between AI/AN and a matched comparison group at 12-months post-treatment based on legal, employment, medical, and psychiatric measures or ASI scores. Also, although AI/ANs received more services, no statistically significant differences were noted. Also, treatment retention and completion rates were similar between the AI/AN and comparison groups.

Contrary to our hypothesis, substance abuse treatment outcomes between AI/ANs and a matched comparison group were similar. Our results mirror the California treatment outcomes study conducted by Evans et al. 2006<sup>8</sup>, where similar reductions were found in problem severity. However, our study consisted of patients from a more geographically diverse population covering 44 sites in 3 states (California Montana, and Hawaii) and a greater proportion of patients with methamphetamine dependence. These results suggest that AI/ANs may be equally responsive to substance abuse treatment as non-AI/ANs. However, further larger studies designed to compare treatment outcomes in specific treatment settings [i.e., rural, urban, Indian Health Service (IHS) clinics, community clinics in the general population] and among specific tribal groups and U.S. regions would help increase our understanding of potentially effective treatment strategies for AI/AN with substance use disorders.

Results from our study highlight the need for improving access to substance abuse treatment for AI/ANs since AI/ANs receiving substance abuse services under adequate conditions may experience successful treatment outcomes. The adage “treatment works,” a phrase commonly used among substance abuse providers referring to the hope and promise that substance abuse treatment offers, has relevant connotations as it relates to AI/ANs. However, according to a 2010 report from the SAMHSA National Survey on Drug Use and Health, from 2004-2008, the percentage of AI/ANs who needed alcohol or drug treatment in the past year was higher than the national average for adults (18.0 vs. 9.6 percent)<sup>21</sup>. Of primary concern, significant challenges inhibit AI/ANs’ access to substance abuse services.

For example, in both urban and reservation-based settings, significant barriers to receiving services exist including transportation barriers<sup>22</sup>, low insurance coverage rates among AI/AN<sup>23</sup>, low socioeconomic status, stigma associated with substance abuse, discomfort in the “westernized” treatment delivery system<sup>24</sup>, shortage of opioid treatment programs<sup>25</sup>, and a significant shortage of integrated culturally relevant substance abuse treatment models. Finding solutions towards eliminating these barriers are critically important since an opportunity may exist to uphold the veracity of the adage, “treatment works” among AI/AN with substance use disorders. Thus, a comprehensive and coordinated effort is needed from federal and local agencies including the National Institutes of Health (NIH), Substance Abuse and Mental Health Services Administration (SAMHSA), Indian Health Service (IHS), tribal councils, and other key organizations addressing the needs of urban and rural AI/ANs. Ensuring that AI/AN have access to currently-available substance abuse treatment is long overdue in light of the impact that substance abuse has had in this population.

A potentially useful strategy that may increase the numbers of AI/ANs entering appropriate substance abuse services is the Screening, Brief Intervention, and Referral to Treatment (SBIRT) protocol implemented by SAMHSA<sup>26</sup>. SBIRT is a comprehensive, integrated approach to the early recognition of substance abuse and delivery of intervention and treatment services for individuals with substance abuse disorders and individuals at risk of developing these disorders<sup>27</sup>. In an SBIRT session, clinicians in diverse treatment settings provide a questionnaire that yields a score and assesses the severity and potential need for treatment. Patients are then provided a brief intervention, brief treatment, or a referral to substance abuse treatment based on score severity. Approximately 94% of individuals in the U.S. with substance abuse disorders are unaware they have a problem or do not feel they are in need of treatment<sup>28</sup>. Thus, utilization of SBIRT may be especially useful in providing unidentified AI/AN substance abusers appropriate referrals to treatment.

Screening AI/ANs in diverse healthcare settings such as psychiatric and medical facilities, emergency departments, and dental offices has the potential to increase the numbers of AI/ANs referred to appropriate substance abuse treatment services. Furthermore, in addition to its proven effectiveness among various treatment populations, the SBIRT approach has been demonstrated to be effective among a sub sample of 692 AI/ANs in a large study analyzing the effectiveness of SBIRT across multiple healthcare sites. In this study, AI/ANs who received the SBIRT intervention demonstrated significant reductions in use ( $p < 0.001$ ) of all substances analyzed (alcohol, marijuana, cocaine, methamphetamine, heroin, and other drugs) at 6 months after receiving the SBIRT intervention<sup>22</sup>.

Unexpectedly, no statistically significant differences were observed with regard to specific treatment services received by AI/ANs and the matched comparison group. However, AI/ANs did receive more family-related services, abuse-related services, and psychiatric services. Within AI/AN communities, the effects of substance abuse have been further exacerbated by historically based trauma. For example, AI/AN societies have been adversely affected by genocide, removal from homelands, forced placement into boarding schools, and the breakdown of traditional family systems throughout U.S. history<sup>29</sup>. The effects of these historically-based traumas among AI/ANs have been postulated to having an profound impact on the health and well-being of this population resulting in various unresolved psychosocial issues in this population. Furthermore, these effects associated with historically based trauma have been implicated as a causal factor for substance abuse among AI/ANs<sup>30</sup>.

Our hypothesis that AI/ANs would have lower rates of treatment completion and retention compared to the matched comparison group was also not found. Our results for retention differed from the Evans et al. study that demonstrated significantly shorter treatment retention among AI/ANs receiving residential treatment. Further studies analyzing and

comparing treatment retention and completion, and patient satisfaction levels in diverse treatment settings (i.e., rural, urban, tribally based clinics, etc.) are suggested.

As predicted, notable differences were observed between AI/ANs and non-AI/ANs entering substance abuse treatment as evidenced AI/AN having significantly more medical and psychiatric problems at baseline. These characteristics were expected and not surprising since AI/ANs are known to experience significant health-related disparities (Jones, 2006-8). These results further highlight the need for more culturally tailored, comprehensive treatments addressing medical and psychiatric comorbidities among AI/ANs seeking substance abuse treatment.

Our study is subject to various limitations. For example, the agencies participating in TSI and MTP were not randomly selected. It is therefore possible that our findings are not generalizable to other programs that do not provide similar services. Also, the reliability and validity of self-reported information is uncertain and the cross-cultural validity and applicability to AI/AN have not been established. Also, treatment program information was incomplete, limiting our ability to analyze culturally-specific aspects of treatments which may have been provided in some facilities. In addition, our samples consisted of AI/ANs receiving treatment through a court-monitored treatment program, which may have influenced completion/retention rates. Furthermore, AI/ANs are a heterogeneous population with 562 federally recognized tribes. Thus, generalizing these results to all AI/ANs is not possible. Nonetheless, our study also possesses various strengths, including a geographically diverse sample set, a representative sample of methamphetamine users, in addition to a wide variety of relevant measures.

In summary, similar substance abuse treatment outcomes were observed between a group of AI/ANs and a non-AI/AN comparison group with drug and alcohol problems. These results suggest that AI/ANs can be equally responsive to substance abuse treatment as non-AI/ANs. A significant need exists with regard to increasing access to substance abuse treatment services for AI/ANs and addressing treatment barriers since there may be potential for achieving positive treatment outcomes in this population. In addition, further studies analyzing and comparing substance abuse treatment outcomes in more diverse treatment settings may assist towards optimizing substance abuse treatment outcomes for AI/ANs with substance abuse problems.

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**Table 1**

Sample Characteristics of American Indians/Alaska Natives and Comparison Group (n=558)

	AI/ANs (n=279)	Comparison Group (n=279)
Study %		
TSI	87.8	87.8
MTP	12.2	12.2
Age, Mean (SD)	37.9 (9.7)	37.8 (9.6)
Male, %	59.1	59.1
Race % **		
Caucasian	0.0	65.6
American Indian/Alaska Native	100.0	0.0
Hispanic	0.0	20.1
African American	0.0	11.1
Other	0.0	3.2
Education		
Mean years of education (SD)	11.5 (1.9)	11.5 (1.7)
Less than high school %	39.4	38.9
Employed status %		
Employed (full or part time)	32.6	40.0
Unemployed	29.4	26.9
Not in labor force	38.0	33.1
Homeless, %	10.6	10.7
Married, % *	20.1	13.5
Receiving outpatient treatment, % (TSI only)	81.1	84.8
Primary Drug type %		
Methamphetamine	59.5	58.7
Marijuana	13.8	14.2
Alcohol	10.2	10.6
Cocaine	5.1	5.1
Heroin	8.3	7.9
Other	3.2	3.5
Frequency of primary drug use %		
None	37.3	36.4
1-3 days per month	20.6	20.8
4-12 days per month	9.9	13.6
13-24 days per month	17.1	18.4
Daily	15.1	10.8

\* p&lt;0.05

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p<.01

**Table 2**

Baseline Mental Health, Medical Health, Psychosocial Characteristics, and Criminal Involvement, American Indians/Alaska Natives and Comparison Group based on ASI individual scores

	AI/ANs (n=279)	Comparison Group (n=279)
<b>Medical Health</b>		
Chronic medical problem % **	48.4	34.0
<b>Mental Health</b>		
Had psychiatric problems % *	48.4	39.0
Received pension for psychiatric disability %	4.0	3.7
Had serious depression %	28.8	27.2
Had serious anxiety %	34.4	33.5
Took psychiatric medication %	14.1	11.0
Attempted suicide %	1.1	0.8
Thoughts of suicide %	6.7	4.6
Trouble understanding % **	33.3	21.3
Trouble controlling violent behavior %	9.6	7.2
Hallucinations %	8.2	4.6
<b>Family/Social</b>		
Has children under 18 % (TSI only)	49.5	51.2
Past 30 days serious conflicts with		
Family %	20.1	19.3
Others %	17.3	13.8
Ever physically abused %	45.3	37.6
Ever sexually abused % **	27.0	16.6
<b>Criminal Involvement</b>		
Age at first arrest Mean (SD) (TSI only)	20.9 (10.4)	22.8 (9.0)
Arrested in the past 30 days % (TSI only)	38.6	41.6
Incarcerated in past 30 days % (TSI only)	47.7	51.4
Engaged in illegal activities for profit in the past 30 days %	7.9	4.4
Number of lifetime prior arrests Mean (SD)	8.8 (10.0)	7.6 (10.4)
Property-related Mean (SD)	1.1 (2.6)	1.3 (6.4)
Violence-related Mean (SD)	0.6 (2.6)	0.5 (1.5)
Drug-related Mean (SD)	3.6 (4.6)	3.0 (3.7)
Other Mean (SD)	3.5 (4.8)	2.9 (4.7)
Number of months incarcerated in lifetime Mean (SD) *	28.8 (34.2)	22.8 (32.0)
On probation or parole %	89.4	89.3
ASI Composite Score, Mean (SD)		

	<b>AI/ANs (n=279)</b>	<b>Comparison Group (n=279)</b>
Alcohol	0.10 (0.18)	0.08 (0.15)
Drug	0.15 (0.11)	0.14 (0.12)
Employment	0.73 (0.30)	0.72 (0.30)
Family	0.17 (0.20)	0.15 (0.20)
Legal	0.23 (0.19)	0.24 (0.20)
Medical	0.29 (0.36)	0.25 (0.34)
Psychiatric*	0.21 (0.23)	0.16 (0.21)

\*  
p<0.05

\*\*  
p<0.01

**Table 3**

12 month outcomes after Treatment based on Addiction Severity Index

	AI/AN (n=279)	Comparison Group (n=279)
ASI Composite Scores, Mean (SD)		
Alcohol ++	0.06 (0.13)	0.04 (0.11)
Drug ** ++	0.05 (0.08)	0.04 (0.07)
Employment * +	0.63 (0.34)	0.56 (0.31)
Family ** ++	0.10 (0.16)	0.10 (0.16)
Legal ** ++	0.12 (0.18)	0.12 (0.19)
Medical *	0.19 (0.31)	0.19 (0.31)
Psychiatric * +	0.19 (0.22)	0.16 (0.20)
Outcomes, %		
Used any drug past 30 days (TSI only)	15.6	31.1
Arrested past 30 days (TSI only)	15.6	17.8
Arrested since last interview (MTP only)	32.3	34.5
Illegal activity for profit past 30 days	5.3	1.4
Incarcerated	22.4	24.3
Employed (full-time or part-time) (TSI only)	44.4	57.8
Paid for work in past 30 days	50.0	64.9
Living situation, %		
Homeless	5.3	1.4
Dependent	51.3	54.1
Independent	43.4	44.6
Past 30 day serious conflicts with, %		
Family	13.2	10.8
Others	13.2	13.7
In past 30 days, %		
Had psychiatric problems	47.4	47.3
Received pension for psychiatric disability	6.7	5.4
Took psychiatric medication (TSI only)	22.2	20.0
Had serious depression	34.2	29.7
Had serious anxiety	32.9	31.1
Attempted suicide (TSI only)	0.0	0.0
Thoughts of suicide	4.0	5.4
Trouble understanding	22.4	14.9

\* p&lt;.05

\*\* p&lt;.01 for paired t-test to assess in Native American group whether changes in ASI composite scores from admission to follow-up were significant

<sup>+</sup> p<.05

<sup>++</sup> p<.01 paired t-test to assess in comparison group whether changes in ASI composite scores from admission to follow-up were significant

ANCOVA show that group difference on all ASI scores at 12 months are not significant after controlling psychiatric composite score at intake, the number of incarceration of lifetime at intake, psychiatric problem at intake (y/n), trouble in understanding at intake (y/n), chronic medical problem at intake (y/n), sex abused at intake (y/n).

**Table 4a**

Logistic regression on the probability of any drug use in past 30 day at 12 month follow-up (TSI and MTP combined)

<b>Any drug use in past 30 day at 12 month follow-up</b>	<b>Beta</b>
Group (NatAm vs. Matched)	-0.1426
Employed at intake (yes vs. no)	-0.6500
Modality 1 (outpatient vs. MM)	0.1440
Modality 2 (residential vs. MM)	-0.4763
Primary drug 1 (Alcohol vs. others)	-0.2498
Primary drug 2 (Cocaine vs. others)	-1.2057
Primary drug 3 (Marijuana vs. others)	0.7311
Primary drug 4 (Heroin vs. others)	1.1060
Primary drug 5 (Meth vs. others)	0.4498
Incarceration in past 30 days at intake **	-1.3167
Psychiatric problem in past 30 days at intake **	1.6601
Ever physical abused (yes vs. no)	-0.7793
Ever sexual abused (yes vs. no)	0.4079

\*\*  
p<.01

**Table 4b**

Logistic regression on the probability of any psychiatric problem in past 30 day at 12 month follow-up (TSI and MTP combined)

<b>Any psychiatric problem in past 30 day at 12 month follow-up</b>	<b>Beta</b>
Group (NatAm vs. Matched)	-0.3957
Employed at intake (yes vs. no)	0.0558
Modality 1 (outpatient vs. MM)	-0.5478
Modality 2 (residential vs. MM)	-0.9316
Primary drug 1 (Alcohol vs. others)	-2.2790
Primary drug 2 (Cocaine vs. others)	-2.1007
Primary drug 3 (Marijuana vs. others)	-2.2980
Primary drug 4 (Heroin vs. others)	-3.9869
Primary drug 5 (Meth vs. others)	-2.7980
Incarceration in past 30 days at intake*	-0.8675
Psychiatric problem in past 30 days at intake**	1.2208
Ever physical abused (yes vs. no)	0.5436
Ever sexual abused (yes vs. no)	-0.4779

\* p<.05

\*\* p<.0

**Table 4c**

Logistic regression on the probability of any arrest since last interview at 12 month follow-up (for TSI, the last interview is 3 month follow-up; for MTP the last interview is 6 month follow-up)

<b>Any drug use in past 30 day at 12 month follow-up</b>	<b>Beta</b>
Group (NatAm vs. Matched)	-0.1386
Employed at intake (yes vs. no)	0.2046
Modality 1 (outpatient vs. MM)	-0.4159
Modality 2 (residential vs. MM)	-0.2525
Primary drug 1 (Alcohol vs. others)	-0.0127
Primary drug 2 (Cocaine vs. others)	0.0138
Primary drug 3 (Marijuana vs. others)	0.1439
Primary drug 4 (Heroin vs. others)	-0.0798
Primary drug 5 (Meth vs. others)	0.4239
Incarceration in past 30 days at intake	-0.0520
Psychiatric problem in past 30 days at intake	0.5437
Ever physical abused (yes vs. no)	-0.4332
Ever sexual abused (yes vs. no)	0.3625

**Table 5**

Treatment Services Received, Treatment Retention and Treatment Completion among American Indians/Alaska Natives and Comparison Group (TSI only)

	AI/AN (n=279)	Comparison Group (n=279)
<b>Treatment Services Received</b>		
Total % (p=.39)	89.6	93.9
Drug % (p=.10)	81.8	91.5
Alcohol % (p=.20)	63.6	52.4
HIV % (TSI Only) (p=1.0)	36.2	37.7
Medical % (p=.75)	41.6	37.8
Employment % (p=.29)	32.5	24.4
Psychiatric % (p=.84)	19.5	17.1
Family % (p=.06)	29.9	17.1
Survival Skills % (TSI Only) (p=.42)	8.5	3.8
Abuse % (TSI Only) (p=.08)	21.3	7.6
Legal % (p=.37)	28.6	22.0
Parenting % (TSI Only) (p=.60)	4.7	2.0
<b>Treatment Retention %</b>		
≤ 30 days	19.4	16.5
31-60 days	11.5	19.3
61-89 days	17.6	14.8
≥ 90 days	51.5	49.4
<b>Retention in Days, Mean (SD)</b>	127.5 (115.5)	121.7 (103.2)
<b>Completed treatment %</b>	18.8	21.9

\*  
p<0.05