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Comorbidities and Race/Ethnicity Among Adults with Stimulant Use Disorders in Residential Treatment

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Abstract

Comorbid physical and mental health problems are associated with poorer substance abuse treatment outcomes; however, little is known about these conditions among stimulant abusers at treatment entry. This study compared racial and ethnic groups on baseline measures of drug use patterns, comorbid physical and mental health disorders, quality of life, and daily functioning among cocaine and stimulant abusing/dependent patients. Baseline data from a multi-site randomized clinical trial of vigorous exercise as a treatment strategy for a diverse population of stimulant abusers (N = 290) were analyzed. Significant differences between groups were found on drug use characteristics, stimulant use disorders, and comorbid mental and physical health conditions. Findings highlight the importance of integrating health and mental health services into substance abuse treatment and could help identify potential areas for intervention to improve treatment outcomes for racial and ethnic minority groups.

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Keywords

stimulant abuse/dependence; comorbidities; racial and ethnic minorities; integration of physical and mental health

INTRODUCTION

U.S. population surveys and treatment studies indicate there are racial and ethnic differences in the prevalence of substance use and participation in substance abuse treatment (Substance Abuse and Mental Health Services Administration, 2008, 2010). The National Institute on Drug Abuse (NIDA) reports that racial and ethnic minorities comprise 40% of admissions to publicly funded substance abuse treatment programs (National Institue on Drug Abuse, 2011). Recent research suggests these populations may be at particular risk for poor treatment outcomes, largely due to socioeconomic factors (Saloner & Le Cook, 2013). Despite well-described difficulties in fulfilling the National Institutes of Health's required inclusion of racial and ethnic minorities in the design and conduct of clinical trials (Arean, Alvidrez, Nery, Estes, & Linkins, 2003; Yancey, Ortega, & Kumanyika, 2006), the NIDA Clinical Trials Network (CTN) has continually demonstrated success in the recruitment and retention of these populations (Burlew et al., 2011; Carroll et al., 2007). As such, the CTN offers a unique opportunity to better characterize racial and ethnic minorities in treatment and detect differences in the needs of underserved populations. In particular, this study examined racial and ethnic differences in the physical and mental health conditions often comorbid with stimulant abuse/dependence.

Previous evidence from the CTN shows marked heterogeneity in diagnosed stimulant users, with differences in use patterns and subtypes among racial and ethnic minorities (Wu et al., 2009). In one multisite study of treatment-seeking adults, most stimulant users were Black and used cocaine only, whereas primary amphetamine users were more likely to be White or Hispanic. In fact, there were no Black participants among amphetamine users in the study. In addition, amphetamine users were more likely than cocaine users to be court-ordered to treatment and to be on probation or parole (Wu et al., 2009).

Comorbid Physical Health Conditions

Among patients seeking treatment for substance abuse, the comorbid medical illness burden is far greater than for the general population, possibly due to lack of access to primary care (De Alba, Samet, & Saitz, 2004). In addition, there is significant evidence that racial and ethnic minority populations are generally less likely to receive a variety of medical services. These disparities hold even when controlling for insurance status, income, age, and education level (Institute of Medicine, 2003) and are amplified in the presence of substance abuse and comorbid psychiatric disorders (De Alba et al., 2004; Druss & von Esenwein, 2006). Anywhere from 45% to 70% of people with drug addictions report having at least one chronic medical illness (Chang et al., 2010) and many people have poly-substance dependence resulting in combined risks for multiple medical illnesses (Wadland & Ferenchick, 2004). Comorbid mental health disorders and physical health problems negatively affect treatment outcomes via early dropout and relapse (Compton, Cottler,

Jacobs, Ben-Abdallah, & Spitznagel, 2003; Druss & von Esenwein, 2006; Kessler et al., 2003).

Comorbid Mental Health Conditions

The presence of mental health disorders in the context of substance dependence is associated with greater illness severity and substantial disability (Compton et al., 2003; Compton, Thomas, Stinson, & Grant, 2007; L. Davis et al., 2012; Nunes & Levin, 2004). Individuals with substance use disorders endorse greater depression symptom severity, length of illness, likelihood of anxious features, and worse remission/response outcomes with treatment (Compton et al., 2007; K. Davis, Schoenbaum, & Audet, 2005). Major depression predicts a greater number of substances used, and alcohol dependence and generalized anxiety disorder both predict higher rates of drug dependence diagnoses (Compton et al., 2003). The physical, mental, and legal consequences of drug use are far greater for racial and ethnic minorities, and the presence of multiple disorders at baseline predicts worse substance abuse treatment outcomes (Burlew, Feaster, Brecht, & Hubbard, 2009).

The Current Study

The current study compared racial and ethnic groups on baseline measures of drug use patterns, comorbid physical and mental health disorders, quality of life, and daily functioning among participants in the Stimulant Reduction Intervention using Dosed Exercise (CTN-0037) trial, a multisite randomized clinical trial implemented through the NIDA's National Drug Abuse Treatment CTN. The trial aimed to test a novel approach to the treatment of stimulant abuse via the addition of vigorous exercise compared to health education as a treatment strategy for stimulant abuse or dependence (Trivedi, Greer, et al., 2011). CTN-0037 hypothesized that exercise has the potential to improve other health domains that might be adversely affected by stimulant use or its treatment, such as sleep disturbance, cognitive function, mood, weight gain, quality of life, and anhedonia.

For the current study, we hypothesized that racial and ethnic groups would use different substances and report different patterns of drug use resulting in different rates of stimulant use disorder diagnosis. We also expected the presence of comorbid mental health diagnoses to be more prevalent and severity of depression to be greater among racial and ethnic minority populations and to correspond with poor physical health functioning and quality of life in this sample of stimulant abusing/dependent patients in residential treatment.

METHODS

Study Sample and Procedures

Participants were recruited from 9 geographically diverse, community-based substance abuse treatment programs across the United States and were enrolled in the multi-site Stimulant Reduction Intervention using Dosed Exercise (CTN-0037) trial within the NIDA National Drug Abuse Treatment CTN. The NIDA CTN framework consists of 13 research nodes across the United States that partner with a variety of community-based treatment programs. The CTN provides a broad infrastructure for rapid, multisite testing of promising science-based therapies and the subsequent delivery of these treatments to patients in

community-based treatment. Details of the study rationale and design have been previously published (Trivedi, Greer, et al., 2011). The study was reviewed and approved by the Institutional Review Board (IRB) at University of Texas Southwestern Medical Center, as well as the IRBs of each of the participating treatment programs. All participants provided written informed consent.

Trial site selection criteria were broad, with the goal of testing the intervention in a wide range of outpatient substance abuse populations, and geographic location was an important consideration in enhancing representation in the trial. Selected sites had a residential component and length of stay generally between 21 and 30 days. Other site characteristics included a requirement of no formal exercise program as a component of treatment and availability of outpatient treatment at or near the residential setting where the study was located so that it was feasible for participants to return to the study site to complete study activities for the full 9 months of the study (Trivedi, Greer, et al., 2011; Warden et al., 2012).

Eligible participants were those reporting illicit stimulant drug use (e.g., cocaine, methamphetamine, or amphetamine) within the 30 days prior to admission to residential treatment and who received medical clearance for exercise through a protocol-defined maximal exercise test (in accordance with American College of Sports Medicine (2010) guidelines), medical history, and physical examination from protocol-approved medical personnel. Participants with general medical conditions that contraindicated exercise and those with psychosis or other psychiatric conditions that posed a safety risk were excluded (Trivedi, Greer, et al., 2011).

This analysis included data collected during the baseline evaluation ($N = 290$) for participants who self-identified as non-Hispanic Black ($n = 128$), non-Hispanic White ($n = 131$), or Hispanic ($n = 31$). Individuals identifying multiple races ($n = 8$) or “other” ($n = 4$) were too few to analyze and were excluded. Recruited individuals were diagnosed with stimulant abuse or dependence (i.e., cocaine, methamphetamine, amphetamine or other stimulant, except caffeine or nicotine) as defined by *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, Text Revision (DSM-IV-TR) (American Psychiatric Association, 2000). Those with opioid dependence were excluded from participation. Eligible participants were randomized to one of two treatment arms: vigorous intensity high dose exercise augmentation or health education intervention augmentation. The CTN-0037 study design has been described in detail elsewhere (Trivedi, Greer, et al., 2011).

Measures

Demographics—Standard demographic information collected included gender, race, ethnicity, and education.

Diagnostic assessments—Stimulant use disorders were assessed using the substance use modules from the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI) (Version 2.1) for DSM-IV-TR stimulant abuse and dependence (Robins et al., 1988; WHO, 1997). Diagnostic categories required for study entry included one or more of the following: cocaine abuse, cocaine dependence, other stimulant abuse, and

other stimulant dependence. Because several participants received more than one diagnosis, the sample was grouped into the following categories to collapse the abuse/dependence differentiation and better reflect the substance(s) used, as follows: cocaine use disorder only, cocaine plus other stimulant use disorder (e.g., methamphetamine), and other stimulant use disorder only.

The Mini International Neuropsychiatric Interview (MINI) (Sheehan et al., 1997) was used to obtain diagnostic information for other DSM-IV-TR Axis I disorders. The total number of current psychiatric disorders was summed for each participant (range, 0–13). Nicotine dependence among smokers was evaluated using the Fagerström Test for Nicotine Dependence, a 6-item questionnaire with a total score range of 0 to 10, with higher scores indicating greater nicotine dependence (Heatherton, Kozlowski, Frecker, & Fagerstrom, 1999; Kozlowski, Porter, Orleans, Pope, & Heatherton, 1994).

Drug use—Drug, alcohol, and nicotine quantity and frequency were assessed for the 30 days prior to residential treatment admission using the Timeline Followback method (Sobell & Sobell, 1992). The Addiction Severity Index-Lite assessed multiple domains commonly affected by substance use, including medical, employment/self-support, alcohol use, drug use, legal status, family/social, and psychiatric status (McLellan, Luborsky, Woody, & O'Brien, 1980).

Mental health and well being—Risk for suicide and related behaviors was evaluated using the Concise Health Risk Tracking–Self-Report, a 14-item participant self-report assessment with item responses ranging from 0 (strongly disagree) to 4 (strongly agree) (Trivedi, Wisniewski, et al., 2011). A propensity score is derived by summing items 1 to 11, resulting in a range of 0 to 44. A risk score is derived by summing items 12 to 14, resulting in a range of 0 to 12.

The Short-Form Health Survey (SF-36) was used to assess quality of life and general health (Ware, 2003). The SF-36 contains eight subscales measuring the following domains: Physical Functioning, Role-Physical, Bodily Pain, General Health, Vitality, Social Functioning, Role-Emotional, and Mental Health. Subscale scores range from 0 to 100, with higher scores indicating better perceived health and functioning. The Mental Health Status component score is a weighted average of all of the subscale scores, with the Vitality, Social Functioning, Role-Emotional, and Mental Health subscales contributing the most.

The Quality of Life Enjoyment and Satisfaction Questionnaire Short Form (Endicott, Nee, Harrison, & Blumenthal, 1993) was used to examine participants' general quality of life. Participants rated their satisfaction with the following domains of activity: physical health, feelings, work, household duties, school/course work, leisure time activities, and social relations. Each item uses a 5-point scale ranging from 1 (very poor) to 5 (very good). The raw total score (possible range from 14 to 70) was transformed into a percentage maximum possible score with a possible range of 0 to 100. Higher scores indicate greater life satisfaction and enjoyment.

Physical health—Participants completed the Self-Administered Comorbidity Questionnaire (Sangha, Stucki, Liang, Fossel, & Katz, 2003), which assesses the presence of medical problems, their severity, and whether the condition limits functioning. Participants received a maximum of 3 points for each medical condition (1 point for its presence, 1 point if they received treatment for the condition, and 1 point if the condition limited activities). There were 15 conditions and the option to add 3 additional conditions. The possible score range was 0 to 54.

The Massachusetts General Hospital Cognitive and Physical Functioning Questionnaire (CPFQ) (Fava et al., 2006) is a 7-item measure of physical well-being and cognitive and executive dysfunction. Each item uses a 6-point scale ranging from 1 (greater than normal) to 6 (totally absent). The total score is the sum of items a to g, with a range of 7 to 42. Higher scores indicate poorer functioning.

The Physical Health Status component score of the SF-36 (Ware, 2003) was used to assess physical health. It is a weighted average of all of the subscale scores for Physical Functioning, Role-Physical, Bodily Pain, General Health, Vitality, Social Functioning, Role-Emotional, and Mental Health, with the Physical Functioning, Role-Physical, Bodily Pain, and General Health subscales contributing the most. Higher scores indicate perceived better health and functioning.

Data Analysis

Bivariate tests for race and ethnic differences at baseline were conducted using chi-square and analysis of variance (ANOVA) for categorical and continuous outcomes, respectively. Significant chi-square tests were followed by Bonferroni-corrected comparisons between each pair of groups. Significant ANOVAs were followed by pair-wise comparisons using the Tukey-Kramer test (results not shown and only significant pair-wise comparisons are reported in the text). However, because this study is intended to characterize the sample using a retrospective analysis of baseline data, no correction was made for the number of outcomes examined.

Effect sizes were measured by omega-squared for continuous outcomes and Cramer's V for categorical outcomes. Omega-squared can be interpreted as an estimate of the percent of population variance explained by group membership. Therefore, benchmarks from Cohen's d can be applied (Cohen, 1988) where small (d = 0.2), medium (d = 0.5), and large (d = 0.8) effects account for 1%, 6%, and 14% of variance explained, respectively. Because Cramer's V can be interpreted as a correlation, we applied Cohen's benchmarks for correlations and regard Cramer's V of 0.1, 0.3, and 0.5 as small, medium, and large, respectively. Multivariate tests were produced by analysis of covariance (ANCOVA) controlling for age, gender, and education.

RESULTS

Demographics and Drug Use

The baseline demographic and drug use characteristics for this treatment seeking sample of stimulant abusers (N = 290) are presented in Table 1, stratified by race and ethnicity. Black

participants were significantly older than Whites or Hispanics ($p < .001$). Hispanic participants were more likely to have less education ($p = .014$). Gender also varied significantly across race and ethnicity ($p < .001$).

Significant differences between groups were found on drug use characteristics. Black and Hispanic participants were more likely to use alcohol (78.1% and 71.0%, respectively) than White participants (55.0%) ($p < .001$). Blacks had higher rates of cocaine use (97.7%) versus Whites (63.4%) or Hispanics (67.7%) ($p < .001$), but lower rates of methamphetamine use (3.1%) than Hispanics (35.5%) and especially Whites (47.3%) ($p < .001$). Whites had higher rates of other stimulant use (5.3%) than Blacks (0%) ($p < .001$). Whites also used other illicit drugs (32.1%) at higher rates than Blacks (4.7%) and Hispanics (9.7%) ($p < .001$).

Stimulant use diagnoses showed similar differences by race and ethnicity. Black participants (91.4%) were more likely than Hispanics (51.6%) to be diagnosed with cocaine abuse or dependence only, whereas Whites (28.5%) were least likely to have a cocaine only use disorder. Whites (53.1%) and Hispanics (38.7%) were more likely than Blacks (5.5%) to be diagnosed with both a cocaine and other stimulant use disorder, whereas Whites (18.5%) were more likely than Hispanics (9.7%) and Blacks (3.1%) to be diagnosed with other stimulant use disorder only. Blacks were significantly more likely to report smoking cocaine (74.8%) than Whites (45.9%) or Hispanics (59.3).

Comorbid Mental Health and Physical Health Conditions

Table 2 describes comorbid conditions across race and ethnic groups, and related mental health, physical health, and well-being. On measures of mental health, Black participants endorsed fewer psychiatric disorders (mean = 0.7, standard deviation [*SD*] = 0.9, $p = .002$) and symptoms of depression (mean = 4.2, *SD* = 2.4, $p < .001$) than Whites or Hispanics and reported a lower risk for suicide (mean = 7.2, *SD* = 6.0, $p = .008$) than Whites. Black participants reported better mental health status (mean = 47.0, *SD* = 11.4) than Hispanics (mean = 40.0, *SD* = 13.4) and Whites (mean = 39.3, *SD* = 14.4, $p < .001$), as well as better quality of life (mean = 72.7, *SD* = 14.5) than Whites (mean = 65.4, *SD* = 17.2).

Regarding physical health comorbidities (Table 2), Black participants reported poorer physical health status (Blacks: mean = 53.5, *SD* = 7.6; Whites: mean = 56.2, *SD* = 6.8; Hispanics: mean = 56.6, *SD* = 7.1; $p = .005$), and lower cognitive and physical functioning than Whites (Blacks; mean = 16.0, *SD* = 4.9; Whites: mean = 19.6, *SD* = 7.1; Hispanics: mean = 18.0, *SD* = 5.5; $p < .001$).

The results of the multivariate analysis are shown in Table 3. After adjusting for age, gender, and education, findings for physical health status were no longer significant ($p = .373$). All other significant findings remained.

DISCUSSION

In this large, heterogeneous sample of community-based treatment seeking stimulant abusers, we found important differences between race and ethnic groups on several mental

health, physical health, and wellness measures that could help identify potential areas for intervention to improve treatment outcomes. White, Black, and Hispanic participants reported varied demographic characteristics, substance use patterns and diagnoses, and comorbid mental and physical health conditions. Effect sizes for ethnic differences on demographic and substance abuse variables were relatively large compared to those associated with comorbid conditions. Blacks were more likely to use alcohol and to be diagnosed with a cocaine use disorder only, whereas Whites were more likely to use methamphetamines and a variety of other illicit drugs and to be diagnosed with both a cocaine and other stimulant use disorder or other stimulant use disorder only. Hispanics, similar to Blacks, were more likely to use alcohol, but their rates of methamphetamine use and diagnoses for cocaine and other stimulant use disorder or other stimulant use disorder only fell in between Whites and Blacks.

These findings are consistent with other studies examining the relationship of race and ethnicity to drug use across various settings. An aggregate investigation of self-reported drug abuse and dependence from multiple National Household Surveys on Drug Abuse showed that Blacks report higher rates of cocaine use by routes with faster absorption (i.e., smoking or injection), which are associated with higher rates of dependence (Chen & Kandel, 2002). Nearly half of all cocaine-related emergency room episodes in the United States in the past decade occurred among Blacks, significantly higher than any other race or ethnic group (Chen & Kandel, 2002). Methamphetamine-positive patients in a trauma setting were more likely to be White or Hispanic (Schermer & Wisner, 1999) and Blacks in rural settings were less likely to use methamphetamine compared to Whites (Borders et al., 2008), suggesting that our finding of more methamphetamine use among Whites and Hispanics is not limited to this treatment-seeking population.

Blacks in this study reported fewer psychiatric disorders and symptoms of depression and better mental health status and well-being, consistent with several large studies that found lower rates of depression in Blacks compared to other groups (Jonas, Brody, Roper, & Narrow, 2003; Kessler et al., 2003). These findings were unexpected given the higher rates of reported physical comorbidities and cognitive difficulties observed in this group. However, these findings are consistent with other data in which similar differences have been attributed to a variety of reasons including underreporting despite using systematic measures, differences in expression of depressive symptoms, or true differences in prevalence (Alim, Charney, & Mellman, 2006). Underreporting may occur because Blacks delay seeking help for mental health concerns or utilize informal behavioral health services (K. Davis, 2011).

By contrast, Hispanics and Whites also appeared to have the greatest mental health needs, with both reporting more psychiatric disorders and depressive symptoms and Whites reporting more risk for suicide, although effect sizes were small. Methamphetamine abuse predicts reduced mental health status (Vearrier, Greenberg, Miller, Okaneku, & Haggerty, 2012) and the reports of poor mental health in Whites and Hispanics in this study may be associated with their greater use of methamphetamine, although a causal relationship cannot be established. This is consistent with previous findings among mostly White methamphetamine users in outpatient treatment who reported more past suicide attempts,

had higher rates of mood disorders (primarily major depression), and were twice as likely to be prescribed psychiatric medications compared to primary cocaine users (Copeland & Sorensen, 2001).

In this study, Black participants reported more comorbid medical conditions, poorer health status, and lower physical and cognitive functioning than other groups. These differences may be explained by age differences at treatment entry (i.e., Blacks were older) and correspond with previous research that found Black clients were least likely to initiate substance abuse treatment (Acevedo et al., 2012). Alternative explanations may also include barriers to services or poorer quality medical care for Blacks associated with, among other factors, a general mistrust of medical providers that arises from historical persecution and documented abuse and perceived mistreatment in health care settings because of racial background (U.S. Department of Health and Human Services, 2001).

Physical health conditions could also be associated with the effects of cocaine or alcohol use in Blacks and linked directly to the toxicity of each drug (Corrao, Bagnardi, Zambon, & La Vecchia, 2004; Stein, 1999) or route of drug administration (e.g., smoking of crack cocaine) (Winger, Woods, & Hofmann, 2004). However, explanations for race and ethnic differences in physical health associated with drug of choice may be weaker than other possible explanations because methamphetamine abusers (mostly White and Hispanic in this sample) experience numerous medical conditions (Panenka et al., 2013) and cocaine and methamphetamine use are both related to impaired cognitive functions (Simon et al., 2002).

There are limitations to this study that should be noted. The study was a retrospective assessment of baseline substance abuse and mental and physical health measures collected. Future studies should prospectively aim to better clarify the relationships between these disorders, substance use, and comorbid conditions. In addition, the data are self-report, which may be subject to recall bias, although the time periods assessed for most measures were relatively short (7–30 days). The eligibility criteria were also somewhat restricted in that individuals with physical issues or illnesses that would preclude exercise or those with psychiatric safety concerns were not eligible, thus potentially restricting information on physical and psychiatric health. Participants also had to be interested and willing to exercise, which may reduce generalizability to the larger treatment-seeking population.

Alternatively, a major strength is that the data for this study come from a sample of stimulant abusers seeking community-based addiction treatment across a geographically diverse set of community treatment providers. Thus, results may generalize to a broader clinical sample. This baseline study also adds to the current research literature because racial and ethnic minority populations are underrepresented in clinical trials. There is less information available about the treatment needs of minority groups, even more so for racial and ethnic minority stimulant abusers. Racial and ethnic groups have different patterns of substance use, which may impact their risk for comorbid mental and physical health conditions, as well as their risk for relapse after treatment.

CONCLUSION

Furthermore, these findings offer implications for stimulant abuse treatment. They highlight the usefulness of integrating mental and physical health services into substance abuse treatment programs serving racially and ethnically diverse patients. Receipt of primary medical care is associated with lower addiction severity and suggests that efforts to link treatment seeking substance abusers to primary medical care services should be considered (Saitz, Horton, Larson, Winter, & Samet, 2005). Integrating mental and physical health care into substance abuse treatment while paying attention to differences in racial and ethnic groups, who have varying comorbid drug use, mental health, and medical needs, could have a substantial impact on treatment outcomes.

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REFERENCES

Acevedo A, Garnick DW, Lee MT, Horgan CM, Ritter G, Panas L, Reynolds M. Racial and ethnic differences in substance abuse treatment initiation and engagement. Journal of Ethnicity in Substance Abuse. 2012; 11(1):1–21. [PubMed: 22381120]

Alim TN, Charney DS, Mellman TA. An overview of posttraumatic stress disorder in African Americans. Journal of Clinical Psychology. 2006; 62:801–813. [PubMed: 16703601]

American College of Sports Medicine. ACSM's Guidelines for Exercise Testing and Prescription. 8th. Philadelphia, PA: Lippincott Williams & Wilkins; 2010.

American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders DSM-IV-TR. 4th. Washington, DC: American Psychiatric Association; 2000.

Arean PA, Alvidrez J, Nery R, Estes C, Linkins K. Recruitment and retention of older minorities in mental health services research. The Gerontologist. 2003; 43(1):36–44. [PubMed: 12604744]

Borders TF, Booth BM, Han X, Wright P, Leukefeld C, Falck RS, Carlson RG. Longitudinal changes in methamphetamine and cocaine use in untreated rural stimulant users: Racial differences and the impact of methamphetamine legislation. Addiction. 2008; 103:800–808. [PubMed: 18412758]

Burlew AK, Feaster D, Brecht ML, Hubbard R. Measurement and data analysis in research addressing health disparities in substance abuse. Journal of Substance Abuse Treatment. 2009; 36(1):25–43. [PubMed: 18550320]

Burlew AK, Weekes JC, Montgomery L, Feaster DJ, Robbins MS, Rosa CL, Wu LT. Conducting research with racial/ethnic minorities: Methodological lessons from the NIDA Clinical Trials Network. The American Journal of Drug and Alcohol Abuse. 2011; 37:324–332. [PubMed: 21854274]

Carroll KM, Rosa CL, Brown LS Jr, Daw R, Magruder KM, Beatty LB. Addressing ethnic disparities in drug abuse treatment in the Clinical Trials Network. Drug and Alcohol Dependence. 2007; 90:101–106.

Chang CK, Hayes RD, Broadbent M, Fernandes AC, Lee W, Hotopf M, Stewart R. All-cause mortality among people with serious mental illness (SMI), substance use disorders, and depressive disorders in southeast London: A cohort study. BMC Psychiatry. 2010; 10:77. [PubMed: 20920287]

Chen K, Kandel D. Relationship between extent of cocaine use and dependence among adolescents and adults in the United States. Drug and Alcohol Dependence. 2002; 68:65–85. [PubMed: 12167553]

Cohen, J. Statistical power analysis for the behavioral sciences. 2nd. Mahwah, NJ: Lawrence Erlbaum; 1988.

Compton WM, Cottler LB, Jacobs JL, Ben-Abdallah A, Spitznagel EL. The role of psychiatric disorders in predicting drug dependence treatment outcomes. American Journal of Psychiatry. 2003; 160:890–895. [PubMed: 12727692]

Compton WM, Thomas YF, Stinson FS, Grant BF. Prevalence, correlates, disability, and comorbidity of DSM-IV drug abuse and dependence in the United States - Results from the national epidemiologic survey on alcohol and related conditions. Archives of General Psychiatry. 2007; 64:566–576. [PubMed: 17485608]

Copeland AL, Sorensen JL. Differences between methamphetamine users and cocaine users in treatment. Drug and Alcohol Dependence. 2001; 62:91–95. [PubMed: 11173172]

Corrao G, Bagnardi V, Zambon A, La Vecchia C. A meta-analysis of alcohol consumption and the risk of 15 diseases. Preventive Medicine. 2004; 38:613–619. [PubMed: 15066364]

Davis, K. Pathways to integrated health care: Strategies for African American communities and organizations. Rockville, MD: United States Department of Health and Human Services, Office of Minority Health; 2011.

Davis K, Schoenbaum SC, Audet AM. A 2020 vision of patient-centered primary care. Journal of General Internal Medicine. 2005; 20:953–957. [PubMed: 16191145]

Davis LL, Pilkinton P, Wisniewski SR, Trivedi MH, Gaynes BN, Howland RH, Rush AJ. Effect of concurrent substance use disorder on the effectiveness of single and combination antidepressant medications for the treatment of major depression: An exploratory analysis of a single-blind randomized trial. Depression and Anxiety. 2012; 29:111–122. [PubMed: 22495941]

De Alba I, Samet JH, Saitz R. Burden of medical illness in drug- and alcohol-dependent persons without primary care. The American Journal on Addictions. 2004; 13(1):33–45. [PubMed: 14766436]

Druss BG, von Esenwein SA. Improving general medical care for persons with mental and addictive disorders: Systematic review. General Hospital Psychiatry. 2006; 28:145–153. [PubMed: 16516065]

Endicott J, Nee J, Harrison W, Blumenthal R. Quality of life enjoyment and satisfaction questionnaire: A new measure. Psychopharmacology Bulletin. 1993; 29:321–326. [PubMed: 8290681]

Fava M, Graves LM, Benazzi F, Scalia MJ, Iosifescu DV, Alpert JE, Papakostas GI. A cross-sectional study of the prevalence of cognitive and physical symptoms during long-term antidepressant treatment. The Journal of Clinical Psychiatry. 2006; 67:1754–1759. [PubMed: 17196056]

Heatherton TF, Kozlowski LT, Frecker RC, Fagerstrom K. The Fagerstrom test for nicotine dependence: A revision of the Fagerstrom tolerance questionnaire. British Journal of Addiction. 1999; 86:1119–1127. [PubMed: 1932883]

Institute of Medicine. Unequal treatment: Confronting racial and ethnic disparities in health care. Washington, DC: The National Academies Press; 2003.

Jonas BS, Brody D, Roper M, Narrow WE. Prevalence of mood disorders in a national sample of young American adults. Social Psychiatry and Psychiatric Epidemiology. 2003; 38:618–624. [PubMed: 14614549]

Kessler RC, Berglund P, Demler O, Jin R, Koretz D, Merikangas KR, Wang PS. The epidemiology of major depressive disorder - Results from the national comorbidity survey replication (NCS-R). JAMA: The Journal of the American Medical Association. 2003; 289:3095–3105. [PubMed: 12813115]

Kozlowski LT, Porter CQ, Orleans CT, Pope MA, Heatherton T. Predicting smoking cessation with self-reported measures of nicotine dependence: FTQ, FTND, and HSI. Drug and Alcohol Dependence. 1994; 34:211–216. [PubMed: 8033758]

McLellan AT, Luborsky L, Woody GE, O'Brien CP. An improved diagnostic evaluation instrument for substance abuse patients. The addiction severity index. The Journal of Nervous and Mental Disease. 1980; 168(1):26–33. [PubMed: 7351540]

National Institue on Drug Abuse. Rockville, MD: NIDA; 2011. DrugFacts: Treatment statistics. Retrieved from http://www.drugabuse.gov/publications/drugfacts/treatment-statistics

Nunes EV, Levin FR. Treatment of depression in patients with alcohol or other drug dependence: A meta-analysis. JAMA: The Journal of the American Medical Association. 2004; 291:1887–1896. [PubMed: 15100209]

Panenka WJ, Procyshyn RM, Lecomte T, MacEwan GW, Flynn SW, Honer WG, Barr AM. Methamphetamine use: A comprehensive review of molecular, preclinical and clinical findings. Drug and Alcohol Dependence. 2013; 129:167–179. [PubMed: 23273775]

Robins LN, Wing J, Wittchen HU, Helzer JE, Babor TF, Burke J, Towle LH. The composite international diagnostic interview. An epidemiologic instrument suitable for use in conjunction with different diagnostic systems and in different cultures. Archives of General Psychiatry. 1988; 45:1069–1077. [PubMed: 2848472]

Saitz R, Horton NJ, Larson MJ, Winter M, Samet JH. Primary medical care and reductions in addiction severity: A prospective cohort study. Addiction. 2005; 100:70–78. [PubMed: 15598194]

Saloner B, Le Cook B. Blacks and Hispanics are less likely than whites to complete addiction treatment, largely due to socioeconomic factors. Health Affairs. 2013; 32:135–145. [PubMed: 23297281]

Sangha O, Stucki G, Liang MH, Fossel AH, Katz JN. The self-administered comorbidity questionnaire: A new method to assess comorbidity for clinical and health services research. Arthritis & Rheumatism. 2003; 49:156–163. [PubMed: 12687505]

Schermer CR, Wisner DH. Methamphetamine use in trauma patients: A population-based study. Journal of the American College of Surgeons. 1999; 189:442–449. [PubMed: 10549732]

Sheehan DV, Lecrubier Y, Harnett-Sheehan K, Janavs J, Weiller E, Keskiner A, Dunbar GC. The validity of the Mini International Neuropsychiatric Interview (MINI) according to the SCID-P and its reliability. European Psychiatry. 1997; 12:232–241.

Simon SL, Domier CP, Sim T, Richardson K, Rawson RA, Ling W. Cognitive performance of current methamphetamine and cocaine abusers. Journal of Addictive Diseases. 2002; 21:61–74. [PubMed: 11831501]

Sobell, LC.; Sobell, MB. Timeline follow-back: A technique for assessing self-reported ethanol consumption. In: Litten, RZ.; Allen, JP., editors. Measuring alcohol consumption: Psychosocial and biological methods. Totowa, NJ: Humana Press; 1992. p. 41-72.

Stein MD. Medical consequences of substance abuse. The Psychiatric Clinics of North America. 1999; 22:351–370. [PubMed: 10385938]

Substance Abuse and Mental Health Services Administration. Treatment Episode Data Set (TEDS) 2005: Discharges from substance abuse treatment services. Rockville, MD: SAMHSA; 2008. DASIS Series: S-41, DHHS Publication No. (SMA) 08–4314.

Substance Abuse and Mental Health Services Administration. Center for Behavioral Health Statistics and Quality. Rockville, MD: SAMHSA; 2010. Results from the 2009 national survey on drug use and health: Mental health findings. NSDUH Series H-39, HHS Publication No. SMA 10–4609.

Trivedi MH, Greer TL, Grannemann BD, Church TS, Somoza E, Blair SN, Nunes E. Stimulant reduction intervention using dosed exercise (STRIDE) - CTN 0037: Study protocol for a randomized controlled trial. Trials. 2011; 12:206. [PubMed: 21929768]

Trivedi MH, Wisniewski SR, Morris DW, Fava M, Gollan JK, Warden D, Rush AJ. Concise health risk tracking scale: A brief self-report and clinician rating of suicidal risk. The Journal of Clinical Psychiatry. 2011; 72:757–764. [PubMed: 21733476]

U.S. Department of Health and Human Services. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2001. Mental health: Culture, race, and ethnicity: A supplement to mental health: A report to the surgeon general.

Vearrier D, Greenberg MI, Miller SN, Okaneku JT, Haggerty DA. Methamphetamine: History, pathophysiology, adverse health effects, current trends, and hazards associated with the clandestine manufacture of methamphetamine. Disease-a-Month. 2012; 58:38–89. [PubMed: 22251899]

Wadland WC, Ferenchick GS. Medical comorbidity in addictive disorders. The Psychiatric Clinics of North America. 2004; 27:675–687. [PubMed: 15550287]

Warden D, Trivedi MH, Greer TL, Nunes E, Grannemann BD, Horigian VE, Szapocznik J. Rationale and methods for site selection for a trial using a novel intervention to treat stimulant abuse. Contemporary Clinical Trials. 2012; 33(1):29–37. [PubMed: 21946515]

Ware JE Jr. Conceptualization and measurement of health-related quality of life: Comments on an evolving field. Arch Physical Medicine and Rehabilitation. 2003; 84(4 Suppl 2):S43–S51.

WHO. Geneva: World Health Organization; 1997. Composite International Diagnostic Interview (CIDI core) version 2.1.

Winger, G.; Woods, JH.; Hofmann, FG. A handbook on drug and alcohol abuse: The biomedical aspects. 4th. New York: Oxford University Press; 2004.

Wu LT, Blazer DG, Patkar AA, Stitzer ML, Wakim PG, Brooner RK. Heterogeneity of stimulant dependence: A national drug abuse treatment clinical trials network study. The American Journal on Addictions. 2009; 18:206–218. [PubMed: 19340639]

Yancey AK, Ortega AN, Kumanyika SK. Effective recruitment and retention of minority research participants. Annual Review of Public Health. 2006; 27:1–28.

TABLE 1

Baseline Demographic and Drug Use Characteristics by Race/Ethnic Groups

Baseline Characteristic	**All** ***N*** **= 290**	**White** ***n*** **= 131 (45%)**	**Black** ***n*** **= 128 (44%)**	**Hispanic** ***n*** **= 31 (11%)**	**χ^2/ F stat**	***p*-value**	**Effect Size**
	***M* (*SD*)**	***M* (*SD*)**	***M* (*SD*)**	***M* (*SD*)**			
Age (yrs)	**39.1 (10.8)**	**35.5 (9.9)**	**44.1 (10.1)**	**33.7 (9.2)**	29.5	<0.001	0.16
	n (%)	*n* (%)	*n* (%)	*n* (%)			
Female	**115 (39.7)**	**58 (44.3)**	**36 (28.1)**	**21 (67.7)**	**18.5**	**<0.001**	**0.25**
Education level					**12.5**	**0.014**	**0.15**
Less than High School	55 (19.0)	16 (12.2)	29 (22.7)	10 (32.3)			
High School graduate	149 (51.4)	67 (51.1)	70 (54.7)	12 (38.7)			
Post High School	86 (29.7)	48 (36.6)	29 (22.7)	9 (29.0)			
Substance use (past 30 days)							
Cigarettes	225 (77.6)	107 (81.7)	92 (71.9)	26 (83.9)	4.4	0.113	0.12
Other tobacco	10 (3.4)	4 (3.1)	5 (3.9)	1 (3.2)	0.1	0.929	0.02
Alcohol	**194 (66.9)**	**72 (55.0)**	**100 (78.1)**	**22 (71.0)**	**15.9**	**<0.001**	**0.23**
Cocaine	**229 (79.0)**	**83 (63.4)**	**125 (97.7)**	**21 (67.7)**	**48.5**	**<0.001**	**0.41**
Amphetamine	4 (1.4)	4 (3.1)	0 (0.0)	0 (0.0)	4.9	0.085	0.13
Methamphetamine	**77 (26.6)**	**62 (47.3)**	**4 (3.1)**	**11 (35.5)**	**66.3**	**<0.001**	**0.48**
Other stimulants	**7 (2.4)**	**7 (5.3)**	**0 (0.0)**	**0 (0.0)**	**8.7**	**0.013**	**0.17**
Marijuana	125 (43.1)	59 (45.0)	52 (40.6)	14 (45.2)	0.6	0.750	0.04
Other illicit drugs	**51 (17.6)**	**42 (32.1)**	**6 (4.7)**	**3 (9.7)**	**35.0**	**<0.001**	**0.35**
Substance use disorders					**106.7**	**<0.001**	**0.43**
Cocaine (not stimulant) abuse or dependence	170 (58.8)	37 (28.5)	117 (91.4)	16 (51.6)			
Cocaine and stimulant abuse or dependence	88 (30.4)	69 (53.1)	7 (5.5)	12 (38.7)			
Stimulant (not cocaine) abuse or dependence	31 (10.7)	24 (18.5)	4 (3.1)	3 (9.7)			
Cocaine route of use					**28.4**	**<.001**	**0.23**
Oral	1 (0.4)	0 (0.0)	1 (0.8)	s0 (0.0)			
Nasal	80 (30.4)	42 (38.5)	29 (22.8)	9 (33.3)			
Smoking	161 (61.2)	50 (45.9)	95 (74.8)	16 (59.3)			

Baseline Characteristic	All *N* = 290	White *n* = 131 (45%)	Black *n* = 128 (44%)	Hispanic *n* = 31 (11%)	χ^2/ F stat	*p*-value	Effect Size
	***M* (*SD*)**	***M* (*SD*)**	***M* (*SD*)**	***M* (*SD*)**			
Injection	21 (8.0)	17 (15.6)	2 (1.6)	2 (7.4)			

Note: Data are mean (standard deviation) or *n* (percentage); statistics were χ^2 and *F* tests for categorical and continuous variables, respectively. Bolded information indicates group differences that were significant at $p < 0.05$.

TABLE 2

Comorbid Conditions and Quality of Life at Baseline

Comorbid Conditions	All *n* = 290	White *n* = 131	Black *n* = 128	Hispanic *n* = 31	F stat	*p*-value	Effect Size
			M(SD)				
No. of Current Psychiatric Disorders (MINI)	**1.0 (1.3)**	**1.2 (1.4)**	**0.7 (0.9)**	**1.3 (1.8)**	**6.4**	**0.002**	**0.04**
Depressive Symptoms (QIDS-C)	**5.3 (3.1)**	**6.3 (3.3)**	**4.2 (2.4)**	**5.9 (3.3)**	**16.9**	**<0.001**	**0.10**
Mental Health Risk (CHRT-SR)	**8.6 (6.8)**	**9.6 (7.5)**	**7.2 (6.0)**	**10.1 (5.9)**	**4.9**	**0.008**	**0.03**
Physical Health Status (SF-36)	**55.1 (7.3)**	**56.2 (6.8)**	**53.5 (7.6)**	**56.6 (7.1)**	**5.3**	**0.005**	**0.03**
Nicotine Dependence (FTND)	**3.4 (2.1)**	**3.9 (2.2)**	**3.1 (2.0)**	**2.3 (2.0)**	**5.9**	**0.003**	**0.05**
No. of medical conditions (SCQ)	1.2 (1.9)	1.0 (1.7)	1.4 (2.3)	0.8 (1.5)	2.2	0.118	0.01
Cognitive and Physical Function (CPFQ)	**17.8 (6.3)**	**19.6 (7.1)**	**16.0 (4.9)**	**18.0 (5.5)**	**11.0**	**<0.001**	**0.06**
Mental Health Status (SF-36)	**42.8 (13.5)**	**39.3 (14.4)**	**47.0 (11.4)**	**40.0 (13.4)**	**12.3**	**<0.001**	**0.07**
Quality of Life (Q-LES-Q-SF)	**68.8 (16.1)**	**65.4 (17.2)**	**72.7 (14.5)**	**66.4 (14.1)**	**7.4**	**0.001**	**0.04**

Note: Data are mean (standard deviation); statistics were *F* tests for continuous variables. Bolded information indicates group differences that were significant at $p < 0.05$.

MINI: Mini International Neuropsychiatric Interview, QIDS-C: Quick Inventory of Depressive Symptomatology- Clinician Rated, CHRT-SR: Concise Health Risk Tracking-Self Report, SF-36: Short-Form Health Survey, FTND: Fagerstrom Test for Nicotine Dependence, SCQ: Self-Administered Comorbidity Questionnaire, CPFQ: Cognitive and Physical Functioning Questionnaire, Q-LES-Q-SF: Quality of Life Enjoyment and Satisfaction Questionnaire Short Form.

TABLE 3

Adjusted Means by Race/Ethnic Groups for Mental Health, Physical Health and Quality of Life

	White Mean	Black Mean	Hispanic Mean	F stat	*p*–value	Effect size
No. Current Psychiatric Disorders (MINI)	**1.2**	**0.6**	**1.3**	**6.8**	**0.001**	**0.04**
Depressive Symptoms (QIDS-C)	**6.3**	**4.2**	**5.8**	**13.0**	**0.000**	**0.07**
Mental Health Risk (CHRT-SR)	**9.8**	**6.8**	**10.7**	**6.3**	**0.002**	**0.04**
Physical Health Status (SF-36)	55.6	54.4	56.0	1.0	0.373	−0.00
Nicotine Dependence (FTND)	**4.0**	**3.0**	**2.5**	**6.8**	**0.001**	**0.05**
No. of medical conditions (SCQ)	1.2	1.2	1.0	0.1	0.929	−0.01
Cognitive and Physical Function (CPFQ)	**19.8**	**15.7**	**18.4**	**12.1**	**0.000**	**0.07**
Mental Health Status (SF-36)	**39.3**	**47.1**	**39.5**	**10.0**	**0.000**	**0.06**
Quality of Life (Q-LES-Q-SF)	**64.8**	**74.0**	**64.4**	**9.8**	**0.000**	**0.06**

Note: Data are means; statistics were *F* tests for continuous variables. Models adjusted for age, gender and education. Bolded information indicates group differences that were significant at $p < 0.05$.

MINI: Mini International Neuropsychiatric Interview, QIDS-C: Quick Inventory of Depressive Symptomatology-Clinician Rated, CHRT-SR: Concise Health Risk Tracking- Self Report, SF-36: Short-Form Health Survey, FTND: Fagerstrom Test for Nicotine Dependence, SCQ: Self-Administered Comorbidity Questionnaire, CPFQ: Cognitive and Physical Functioning Questionnaire, Q-LES-Q-SF: Quality of Life Enjoyment and Satisfaction Questionnaire Short Form.