

# Utilization of Medical Treatments and Adherence to Antiretroviral Therapy among HIV-Positive Adults with Histories of Childhood Sexual Abuse

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## Abstract

HIV is a chronic, life-threatening illness that necessitates regular and consistent medical care. Childhood sexual abuse (CSA) is a common experience among HIV-positive adults and may interfere with treatment utilization. This study examined rates and correlates of treatment utilization among HIV-positive adults with CSA enrolled in a coping intervention trial in New York City. The baseline assessment included measures of treatment utilization, mental health, substance abuse, and other psychosocial factors. In 2002–2004, participants (50% female, 69% African-American,  $M = 42.3 \pm 6.8$  years old) were recruited. Nearly all (99%) received HIV medical care. However, 20% had no outpatient visits and 24% sought emergency services in the past 4 months. Among 184 participants receiving antiretroviral therapy (ART), 22% were less than 90% adherent in the past week. In a multivariable logistic regression model, no outpatient treatment was associated with African American race (AOR = 3.46 [1.42–8.40]), poor social support (AOR = 1.59 [1.03–2.45]), and abstinence from illicit drug use (AOR = 0.37 [0.16–0.85]). Emergency service utilization was associated with HIV symptoms (AOR = 2.30 [1.22–4.35]), binge drinking (AOR = 2.92 [1.18–7.24]), and illicit drug use (AOR = 1.98 [1.02–3.85]). Poor medication adherence was associated with trauma symptoms (AOR = 2.64 [1.07–6.75]) and poor social support (AOR = 1.82 [1.09–2.97]). In sum, while participants had access to HIV medical care, a sizable minority did not adhere to recommended guidelines and thus may not be benefiting optimally from treatment. Interventions targeting HIV-positive adults with CSA histories may need to address trauma symptoms, substance abuse, and poor social support that interfere with medical treatment utilization and adherence.

## Introduction

**H**IV IS A CHRONIC, life-threatening illness that necessitates regular and consistent use of medical services. With improvements in HIV treatments, particularly antiretroviral therapy (ART), the long-term clinical management of HIV/AIDS can occur primarily in outpatient settings. Guidelines for outpatient visit intervals recommend that HIV-positive persons see providers at least every 3 months, and more frequently when experiencing health-related problems.<sup>1</sup> Less frequent outpatient treatment is a well-established indicator of poor access to HIV care.<sup>2,3</sup> Unfortunately, about half of HIV-positive Americans do not receive regular and consistent care, including fewer than recommended outpatient visits, and many patients use the emergency department

rather than outpatient clinics to receive medical care.<sup>2,4–6</sup> For example, the HIV Cost and Services Utilization Study found that, in the past 6 months, 15% of patients had less than 2 outpatient visits and 23% of patients had one or more emergency department visits not leading to hospitalization.<sup>2</sup> Finally, while ART has dramatically improved clinical outcomes, patients must adhere to their medication regimens to obtain full benefits.<sup>7–9</sup> A recent meta-analysis found that 45% of HIV-positive persons living in North America were not perfectly adherent, and 17%–29% reported less than 90% or 95% adherence in the past 3 to 30 days.<sup>10</sup> While nearly perfect adherence ( $\geq 95\%$ ) is ideal, with newer regimens (e.g., non-nucleoside reverse-transcriptase inhibitor therapy), viral suppression can be achieved with lower levels of adherence.<sup>11,12</sup>

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Childhood sexual abuse (CSA) is a common experience among HIV-positive adults, with estimated rates of abuse ranging from 33% to 53%.<sup>13–22</sup> Living with HIV disease carries with it a multitude of stressors, including physical illness, complex medical treatments, altered relationships, and stigma. The additional burden of coping with CSA may further contribute to suboptimal clinical outcomes. CSA is associated with psychiatric disorders, substance abuse, compromised social support networks, and insufficient self-capacities that may interfere in the utilization of and adherence to HIV medical treatments.<sup>23–28</sup>

While it has been speculated that HIV-positive adults with CSA might be at increased risk for poor utilization of and nonadherence to HIV medical treatments,<sup>29</sup> few studies have examined this. One study found that individuals with CSA were more likely to present early for HIV care, possibly due to higher rates of health care utilization in general.<sup>30</sup> In a study of women with CSA, about a quarter reported imperfect adherence to ART in the past 2 weeks.<sup>31</sup>

Additionally, severity of CSA was associated with substance use, which in turn predicted poor medication adherence.<sup>32</sup> Another study found that number of lifetime traumas, which for many included CSA, was associated with medication nonadherence.<sup>22</sup> In general, factors often associated with CSA have been found to predict poor treatment utilization. Examples include posttraumatic stress and depression, substance abuse, current life stressors, and poor social supports.<sup>33–38</sup> In sum, the available evidence suggests that trauma is associated with poorer medication adherence. However, despite the high prevalence of CSA in HIV-positive adults, it is unclear how or why trauma interferes with the utilization of and adherence to medical treatments. In order to improve HIV clinical outcomes in patients with trauma histories, it is important to identify relevant factors that might be modifiable through social and behavioral intervention.

To address this gap in the literature, the current study examined treatment utilization among a sample of HIV-positive adults with histories of CSA who were enrolled in a coping group intervention trial.<sup>39,40</sup> The specific aims were to: (1) describe the utilization of medical outpatient treatment and emergency department services and adherence to ART, and (2) identify correlates of these treatment utilization variables. It was hypothesized that psychiatric diagnosis, traumatic stress, depression, perceived stress, lack of social support, binge drinking, and illicit drug use would be associated with suboptimal treatment utilization.

## Method

### *Participants and procedures*

Data for this study were collected as part of a clinical trial of a group coping intervention for HIV-positive adults with CSA.<sup>39</sup> Between March and January, participants were recruited in New York City from community-based organizations, including public health and AIDS service organizations and health care clinics. Brochures describing the intervention were distributed at these sites to advertise the study. Interested participants self-referred themselves. Inclusion criteria were HIV infection, sexual abuse prior to age 18, and 18 or more years of age. Exclusion criteria were acute distress due to

sexual victimization in the past month, acute psychosis or impaired mental status, and extreme distress evidenced by suicidal intention or severe depression.

Participants were screened using a structured clinical interview assessing demographics, sexual abuse history, depression, mental status, and participant risk to self or others. A modified version of the Traumatic Experiences Questionnaire was used to verify childhood abuse history.<sup>41</sup> The Beck Depression Inventory was used to identify severe depression (score of  $\geq 30$ ).<sup>42</sup> Of 333 individuals screened, 21 were ineligible (no sexual abuse, 7 severe depression, 6 cognitive impairment, 1 acute sexual victimization),<sup>41</sup> did not return for the baseline assessment, and 271 were enrolled in the study. Three participants missing significant portions of the baseline assessment were omitted, leaving a final sample of 268 participants. Participants completed a 90-minute baseline assessment using a self-administered computer assisted interview. All procedures were approved by an institutional review board.

### *Measures*

**Medical treatment utilization.** As part of an assessment on HIV health care, participants reported how many visits they had attended in the past 4 months with primary care providers and with specialists. These variables were summed and recoded as a dichotomous variable of outpatient visits (0 versus  $\geq 1$ ). As HIV patients are recommended to have at least one outpatient visit every 3 months,<sup>1</sup> this variable provides an indicator of adequate outpatient treatment.

Mental health treatment, substance abuse treatment, and case management were captured in other questions. Participants also reported how many times they had sought emergency services in the past 4 months. This variable was recoded as a dichotomous variable of emergency department visits ( $\geq 1$  versus 0). Participants were then asked if they were receiving ART and, if so, to rate their adherence in the past week using a 0–100 scale (0 = not at all, 100 = all the time). This variable was then dichotomized ( $\geq 9\%$  versus  $< 9\%$ ).

**Predictor variables.** A 20-item measure assessed severity of HIV-related symptoms in the past 4 months using with a 5-point scale ( $\alpha = 0.88$ , current sample).<sup>43</sup> Means scores ranged from 0 (not present) to 4 (very severe). The Personality Assessment Inventory screened for psychiatric disorders.<sup>44</sup> This 344-item measure of personality and psychopathology provides diagnostic hypotheses about Axis I diagnoses. Participants were categorized based on presence of any non-substance use psychiatric disorder (yes versus no), including posttraumatic stress, generalized anxiety, panic, social phobia, depressive, bipolar, and psychotic disorders. The 100-item Trauma Symptom Inventory assessed frequency of trauma symptoms over the past 6 months using a 4-point scale.<sup>45</sup> Fifteen items composing validity scales were excluded, and the mean of the remaining 85 items was calculated ( $\alpha = 0.98$ , current sample). Mean scores ranged from 0 (never) to 3 (often). The 20-item Center for Epidemiologic Studies Depression measure assessed frequency of depressive symptoms over the past week using with a 4-point scale ( $\alpha = 0.92$ , current sample).<sup>46</sup> Mean scores ranged from 0 (rarely/never) to 3 (most/all of the time). The 10-item Per-

ceived Stress Scale assessed how unpredictable, uncontrollable, and overloaded participants perceived their lives to be during the past month using a 5-point scale ( $\alpha = 0.77$ , current sample).<sup>47</sup> Mean scores ranged from 0 (never) to 4 (very often). The 7-item Perceived Availability of Support subscale of the Social Relationship Scale assessed participants' perceptions of their social support system using a 5-point scale ( $\alpha = 0.85$ , current sample).<sup>48</sup> Mean scores ranged from 1 (definitely not) to 5 (definitely yes). Finally, participants reported their frequency of use of various substances, including alcohol, marijuana, cocaine, opioids, amphetamines, and benzodiazepines, in the past 4 months. Because the data were highly skewed (many reported no use), two dichotomous variables were created. Binge drinking was defined as 4 or more alcoholic beverages on any one occasion (yes versus no). Drug use was defined as any use of substances other than alcohol (yes versus no).

### Data analysis

All analyses were performed using SPSS 13.00 (SPSS Inc., Chicago, IL). Descriptive statistics were used to determine sample characteristics and rates of treatment utilization. Binary logistic regression was used to identify correlates of the following medical treatment utilization variables: outpatient visits (0 versus  $\geq 1$  visits), emergency department visits ( $\geq 1$  versus 0 visits), and medication adherence ( $< 90\%$  versus  $\geq 90\%$ ; restricted to participants receiving ART). For both bivariable and multivariable models, odds ratios and 95% confidence intervals for each predictor variable were computed. In the multivariable models, all predictor variables were entered simultaneously. The  $\chi^2$  statistic was used to test the overall fit of each model, and Nagelkerke  $R^2$  was computed as a measure of effect size. Statistical significance was determined at the  $p < 0.05$  level.

## Results

### Sample characteristics

The sample included 133 women and 135 men. The men were primarily (94%) gay/bisexual, and the women were primarily (76%) heterosexual. Participants were ethnically diverse (69% African-American, 17% Hispanic/Latino, 9% Caucasian, 5% other) and had a mean age of 42.3 years (standard deviation [SD] = 6.8). The majority had at least a high school education (60%), had an annual income less than \$10,000 (68%), were currently unemployed (89%), and had a history of homelessness (68%). Most participants (75%) received Medicare/Medicaid or veterans' benefits, 8% had private insurance, and 17% were uninsured. The mean time since HIV diagnosis was 9.7 years (SD = 5.3). Approximately half of the sample (53%) screened positive for one or more psychiatric disorders (30% depressive, 25% anxiety, 11% psychotic, 10% adjustment, 4% bipolar). Approximately one third (37%) used illicit drugs (26% marijuana, 26% cocaine, 20% other), and 10% reported binge drinking in the past 4 months.

### Rates of medical treatment utilization

As shown in Table 1, nearly all participants (99%) were enrolled in HIV medical treatment. Nearly two thirds of participants (62%) received HIV health care in hospital-based

TABLE 1. RATES OF HIV MEDICAL TREATMENT UTILIZATION (N = 268)

	n (%)
Enrolled in HIV medical treatment	265 (99%)
Any outpatient visits, past 4 months	215 (80%)
Frequency of primary care visits, past 4 months	
0	53 (20%)
1–2	93 (35%)
3–4	89 (33%)
$\geq 5$	29 (11%)
Don't know	4 (1%)
Frequency of specialty visits, past 4 months	
0	209 (78%)
1–2	41 (15%)
3–4	11 (4%)
$\geq 5$	4 (2%)
Don't know	3 (1%)
Any emergency department visit, past 4 months	68 (24%)
Any inpatient hospitalization, past 4 months	35 (13%)
Receiving ART, currently	184 (69%)
$\geq 90\%$ ART adherence, past week	140 (78%) <sup>a</sup>
Mean ART adherence, past week	90.92% (SD = 19.93%) <sup>a</sup>

<sup>a</sup>n = 180 (4 participants did not provide adherence data. ART, antiretroviral therapy; SD, standard deviation.

clinics specializing in HIV/AIDS; the rest received treatment in other types of clinics. The majority (80%) had at least one outpatient visit in the past 4 months. All of these participants saw their primary care provider, and 24% also saw a specialist. The majority of participants (87%) who scheduled medical appointments attended all visits. Among participants with no outpatient visits, 91% did not schedule appointments and 9% missed appointments. In the past 4 months, 24% of participants reported one or more emergency department visits, and 13% were admitted for inpatient hospitalization. Patients who received outpatient treatment and those who did not were equally likely to have visited the emergency department (76% versus 79%;  $\chi^2(1) = 0.20$ ,  $p = 0.66$ ). Approximately two thirds of participants (69%) were receiving ART. Among these participants, 78% reported taking at least 90% of medication doses over the past week. Mean adherence was 90.9% (SD = 19.9%). Many participants also received mental health treatment in the past 4 months, with those screening positive for a psychiatric disorder being more likely than those who did not (59% versus 41%,  $\chi^2(1) = 73.46$ ,  $p < 0.001$ ). Participants who received mental health treatment were significantly more likely than those who did not to have an outpatient medical visit (99% versus 57%;  $\chi^2(1) = 73.46$ ,  $p < 0.001$ ), but they were equally likely to have an emergency department visit (26% versus 21%;  $\chi^2(1) = 0.90$ ,  $p = 0.34$ ) and be poorly adherent to ART (73% versus 82%;  $\chi^2(1) = 2.00$ ,  $p = 0.16$ ).

### Correlates of medical treatment utilization

**Outpatient treatment.** In both bivariable and multivariable analyses, receiving no outpatient treatment was significantly associated with African-American race, poorer social

TABLE 2. UNIVARIABLE CORRELATES OF MEDICAL TREATMENT UTILIZATION  
(UNADJUSTED ODDS RATIOS AND 95% CONFIDENCE INTERVALS)

	Outpatient visits (0 vs. $\geq 1$ ), past 4 months N = 268	Emergency department visits ( $\geq 1$ vs. 0), past 4 months N = 268	Medication adherence (< 90% vs. $\geq 90\%$ ), past week n = 180
Female	1.82 (0.98–3.38)	1.49 (0.84–2.62)	1.40 (0.63–3.13)
African American	3.36 (1.44–7.81) <sup>a</sup>	0.76 (0.41–1.41)	1.11 (0.55–2.26)
HIV symptoms	1.02 (0.56–1.86)	2.28 (1.34–3.88) <sup>a</sup>	1.53 (0.76–2.67)
Psychiatric disorder	1.09 (0.58–2.03)	1.22 (0.69–2.16)	1.32 (0.63–2.67)
Traumatic stress symptoms	0.57 (0.33–1.01)	1.08 (0.66–1.76)	1.75 (0.95–3.21)
Depressive symptoms	0.88 (0.53–1.46)	1.12 (0.71–1.78)	1.22 (0.66–2.20)
Perceived stress	1.14 (0.79–1.63)	1.13 (0.81–1.58)	1.14 (0.75–1.73)
Poor social support	1.47 (1.03–2.13) <sup>b</sup>	0.98 (0.68–1.41)	1.56 (1.02–2.41) <sup>b</sup>
Any binge drinking	0.29 (0.07–1.27)	3.28 (1.46–7.33) <sup>a</sup>	2.87 (1.01–8.11) <sup>b</sup>
Any illicit drug use	0.30 (0.14–0.64) <sup>a</sup>	2.00 (1.12–3.54) <sup>b</sup>	1.35 (0.65–2.79)

<sup>a</sup> $p < 0.01$ .

<sup>b</sup> $p < 0.05$ .

support, and abstinence from illicit drugs (Tables 2 and 3). Specifically, African Americans were 3.5 times more likely than participants of other races to have no outpatient visits. For every 1 point decrease in social support (on the 5-point scale), participants were 1.6 times more likely to have no outpatient visits. Finally, participants who used illicit drugs were 2.7 times less likely to have no outpatient visits.

**Emergency services.** In both bivariable and multivariable analyses, emergency service utilization was significantly associated with HIV symptoms, binge drinking, and illicit drug use (Tables 2 and 3). Specifically, for every 1 point increase in severity of HIV symptoms (on the 5-point scale), participants were 2.0 times more likely to have visited the emergency department. Participants who engaged in binge drinking were 0.9 times more likely to have visited the emergency department, and those who used illicit drugs were 2.0 times more likely to have visited the emergency department.

**Poor medication adherence.** In bivariable analyses, among participants receiving ART, poor social support and binge drinking were associated with poor adherence (<90%; Table 2).

In multivariable analysis, traumatic stress symptoms and poorer social support were significant predictors; binge drinking was marginally but not significantly associated with poor adherence (Table 3). Specifically, for every 1 point increase in traumatic stress symptoms (on the 4-point scale), participants were 2.0 times more likely to be poorly adherent. For every 1-point decrease in social support, participants were 1.8 times more likely to be poorly adherent.

A subanalysis of 232 participants (87% of the sample) who reported their most recent CD4 cell count found that CD4 cell count was unrelated to outpatient treatment (OR = 0.98 [0.87–1.11],  $p = 0.80$ ) or emergency services (OR = 1.00 [0.90–1.10],  $p = 0.95$ ), but it was significantly associated with poor medication adherence (OR = 0.85 [0.73–0.98],  $p = 0.025$ ). Specifi-

TABLE 3. MULTIVARIABLE CORRELATES OF MEDICAL TREATMENT UTILIZATION  
(ADJUSTED ODDS RATIOS AND 95% CONFIDENCE INTERVALS)

	Outpatient visits (0 vs. $\geq 1$ ), past 4 months N = 268	Emergency department visits ( $\geq 1$ vs. 0), past 4 months N = 268	Medication adherence (< 90% vs. $\geq 90\%$ ), past week n = 180
Female	1.40 (0.70–2.79)	1.84 (0.96–3.54)	1.19 (0.53–2.65)
African American	3.46 (1.42–8.40) <sup>a</sup>	0.76 (0.40–1.44)	1.77 (0.73–4.28)
HIV symptoms	1.25 (0.62–2.54)	2.30 (1.22–4.35) <sup>b</sup>	1.31 (0.55–3.11)
Psychiatric disorder	1.27 (0.60–2.68)	1.26 (0.62–2.55)	0.46 (0.19–1.15)
Traumatic stress symptoms	0.50 (0.23–1.12)	0.58 (0.28–1.22)	2.64 (1.07–6.75) <sup>b</sup>
Depressive symptoms	0.60 (0.25–1.45)	0.87 (0.39–1.93)	0.81 (0.29–2.32)
Perceived stress	1.59 (0.89–2.81)	1.09 (0.64–1.85)	0.74 (0.38–1.44)
Poor social support	1.59 (1.03–2.45) <sup>b</sup>	0.89 (0.60–1.34)	1.82 (1.09–2.97) <sup>b</sup>
Any binge drinking	0.50 (0.11–2.38)	2.92 (1.18–7.24) <sup>b</sup>	3.05 (0.92–10.09)
Any illicit drug use	0.37 (0.16–0.85) <sup>b</sup>	1.98 (1.02–3.85) <sup>b</sup>	1.08 (0.45–2.56)
$\chi^2$ ( $df = 11$ )	33.97 <sup>a</sup>	24.68 <sup>c</sup>	16.72 <sup>b</sup>
Nagelkerke $R^2$	0.19	0.13	0.14

<sup>a</sup> $p < 0.001$ .

<sup>b</sup> $p < 0.05$ .

<sup>c</sup> $p < 0.01$ .

cally, for every 100-point decrease in CD4 cell count, participants were 18% more likely to have been less than 90% adherent.

## Discussion

In this sample of HIV-positive adults with histories of CSA, nearly all reported being enrolled in medical care for HIV. While the majority of participants reported at least one outpatient visit in the previous 4 months (as per recommended guidelines), 20% reported no visits and 24% utilized emergency services. Among participants receiving ART, 22% were poorly adherent (<90%) to their medications during the past week. In sum, while nearly all participants had access to HIV treatment, a sizable minority was insufficiently adherent to recommended medical treatments and thus may not be benefiting optimally.

The rates of medical treatment utilization in our sample were lower than those observed in nationally representative samples of adults receiving HIV care in the United States,<sup>2,4</sup> but they were comparable to other studies of socioeconomically disadvantaged persons.<sup>49,50</sup> These findings add to the accumulating evidence that vulnerable persons, including those who have trauma histories, abuse alcohol and other drugs, and live in unstable conditions, may be at higher risk for suboptimal treatment utilization. CSA increases the likelihood of these and many other outcomes that may negatively impact health care, including sexual revictimization as children and adults, partner violence, unstable relationships, poor social support, substance abuse and dependence, suicidal and self-harm behaviors, and diminished self-care.<sup>13–21,23–28</sup> Prior research has found that recent stressful events are associated with ART nonreceipt,<sup>36</sup> and that number of lifetime traumas and current depression are associated with ART nonadherence<sup>22</sup> in HIV-positive adults in general. Thus, trauma-related issues may play an important role in HIV treatment utilization.

In this sample of HIV-positive adults with CSA, we found that traumatic stress, binge drinking and illicit drug use, HIV symptoms, and poor social support were risk factors for one or more indicators of suboptimal treatment utilization. First, greater traumatic stress symptoms were associated with poorer adherence to ART; interestingly, psychiatric disorder, depressive symptoms, and perceived stress were not. Liu and colleagues<sup>32</sup> also found that depression and anxiety were unrelated to medication adherence in HIV-positive women with histories of CSA. Second, as in previous studies of HIV patients in general,<sup>51,52</sup> poor social support was associated with both not attending outpatient visits and not adhering to ART. Thus, in HIV-positive adults with CSA, symptoms of traumatic stress and interpersonal difficulties, specifically, may be more important predictors of treatment utilization than general psychiatric distress. Common symptoms of traumatic stress include flashbacks, hyperarousal, and intrusive images, which often lead to avoidance and escape behaviors.<sup>53</sup> For some, medical care may serve as a trigger for prior life experiences that contributed to their HIV infection, resulting in missed medical appointments and medication doses. A sense of foreshortened future is also common,<sup>53</sup> which may lead to hopelessness about the potential benefits of treatment. Many victims of interpersonal trauma have difficulty trusting others, including medical providers, which may

further compromise treatment adherence.<sup>52</sup> Finally, many traumatized individuals have difficulty recognizing harm and developing self-protective mechanisms, and non-adherence to medical treatment may be a manifestation of this.<sup>29</sup> Thus, mental health treatment for trauma may be important for optimizing clinical outcomes in HIV-positive individuals. Indeed, in this study, mental health treatment was associated with increased utilization of medical care. Interventions aimed at improving treatment utilization might also focus on increasing supports, both formal and informal, particularly in communities of color.

Not surprisingly, individuals with more severe HIV symptoms were more likely to visit the emergency department, likely reflecting appropriate use of emergency services. After accounting for HIV symptoms, however, binge drinking and illicit drug use remained strongly associated with emergency department visits. Substance abuse may lead to injuries (e.g., due to falls or physical assaults) that require immediate medical attention, and it may also exacerbate physical illness. A study of HIV-positive veterans also found that alcohol abuse predicted emergency department visits.<sup>54</sup> Binge drinking may also interfere with adherence to medication regimens, which may partially explain why hazardous alcohol consumption is associated with increased HIV and comorbid disease progression and mortality.<sup>55–57</sup> In this sample, binge drinkers were more likely to be nonadherent to their medications, but this relationship was not significant in multivariable analyses accounting for other psychosocial variables. These results highlight the importance of assessing substance abuse among HIV-positive persons and providing treatment for alcohol and other drug use when indicated. Unfortunately, alcohol and other drug abuse is often under-recognized, with only a minority of patients discussing these issues with HIV medical providers.<sup>58</sup>

Finally, we found that African Americans were over three times less likely to have received outpatient medical care in the past 4 months. In the United States, African American women and men are 23 and 8 times more likely to be diagnosed with HIV/AIDS than are white women and men, respectively, and they have shorter survival times.<sup>59</sup> Other studies have also observed suboptimal treatment utilization in minority groups.<sup>2,36,60,61</sup> These findings reinforce the importance of eliminating health disparities by increasing services to provide early and equal access to health care for low-income persons living with HIV/AIDS.<sup>62</sup>

The results of this study must be interpreted in light of the following limitations. First, while the sample was diverse in terms of gender, race, and sexual orientation and was recruited from various community-based organizations, participants all sought group treatment for coping with HIV and CSA. Furthermore, the vast majority was enrolled in HIV care and had been living with HIV/AIDS for an average of 10 years. Thus, results may not generalize to HIV-positive individuals who live in communities with fewer HIV services, are not actively seeking or lack access to services, have been more recently infected, and/or live in other regions of the world. Second, this study relied on self-report data, which is subject to recall and social desirability biases. Prior studies of marginalized HIV-infected samples found that participants overestimated outpatient visits and medication adherence,<sup>63–65</sup> so rates of treatment utilization in this study may have been even lower than reported.<sup>64,66,67</sup> Future studies might consider

multiple assessment methods, including medical record review and Medication Event Monitoring System, and lower adherence thresholds to account for improvements in ART regimens.<sup>12,64,65</sup> Nevertheless, self-reported adherence to ART has been found to predict virologic failure,<sup>68</sup> and it was predictive of immune functioning in this study. Finally, limited information on participants' medical history was available, so it was not possible to determine the purpose of medical visits or whether emergency department visits might have been prevented through more appropriate utilization of outpatient treatment.

In conclusion, the vast majority of participants in this diverse sample of HIV-positive adults with CSA had access to HIV medical care. Nevertheless, as in previous studies, a sizable minority did not adhere to recommended guidelines on outpatient visits and ART adherence. Trauma symptoms, binge drinking, illicit drug use, poor social support were associated with suboptimal treatment utilization. Interventions aimed at improving HIV clinical outcomes in this population may need to address these psychosocial problems. Prior research has found that HIV case management can improve treatment utilization, including more outpatient visits and fewer hospital days, with lower overall health care costs.<sup>64,66,67</sup> Thus, many HIV-positive adults with CSA might benefit from case management or other interventions to help address psychosocial problems that interfere with optimal treatment utilization.

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### Author Disclosure Statement

No competing financial interests exist.

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