Coping Strategies and Patterns of Alcohol and Drug Use among HIV-Infected Patients in the United States Southeast

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Abstract

Alcohol and drug use are common among HIV-infected patients and are important determinants of secondary transmission risk and medication adherence. As part of the Coping with HIV/AIDS in the Southeast (CHASE) Study, 611 HIV-infected patients were consecutively recruited from eight clinical care sites in five southeastern U.S. states in 2001–2002. We examined the distribution and predictors of alcohol and drug use in this sample with an emphasis on psychosocial predictors of use. In the prior 9 months, 27% of participants drank alcohol and 7% drank to intoxication at least weekly. The most common drugs used at least weekly were marijuana (12%) and crack (5%); 11% used a non-marijuana drug. 7% reported polysubstance use (use of multiple substances at one time) at least weekly. Injection drug use was rare (2% injected at least once in the past 9 months). There were few differences in alcohol and drug use across sociodemographic characteristics. Stronger adaptive coping strategies were the most consistent predictor of less frequent alcohol and drug use, in particular coping through action and coping through relying on religion. Stronger maladaptive coping strategies predicted greater frequency of drinking to intoxication but not other measures of alcohol and drug use. Those with more lifetime traumatic experiences also reported higher substance use. Interventions that teach adaptive coping strategies may be effective in reducing alcohol and substance use among HIV-positive persons.

Introduction

ALCOHOL AND DRUG ABUSE play important roles in driving HIV transmission and clinical course. Sharing of injection drug use (IDU) equipment remains an important mode of HIV acquisition.¹ Use of alcohol and noninjection drugs is also associated with increased risk for HIV acquisition because of exchange of sex for drugs or money, sexual disinhibition resulting from drug or alcohol use, and related high-risk sexual behaviors.^{2–4} Indeed, HIV and alcohol/drug use have been termed “twin epidemics” because of their interconnectedness.⁵

Consequently, alcohol and drug abuse are highly prevalent among those infected with HIV.⁶ Alcohol and drug abuse are associated with increased risk behaviors for secondary HIV transmission as well as decreased antiretroviral medication adherence.^{7–9} Alcohol use of any amount is of further clinical concern for the approximately 30% of

HIV-infected individuals who are coinfecting with hepatitis C,¹⁰ as alcohol use increases the risk of cirrhosis of the liver and the negative effects of hepatotoxic antiretroviral medications.^{11,12}

Thus, interventions to reduce alcohol and drug use among HIV-positive patients are of prime importance both for the individual prognosis and the public health. The development of such interventions will be aided by the identification of potentially modifiable intervention points such as coping styles and other psychosocial characteristics. Increasing interest has focused on the importance of psychosocial characteristics, especially coping styles, stress, and trauma history, in determining health behaviors and outcomes in HIV.^{9,13,14} Accordingly, in this paper we present the psychosocial predictors of alcohol and drug use in a consecutive sample of patients seeking HIV clinical care in five southern U.S. states with the goal of informing clinical interventions to identify and reduce substance use in HIV patients.

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Methods

Sample and procedures

The Coping with HIV/AIDS in the Southeast (CHASE) Study comprises the largest longitudinal cohort reflective of patients seeking HIV care outside major metropolitan areas in the U.S. Southeast. The study's primary aim was to describe the relationships between psychosocial characteristics (including traumatic experiences, mental illness, and coping strategies), health-related behaviors (medication adherence and transmission risk behaviors), and clinical characteristics in this understudied region that is disproportionately affected by the HIV epidemic.¹⁵ The CHASE study design and sampling methodology have been presented in detail previously.^{16,17} In brief, eight infectious diseases clinics were selected in five southeastern states: North and South Carolina, Georgia, Alabama, and Louisiana. The largest metropolitan areas in the region were excluded (Charlotte, NC; Atlanta, GA; and New Orleans, LA). Consecutive sampling of all scheduled patients was strictly followed and confirmed through close monitoring at each site. HIV-infected patients were eligible to participate who were English-speaking, at least 18 years old, and demonstrated no major cognitive impairment on the Short Portable Mental Status Questionnaire.¹⁸ Between December 2001 and April 2002, 773 patients were approached and determined to be eligible; 611 (79%) enrolled and completed the baseline interview. Compared to state-level surveillance data, the final sample was comparable to the population of HIV-infected individuals in the five states in distributions of gender, race, and mode of HIV transmission.¹⁷

Participants provided sociodemographic, psychosocial, and self-reported health information via in-person, structured interviews at a private location of their choosing. Interviews were conducted by trained, field-certified interviewers using validated instruments at enrollment and at 9-month intervals. The present analysis draws on the baseline interview data. All study procedures were approved by the Institutional Review Boards at Duke University and all participating sites, and all participants provided written informed consent.

Measures

Substance use. Alcohol and drug use in the 9 months prior to the baseline interview were assessed with the Addiction Severity Index (ASI),¹⁹ the reliability and validity of which are well established.^{19–21} We computed the ASI alcohol and drug severity scores following standard methodology¹⁹ and additionally draw on individual ASI items to report the proportion of respondents reporting any use and at least weekly use of specific substances in the past 9 months.

Although the ASI alcohol and drug severity scores have been widely used for research purposes, there is no single cutoff that is generally accepted as indicating the presence of a probable alcohol or drug use disorder. Furthermore, the distributions of the ASI scores are heavily skewed, making them inappropriate for use as dependent variables in ordinary least squares regression models. To explore predictors of drug use, we therefore defined the following three dichotomous outcome variables: (1) use of any nonmarijuana drug at least weekly in the past 9 months; (2) use of crack at

least weekly in the past 9 months; and (3) polysubstance use (use of multiple drugs or drugs and alcohol at the same time) at least weekly in the past 9 months. To measure alcohol use, we considered two ordinal-response questions: (1) "In the past 9 months, how often did you usually drink any alcoholic beverage?" and (2) "In the past 9 months, how often did you usually drink alcoholic beverages to the point of intoxication, getting drunk?" Both questions had the following response options: never, once, 2 to 3 times, once per month, once every two weeks, once per week, 2 to 3 times per week, 4 to 5 times per week, almost daily, or daily.

Psychosocial measures have been described in detail previously.^{9,16} In brief, the psychosocial trauma measure, adapted from prior research,^{22–25} assigns 1 point for each of 15 types of possible lifetime traumatic experiences (e.g., sexual abuse, physical trauma, childhood physical and emotional neglect, murder of a close family member, death of a child). This specification of the number of types of traumatic events experienced has been used widely and predicts multiple negative health outcomes.^{9,16,26–28} Recent severe stressful life events during the 9 months preceding the interview were measured using a version of the Life Events Survey (LES),^{29,30} modified to include only those events that were considered moderately to severely stressful based on our previous studies with interviewer-based objectively rated stresses.^{31–33} For the current analysis we focused only on severe stresses in the past nine months, including divorce or separation from spouse/partner, death or serious illness of immediate family member, major financial problems (e.g., foreclosure, not enough money for basic necessities), physical or sexual assault, or more than a week in prison.

Depressive symptoms were measured with the depression subscale of the Brief Symptoms Inventory (BSI); this subscale has adequate internal consistency (Cronbach $\alpha = 0.85$) and test-retest reliability (0.84).³⁴ The BSI was selected because the six items comprising its depression subscale (feeling lonely, feeling blue, feeling no interest in things, feeling hopeless, thoughts of ending life, and feelings of worthlessness) are distinct from physical symptoms of medical illness, medication side effects, or HIV disease progression. Subscale scores were converted to gender-specific *t* scores ranging from 0 to 100, with a change of 10 units corresponding to a shift of one standard deviation in the normative population.³⁴

Social support was assessed with the Medical Outcomes Study Social Support Survey,³⁵ and the Pearlin Self-Efficacy Scale was used to measure self-efficacy.³⁶ Both measures have been shown to have high internal and construct validity. Finally, coping styles were evaluated with 18 items from the Brief Cope, measuring nine styles of adaptive (positive reframing, using emotional support, acceptance, religion, active) and maladaptive coping (denial, self blame, behavioral disengagement, and substance use).³⁷ For the present analysis, substance use coping was removed as redundant with the primary end points. The remaining items were combined into two scales for adaptive (10 items) and maladaptive (6 items) coping styles, respectively. These two scales had satisfactory internal reliability (Cronbach $\alpha = 0.74$ and 0.72 , respectively) and were uncorrelated ($\rho = -0.07$). A factor analysis confirmed this specification, and the two factors jointly explained 79% of the variance in the 16 items.

Sociodemographic characteristics. Participants reported age, gender, race/ethnicity, sexual orientation, educational attainment, and current health insurance. In the analysis, participants were classified as male heterosexual, male gay/bisexual, or female (nearly all female participants self-identified as heterosexual). Race/ethnicity was dichotomously coded as white non-Hispanic versus minority, since nearly everyone in the latter category (89%) was African American non-Hispanic. Educational attainment was dichotomously coded as education beyond high school vs. a high school diploma/equivalent or less. Health insurance status was dichotomously classified according to whether or not the respondent reported any current private health insurance coverage.

Clinical characteristics. Clinical information, including CD4 counts, HIV RNA viral loads, and history of opportunistic infections, was abstracted from participants' medical records by trained chart abstractors using standardized forms.

Statistical analysis

We fit multiple logistic regression models to evaluate independent predictors of the following dichotomous outcomes: (1) nonmarijuana drug use, (2) crack use, and (3) polysubstance use at least weekly in the past nine months. We fit multiple ordinal logistic regression models to evaluate independent predictors of the reported frequency of alcohol consumption and of drinking to intoxication, both coded as ordinal variables. Odds ratios from an ordinal logistic regression model are interpreted as the increased (or decreased) odds that a member of the index group (e.g., depressed) will have a higher value

for the outcome variable than a member of the reference group (e.g., not depressed). We assessed the global fit of each model using Pearson and Hosmer-Lemeshow goodness-of-fit statistics.³⁸ We accounted for the study's multiple sites of recruitment by including site fixed effects in all models.

In sensitivity analyses, we examined whether results and conclusions changed substantively when considering alternate specifications of the outcome variables. Specifically, for the drug use outcomes, we considered any use in the past nine months as opposed to at least weekly use, and for the alcohol outcome we considered drinking and getting drunk at least weekly as opposed to the ordinal measure of alcohol consumption frequency.

Results

Sample description

The CHASE sample was predominantly male (69%) and of minority race/ethnicity (69%), with most participants between 30 and 50 years of age (Table 1). Fewer than half (46%) had received education beyond high school, and three quarters (75%) lacked private health insurance. Participants were characterized by a range of different HIV disease stages, as indicated by the distributions of CD4 count (median, 362; interquartile range, 214–577) and log viral load (2.8; 1.7–4.2).

Prevalence of alcohol and drug use

Two thirds of participants had consumed alcohol in the past 9 months but only one-quarter had gotten drunk and 4% had drunk to blackout (Table 2). The most common drug used

TABLE 1. PATIENT CHARACTERISTICS OF COPING WITH HIV/AIDS IN THE SOUTHEAST (CHASE) STUDY SUBJECTS AT ENROLLMENT ($n = 611$)

Characteristic	n (%) or Median (IQR)
<i>Sociodemographics</i>	
Age (range, 20–71)	40 (34–45)
Female	188 (31%)
Men who have sex with men (MSM)	255 (42%)
Minority race	422 (69%)
Education beyond high school	278 (46%)
No private health insurance	461 (75%)
<i>Psychosocial</i>	
Lifetime traumas ^a (range, 0–12)	3 (1–4)
Recent severe stressful life events (range, 0–8)	1 (1–2)
Depressive symptoms ^b (range, 0–100)	55 (44–65)
Adaptive coping strategies ^c (range, 1–4)	3.1 (2.7–3.5)
Maladaptive coping strategies ^d (range, 1–4)	1.5 (1.2–2.0)
Social support (range, 1–5)	4.1 (3.2–4.7)
Self efficacy (range, 1–4)	3.1 (2.7–3.6)
<i>Clinical</i>	
Baseline CD4 count (range, 0–1580)	362 (214–577)
Baseline HIV viral load (log ₁₀ HIV RNA) (range, 0–5.9)	2.8 (1.7–4.2)
History of Category C opportunistic infection	114 (22%)

^aNumber of types of traumatic experiences reported.

^bBased on Brief Symptoms Inventory (BSI).

^cAdaptive coping strategies include active, acceptance, religious, seeking emotional support, and positive reframing coping.

^dMaladaptive coping strategies include behavioral disengagement, denial, and self-blame coping.

TABLE 2. SUBSTANCES USED BY COPING WITH HIV/AIDS IN THE SOUTHEAST (CHASE) STUDY SUBJECTS DURING THE NINE MONTHS PRIOR TO STUDY ENROLLMENT

<i>Substance</i>	<i>Any use</i>	<i>At least weekly</i>
<i>Alcohol</i>		
Any alcohol	397 (66.1%)	163 (27.1%)
Drank to intoxication	146 (25.3%)	40 (6.9%)
Drank to blackout	21 (3.9%)	7 (1.3%)
<i>Drugs</i>		
Marijuana ^a	156 (26.1%)	71 (11.9%)
Crack	67 (11.1%)	32 (5.3%)
Cocaine	47 (7.8%)	11 (1.8%)
Prescription painkillers/opiates ^a	24 (4.0%)	11 (1.8%)
Sedatives/hypnotics/anxiolytics ^a	23 (3.8%)	10 (1.7%)
Inhalants/poppers	18 (3.0%)	3 (0.5%)
Amphetamines ^a	12 (2.0%)	4 (0.7%)
Heroin	5 (0.8%)	3 (0.5%)
Methadone	4 (0.7%)	2 (0.3%)
Hallucinogens	4 (0.7%)	0 (0.0%)
Barbiturates ^a	2 (0.3%)	0 (0.0%)
Any nonmarijuana drug	136 (22.3%)	65 (10.6%)
Polysubstance use ^b	119 (20.0%)	42 (7.1%)
Any injection drug use	12 (2.0%)	4 (0.7%)

^aEither nonprescription use or use in excess of prescribed amount.

^bUse of two or more substances at the same time during the nine months prior to enrollment (including alcohol).

was marijuana (26% ever used in the past 9 months; 12% used at least weekly), followed by crack (11%, 5%) and cocaine (8%, 2%); the prevalence of use of all other substances in the past 9 months was less than 4%. Overall, 22% of respondents had used any nonmarijuana drug in the past 9 months and 11% used such a drug at least weekly. Twenty percent of participants reported polysubstance use in the past 9 months, with 7% reporting this behavior at least weekly. Of particular note, only 2% of the respondents reporting having engaged in injection drug use in the past 9 months.

Predictors of alcohol and drug use

In multivariable analyses, women were likely both to drink and get drunk less frequently than heterosexual men (odds ratio [OR] 0.52, 95% confidence interval [CI] 0.34–0.81 and 0.48, 0.27–0.86, respectively; Table 3). Age, race/ethnicity, sexual orientation for men, education level, and health insurance status were not associated with drinking or getting drunk.

A number of psychosocial variables were associated with the alcohol consumption measures, although the specific predictors differed between the two endpoints (drinking and getting drunk). More lifetime traumatic experiences and more recent stressful life events were associated with getting drunk more frequently but not with drinking more frequently. Greater adaptive coping strategies were associated with lower frequency of both drinking and getting drunk, but greater maladaptive coping strategies were only associated with getting drunk. Self-efficacy was not associated with either end point. More social support and more depressive symptoms were associated with more frequent drinking but not with frequency of getting drunk.

No sociodemographic characteristic was predictive of any of the three drug use variables considered, apart from sexual orientation (being a MSM was associated with a lower

odds of weekly or more polysubstance use relative to heterosexual men). Greater adaptive coping strategies were predictive of lower odds of drug use for all measures considered. Several other psychosocial measures were associated with one out of the three endpoints: lifetime trauma and depressive symptoms were associated with polysubstance use, recent stressful life events were associated with any non-marijuana drug use, and greater self-efficacy was associated with crack use. Social support was not associated with any drug use measure. Point estimates were notably imprecise in the model of crack use, reflecting a small number of outcomes. For example, the odds of crack use were higher for those of minority race/ethnicity (OR 1.72) but the confidence interval (0.54–5.52) was more than tenfold wide and included the null.

Specific coping strategies

To further explore the relationship between specific coping strategies and alcohol and drug use, we fit eight separate models for each endpoint, with each model including one of the eight coping strategy measures as well as all other covariates. Active and religious coping strategies were negatively and consistently associated with all measures of alcohol and drug use (Table 4). Acceptance and positive reframing coping strategies also were generally negatively associated with alcohol and drug use; although statistical significance varied across the five endpoints, the odds ratios were largely consistent in magnitude. Among maladaptive coping strategies, behavioral disengagement was positively associated with greater frequency of getting drunk and with nonmarijuana drug use, while denial coping was associated only with greater frequency of getting drunk. Two coping strategies (using emotional support and self-blame) were not associated with any alcohol or drug use measure.

TABLE 3. MULTIVARIABLE ANALYSES OF PREDICTORS OF ALCOHOL CONSUMPTION, NONMARIJUANA DRUG USE, CRACK USE, AND POLYSUBSTANCE USE DURING THE NINE MONTHS PRIOR TO STUDY ENROLLMENT

Characteristic	Frequency of alcohol consumption ^a OR (95% CI)	Frequency of getting drunk ^a OR (95% CI)	Nonmarijuana drug use $\geq$ weekly ^b OR (95% CI)	Crack use $\geq$ weekly ^b OR (95% CI)	Polysubstance use $\geq$ weekly ^b OR (95% CI)
Age (per 10 years)	0.99 (0.83, 1.18)			1.36 (0.83, 2.23)	1.27 (0.81, 1.99)
Gender/sexual orientation:					
Male heterosexual	1.00 (ref)		1.00 (ref)	1.00 (ref)	1.00 (ref)
Female	0.52 (0.34, 0.81)		0.88 (0.41, 1.89)	1.01 (0.38, 2.73)	0.46 (0.18, 1.18)
Male who has sex with men	0.91 (0.60, 1.39)		0.73 (0.34, 1.59)	0.56 (0.19, 1.68)	0.38 (0.15, 0.95)
Minority race	0.93 (0.65, 1.34)		0.61 (0.30, 1.25)	1.72 (0.54, 5.52)	1.26 (0.51, 3.10)
Education beyond high school	1.28 (0.91, 1.80)		0.57 (0.28, 1.15)	0.61 (0.21, 1.74)	1.30 (0.57, 2.95)
No private health insurance	1.14 (0.78, 1.67)		0.93 (0.39, 2.19)	^c	3.23 (0.88, 11.86)
Lifetime trauma (per trauma) ^d	1.07 (0.99, 1.14)				
Stressful life events (per event)	1.04 (0.91, 1.18)			1.09 (0.91, 1.32)	1.30 (1.11, 1.52)
Depressive symptoms ^e	1.29 (1.09, 1.53)		1.38 (1.09, 1.76)	1.31 (0.94, 1.82)	1.18 (0.89, 1.57)
Adaptive coping strategies ^f	0.56 (0.42, 0.76)		1.21 (0.87, 1.68)	1.61 (0.99, 2.60)	1.59 (1.07, 2.37)
Maladaptive coping strategies ^g	0.96 (0.71, 1.29)		0.38 (0.22, 0.65)	0.33 (0.15, 0.71)	0.38 (0.20, 0.75)
Self efficacy	1.08 (0.80, 1.47)		1.27 (0.74, 2.17)	1.14 (0.57, 2.30)	0.72 (0.39, 1.33)
Social support	1.21 (1.01, 1.46)		1.74 (0.97, 3.13)	2.48 (1.04, 5.90)	1.21 (0.61, 2.40)
			1.02 (0.72, 1.44)	0.82 (0.51, 1.31)	1.39 (0.91, 2.13)

^aFrequency of alcohol consumption and getting drunk divided into nine ordinal categories ranging from never to daily /almost daily use; modeled using ordinal logistic regression.

^bModeled using ordinary logistic regression; polysubstance use is use of two or more substances (including alcohol) at the same time.

^cInsurance was excluded from the model of crack use due to collinearity with the outcome (all those reporting crack use $\geq$ weekly lacked private health insurance, i.e., the OR would be infinitely large).

^dNumber of types of traumatic experiences reported.

^eBased on Brief Symptoms Inventory (BSI).

^fAdaptive coping strategies include active, acceptance, religious, seeking emotional support, and positive reframing coping.

^gMaladaptive coping strategies include behavioral disengagement, denial, and self-blame coping.

OR, odds ratio; CI, confidence interval.

TABLE 4. ASSOCIATION BETWEEN SPECIFIC COPING STRATEGIES AND ALCOHOL AND DRUG USE

Characteristic	Frequency of alcohol consumption ^a OR (95% CI)	Frequency of getting drunk ^a OR (95% CI)	Nonmarijuana drug use $\geq$ weekly ^b OR (95% CI)	Crack use $\geq$ weekly ^b OR (95% CI)	Polysubstance use $\geq$ weekly ^b OR (95% CI)
<i>Adaptive coping strategies</i>					
Active	0.71 (0.59, 0.86)	0.61 (0.48, 0.76)	0.65 (0.47, 0.90)	0.51 (0.32, 0.81)	0.62 (0.42, 0.92)
Religious	0.66 (0.56, 0.78)	0.66 (0.54, 0.83)	0.63 (0.46, 0.84)	0.56 (0.36, 0.86)	0.65 (0.45, 0.94)
Acceptance	0.69 (0.54, 0.89)	0.63 (0.46, 0.85)	0.81 (0.54, 1.22)	0.71 (0.42, 1.19)	0.47 (0.28, 0.78)
Positive reframing	0.88 (0.75, 1.04)	0.81 (0.65, 1.01)	0.64 (0.47, 0.88)	0.60 (0.39, 0.92)	0.78 (0.54, 1.12)
Emotional support	1.06 (0.90, 1.23)	0.97 (0.79, 1.19)	0.83 (0.62, 1.12)	1.04 (0.68, 1.59)	1.06 (0.75, 1.52)
<i>Maladaptive coping strategies</i>					
Behavioral disengagement	1.02 (0.79, 1.32)	1.50 (1.10, 2.04)	1.73 (1.15, 2.58)	1.56 (0.90, 2.72)	1.28 (0.79, 2.05)
Denial	0.93 (0.76, 1.14)	1.31 (1.02, 1.68)	0.95 (0.67, 1.35)	0.99 (0.63, 1.54)	0.92 (0.62, 1.38)
Self blame	1.03 (0.87, 1.23)	1.09 (0.86, 1.38)	1.06 (0.77, 1.48)	1.08 (0.69, 1.69)	0.71 (0.48, 1.06)

^aFrequency of alcohol consumption and getting drunk divided into nine ordinal categories ranging from never to daily / almost daily use; modeled using ordinal logistic regression.^bModeled using ordinary logistic regression; polysubstance use is use of two or more substances (including alcohol) at the same time.
OR, odds ratio; CI, confidence interval.

Sensitivity analyses

Consideration of alternate definitions of the primary endpoints yielded the same substantive conclusions. Alternate definitions included any use of crack, polysubstance, and any non-marijuana drug in the past 9 months (as opposed to at least weekly use); dichotomous variables indicating alcohol consumption and getting drunk at least weekly; and continuous ASI alcohol and drug severity scores. Female gender was associated or showed a trend toward association ($p < 0.10$) with less alcohol use in all specifications. Minority race/ethnicity was associated with higher odds of any crack use, due in part to more outcomes and therefore narrower confidence intervals when considering any use. No other sociodemographic characteristics were associated with any end point. Consistent with our primary analyses (Table 3), adaptive coping strategies were associated with most specifications of alcohol and drug use, and lifetime trauma, recent stressful events, depressive symptoms, and social support were each associated with some outcomes. PTSD symptom severity, as measured by the PTSD Symptoms Checklist,³⁹ was not associated with measures of alcohol or drug use when added to the models and did not modify the associations of other independent variables with the outcome measures.

Discussion

This study provides a unique insight into the alcohol- and drug-using behaviors of patients seeking care for HIV in the U.S. Southeast. For some time, the HIV epidemic has been spreading faster in the Southeast compared to other regions of the United States, and the region's epidemic has been characterized by relatively high proportions of cases transmitted through heterosexual intercourse and occurring in poor, female, minority, and rural-living individuals.^{15,40} Evidence suggests that noninjection drug use may play an important role in many of these dynamics.^{4,41}

We found that heroin and other IDU was quite rare in this sample, with only 2% of the sample reporting any IDU in the past 9 months. Apart from marijuana, crack and cocaine were the most commonly used illicit substances. While heroin and injection drug use have been hallmarks of the HIV epidemics in urban cores of the Northeast, other studies have similarly found crack/cocaine (and sexual activity related to use of crack/cocaine) to be more important characteristics of HIV transmission in rural and Southern areas.^{41,42}

Of note, amphetamine (including methamphetamine) use was also relatively uncommon in this sample. The CHASE sample was recruited in 2001–2002, just before reports emerged of a rapid increase in methamphetamine use nationwide. Other studies have reported less frequent use of methamphetamine in eastern regions of the United States relative to the West.⁴²

The distribution of specific types of substances used in the Southeast is relevant to understand barriers to health care. Some data indicate that utilization of health services among HIV-positive patients is negatively correlated with crack or cocaine use, positively correlated with binge alcohol use, and uncorrelated with heroin or injection drug use.⁴³

While direct comparison of patterns of alcohol and illicit drug use between studies is challenging due to different definitions, the overall prevalence of substance use does not

appear to exceed estimates from other general samples of HIV-positive patients. In a national probability sample of U.S. adults seeking HIV care recruited in the mid-1990s (HC-SUS), 55% reported any alcohol consumption in the past 4 weeks and 19% were classified as heavy drinkers. In addition, 12% reported any marijuana use and 38% reported any non-marijuana drug use in the past year.⁶ In a sample of over 1100 patients from one southeastern academic medical center's HIV clinic, 11% and 14% were estimated to meet criteria for alcohol and drug abuse/dependence, respectively.⁴⁴

Perhaps the most striking finding of this study is the consistent negative relationship between adaptive coping and all measures of alcohol and substance use ($OR = 0.33$ – 0.56 across models). Looking more closely, active and religious coping were inversely associated with all measures of use, while acceptance and positive reframing coping were associated with some of the alcohol and substance use outcomes evaluated. In prior research assessing the influence of coping styles on HIV medication adherence in a sample of rural-living HIV-positive women in the Southeast, higher barriers to adherence were positively associated with denial-based coping and negatively associated with religious coping and active coping.⁴⁵

Recent studies have evaluated interventions to improve coping skills in persons living with HIV/AIDS,⁴⁶ and the efficacy of coping interventions in improving ARV adherence and reducing traumatic stress and grief.^{47–49} In the future, studies evaluating the efficacy of coping interventions in reducing alcohol and substance use among HIV-positive persons may be indicated based on the results of the current study. Particular emphasis on teaching and reinforcing adaptive coping strategies may serve as a useful focus for such interventions. An intervention based on the cognitive theory of stress and coping⁵⁰ that reinforced adaptive (active and emotion-based) coping strategies was shown to be effective in reducing sexual risk behaviors in a cohort of HIV-positive male and female survivors of childhood sexual abuse.⁵¹ Such an approach may merit evaluation as a supplement to existing evidence-based substance abuse treatment programs for HIV-positive patients.

Consistent with prior research,^{27,52} lifetime history of traumatic experiences appears to play an important role in determining adult alcohol and drug use in this population. While the magnitude of the odds ratios relating trauma to substance use may appear modest (1.07 – 1.30 across models), it should be noted that this represents the increased odds of alcohol or drug use for each additional type of traumatic experience. The number of types of traumatic experiences ranged from 0 to 12 in this sample, with over half of participants having experienced 3 or more different types of trauma. The vast majority of the traumatic experiences in this sample occurred in childhood, strengthening the argument for a potential causal relationship between trauma history and adult substance use.

Our findings should be interpreted with respect to the limitations of our study. Alcohol and substance use were obtained by patient self-report and therefore may be biased measures. As with all observational studies, we can identify associations but cannot attribute causality. For example, we can identify an association between adaptive coping strategies and alcohol and substance use, but cannot determine the direction of this relationship. However, we believe it is reasonable to evaluate the role of interventions promoting

adaptive coping strategies to reduce alcohol and substance abuse among HIV-positive persons as a next step based upon the findings of the current study.

The CHASE study used a consecutive sampling approach at eight clinics throughout the rural Southeast United States to reduce volunteer (selection) bias and to enroll a cohort of patients reflective of HIV-positive persons seeking care in the region. As a consequence of this sampling strategy, patients with more frequent clinic visits may be overrepresented and those with missed clinic visits underrepresented. This study does not provide information on patterns of alcohol and substance use among HIV-positive persons not engaged in clinical care. However, the CHASE Study comprises the largest longitudinal cohort reflective of patients seeking HIV care outside major metropolitan areas in the U.S. Southeast. Because of the rapid growth of the HIV/AIDS epidemic in the U.S. Southeast relative to the rest of the country, we believe the findings of this study have important clinical and policy implications.

In summary, this multisite study characterizes alcohol and substance use patterns among the largest longitudinal cohort reflective of people seeking care for HIV/AIDS in the U.S. Southeast, a region disproportionately impacted by the U.S. epidemic. As with studies of HIV-positive persons in other regions, the prevalence of alcohol and substance use was high among the CHASE cohort. However, patterns of use differed, with crack and cocaine use being reported most frequently among study participants and IDU being relatively uncommon. A consistent negative relationship between adaptive coping strategies and alcohol and drug use was observed. Because of the high prevalence of alcohol and substance use among people living with HIV/AIDS (the "twin epidemics"), and the negative effects of such use on health behaviors (e.g., medication adherence and secondary transmission risk behaviors) and clinical outcomes, developing efficacious interventions to address alcohol and substance use disorders is an area of considerable importance. Based upon the findings of this study, teaching and reinforcing adaptive coping strategies may be an important component of such interventions.

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Author Disclosure Statement

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