Ethnic differences among substance using adolescents in a treatment dissemination project.

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Abstract:

Despite evidence of ethnic differences in substance use patterns among adolescents in community samples, clinical studies have not found ethnic differences in posttreatment outcomes. Prior clinical studies have been limited by small samples, focus on broad treatment modalities, and lack of consideration of important covariates. We investigated ethnic differences in substance use frequency and problems in a large sample of White (60%), African American (12%), and Latino (28%) adolescents prior to and following an evidence-based treatment. Participants included 4,502 adolescents (29% female), with ages 13–18 years, who received Motivational Enhancement Therapy/Cognitive Behavior Therapy 5 Sessions. At baseline, African American adolescents demonstrated less frequent use, fewer problems, and less comorbidity than Whites or Latinos. Consistent with prior research, there were no ethnic differences in substance use outcomes among assessment completers (71%) when controlling for baseline differences. However, African Americans, older adolescents, and males were less likely to complete the posttreatment assessment. Implications for clinical service and effectiveness research are discussed.

Keywords: adolescent substance abuse | treatment outcome | African American | latino | ethnic differences | substance abuse

Article:

1. Introduction

A critical issue in developing and delivering effective treatment for adolescent substance abuse (ASA) is to establish whether evidence-based interventions are effective across racial and ethnic groups (U.S. Department of Health and Human Services, 2001). Understanding the applicability of ASA interventions for African Americans and Latinos is particularly important, considering that these groups comprise more than one quarter of the American population (Humes, Jones, &

Ramirez, 2011). Examining whether treatment is effective across White, African American, and Latino adolescents requires addressing several specific questions. First, do African American and Latino youth differ from White youth when they enter treatment? Second, does treatment lead to significantly different outcomes for White versus African American and Latino youth? Third, are differences in outcome attributable to baseline differences among the groups? In this study, we address these questions to evaluate the applicability of a brief evidence-based, outpatient intervention for ASA within a treatment dissemination project. For parsimony, we refer to differences among White, African American, and Latino youth as ethnic differences rather than racial/ethnic differences (Strada, Donohue, & Lefforge, 2006).

Hypotheses regarding ethnic differences in ASA prior to treatment can be based on community studies. In community samples, White youth often report higher levels of substance use and higher rates of diagnosed substance use disorders than do African American youth, whereas White and Latino teens report more similar patterns of use (Blum et al., 2000, Griffin et al., 2000, Johnston et al., 2008, Kilpatrick et al., 2000, Roberts et al., 2006 and Wallace et al., 2002). However, some studies suggest that African Americans experience more social problems and internalizing distress associated with alcohol use than Whites (Godette et al., 2006 and Maag and Irvin, 2005).

Regarding posttreatment outcome, relatively few clinical studies have reported on ethnic differences. Rounds-Bryant and Staab (2001) compared the substance abuse and mental health outcomes of White, African American, and Latino youth in the large, multisite Drug Abuse Treatment Outcome Study for Adolescents (DATOS-A; Hser et al., 2001). At baseline, rates of alcohol and marijuana use were similar across the three groups, but Whites were more likely to meet diagnostic criteria for substance dependence and more likely to have comorbid depression. Despite these differences, all three ethnic groups experienced similar reductions in substance use after treatment. A limitation of this study was that it evaluated broad treatment modalities (e.g., outpatient, residential, short-term inpatient) rather than specific evidence-based interventions.

In a recent review of controlled ASA treatment studies, Strada et al. (2006) similarly found a lack of ethnic effects on treatment response. Although more than 90% of the 18 reviewed studies considered ethnicity in the analyses, no study found significant effects of ethnicity on outcome. However, Strada et al. found that only 6% of the studies had sufficient power to detect such effects. Hence, a second limitation of prior research has been insufficient sample sizes to test for ethnicity effects in treatment outcome.

A third limitation of prior studies is failure to consider variables that might interact with ethnicity to affect outcome, such as comorbid psychopathology, gender, and age. Comorbid psychopathology has been associated with greater severity of substance use disorders and worse substance use outcomes (Brown et al., 1994, Grella et al., 2001 and Tims et al., 2002), and in at least one study, comorbidity has varied by ethnic group (Rounds-Bryant & Staab, 2001). Age and gender are also important variables to consider because older adolescents and males generally have higher rates of alcohol or illicit substance use than younger adolescents and females (Johnston et al., 2008). Finally, comorbidity may vary as a function of age and/or gender among substance-abusing adolescents, as the prevalence of common comorbid disorders is related to these variables (Lewinsohn et al., 1993 and Roberts et al., 2007). Thus, it is important to consider the effects of gender, age, and comorbidity when evaluating ethnic effects on ASA treatment outcomes.

In this study, we address the aforementioned limitations by investigating baseline and posttreatment differences in a large, national sample of White, African American, and Latino youth, all of whom received the same evidence-based outpatient treatment for ASA. We also investigated baseline differences in comorbidity across the three groups and tested whether gender, age, or comorbidity predict or interact with ethnicity to affect treatment outcome. The context for this study was the multisite Effective Adolescent Treatment (EAT) project, which aimed to broadly disseminate an outpatient treatment for ASA that had prior evidence of effectiveness (SAMHSA, 2003). The treatment was Motivational Enhancement Therapy/Cognitive Behavior Therapy 5 Sessions (MET/CBT-5). In the Cannabis Youth Treatment study, MET/CBT-5 demonstrated comparable effectiveness to four more intensive treatments among 600 adolescents with cannabis abuse or dependence (Dennis, Godley, et al., 2004).

Our analysis was guided by two hypotheses. First, we expected that there would be ethnic differences in substance use and comorbid psychopathology at baseline. Specifically, we predicted that substance frequency would be higher in Whites and Latinos than in African Americans but that substance-related problems would be greater in African Americans than in Whites or Latinos. We also expected that rates of comorbid psychopathology at baseline would be higher in Whites, as compared with African Americans or Latinos. Second, we hypothesized that any ethnic group differences in substance use outcomes would be accounted for by baseline differences in substance frequency, substance-related problems, or comorbidity. Because age and gender have been associated with substance use and comorbidity, we explored potential effects of these variables in all analyses.

2. Materials and methods

2.1. Participants

Participants in this study were adolescents (aged 13 through 18 years) who participated in the EAT dissemination project (SAMHSA, 2003). Inclusion criteria were as follows: (a) presenting problem of cannabis or alcohol use and (b) suitable for outpatient care by the American Society for Addiction Medicine criteria (Mee-Lee, Shulman, Fishman, Gastfriend, & Griffith, 2001). There were no other exclusion criteria to maximize opportunity for participation. Inclusion criteria were assessed in a structured interview (described in Measures). Participants were permitted to receive concurrent care for comorbid conditions, such as psychotropic medication for psychiatric disorders, but were asked to refrain from concurrent treatment for ASA. The project also included young adults, aged 19 to 21 years, but we restricted this study to adolescents to avoid confounds associated with increased drinking during the college years (SAMHSA, 2008) and to relate our findings to other ASA treatment studies. The EAT coordinating center at Chestnut Health Systems provided the multisite database for this study, which included 4,947 adolescents who were recruited across 36 sites.

To test our hypotheses, we restricted the sample to those reporting White, African American, or Latino ethnic identity, resulting in the exclusion of 144 adolescents. We also excluded adolescents for whom no ethnic identification was denoted (n = 287) and for whom baseline comorbidity measures were missing (n = 14). Our final sample, therefore, included 4,502 adolescents. Participants were predominantly male (71%), with a mean age of 15.62 years (SD = 1.33 years). Ethnic composition was 59% White, 29% Latino, and 12% African American. Thirty-nine percent of the sample met diagnostic criteria for substance abuse, 38% met for dependence, and the remaining 21% reported substance problems that did not meet full criteria for abuse or dependence (American Psychiatric Association, 2000).

2.2. Sites

The 36 participating sites were geographically and ethnically diverse. Percentage of White adolescents ranged from 2.4% to 97.3% across the sites (M = 55.79%, SD = 27.27%). Percentage of African American teens ranged from 0% to 37% (M = 12.58%, SD = 11.74%), and percentage of Latino teens ranged from 1% to 97.6% (M = 29.38%, SD = 26.53%). The 36 sites covered 22 states and the District of Columbia. Of the sites, 11 were in the Northeast, 7 in the South, 5 in the Midwest, and 13 in the West.

2.3. Measures

The core assessment measure in the EAT project was the Global Appraisal of Individual Needs Version 5 (GAIN; Dennis, White, Titus, & Unsicker, 2008), a standardized, structured interview with the adolescent. The GAIN has been normalized on both adolescents and adults and is one of the most widely used measures in ASA treatment studies in the United States (Dennis, Dawud-Noursi, Muck, & McDermeit, 2003). A cross-validation of the GAIN alcohol and cannabis use measures with the Form 90 Timeline Followback indicated excellent comparability ($r = .70–.80$; Dennis, Funk, Godley, Godley, & Waldron, 2004).

The GAIN spans eight domains, of which three were used in this study: background, substance use, and mental health. The GAIN was administered by trained, nationally certified interviewers at baseline and at 3, 6, and 12 months postbaseline. To assess acute treatment response, we focused on the 3-month assessment.

2.3.1. Background items

Participants' age in years, gender, and ethnic identity were assessed on specific items in the GAIN's background section. Ethnic identity was based on adolescent responses to the question “which races, ethnicities, nationalities, or tribes best describe you?”

2.3.2. Comorbidity

Internalizing comorbidity was assessed with the GAIN Internal Mental Distress Scale (IMDS). The IMDS has 43 items measuring symptoms experienced over the past 12 months, including depression, anxiety, traumatic stress, and suicidal ideation. Scores range from 0 to 43, with higher scores indicating more symptoms. The IMDS has demonstrated high internal consistency ($\alpha = .94$; Dennis et al., 2008) and diagnostic validity for depressive disorders ($\kappa = .85$; Shane, Jasiukaitis, & Green, 2003).

Externalizing comorbidity was assessed with the GAIN Behavior Complexity Scale (BCS). The BCS has 33 items measuring inattention, hyperactivity, and conduct problems experienced during the past 12 months. Scores range from 0 to 33, with higher scores indicating a higher level of symptoms. The BCS has exhibited high internal consistency ($\alpha = 91$; Dennis et al., 2008) and diagnostic validity for attention-deficit/hyperactivity disorder ($\kappa = 1.00$) and for oppositional or conduct disorder ($\kappa = 0.82$; Shane et al., 2003).

2.3.3. Substance use frequency

The GAIN Substance Frequency Scale (SFS) is an eight-item scale that calculates the percentage of the past 90 days that the adolescent used alcohol or other drugs (excluding nicotine), with weighting for days of heavy use and crack/cocaine or heroin use. Scores range from 0 to 1, with higher scores indicating a greater percentage of heavy use days. The SFS has demonstrated internal consistency ($\alpha = .74$), test–retest reliability, and evidence of construct and predictive validity (Dennis et al., 2008 and Lennox et al., 2006). In the current sample, internal consistency was consistent with prior adolescent studies and comparable across ethnic groups: .76 for Whites, .72 for African Americans, and .75 for Latinos.

2.3.4. Substance-related problems

The GAIN Substance Problems Scale (SPS) is a 16-item scale that assesses the prevalence of problems associated with substance abuse or dependence over the past 30 days. The SPS includes symptoms of abuse and dependence and substance-related physical health, psychological, and interpersonal problems. Scores range from 0 to 16, with higher scores reflecting more problems. It has shown high internal consistency ($\alpha = .90$) and test–retest reliability ($r = .70$; Dennis et al., 2002 and Dennis et al., 2008). Internal consistency in this sample was .87 for Whites, .85 for African Americans, and .87 for Latinos.

2.4. Treatment

The intervention was MET/CBT-5 (Sampl & Kadden, 2001), which combined two sessions of MET with three sessions of CBT. The two MET sessions focused on helping the adolescents to resolve ambivalence regarding their substance use and enhance motivation to change. In the CBT sessions, the focus changed to building drug or alcohol refusal, social support seeking, and relapse-prevention skills. Sessions were 60 minutes long. Anticipated treatment duration was 6 to 7 weeks, but therapists could extend the duration to include all sessions. Treatment was delivered across a range of settings, including clinics, community mental health centers, and schools. Therapists were generally master's-level clinicians, social workers, or substance use counselors.

2.5. Therapist training

Therapists were trained using a train-the-trainers model. Each site designated one or more local MET/CBT-5 supervisors who were trained by expert clinicians in 3-day workshops. Supervisors then submitted audiotapes of one MET and one CBT session to national supervisors, which had to meet criteria for adherence and competence to proceed. Next, both local supervisors and the

national supervisors independently rated audiotapes of sessions conducted by local therapists to determine the local supervisor's proficiency in approving and supervising site therapists. The local therapists needed to be rated as adherent and competent on a full set of MET/CBT-5 sessions to obtain certification. Local supervisors met weekly with local therapists to monitor adherence and competence and participated in cross-site conference calls with national supervisors to address implementation and clinical issues across sites.

2.6. Data analysis plan

Prior to testing the two hypotheses, descriptive statistics were generated by ethnic group, and baseline correlations among the study variables were calculated. In addition, gender and age differences in the outcome variables (e.g., substance frequency, problems, and comorbidity) were examined. These analyses helped to determine which variables should be retained as covariates.

To test the hypothesis of ethnic differences at baseline, we conducted hierarchical linear modeling (HLM) analyses to account for the nesting of participants within sites. All 4,502 participants were included in these analyses. Demographic predictors (gender, age, and ethnicity) were modeled at Level 1, with random intercepts modeled at Level 2 to parcel out site effects. Variability due to site was calculated using an intraclass correlation coefficient. Age was split, with ages 13 to 15 years (45%) comprising the younger group and ages 16 to 18 years (55%) comprising the older group. All models were estimated in Proc Mixed in SAS 8.0, using restricted likelihood estimation and the between-within method to calculate degrees of freedom. In each model, ethnicity was dummy coded, and two analyses were run: one with Whites as the reference group and another with Latinos as the reference group. Additional HLM models examined whether age or gender significantly interacted with ethnicity to predict baseline substance use or comorbidity.

Comparisons of assessment completers with noncompleters were conducted using multivariate analysis of variance (MANOVA) and chi-square. To test the hypothesis that any ethnic differences in outcomes would be attributable to baseline differences, we conducted two-step HLM analyses. Because imputation of posttreatment substance use outcomes was not justified with two time points, only those adolescents who completed the posttreatment assessment were included in these analyses. In Step 1 of the HLM, demographic predictors (age, gender, and ethnicity) were entered at Level 1, along with a variable indicating the number of MET/CBT-5 sessions received. Site was entered as a random effect at Level 2. In Step 2, baseline values of the substance use and comorbidity variables were entered to determine if they accounted for any effects of the demographic predictors observed in the first step. Additional HLM models

examined whether age, gender, or comorbid psychopathology significantly interacted with ethnicity to predict substance use frequency or problems.

3. Results

3.1. Preliminary analyses

Baseline sample characteristics by ethnic group, prior to adjustments for site differences, are depicted in Table 1. Relative to the other groups, the White group contained a greater proportion of females and older adolescents. African American adolescents had lower levels of dependence diagnoses and comorbid mental health diagnoses than White or Latino adolescents.

Table 1. Baseline sample characteristics by ethnic group (N = 4,502)

Characteristic	White	Latino	African American	F/χ^2
Sample size, *n* (%)	2,670 (59)	1,282 (28)	550 (13)	
Female	58	49	52	20.63
Age				15.07
13–15 years	42	51	48	
16–18 years	58	49	52	
Substance diagnoses				
Abuse	39	40	39	0.74
Dependence	40	25	42	24.88
Comorbid diagnoses				
Depression	31	20	30	14.01
Generalized anxiety	9	4	10	8.87
Traumatic stress	19	12	22	11.97
Conduct disorder	45	34	47	14.33
ADHD	46	23	39	50.85

Note. Values are percentages unless otherwise indicated. ADHD = attention-deficit/hyperactivity disorder.

□ *p < .001*

Table 2 depicts baseline correlations among the study variables. The two ASA measures (frequency and problems) were highly correlated with one another, as were the two measures of comorbidity (internalizing and externalizing). Measures of ASA were moderately correlated with measures of comorbidity. T tests by age indicated that older adolescents reported higher substance frequency, t(4,500) = −4.32, p < .001, whereas younger adolescents had higher levels of internalizing, t(4,500) = 2.23, p =.03, and externalizing, t(4,500) = 5.53, p < .001, comorbidity. T tests by gender indicated that girls had more substance problems, more internalizing symptoms and more externalizing symptoms than boys, t(4,500) = 3.40, 23.05, 10.16; all p values < .001. These results, as well as the group differences in Table 1, reinforced the need to retain gender, age, and comorbid psychopathology as covariates.

Table 2. Means, standard deviations, and correlations of outcome variables at baseline (*N* = 4,502)

Variable	2	3	4	*M*	*SD*
1. SFS	0.60□	0.27□	0.29□	0.11	0.13
2. SPS		0.35□	0.34□	2.72	3.37
3. IMDS			0.59□	7.39	8.14
4. BCS				9.57	7.88

Note. SFS, possible range = 0–1; SPS, possible range = 0–16; IMDS, possible range = 0–43; BCS, possible range = 0–33.

□ p < .001.

3.2. Ethnic differences at entry into treatment

3.2.1. Substance use frequency

The HLM including SFS as the criterion indicated gender, age, and ethnicity effects at baseline. Site accounted for 9% of the variance in SFS. Girls and older adolescents reported more frequent use (for gender, B = −0.01, p = .02; for age, B = 0.02, p < .001). Consistent with our hypothesis, African American adolescents reported less frequent use than Whites (B = −0.01, p = .02) or Latinos (B = −0.01, p = .02). No differences were found between White and Latino youth. There were no significant interactions of age or gender with ethnicity.

3.2.2. Substance-related problems

The HLM with SPS as the criterion indicated gender and ethnicity effects. Site accounted for 8% of the variance. Girls reported more problems than boys ($B = -0.52$, $p < .001$). Counter to our hypothesis, African American teens reported fewer problems than Whites ($B = -0.39$, $p = .01$) or Latinos ($B = -0.42$, $p = .02$). White and Latino youth did not significantly differ. There were no significant interactions of age or gender with ethnicity.

3.2.3. Internalizing comorbidity

With IMDS as the criterion, site accounted for 9% of the variance. The HLM revealed gender and ethnicity effects. Girls reported more internalizing symptoms than boys ($B = -5.55$, $p < .001$). African American teens reported fewer symptoms than Whites ($B = -1.10$, $p < .01$) or Latinos ($B = -1.57$, $p < .001$). Again, White and Latino youth did not differ. There were no significant interactions of age or gender with ethnicity.

3.2.4. Externalizing comorbidity

With BCS as the criterion, site accounted for 8% of the variance. The HLM revealed effects for gender, age, and ethnicity. Girls had more externalizing problems than boys ($B = -2.16$, $p < .001$); younger adolescents had more problems than older adolescents ($B = -1.22$, $p < .001$); and African Americans had fewer problems than White ($B = -2.06$, $p < .001$) or Latinos ($B = -1.76$, $p < .001$). White and Latino teens did not differ. There were no significant interactions of age or gender with ethnicity on externalizing comorbidity.

3.3. Ethnic differences at posttreatment assessment

3.3.1. Comparison of completers versus noncompleters

Of those entering the EAT project, 3,184 (71%) completed the 3-month assessment and were included in the posttreatment analyses. A MANOVA comparing assessment completers and noncompleters on the two baseline measures of substance use and the two baseline measures of comorbidity was not significant, $F(4, 4{,}497) = 1.64$, $p = .16$. However, chi-square tests indicated that assessment completion was associated with all three demographic variables. Assessment completion was more likely among females than males (75% vs. 69%), $\chi^2(1, N = 4{,}502) = 13.09$, $p < .001$, and among younger adolescents than older adolescents (74% vs. 68%), $\chi^2(1, N = 4{,}502)$ 15.97, $p < .001$. In addition, African American teens (63%) were less likely to complete the assessment than White teens (73%), $\chi^2(1, N = 4{,}502) = 21.33$, $p < .001$, or Latino

teens (70%), $\chi^2(1, N = 4{,}502) = 7.22$, $p < .01$. Thus, the following results are only relevant to assessment completers.

Mean SFS and SPS scores were significantly lower at 3 months than at baseline for all three ethnic groups (*p*values < .001). Using Cohen's *d* (1988), effect sizes of the change were .39 to .45 for substance frequency and .30 to .39 for substance problems, indicating that all three groups experienced medium-sized reductions in substance frequency and problems.

A one-way analysis of variance indicated significant differences in the number of treatment sessions received by ethnic group, $F(2, 3{,}182) = 34.21$, $p < .001$. Comparisons using Tukey's post-hoc test revealed that White teens received significantly more sessions ($M = 3.5$, $SD = 2.5$) than African American s ($M = 2.7$,$SD = 2.6$) or Latinos ($M = 2.8$, $SD = 2.7$). These data underscored the need to control for number of MET/CBT-5 sessions in the posttreatment HLM.

3.3.2. Substance use frequency

When only demographic variables (gender, age, and ethnicity) and number of treatment sessions were entered into the HLM with 3-month SFS as the criterion, there were ethnic and age effects. African American teens demonstrated lower SFS scores than Latinos (B = −0.02, p = .02). Whites did not differ from Latinos or African Americans. In addition, older adolescents had higher SFS scores than younger adolescents (B = .01, p = .01).

Consistent with our hypothesis, the posttreatment ethnic differences were no longer significant when controlling for baseline SFS and comorbidity. Site differences dropped to 2%. As shown in Table 3, higher 3-month SFS scores were significantly predicted by baseline SFS (B = 0.39, p < .001) and externalizing symptoms (B = 0.001, p = .02). In addition, males had higher 3-month SFS scores than females (B = 0.01, p = .02). Further HLM models revealed no significant interactions of ethnicity with gender, age, or comorbid psychopathology on 3-month SFS scores.

Table 3. Predictors of substance use frequency posttreatment with Latino youth as reference group ($n = 3{,}181$)

Predictor	*B*	*SE*	*t*	*p*
Intercept	−0.01	0.01	0.76	.46
African American	−0.01	0.01	−1.18	.24
White	−0.01	0.00	−1.54	.12
Age	0.00	0.00	1.46	.14

Predictor	*B*	*SE*	*t*	*p*
Gender	0.01	0.00	2.37	.02
No. of sessions	−0.00	0.00	−0.74	.46
Baseline SFS	0.39	0.01	28.15	<.001
Baseline BCS	0.00	0.00	2.23	.03
Baseline IMDS	0.00	0.00	1.35	.18

Note. The same pattern of results was observed with White youth as the reference group.

3.3.3. Substance-related problems

When demographic predictors (gender, age, and ethnicity) and number of sessions were entered into the HLM with 3-month SPS as the criterion, there were effects of ethnicity and number of sessions received. Site accounted for 5% of the variance. African American teens demonstrated significantly lower SPS scores compared with White teens (B = −0.40, p = .02) but did not differ from Latino youth. Across all adolescents, more treatment sessions were associated with higher SPS scores (B = 0.06, p = .02).

Consistent with our hypothesis, ethnic differences in the 3-month SPS were no longer significant when controlling for baseline SPS and comorbidity. Site differences dropped to 2%. As indicated in Table 4, SPS scores at 3 months were significantly predicted by greater baseline SPS (B = 0.28, p < .001), externalizing symptoms (B = 0.04, p < .001), internalizing symptoms (B = 0.02, p = .03), and more treatment sessions (B = 0.06, p < .01). In addition, males had higher 3-month SPS scores than females (B = 0.30, p < .01). Further, HLM models found no significant interaction effects of gender, age, or comorbid psychopathology with ethnicity.

Table 4. Predictors of substance-related problems posttreatment with White youth as reference group (*n* = 3,178)

Predictor	*B*	*SE*	*t*	*p*
Intercept	−0.31	0.22	−1.38	.18
African American	−0.15	0.16	−0.95	.34
Latino	0.05	0.12	0.44	.66
Age	0.19	0.10	1.90	.06

Predictor	*B*	*SE*	*t*	*p*
Gender	0.30	0.11	2.71	<.01
No. of sessions	0.06	0.02	2.90	<.01
Baseline SPS	0.28	0.02	17.66	<.001
Baseline BCS	0.04	0.01	5.46	<.001
Baseline IMDS	0.02	0.01	2.22	.03

Note. The same pattern of results was observed with Latino youth as the reference group.

4. Discussion

This study evaluated the effectiveness of a brief evidence-based intervention for ASA across three ethnic groups (Whites, Latinos, and African Americans) while controlling for four putative covariates (e.g., age, gender, internalizing comorbidity, externalizing comorbidity). In this large national sample, we found significant ethnic differences at baseline. Consistent with prior literature and our first hypothesis, African American adolescents began treatment with lower frequency of substance use than did White or Latino teens. Moreover, African American youth presented with fewer substance-related problems, internalizing symptoms, and externalizing symptoms. These findings are internally consistent, although our finding that African Americans had fewer substance-related problems was counter to our hypothesis. Prior studies documenting elevated substance-related problems among African American teens relative to Whites (e.g., Godette et al., 2006 and Maag and Irvin, 2005) have often focused on alcohol-related problems. The fact that African Americans in this sample had fewer substance problems may reflect our broader inclusion of teens with problematic alcohol and/or cannabis use.

At baseline, our two putative covariates—age and gender—were both related to indices of ASA and comorbid psychopathology. Girls entering treatment had significantly higher scores than boys on measures of substance use frequency, substance-related problems, and internalizing and externalizing symptoms. Our findings are consistent with those of Stevens, Estrada, Murphy, McKnight, and Tims (2004), who compared 941 males and 266 females in seven treatment programs. In their study, females had greater baseline severity in substance use, substance-related problems, and mental health problems. These results may reflect a generalized vulnerability among females who abuse substances, or a treatment-seeking effect whereby girls are less likely to enter or be referred to ASA treatment until their problems are more severe.

Age differences at baseline were somewhat less consistent. Substance use frequency was higher among older teens, congruent with epidemiological surveys (Wallace et al., 2003). By contrast, externalizing symptoms were higher in younger teens. Our findings suggest that older teens may present with a more “pure” form of substance use disorders, whereas younger teens may present with substance use in the context of attentional and/or behavioral problems.

Among adolescents who completed the posttreatment assessment (71%), there were again ethnic differences, but consistent with our second hypothesis, these differences were attributable to baseline differences. With all of our putative covariates entered into the model, baseline substance use frequency and comorbid externalizing psychopathology, but not ethnicity, predicted substance use frequency after treatment. In a similar analysis, baseline substance-related problems, comorbid internalizing and externalizing symptoms, and amount of treatment received, but not ethnicity, predicted substance-related problems after treatment. This lack of ethnic differences in treatment outcome is similar to the findings of Rounds-Bryant and Staab (2001) from the DATOS-A project and those of Strada et al. (2006) in their review of ASA treatment studies. Results are also consistent with a recent multisite implementation study by Godley, Hedges, and Hunter (2011), which found that White, African American, and Latino youth had equivalent initiation, engagement, and treatment outcomes following an evidence-based outpatient intervention. Although we cannot disregard the possibility that differential completion of the posttreatment assessment contributes to these findings (discussed further below), our results are bolstered by the large sample size, as well as the consistency with prior investigations.

The posttreatment analysis also indicated significant, independent effects of gender and comorbidity, highlighting the importance of including these covariates in analyses of ethnic differences. At the posttreatment assessment, males had poorer outcomes than females, despite having entered the project with more favorable baseline scores. In addition, teens with more internalizing symptoms had more substance-related problems following treatment, whereas teens with more externalizing symptoms had higher substance frequency and problems. The effects of comorbidity on posttreatment outcome were small, particularly for internalizing symptoms. Our findings on gender and comorbidity are consistent with previous studies. In one study, Harrison and Asche (2001) studied 387 adolescents in 37 programs and found that females were more likely than males to complete treatment and to be abstinent from drug use after treatment. In another study, Hsieh and Hollister (2004) studied more than 2,000 adolescents and found that females had more psychological difficulties than males but had better treatment attendance and better outcomes. Finally, several studies have documented an association between comorbid psychopathology and substance use severity both at baseline and posttreatment (Grella et al., 2001, Tomlinson et al., 2004 and Winters et al., 2008).

4.1. Limitations

The primary limitation of this study is that the outcome findings are restricted to adolescents who completed the posttreatment assessment: 71% of the total sample. It is critical to note that assessment completion is not identical to treatment completion. Among assessment completers, adolescents received an average of 3.4 sessions (SD = 2.5), demonstrating that many adolescents who did not complete all five treatment sessions remained in the assessment protocol. The EAT project continued to collect data from those adolescents who dropped out of treatment and who participated in assessments. However, because of the EAT project's emphasis on treatment dissemination, limited data were collected from those adolescents who did not complete assessments. The multisite database did not systematically track reasons for withdrawal or the number of sessions completed by youth who dropped out of the research protocol. Thus, we cannot generalize findings to youth who either dropped out of the project or who completed treatment but not the subsequent assessment.

Assessment completers were more likely to be young adolescents, females, and either White or Latino. Further research is needed to understand whether greater dropout among African American youth is attributable to limited cultural sensitivity, poor engagement strategies, or differential effectiveness of early treatment. It is encouraging that teens who did not complete the assessment did not differ from completers at baseline on the two substance use outcomes or two mental health outcomes that were the focus of this analysis. Moreover, the large proportion of African American youth who completed the assessment experienced equivalent treatment benefit to White and Latino youth, despite receiving fewer sessions. Indeed, receipt of more treatment sessions was associated with more substance problems at 3 months, suggesting that the full treatment may not have been deemed as necessary by teens with fewer substance problems.

This study has several other limitations. First, the EAT project aimed to disseminate a single evidence-based brief intervention and did not include a control or comparison condition. Although we controlled for the number of sessions received, outcomes cannot be attributed specifically to the intervention. Second, it is possible that the brevity of the treatment may have limited our ability to detect differences in outcome. This limitation is tempered by the fact that all three ethnicities had significant, medium-sized reductions in substance frequency and problems. Third, among the variables not included in the EAT database was socioeconomic status (SES), which is often related to ethnicity and therefore may contribute to the observed effects of ethnic status on substance use. Moreover, this analysis intentionally focused on four putative covariates and did not consider other variables that might be associated with ethnicity, such as family composition, criminal justice involvement, level of acculturation, country of

origin, and foreign- versus American-born status (Godley et al., 2011, Wallace et al., 2002 and Wallace et al., 2003). Given the lack of ethnic effects on posttreatment outcome, confounding effects of SES and other covariates are somewhat less of a concern in this study.

4.2. Implications

Results of this study indicate that MET/CBT-5 did not differ in effectiveness across a large sample of White, African American, and Latino youth who completed the posttreatment assessment. Although encouraging, we cannot conclude that these results would have held up if the proportion of outcome data were equivalent across ethnic groups. These findings have two major implications for clinical practice and effectiveness research. First, our results argue for the applicability of MET/CBT-5 among adolescents and add to the growing body of literature suggesting that evidence-based treatments may not require significant adaptations to be effective across ethnic groups. Second, and as a caveat to the first, our findings demonstrate that differential retention in research needs to be addressed proactively in the evaluation of evidence-based practice. Specifically, our data suggest that culturally sensitive strategies may be needed to retain African Americans in research. More generally, this study underscores the need for effectiveness researchers to use comprehensive follow-up strategies to retain all participants in the assessment protocol and to systematically track reasons for dropout.

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