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More Alike than Different: Health Needs, Services Utilization, and Outcomes of Asian American and Pacific Islander (AAPI) Populations Treated for Substance Use Disorders

Elizabeth Evans, MA^a, Jennifer Pierce, BS^a, Libo Li, PhD^a, Richard Rawson, PhD^a, and Yih-Ing Hser, PhD^a

^aUCLA Integrated Substance Abuse Programs, Semel Institute for Neuroscience and Human Behavior, Department of Psychiatry and Biobehavioral Sciences, David Geffen School of Medicine, 11075 Santa Monica Blvd., Suite 200, Los Angeles, CA, 90025, USA

Abstract

Asian Americans and Pacific Islanders (AAPI) are often portrayed as a healthy group with minor substance use problems. Utilizing data from two studies of patients treated in 44 community-based substance use treatment sites located in three states, 298 AAPI and a matched comparison group of 298 non-AAPI patients were compared on demographic characteristics, treatment experiences, and 1-year outcomes. At treatment entry more AAPI reported recent drug use and fewer injected drugs, AAPI had less severe medical and alcohol problems, and AAPI reported worse general health but less desire for medical and alcohol services. After controlling for baseline problem severity there were no differences in treatment retention, completion, or outcomes. Contrary to the model minority stereotype, AAPI have mostly similar treatment needs, experiences, and outcomes as other racial/ethnic groups in drug treatment.

Introduction

Minority groups experience more persistent and severe drug addiction as well as greater harmful consequences, such as an increased rate of infectious diseases related to intravenous drug use (e.g., HIV) and a higher prevalence of morbidity and mortality (Cooper, S. Friedman, Tempalski, R. Friedman, & Keem 2005; Demetriades et al., 2004; Friedman et al., 1987; Galea et al., 2003; Harlow, 1990; Kochanek, Murphy, Anderson, & Scott, 2004; Heron et al., 2009; National Center for Health Statistics (US), 2004; National Center for Health Statistics (US), 2009; Prendergast, Hser, & Gil-Rivas, 1998; Substance Abuse and Mental Health Services Administration, 2003; Tardiff, Gross, Wu, Stajic, & Millman, 1989). These research findings are based primarily on African Americans and Hispanics, and relatively little is known about the substance use behaviors and treatment needs of other minority groups.

AAPI and substance use—model minority no more

Substance abuse within Asian American and Pacific Islander (AAPI) populations has largely been ignored. It is estimated that more than 15 million AAPI live in the United States comprising approximately 5% of the total population (US Census Bureau, 2010), and the AAPI population is expected to double by 2050 (US Census Bureau Population Division, 2009). AAPI are concentrated in particular geographic areas, especially the western region

of the United States (i.e., California and Hawaii) (US Census Bureau Population Division, 2010a). However, large groups of AAPI live in other areas as well (e.g., New York, Texas) and in some states (e.g., Vermont) Asians are the largest minority group (US Census Bureau Population Division, 2010b).

The popular “model minority” theory portrays AAPI populations as exemplary racial/ethnic groups with minor substance abuse problems (Uba, 1994). Developed in opposition to the 1960s civil rights movement as an example of equal opportunities for people of diverse backgrounds (Tran & Birman, 2010), the AAPI model minority stereotype persists. AAPI do consistently report better physical and mental health than other minorities (Leong & Lau, 2001; National Center for Health Statistics (US), 2010). Mortality rates are substantially lower among AAPI both overall (Liao, McGee, & Cooper, 1999) and in relation to drug and alcohol use (Heron et al., 2009). Yet growing empirical evidence warns that AAPI, in contrast to their stereotype as a model minority with few health problems, experience health disparities relative to the rest of the US population in the incidence and treatment of particular diseases and conditions (Ghosh, 2010; Trinh-Shevrin, Islam, & Rey, 2009).

Research is mixed on the prevalence of substance use disorders among AAPI. Some studies report that among major racial groups, substance use is lowest for AAPI (Price, Risk, Wong, & Klinge, 2002), while others indicate that use among AAPI is lower compared to some but not all other racial/ethnic groups. For example, one study reported substance use prevalence rates that were lower among AAPI than among Blacks and Hispanics, but similar to those of Whites (Lim, Kaspro, & Rosenheck, 2006). Among a sample of undergraduate college students, Asian and African American students were less likely than Hispanic and White students to report drug use and abuse (McCabe et al., 2007). As another example, AAPI youth in one study were more likely than their White peers to have had conduct disorder, which was strongly associated with adult antisocial behavior, affective disorders, and substance use (Sakai, Risk, Tanaka & Price, 2008).

Increasing evidence indicates that differential substance use rates correspond to acculturation pressures and socioeconomic indices (O’Hare & Van Tran, 1998; Price et al., 2002). Substance use behaviors and mental disorders among AAPI are impacted by stressors associated with immigration-related factors, such as acculturation and nativity and development of Asian American identities (Moloney, Hunt, & Evans, 2008; Takeuchi et al., 2007; Uppaluri, Schumm, & Lauderdale, 2001). For example, one study found that U.S.-born urban-dwelling Asian Americans are about three times likelier to have past month substance use compared to those who are foreign-born (Wong et al., 2007), and among a sample of second-generation Southeast Asian youth marijuana use was determined to be pervasive and highly normative (Lee & Kirkpatrick, 2005). Similar to other racial/ethnic groups, substance use or other chronic conditions among AAPI may be increased by factors such as sexual minority status (Hahm, Wong, Huang, Ozonoff, & Lee, 2008), homelessness (Lim et al., 2006), and daily discrimination (Gee, Spencer, Chen, & Takeuchi, 2007). Notably, strong family cohesion has been identified as a salient protective health factor among AAPI (Herrick & Brown, 1998), and its effect appears to remain despite immigration factors or socioeconomic status (Ta, Holck, & Gee, 2010).

Health care access and utilization

There have been concerns that barriers exist with respect to AAPI utilization of and access to health and health-related care (Fong & Tsuang, 2007; Ja & Aoki, 1993). It has been suggested that while foreign-birth and AAPI ethnicity is generally associated with better health status, these attributes are negatively associated with health care access and utilization. Research on HIV prevention and treatment needs indicates AAPI may be a “forgotten population” (Sabato & Silverio, 2010). Such findings indicate the need for

outreach to AAPI immigrant populations to educate them on accessing the health care system (Yu, Huang, & Singh, 2004).

Not only do different racial/ethnic groups come into treatment with distinct needs for specialized services, but in addition racial/ethnic minorities are underserved in the substance abuse service system (Marsh, Cao, Guerrero, & Shin, 2009). AAPI are particularly underrepresented in the drug treatment system relative to their share of the population with drug problems (Wong & Barnett, 2010). Other studies have reported that AAPI are less likely to receive mental health or substance abuse services (Sorkin, Tan, Hays, Mangione, & Ngo-Metzger, 2008; Ta, Juon, Gielen, Steinwachs, & Duggan, 2008) and are more likely to be discharged from care against medical advice (Chen, 2005). Further research is needed to understand the characteristics and needs of AAPI receiving substance abuse treatment, in order to expose factors that may lead to such disparities in service utilization and help treatment providers make more informed decisions in their work with AAPI individuals.

Research challenges and gaps

AAPI are particularly difficult to study. National outcome studies make sparse reference to utilization or benefits of substance abuse treatment among AAPI (Marsh et al., 2009; Perron et al., 2009; Wells, Klap, Koike, & Sherbourne, 2001). Local studies that examine data from individual programs often have small AAPI samples, focus primarily on alcohol or tobacco treatment, or lack a non-AAPI comparison group. In addition, the AAPI term encompasses many diverse ethnic sub-populations. Considerable variation among AAPI ethnicities has been documented in substance use rates (Wong, Klinger, & Price, 2004; Wong et al., 2007) and other health problems and health needs (Klatsky & Tekawa, 2005). Accordingly, great ethnic diversity among AAPI communities presents unique challenges for gathering the information necessary to carry out informed policy decisions and service planning for this population (Ghosh, 2010).

Very few studies have examined how AAPI entering treatment for drug use disorders fare over time or whether they do as well as other groups. One notable study by Niv and colleagues examined AAPI entering substance abuse treatment in California and found that AAPI presented to treatment with lower alcohol and drug severity than other groups, but with similar problem severity in other domains (Niv, Wong, & Hser, 2007). There were some differences in services received, but 9 month treatment outcomes were similar among groups with one exception: AAPI demonstrated better alcohol outcomes (Niv et al., 2007). Nevertheless, limited information is available on the disparities that may affect health and quality of life among substance using AAPI entering drug treatment.

Current study

To examine the patterns and consequences of drug use in a large sample of AAPI, secondary analysis was conducted with data collected on AAPI patients entering treatment for substance use disorders (further detail is provided in the Methods section). Several research questions were explored: contrasting AAPI with non-AAPI, is there racial/ethnic variation in (1) patient characteristics, problem severity, and treatment needs at treatment intake, (2) type of treatment services received, (3) treatment retention and completion rates, and (4) 12-month treatment outcomes?

This study represents a unique opportunity to provide an in-depth examination of drug use in a large sample of AAPI, in order to determine if AAPI have better or worse outcomes than others in drug treatment. Findings will be useful in identifying best practices for treating AAPI, thus providing an empirical basis for improving treatment strategies in predominately AAPI communities.

Method

Data sources

The study capitalized on comprehensive data collected by two federally-funded studies of patients admitted to community-based drug treatment in three states (California, Hawaii and Montana) that utilized the same standardized measures at three observation points over a one-year period from treatment intake. For each study, the relevant Institutional Review Boards reviewed and approved the procedures, participants provided informed consent, and participants received payment for completing each interview. More detailed information on the MTP and TSI studies is available elsewhere (Rawson et al., 2004; Hser et al., 2003).

The Methamphetamine Treatment Project (MTP) was a multi-site randomized clinical trial designed to compare the Matrix Model of treatment with usual treatment for methamphetamine-dependent individuals at eight treatment sites in California, Hawaii, and Montana. Data were collected at treatment entry from 1999 to 2001 on 978 patients who were subsequently assessed at treatment discharge and at 6-month and 12-month follow-up interviews. MTP included 171 AAPI individuals.

Treatment System Impact and Outcomes of Proposition 36 (TSI) was a multi-site prospective treatment outcome study designed both to assess the impact of Proposition 36 (a mechanism for referring non-violent drug offenders to treatment instead of jail or prison) on California's drug treatment delivery system and to evaluate the effectiveness of services delivered. Data were collected at assessment for treatment from 2003 to 2006 by 36 sites in 7 counties, and follow-up interviews occurred at 3 and 12-months post-assessment for treatment. Of 1,588 patients targeted for follow-up, 86% completed the 3-month follow-up and 80% completed the 12-month follow-up. TSI included 127 AAPI individuals.

Sample

At treatment entry, individuals self-identified ethnicity and race by answering these two Addiction Severity Index questions: "Of what ethnic group do you consider yourself: Hispanic or Latino or not Hispanic or Latino?" and "Of what race do you consider yourself (choose one or more): Asian, Native Hawaiian or other Pacific Islander, White, Black or African American, Hispanic or Latino (Mexican, Puerto Rican, Cuban, Other), American Indian or Alaska Native, or Other?" For this analysis, the AAPI category included individuals who self-identified as Asian (not Hispanic or Latino) or as Native Hawaiian or other Pacific Islander (not Hispanic or Latino), whereas the non-AAPI category included all other race/ethnicities, i.e., White (not Hispanic or Latino), Black or African American (not Hispanic or Latino), Hispanic or Latino, American Indian or Alaska Native (not Hispanic or Latino), and Other (not Hispanic or Latino).

Combining data from these two studies resulted in an AAPI sample size of 298 and a matched comparison group of 298 non-AAPI. The matched non-AAPI comparison group was selected from the remaining TSI and MTP patients using gender, age [± 3], type of primary drug problem and treatment program as criteria. A case-by-case matching procedure was used.

Of the total sample ($n=596$), 57.4% was drawn from the TSI study and 42.6% from the MTP study. At treatment entry, the mean age of the total sample was 32.8 (8.1) years, 51.7% were male, mean years of education was 12.0 (1.8), approximately 54.7% were employed full or part-time, and 75.4% reported methamphetamine as their primary drug problem.

Instruments and measures

The two studies assessed individuals using comparable standardized measures at initial assessment and follow-up.

Treatment needs, severity of problems, general health status—Widely used in the addictions field, (McLellan, Cacciola, Alterman, Rikoon, & Carise, 2006) the Addiction Severity Index (ASI) is a semi-structured interview instrument that captures demographic information and assesses problem severity in seven areas: alcohol and drug use, employment, family and social relationships, legal, psychological, and medical status (McLellan, Luborsky, Woody, & O'Brien, 1980; McLellan et al., 1992b). A composite score can be computed for each domain to indicate severity in that area; scores range from 0 to 1 with higher scores indicating greater problem severity. Also, patient-reported need for treatment is captured for each ASI domain via responses to two questions (“How troubled/bothered have you been by these problems?” and “How important is counseling for these problems?”) using a 5-point Likert scale where 0 = (*not at all*) and 4 = (*extremely*). The ASI was administered at initial assessment and 12-month follow-up.

Initial assessment also included the Short-Form Health Survey (SF-36 was used by MTP; SF-12 by TSI), a commonly used measure of self-reported physical health and functioning. (McLellan, Alterman, Cacciola, Metzger, & O'Brien, 1992a) As an indicator of current general health status, patients' response to the question “In general, would you say your health is: poor, fair, very good, excellent?” was captured using a 0-4 Likert scale, with a rating of 4 representing excellent health.

Services received—The Treatment Services Review (TSR) captures self-reported services received in each of the seven domains of the ASI (e.g., alcohol and drug use, employment, family etc.), including the number of professional services and discussion sessions received. The TSR was collected weekly by MTP and administered at the 3-month follow-up by TSI. The TSR documents the number of services received by the patient in the past week (for MTP) and 3 months (for TSI). Test-retest studies on the TSR indicated satisfactory reliability, and tests of concurrent validity showed the ability to discriminate different levels of treatment services as well as good correspondence with independent measures of treatment provided (McLellan et al., 1992a).

Treatment modality, retention, and status at discharge—Information collected at discharge from treatment was analyzed to determine modality of care at treatment entry (outpatient, residential, methadone maintenance), length of stay in treatment, and completion status at treatment discharge.

Treatment outcomes—The ASI was re-administered at the 12-month follow-up interview. ASI problem severity scores were examined. Also examined were the following individual items on prior 30-day multi-dimensional behavior, which research has indicated to be of particular relevance to treatment outcomes among AAPI and other groups: serious family conflict, drug use, incarceration, employment, and homelessness.

Statistical analyses

Differences between AAPI and non-AAPI groups in patient characteristics, substance abuse and treatment history, criminal involvement, family/social relationships, medical and mental health status, patient-reported treatment needs at intake, and treatment program variables and outcomes at 12-month follow-up were compared at $p < 0.05$ by using Pearson chi-square test (or the Fisher' exact test for small cell sizes) for categorical measures and ANOVA for continuous measures. In addition, group differences on ASI composite scores

at 12-month follow-up were compared controlling for project (MTP and TSI), the corresponding ASI composite score at intake, and their interaction with groups (AAPI, non-AAPI).

Results

Patient characteristics and severity of problems at initial assessment for treatment

AAPI were distinguishable from non-AAPI on only a few characteristics at initial assessment (see Table 1). Compared to non-AAPI, fewer AAPI were homeless (2.9% vs. 9.5%) and more depended on others for their living situation (70.2% vs. 61.1%). Severity of problems as indicated by ASI composite scores was lower among AAPI in domains related to alcohol (0.06 vs. 0.10) and medical health (0.15 vs. 0.21). As for differences in drug use history, more AAPI than non-AAPI had used drugs in the 30 days prior to treatment entry (85.5% vs. 79.4%, borderline significance at $p=0.06$), more reported smoking (82.3% vs. 66.4%) and fewer reported injection (4.0% vs. 13.2%) drug use behaviors. AAPI also reported fewer drug-related arrests over the lifetime (1.3 vs. 2.0). Fewer AAPI reported having experienced hallucinations (2.1% vs. 5.5%) in the 30 days prior to treatment entry, and AAPI self-reported poorer general health (2.07 vs. 2.28 on a 0-4 scale).

AAPI and non-AAPI were similar on all other baseline characteristics that were examined. For both groups, about 16% were married, mean years of education was 12.0, about half were employed full- or part-time, one-third reported serious conflict with family, and severity of problems were similar in the remaining domains measured by the ASI (i.e., drug, employment, family, legal, and psychiatric). Aside from the individual indicators noted previously, AAPI and non-AAPI had comparable criminal justice system histories, substance use and treatment experiences, family and social relationships, and mental health functioning.

Patient-reported treatment needs

As shown in Table 2, self-reported treatment needs were equivalent among AAPI and non-AAPI for five of the seven domains that were examined: problems related to drug use, employment, family/social relationships, legal status, and psychiatric health. As for differences in treatment needs, AAPI were less troubled or bothered than non-AAPI by alcohol (0.19 vs. 0.40) and medical (0.70 vs. 1.00) problems and AAPI reported a lower need for treatment to address problems in both of these domains (0.23 vs. 0.63 and 0.70 vs. 1.01, respectively).

Treatment received and status at treatment discharge

There were no differences between AAPI and non-AAPI in the type and length of treatment received or in treatment discharge status (see Table 3). Most patients in both groups were treated in an outpatient setting, and few received residential or methadone maintenance care. Most services received were for drug or alcohol problems, followed by legal, medical, employment, family, and psychiatric services. Almost 40% of both groups remained in treatment for 90 or more days and average treatment retention was about 80 days. Approximately one-quarter of both AAPI and non-AAPI completed treatment.

Treatment outcomes

AAPI and non-AAPI had similar outcomes at one year after treatment entry (Table 4). ASI problem severity was lower among AAPI compared to non-AAPI in alcohol (0.04 vs. 0.07), family (0.10 vs. 0.14), and medical (0.11 vs. 0.17) domains, but problem severity was comparable across groups in the drug, employment, legal, and psychiatric domains. However, after baseline severity of these problems was controlled for, group differences

were no longer statistically significant. As for other outcomes, fewer AAPI reported serious family conflict (15.9% vs. 25.3%) but similar percentages reported drug use (~40%), incarceration (~12%), employment (~50%), and homelessness (3-5%).

4. Discussion

Summary

At treatment entry, approximately two-thirds of both AAPI and non-AAPI groups reported methamphetamine as the primary drug problem, most had experienced only one prior drug treatment despite an average of 12 years of use, half reported psychiatric problems, and one-third had been incarcerated recently. More AAPI than non-AAPI had used drugs in the 30 days prior to treatment entry (borderline significance), and fewer AAPI reported injection as the primary method for using drugs. AAPI entered treatment with less severe alcohol and medical problems than non-AAPI, but with similarly severe problems in other domains. Compared to non-AAPI, AAPI reported poorer general health but less desire for services to address alcohol and medical problems. There were no differences between groups in type of treatment received, treatment retention, or treatment completion. Treatment outcomes were similar between the two groups in the drug, employment, legal, and psychiatric domains. AAPI demonstrated better outcomes in the alcohol, family, and medical domains, however after baseline severity of these problems was controlled for, group differences were no longer statistically significant.

Implications

Findings have important implications for health services and disparities research regarding racial/ethnic differences in drug use disorders, service utilization, and treatment outcomes among AAPI groups. Congruent with findings reported by Niv and colleagues (Niv et al., 2007), AAPI in the current study presented to substance abuse treatment with a level of problems largely similar to other racial/ethnic groups; treatment received by AAPI appeared to be commensurate with care received by non-AAPI groups, and most outcomes were equivalent between groups. Both studies did report that compared to non-AAPI, AAPI demonstrated lower alcohol problem severity at treatment intake and AAPI had better alcohol outcomes. However, taken together the findings from these two studies indicate that among patients entering drug use treatment, the treatment needs, services received, and outcomes among AAPI and non-AAPI are more alike than different.

Methamphetamine is a significant problem among AAPI treatment-seeking populations (Crevecœur, Rutkowski, & Rawson, 2007; Gonzales, Ang, McCann, & Rawson, 2008; Kim & Jackson, 2008). Congruent with extant research, two-thirds of AAPI in the study sample reported methamphetamine as the primary drug problem. In addition, about half reported psychiatric illness but very few reported receiving services for psychiatric problems. Methamphetamine use has been associated with neuropsychological dysfunction (Kalechstein, Newton, & Green, 2003; Simon et al., 2000) and elevated rates of psychiatric diagnoses (Glasner-Edwards et al., 2010). Cognitive improvements are evident with methamphetamine abstinence (Iudicello et al., 2010) but greater lengths of abstinence may be needed for cognitive gains to occur (Salo et al., 2009; Simon, Dean, Cordova, Monterosso, & London, 2010). Additionally, methamphetamine use is strongly associated with risk behaviors for infectious disease among treatment populations (Rawson et al., 2008), including among AAPI (Nemoto, Operario, & Soma, 2002; Pinhey & Wells, 2007). These findings emphasize that treatment outcomes among AAPI methamphetamine users may be improved by psychiatric assessment and treatment in substance abuse treatment settings, in addition to use of health risk reduction strategies, pharmacologic interventions

(Ling, Rawson, Shoptaw, & Ling, 2006), and other evidence-based treatment practices for methamphetamine use (Rawson, 1999).

Finally, an apparent paradox was revealed among AAPI in their perceived health needs versus desire for care, which may be related to family factors. AAPI reported poorer general health than non-AAPI but less desire for services to address alcohol and medical problems. Some research on self-reported health status suggests that AAPI indicate lower quality health than other groups, despite having similar or fewer health problems (Leung, Luo, So, & Quan, 2007; Sorkin et al., 2008). Alternatively, keeping in mind that family cohesion negatively affects the likelihood of Asian Americans to seek mental health services, (Ta et al., 2010; Snowden, 2007) it may be that compared to other groups AAPI have higher levels of social support which affect whether one seeks services, or AAPI wish to avoid perceived social stigmas associated with treatment for ill health or alcohol problems (Smith, Dawson, Goldstein, & Grant, 2010). Notably, significantly fewer AAPI than non-AAPI in our sample reported serious family conflict at follow-up despite similar levels of conflict at treatment entry. Taken together, such findings suggest that among AAPI family dynamics may function as a risk factor (i.e., AAPI may be less likely to seek care) or as a protective factor (i.e., AAPI may experience external pressure to initiate or sustain behavioral changes) for health outcomes.

Family conflict and cohesion among AAPI appear to impact health seeking behaviors and treatment outcomes in diverse ways, and more research is needed to better understand their impact. Current research suggests that family may be an important mediating factor between Asian ethnicity, levels of substance use, and outcomes (Shih, Miles, Tucker, Zhou, & D'Amico, 2010; Ja & Aoki, 1993), and it has been recommended that alcohol and drug prevention media should emphasize cultural and family strengths in order to be most effective in AAPI populations (Kuramoto & Nakashima, 2000). Community drug treatment providers should consider increased family involvement in the treatment process as a possible means to improve outcomes among AAPI individuals. However, taking into account that AAPI enter treatment with a level of family problems equivalent to other racial/ethnic groups and that family factors may deter AAPI from seeking or sustaining treatment, providers should be careful to evaluate the potential role of family in the treatment plan on a case by case basis.

Limitations

The present study has several limitations. The participating treatment programs were not randomly selected and findings may not be generalizable to other types of programs or to individuals with substance use problems who are not in treatment. Data were self-reported and subject to reliability and validity issues. Treatment program information was incomplete, limiting the ability to analyze culturally-specific treatment components that may have been provided. Also not examined were factors found to be associated with differential AAPI health such as family cohesion and generational status (Ta et al., 2010), cultural competence of services received (Yu, Clark, Chandra, Dias, & Lai, 2009), ethnic identity (Ghosh, 2010), and migration-related factors such as foreign-born status, age at migration, or time since migration. Also, questionnaires may elicit differential item functioning by race such that certain items may be interpreted differently by AAPI vs. non-AAPI, or by culture, even given the same level of the underlying construct. These issues remain important areas for future research on drug use disorders and treatment-seeking behaviors. In addition, our samples included individuals receiving court-supervised treatment, which may have influenced treatment experiences and outcomes, and the sample mostly consisted of methamphetamine users. Furthermore, AAPI populations are heterogeneous and generalization of these findings to all AAPI is not warranted.

These limitations are balanced by several strengths. The study focused on a historically understudied group and utilized a geographically diverse sample across three states in which more than a third of the United States AAPI population resides (US Census Bureau Population Division, 2010a). Analyses were conducted using standardized measures and a longitudinal design. In addition, findings have important implications for community-based substance use treatment providers.

Conclusion

AAPI health problems and treatment outcomes remain relatively unexplored (Ghosh, 2003; Ghosh, 2010). Contrasting AAPI and non-AAPI populations provides a focusing framework for understanding racial/ethnic-related differences in patterns of drug use disorders and associated health, behavioral, and social consequences. Findings suggest that contrary to the model minority stereotype, and despite cultural protective factors, AAPI have similar service needs, treatment experiences, and outcomes as other racial/ethnic groups in drug treatment. Such information can aid efforts to develop and implement more appropriate treatment services and health promotion and intervention programs.

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Table 1

Patient characteristics at initial treatment assessment

	AAPI (N=298)	Non-AAPI (N=298)	Degrees of freedom	p-value
Race/Ethnicity, % ^b			$\chi^2(4)$	<0.0001
Asian/Pacific Islander	100	0		
White (non-Hispanic)	0	56.7		
Hispanic	0	32.9		
African-American	0	9.1		
Other	0	1.3		
Women, %	48.3	48.3	*	1.0000
Age, Mean (SD)	32.9 (8.0)	32.8 (8.1)	$F(1, 594)$	0.8672
Education, Mean (SD)	12.0 (1.7)	12.0 (1.7)	$F(1, 588)$	0.6230
Employed (full- or part-time), %	51.4	58.0	*	0.1161
Married, %	16.8	16.0	*	0.8242
Living Situation, % ^b			$\chi^2(2)$	0.0033
Homeless	2.9	9.5		
Dependent	70.2	61.1		
Independent	26.8	29.5		
Problem Severity (ASI Composite Score)	Mean (SD)	Mean (SD)		
Alcohol ^b	0.06 (0.11)	0.10 (0.17)	$F(1, 581)$	0.0005
Drug	0.15 (0.10)	0.17 (0.10)	$F(1, 574)$	0.1657
Employment	0.63 (0.30)	0.63 (0.31)	$F(1, 588)$	0.8845
Family	0.20 (0.23)	0.20 (0.23)	$F(1, 581)$	0.8224
Legal	0.22 (0.20)	0.25 (0.21)	$F(1, 584)$	0.0586
Medical ^a	0.15 (0.27)	0.21 (0.29)	$F(1, 587)$	0.0129
Psychiatric	0.17 (0.20)	0.19 (0.21)	$F(1, 576)$	0.2603
Substance Abuse and Treatment History				
Age at first drug use, Mean (SD)	19.6 (7.5)	20.1 (7.1)	$F(1, 195)$	0.6130
Primary drug problem type, %			$\chi^2(5)$	0.9563
Methamphetamine	76.5	74.2		
Cocaine	5.4	6.4		
Marijuana	4.1	3.4		
Heroin	2.7	3.4		
Alcohol	4.4	5.4		
Used any drug-past 30 days,%	85.5	79.4	*	0.0660
Years primary drug use, Mean (SD)	12.7 (25.9)	11.9 (23.6)	$F(1, 576)$	0.6972
Route of primary drug administration, % ^b			$\chi^2(4)$	0.0006
Oral	4.0	6.4		

	AAPI (N=298)	Non-AAPI (N=298)	Degrees of freedom	p-value
Smoke	82.3	66.4		
Inhale	9.3	13.2		
Inject	4.0	13.2		
No. prior drug treatments, Mean (SD)	1.1 (2.0)	1.2 (2.2)	<i>F</i> (1, 583)	0.6391
No. prior alcohol treatments, Mean (SD)	0.2 (0.6)	0.3 (0.8)	<i>F</i> (1, 584)	0.0945
Criminal Justice System Interactions				
On probation or parole, %	62.1	65.4	*	0.4402
Incarcerated-past 30 days, %	27.9	31.4	*	0.3681
No. prior arrests-lifetime, Mean (SD)	4.6 (6.8)	5.2 (7.3)	<i>F</i> (1, 587)	0.2714
Property	1.1 (3.7)	0.7 (1.7)	<i>F</i> (1, 583)	0.1138
Violent	0.3 (1.1)	0.3 (0.8)	<i>F</i> (1, 581)	0.9568
Drug ^b	1.3 (1.9)	2.0 (3.2)	<i>F</i> (1, 586)	0.0023
Other	1.9 (3.8)	2.2 (5.0)	<i>F</i> (1, 585)	0.3201
No. months incarcerated-lifetime, Mean (SD)	11.5 (23.0)	12.3 (21.9)	<i>F</i> (1, 588)	0.6669
Family/Social Relationships				
Has children under 18 years old, %	42.5	41.3	*	0.7923
Serious conflict with family-past 30 days, %	32.0	30.6	*	0.7897
Serious conflict with others-past 30 days, %	25.8	26.5	*	0.8516
Lives with alcohol user, %	9.3	13.0	*	0.1880
Lives with drug user, %	16.0	15.3	*	0.8210
Ever physically abused, %	42.0	38.1	*	0.3553
Ever sexually abused, %	19.0	17.3	*	0.6692
Medical and Mental Health Status				
General health score, Mean (SD) ^a	2.07 (1.0)	2.28 (1.1)	<i>F</i> (1, 503)	0.0210
Has chronic medical problems, %	25.2	31.3	*	0.1192
Pregnant, %	2.2	5.1	*	0.3347
In the past 30 days, %				
Had psychiatric problems	46.9	49.3	*	0.5640
Had serious depression	26.6	26.6	*	1.0000
Had serious anxiety	26.2	28.2	*	0.6421
Trouble understanding	25.2	27.0	*	0.6382
Trouble controlling violent behavior	15.9	12.6	*	0.2867
Took psychiatric medication	6.6	10.9	*	0.0783
Had hallucinations ^a	2.1	5.5	*	0.0482
Had thoughts of suicide	5.2	4.8	*	0.8510
Received pension for psychiatric disability	2.4	3.8	*	0.4739
Attempted suicide	1.4	1.0	*	0.4495

^a p<0.05,

^b
p<0.01

*
Fisher's exact test was used.

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Table 2

Patient-reported treatment needs at initial treatment assessment

	How troubled/bothered have you been by these problems? (0-4 scale; "Not at all" to "Extremely")				How important is counseling for these problems? (0-4 scale; "Not at all" to "Extremely")			
	AAPI (N=298) Mean (SD)	Non- AAPI (N=298) Mean (SD)	Degrees of freedom	p- value	AAPI (N=298) Mean (SD)	Non- AAPI (N=298) Mean (SD)	Degrees of freedom	p- value
Alcohol	0.19 (0.64) ^a	0.40 (0.97) ^a	F(1, 587)	0.0030	0.23 (0.80) ^a	0.63 (1.34) ^a	F(1, 587)	<.0001
Drug	2.05 (1.57)	2.13 (1.59)	F(1, 587)	0.5341	2.82 (1.60)	2.90 (1.55)	F(1, 587)	0.5116
Employment	1.18 (1.51)	1.31 (1.63)	F(1, 580)	0.3182	1.04 (1.52)	1.15 (1.58)	F(1, 580)	0.4092
Family	2.06 (2.51)	1.95 (2.36)	F(1, 587)	0.6005	1.83 (2.47)	1.86 (2.43)	F(1, 586)	0.9025
Legal	1.74 (1.63)	1.98 (1.62)	F(1, 584)	0.0669	1.33 (1.60)	1.54 (1.71)	F(1, 581)	0.1245
Medical	0.70 (1.21) ^a	1.00 (1.39) ^a	F(1, 587)	0.0053	0.70 (1.34) ^a	1.01 (1.57) ^a	F(1, 588)	0.0090
Psychiatric	1.24 (1.54)	1.42 (1.57)	F(1, 583)	0.1553	1.24 (1.65)	1.37 (1.70)	F(1, 584)	0.3598

^ap<0.01

Table 3

Treatment modality, services received, retention, and completion

	AAPI (N=298)	Non-AAPI (N=298)	Degrees of freedom	p-value
Modality, %			$\chi^2(2)$	0.5739
Outpatient	92.9	90.5		
Residential	6.0	8.1		
Methadone maintenance	1.1	1.4		
Received treatment services, %				
Any	89.7	93.6	*	0.2443
Drug	87.4	89.0	*	0.7399
Alcohol	54.0	62.8	*	0.1031
Legal	36.2	45.4	*	0.1007
Employment	35.6	35.5	*	1.0000
Medical	33.3	37.8	*	0.4320
Family	25.9	25.6	*	1.0000
Psychiatric	12.1	15.7	*	0.3538
Retention 90 days, %	38.6	36.5	*	0.7012
Retention in days, Mean (SD)	79.3 (71.9)	82.4 (82.9)	$F(1, 461)$	0.6635
Completed treatment, %	27.3	27.4	*	1.0000

For all comparisons there were no statistically significant differences.

* Fisher's exact test was used.

Table 4

Patient status at 12-month follow-up

	AAPI	Non-AAPI		
Problem Severity (ASI Composite Score), Mean (SD)			Degrees of freedom	p-value
Alcohol ^{a, b}	0.04 (0.08)	0.07 (0.14)	<i>F</i> (1, 328)	0.0204
Drug	0.06 (0.09)	0.06 (0.98)	<i>F</i> (1, 327)	0.4977
Employment	0.54 (0.33)	0.50 (0.32)	<i>F</i> (1, 328)	0.2965
Family ^{a, b}	0.10 (0.16)	0.14 (0.20)	<i>F</i> (1, 328)	0.0496
Legal	0.10 (0.15)	0.10 (0.17)	<i>F</i> (1, 327)	0.9193
Medical ^{a, b}	0.11 (0.22)	0.17 (0.28)	<i>F</i> (1, 328)	0.0288
Psychiatric	0.13 (0.19)	0.16 (0.20)	<i>F</i> (1, 327)	0.2016
In past 30 days, %				
Used any drug	40.9	41.0	*	1.0000
Incarcerated	12.9	11.5	*	0.7376
Employed (full-time or part-time)	48.8	55.8	*	0.2254
Homeless	4.9	3.0	*	0.4137
Serious conflicts with family ^a	15.9	25.3	*	0.0410

^a p<0.05^b Differences were no longer statistically significant after controlling for ASI problem severity scores from initial assessment.

* Fisher's exact test was used.