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Substance Use Treatment Utilization Among Women with and without HIV

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An abstract of

A thesis submitted to the Faculty of the

James T. Laney School of Graduate Studies of Emory University

in partial fulfillment of the requirements for the degree of

Master of Science

in Clinical Research

2023

Abstract

Substance Use Treatment Utilization Among Women with and without HIV

By A. Wendy Fujita

Introduction
Substance use (SU) contributes to poor health outcomes, yet limited data exist to inform strategies to optimize SU treatment among people living with HIV. We describe SU and SU treatment utilization among women with and without HIV in the Women's Interagency HIV Study (WIHS).

Methods
We included data from women enrolled in WIHS from 2013-2020. Current SU was self-reported, non-medical use of drugs in the past year, excluding use of only marijuana. Substance use treatment utilization was self-reported use of a drug treatment program in the past year. Multivariable regression models were used to investigate associations between participant characteristics and SU treatment.

Results
Among 2559 women (1802 women living with HIV (WWH), 757 women without HIV), 14% reported current SU. Among those with current SU (n=367), 71% reported crack/cocaine followed by 40% reporting opioids, and 42% reported any treatment in the past year. The most common treatments were methadone (64%), Narcotics Anonymous (29%), inpatient (28%), and outpatient programs (16%). Among women using opioids (n= 147), 67% reported methadone use in the past year compared to 5% using buprenorphine/naloxone. Multivariable analysis showed lower odds of treatment utilization among women with current SU with concurrent alcohol use (OR 0.24, 95% CI 0.12-0.48 for >7 drinks/week) or marijuana use (OR 0.31, 95% CI 0.18-0.54). Visiting a psychiatrist/counselor was associated with higher odds of treatment (OR 2.46, 95% CI 1.34-4.50). Among WWH, SU treatment was not associated with HIV-related clinical outcomes.

Conclusions
Substance use treatment utilization was high, especially for methadone use. Our results highlight opportunities for accessing SU treatment for WWH, such as the need to prioritize buprenorphine and comprehensive, wraparound services in HIV care settings.

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I am grateful for my program director, Wendy Armstrong, who encouraged me to apply for the MSCR program and for my co-fellows in Infectious Diseases who have been supportive as colleagues and friends.

Lastly, I would like to thank my family, including my husband, Morgan Greenleaf, for his endless support throughout the MSCR program as we navigated becoming first-time parents.

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INTRODUCTION

In the United States, up to half of people living with HIV (PWH) report current substance use (SU) or substance use disorders (SUD) (1, 2), which is associated with worse HIV-related outcomes, including decreased antiretroviral therapy (ART) uptake and adherence, retention in HIV care, and virologic suppression (3, 4). Among persons without HIV, SU increases risk of HIV acquisition (5, 6). Therefore, addressing SU may facilitate treatment and prevention of HIV and improve HIV care continuum outcomes, as aligned with the goals of the National HIV/AIDS Strategy (7).

Although evidence-based treatments for SUD exist, uptake remains low. A national survey on drug use in 2015 revealed that as few as 10% of persons with SUD in the US received treatment in the past year (8). Women living with HIV (WWH) experience additional barriers to SU treatment compared to men and to women without HIV, including increased stigma, fear of violence, and loss of parental custody (9-11). Collectively, these barriers emphasize the need for gender-specific interventions to improve SUD care among WWH (9, 12). However, many studies on SUD treatment uptake in PWH are dated or focused on men, thus the current extent of treatment uptake among WWH remains unknown, limiting our ability to tailor strategies to improve SUD treatment utilization for women with and without HIV.

In this study, we aimed to (1) describe patterns of and identify factors associated with SU among women with or without HIV, (2) assess prevalence of and factors associated with SU treatment utilization among participants with current SU, and (3) describe patterns of co-utilization of health services among women with current SU.

BACKGROUND

Substance use and HIV are frequently co-occurring conditions, and engaging in SU is associated with worse HIV care continuum outcomes. The HIV and SU epidemics are deeply intertwined in the US, with nearly half of PWH reporting current SU, often with co-morbid depression, anxiety, and other mental illnesses (1, 2, 13). Substance use in PWH has been shown to be associated with decreased ART uptake, medication adherence, retention in HIV care, and virologic suppression (1-4, 14). In individuals without HIV, engaging in SU has been associated with high-risk sexual behaviors and injection behaviors that increase risk of HIV transmission (15, 16). Therefore, addressing SU may facilitate treatment and prevention of HIV, improve HIV care continuum outcomes, and curb both epidemics which currently fuel each other.

Women with HIV who use substances have worse HIV-related outcomes than their male counterparts and have unique needs in the context of HIV and SU care. Women who engage in SU have higher risk of acquiring HIV and other infections than men, and once acquiring HIV, they have lower ART uptake, faster disease progression, and higher mortality, when compared to men who engage in SU or women without SU (17-20). Gender has also been shown to be a significant moderator in who receives SU treatment (10, 21), although this has not been well-described in PWH. Women experience additional barriers to SU treatment, including increased stigma compared to men, fear of violence, higher rates of psychiatric disorders, and loss of parental custody (9, 10, 12). Additionally, for pregnant women or women of reproductive age, there may be healthcare provider discomfort and bias due to lack of training in treating SU in pregnant women (22), and healthcare may be fragmented during and after pregnancy (23). Collectively, these barriers emphasize the need for gender-specific interventions to improve SU

care among WWH, but there is a concerning absence of contemporary literature on the extent of SU treatment uptake among WWH. Many studies on SUD treatment uptake in PWH are dated or focused on men, limiting our ability to tailor strategies to improve SUD treatment utilization for women with or without HIV.

Evidence-based treatments for SUD exist and have been shown to improve HIV-related outcomes. The strongest evidence in recent literature has emphasized the benefits of medications for opioid use disorder (MOUD), including methadone and buprenorphine. Specifically, buprenorphine has been shown to be effective in reducing overdose deaths, opioid craving, and illicit opioid use (24). In PWH, it improves engagement and retention in HIV care, antiretroviral adherence, and HIV viral suppression (25, 26). Several models of care to integrate comprehensive SU treatment into HIV care settings have been described, such as collaborative care models, where nurse program directors, nurse care managers, program coordinators, and physicians share clinical responsibilities (27). This model of care offloads the burden of treatment from physicians and has demonstrated effective use of physician time while increasing access to OUD treatment (27). Other models for integrating SUD treatment services into HIV care have been previously described, including tele-health models (28-32), however the majority of research has focused on OUD with few evidence-based treatments available for other SUD such as stimulant use disorders.

Data on SUD treatment utilization in diverse populations of women will inform future strategies to fill the implementation gap in SUD treatment in the context of HIV care and prevention services for women. There is a known implementation gap in SU treatment in the

general population (33, 34), with as low as 10% of persons with SUD receiving needed treatment in the past year (8). Some barriers to treatment include cost, stigma, and decreased access to health care services, and these barriers are often higher in PWH. Some SUD treatment strategies have been shown to be better than others; for example, short term detoxification and referrals to external substance use programs have not been shown to produce long- term abstinence from illicit substances as compared to MOUD (35, 36). Some studies have demonstrated that integrating HIV and SUD treatment services into a single location rather than relying on external referrals may facilitate SU treatment uptake by reducing barriers to care (37-39). Other studies have shown that integrating comprehensive, wraparound services into SU treatment programs for women helps to meet their co-occurring social needs, improves access to health care, and improves child welfare (40, 41). Despite these studies, we continue to lack data to guide the implementation process or to determine optimal models of integrated care, recognizing that strategies need to be adapted depending on substance use patterns, which vary with age, sex, HIV status, and geographic region (42). We need contemporary, formative data on SU treatment utilization among diverse populations of WWH to begin closing this implementation gap.

The Women's Interagency HIV Study (WIHS) is a large, prospective cohort study with over 20 years of follow-up of women with HIV and demographically similar women without HIV. The cohort therefore offers the ability to fill this knowledge gap by allowing for data collection from geographically diverse sites across the US in an aging population of women with and without HIV.

METHODS

Hypothesis and Specific Aims

This analysis was conducted with the following three specific aims:

(1) To characterize SU and factors associated with current SU among WIHS participants.

Hypothesis: Current SU would be higher among WWH, and patterns of SU would vary

by HIV serostatus.

(2) To analyze the prevalence and factors associated with SU treatment utilization among

WIHS participants with current SU. *Hypothesis*: Given the availability of resources

provided by the Ryan White HIV/AIDS program, WWH would have higher rates of SU

treatment utilization than women without HIV.

(3) To describe patterns of co-utilization of HIV, SU, and mental health treatment services

among women who report current SU. *Hypothesis*: Among women with current SU,

utilization of SU treatment services would be disproportionately lower than the utilization

of other health care services.

Study Population

The Women's Interagency HIV Study (WIHS) is a large, prospective cohort study that

began in 1993 and includes women with HIV and demographically similar women living without

HIV. Women without HIV were eligible if they had at least one high-risk exposure in the

previous five years, such as sex with a man with HIV or a sexually transmitted infection.

Notably, injection drug use and use of crack/cocaine, heroin, or methamphetamines were

considered high-risk exposures in the inclusion criteria. Additional details on eligibility criteria

and recruitment methods have been published previously (43-45).

The WIHS enrolled participants in 1994-1995, 2001-2002, and 2011-2012 from Bronx, NY; Brooklyn, NY; Chicago, IL; Los Angeles, CA; San Francisco, CA; and Washington, DC. Because of the growing HIV epidemic among minority populations in the South, four additional sites were added in 2013-2015 (Atlanta, GA; Chapel Hill, NC; Miami, FL; Birmingham, AL-Jackson, MS). WIHS participants completed biannual follow-up visits, during which detailed medical histories were obtained by interviewers, and comprehensive physical exams were conducted. The WIHS protocol (43) was approved by each site's Institutional Review Board, and all participants provided written informed consent.

Study Design

We included study visits from women with and without HIV from all 10 clinical sites from October 2013 to March 2020 to provide contemporary information on SU and treatment utilization. To capture both current and past SU, we limited our sample to participants with at least two visits: a baseline visit and at least one follow-up visit during our study period. HIV status was determined at last observed study visit.

Data from questionnaires, including questions on SU behaviors, SU treatment utilization history, other healthcare utilization, demographic factors, sociobehavioral factors, and clinical history completed during the study period were included. Longitudinal WIHS data from study enrollment through observation end were cross-sectionalized such that covariates, SU, and SU treatment utilization were assessed as the last observed study visit for each participant.

Outcome measures
Substance use (Aim 1) and substance use treatment utilization (Aim 2)

Substance use was self-reported as non-medical use of drugs, including crack/cocaine, methamphetamines, other amphetamines, opioids, tranquilizers, and other drugs (including hallucinogens, inhalants, and other club drugs). Marijuana use alone was excluded from the primary outcome, as prior studies have not shown its association with worse HIV care continuum outcomes (46, 47). Marijuana, alcohol, and tobacco were considered covariates. For this study, SU was characterized by time since last use and reported as current use (<1 year, primary outcome), recent use (1-4.9 years), or prior use (≥5 years).

Substance use treatment utilization was self-reported as utilization of any drug treatment and was similarly categorized by time since last reported. We conceptualized drug treatment broadly; types of treatment included: inpatient or outpatient detoxification programs, halfway houses, prison or jail-based programs, Narcotics Anonymous, and medications for opioid use disorder (MOUD, including methadone or buprenorphine/naloxone). Because some persons with SUD utilize Alcoholics Anonymous, we also described use of this program, but it was not included in the primary outcome variable to avoid misclassification of women with alcohol use disorders as those with SU.

For this analysis, the primary outcome was any SU treatment in the past year (yes/no). We assessed SU treatment utilization only among participants with current SU. We also reported utilization of each SU treatment service by type of substance used.

Covariates

Our primary independent variable was HIV serostatus. Gender was not included as a variable, as only 1 participant was transgender. Other demographic covariates included age (continuous), race/ethnicity (White/non-Hispanic, Black/non-Hispanic, Hispanic, Other/non-Hispanic), WIHS study region [New York (Bronx, Brooklyn), Washington, D.C., California (San

Francisco, Los Angeles), Illinois (Chicago), and South (Chapel Hill, Atlanta, Miami, Birmingham-Jackson)], highest level of education (≤ high school, >high school), marital status (married/partner, unmarried/no partner), current employment status (unemployed, employed full/part-time), median household income (≤$24000, >$24000), and insurance status, defined as private health insurance, Ryan White programs, or AIDS Drug Assistance Programs (insurance, no insurance). Sociobehavioral covariates included alcohol use (none, 1-7 drinks/week, >7 drinks/week), tobacco use, defined as cigarette smoking (current, former, never), history of incarceration (yes, no), history of reported physical abuse (yes, no), history of reported sexual abuse (yes, no), history of transactional sex (yes, no), and depressive symptoms (yes/no). Presence of depressive symptoms was defined as Center for Epidemiologic Studies-Depression (CESD) score of ≥16. Degree of alcohol use was based on the National Institute on Alcohol Abuse and Alcoholism, which defines >7 drinks/week as heavy drinking in women (48). Clinical covariates among participants with HIV included HIV CD4+ lymphocyte count >200 cells/μL (yes, no), viral suppression, defined as HIV RNA level <200c/mL^3 (yes, no), and current use of ART (yes, no).

Sample Size Calculation

We estimated that ~40% of participants would report SU over a 5-year period, based on preliminary data from Southern WIHS sites. A logistic regression of current SU (yes, no) on a binary independent variable (X) with a sample size of 600 participants in a subgroup (e.g., women with HIV), of which 50% are in group X=0 and 50% are in group X=1, achieved between 81% and 100% power at 0.05 significance to detect a difference in the probability of SU corresponding to odds ratios of 0.61 and 0.38.

Analytic Plan

We compared participant characteristics by HIV serostatus using Chi-square tests for categorical variables, Wilcoxon rank sum tests for non-normally distributed continuous variables, and t-tests for normally distributed continuous variables. HIV-specific clinical characteristics were described for WWH only.

We performed unadjusted logistic regression (bivariate analyses) to generate odds ratios and 95% confidence intervals for HIV serostatus and current SU:

$$\text{Model: Log } (p/1\text{-}p) = \beta_0 + \beta_1 x_1$$

$$P = \text{probability of current substance use}$$

$$X_1 = \text{HIV serostatus}$$

We repeated these bivariate analyses for each of the covariates.

Fully adjusted models

We then used multivariable logistic regression models to assess the association of demographic, sociobehavioral, and clinical factors with current SU (primary outcome). For our regression models, we included variables with $p < 0.05$ in bivariate analyses or variables selected based on literature review; HIV status and HIV-related clinical outcomes, as well as WIHS study region, were included in the model a priori based on the empirical literature. To assess association between current SU and HIV-related clinical outcomes, we used the same methods to conduct a subset analysis among WWH only with a separate regression model. Model fit was assessed by Hosmer-Lemeshow goodness of fit tests.

$$\text{Model: Log } (p/1\text{-}p) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \dots$$

$$P = \text{probability of current substance use}$$

$$X_1 = \text{HIV serostatus}, X_2 = \text{additional covariates} \dots$$

For Aim 2, we used descriptive statistics to characterize frequency and patterns of SU treatment utilization by treatment types and substance types. We then repeated the same methods as in Aim 1 to assess associations between SU treatment utilization in the past year (primary outcome) and HIV serostatus, as well as other demographic and sociobehavioral factors. Again, we conducted a separate regression model among WWH only to assess associations between SU treatment and HIV-related outcomes.

For Aim 3, we used descriptive statistics to assess the frequency of co-utilization between HIV services, mental health services, and SU services (including drug treatment, alcohol treatment, and tobacco treatment). Among participants who reported current SU and who were eligible for each healthcare service, we described utilization of each healthcare service. For example, only participants who reported heavy alcohol use and current SU were included in the denominator for the proportion of patient who co-utilized alcohol and SU treatment. We compared the utilization of other health services by those who did or did not utilize SU treatment using Chi-square tests. We did not perform regression models for this aim due to the small sample size of women with current SU who co-utilized multiple health services.

We conducted a complete case analysis. Missing data were assumed to be missing at random and not imputed. All analyses were conducted in SAS v9.4 and significance was set at α = 0.05.

RESULTS

Baseline Characteristics

Our study included 2559 women (1802 WWH, 757 women without HIV), **Figure 1**. The mean age was 51.7 (SD 9.5) years, and 71.7% self-identified as non-Hispanic Black race/ethnicity. Most were unemployed (63.0%), had annual household incomes ≤$24000/year (72.1%), had completed high school (65.1%), and had health insurance (95.3%). Nearly half (43.5%) had history of incarceration. High proportions of women had experienced physical abuse (37.6%), depressive symptoms (30.3%), or sexual abuse (26.5%). In this cohort, 39.3% reported current tobacco use, 27.1% reported current marijuana use, and 10.1% reported drinking >7 drinks/week. Regarding healthcare utilization, 85.0% reported seeing any health care provider since their last study visit, and of those, 30.0% saw a psychiatrist or counselor. Among WWH, 89.3% saw an HIV provider in the past 6 months. The majority of WWH in this cohort were virologically suppressed (84.9%) and taking ART (91.8%). Baseline characteristics stratified by HIV serostatus are shown in **Table 1**.

Current Substance Use and Associated Factors

In this cohort of women, 14.3% (12.8% WWH, 18.1% women without HIV-) reported current SU. An additional 9.8% reported recent use, and an additional 41.9% reported prior use. Lifetime SU in this cohort was 66.0%.

Types of substances used currently, recently, or previously are shown in **Figure 2**. Among women with current SU (n=367), 71.4% reported using crack/cocaine, 52.0% marijuana, 40.1% opioids, 6.5% methamphetamines, 6.5% tranquilizers, and 1.9% other amphetamines; 11.7% reported injecting drugs. Additionally, among women with current SU, 77.1% reported current tobacco use, 52.0% reported current marijuana use, and 27.0% reported >7 drinks/week.

Regarding polysubstance use, among those with current SU, crack/cocaine and opioids were the most frequently co-utilized substances (15.5%). **Table 2** shows other patterns of polysubstance use. When assessing the number of substances used, half (50.1%) of women with current SU used two substances when including marijuana. The proportion of women who utilized SU treatment, by number of substances used is shown in **Table 3.**

In an adjusted model (**Table 4**), unemployment (OR 1.96, 95% CI 1.34-2.85), history of incarceration (OR 2.50, 95% CI 1.81-3.45), history of trading sex for drugs/money/shelter (OR 2.35, 95% CI 1.74-3.16), depressive symptoms (OR 1.40, 95% CI 1.05-1.86), consuming >7 drinks/week (OR 3.79, 95% CI 2.59-5.55), and current tobacco use (OR 3.84, 95% CI 2.42-6.10) were associated with higher odds of current SU, while non-Hispanic Black race/ethnicity was associated with lower odds (OR 0.61, 95% CI 0.45-0.83). In a separate model including only WWH, current SU was associated with viral non-suppression (OR 2.25, 95% CI 1.32-3.84), but not other HIV outcomes.

Patterns of Utilization of Types of Substance Use Treatment Programs

The proportion of women with current SU utilizing each SU treatment program, by substance type, is shown in **Table 5** as a heat map. The proportion of women reporting any SU treatment in the past year was 77.6% among those who used opioids, 28.2% among those who used crack/cocaine, and 25.0% among those who used methamphetamines or tranquilizers. Among women with current opioid use (n= 147), 67.4% reported methadone treatment in the past year, and 5.4% received buprenorphine/naloxone treatment. Outpatient detoxification programs were underutilized compared with inpatient programs. Except for use of tranquilizers, fewer than 2% of women with other types of SU reported jail/prison-based treatment programs.

Substance Use Treatment Utilization and Associated Factors

Among women reporting current SU (n=367), 42.2% (40.4% WWH, 45.3% women without HIV) reported utilization of any SU treatment program in the past year. The most common SU treatment types among those who utilized treatment in the past year were methadone (64%), Narcotics Anonymous (29%), and inpatient detoxification programs (28%). Current, recent, and prior treatment among women with current, recent, and prior SU are shown in **Figure 3.**

In an adjusted model, HIV seropositivity was associated with lower odds of SU treatment utilization, although this association did not reach statistical significance (OR 0.57, 95% CI 0.31-1.04, **Table 6**). Co-utilization of alcohol was associated with lower odds of treatment (OR 0.24, 95% CI 0.12-0.48 for >7 drinks/week), as was use of marijuana (OR 0.31, 95% CI 0.18-0.54). In contrast, current tobacco use was associated with higher odds of treatment (OR 3.35, 95% CI 1.07-10.45). Regarding healthcare utilization, seeing a psychiatrist or counselor since their last visit was associated with higher odds of treatment (OR 2.46, 95% CI 1.34-4.50), however seeing any health care provider since last study visit was not associated with treatment.

In a separate model among WWH only, we included age, race, WIHS region, health insurance, depressive symptoms, alcohol use, current tobacco use, current marijuana use, seeing healthcare provider, seeing psychiatrist/counselor, HIV care, viral suppression, CD4 >200 cells/μL, and ART use. Only alcohol use was associated with lower odds of SU treatment (OR 0.20, 95% CI 0.08-0.48 for 0-7 drinks/week and OR 0.24, 95% CI 0.09-0.65 for >7 drinks/week). SU treatment utilization in the past year was not associated with any HIV care continuum outcomes, including engagement in HIV care, ART use, or viral suppression. In a sub-analysis of each SU treatment type among WWH, no individual SU treatment type was associated with HIV-related outcomes in adjusted models.

Frequency and Patterns of Co-utilization of Health Services

Regarding utilization of other health services, 46.5% (n=281) of women reporting depressive symptoms saw a mental health provider, 42.2% (n=155) of women reporting current SU utilized SU treatment, 11.4% (n=105) of women who currently smoke tobacco utilized any tobacco cessation treatment or program, and 8.9% of women who drank >7 drinks/week utilized any alcohol cessation treatment or program.

Patterns of co-utilization of health services is shown in **Figure 4.** Among women with current SU, a higher proportion of women who utilized SU treatment had seen a psychiatrist or counselor since their last study visit compared to women who did not utilize SU treatment (46.3% vs. 33.5%, p=0.03). However, recent engagement with any healthcare provider was similar among those who utilized SU treatment and those who did not (84.3% vs. 78.5%, p=0.18).

Among WWH with current SU (n=218), overall high proportions saw their HIV provider (83.5%) or any health care provider (85.3%) since their last study visit, but only 33.5% saw a psychiatrist or counselor during that time. Among WWH with current SU, the proportion who saw their HIV provider since last study visit was similar between those who did or did not utilize SU treatment (89.4% vs. 79.7%, p=0.06). Similarly, there was no significant difference in the proportion who saw any health care provider among those who did or did not utilize SU treatment (87.1% vs. 84.2%, p=0.56**).** Although there was a statistically significant difference in proportion of women who utilized SU treatment among those who did or did not see a mental health provider, this finding did not persist among WWH who saw a mental health provider, with 44.6% who utilized SU treatment vs. 35.7% who did not (p=0.22).

Among women with current SU and heavy alcohol use (n=95), utilization of alcohol treatment services was 59.1% among women who utilized SU treatment and only 5.5% among women who did not utilize SU treatment (p<0.001). Among women with current SU and current tobacco use (n=54), utilization of any tobacco cessation treatment was low, with 30.4% among women utilizing SU treatment and 25.8% among women who did not utilize SU treatment (p=0.71).

DISCUSSION

Among women in the WIHS cohort, 14% reported past year SU, with crack/cocaine and opioids being the most frequently used substances. Notably, HIV serostatus was not significantly associated with current SU, and non-Hispanic Black race was associated with lower odds of current SU. Women with current SU had a high degree of concomitant health needs and social vulnerabilities, including depression, transactional sex, history of incarceration, alcohol/tobacco use, and unemployment. These factors should be considered as part of comprehensive, wraparound services in SU treatment programs, especially for women. The National Institutes of Drug Abuse recommends wraparound services, which are comprehensive services that address co-occurring needs of individuals with SUD, including medical/HIV care, mental health, child care, housing, transportation, financial, and legal issues (41). Studies have shown that wraparound services improve access to health care and social services, address social determinants of health, and improve child welfare (40, 41).

Regarding SU treatment, among WIHS participants with current SU, 42% utilized any treatment in the past year. This indicates a high level of treatment involvement, especially among a cohort with a majority of Black women aged 50 years and older, a population who historically had low levels of treatment engagement and higher barriers to accessing care in the setting of stigma or discrimination (49, 50). This level of treatment engagement exceeds national estimates of 10-30% lifetime SU treatment utilization among US adults (8, 33). However, when excluding methadone treatment, utilization of other SU treatment programs was lower and mostly <15%, underscoring the need to understand acceptability and barriers to accessing different types of guideline-based treatment services among women.

The most utilized treatment was methadone, with two-thirds of women with current opioid use reporting methadone treatment. This is substantially higher than recent estimates of

under 30% past-year utilization of MOUD among those needing opioid treatment (51). In the general population, MOUD uptake was even lower among older adults, with 13% in the past year among adults ≥50 years (51). Reasons for our findings of high methadone utilization are unclear. Women with HIV in this cohort may be recruited from Ryan White clinics that have more opportunities for linkage to care with local methadone clinics. It is also possible that older women are more engaged in methadone care, in part because methadone has been used as MOUD since the 1960s, and further research is needed in younger women.

In contrast, compared with high rates of methadone treatment, buprenorphine was considerably underutilized in this cohort of predominantly non-Hispanic Black women, and racial/ethnic disparities in buprenorphine access have been observed in prior studies (52-54). Disproportionately low buprenorphine use compared with methadone use has been shown in other studies, with one study reporting 27% past-year treatment with methadone versus fewer than 5% reporting buprenorphine among persons who inject drugs (55, 56). This may be because buprenorphine began being used for OUD treatment more recently than methadone, with approval for this indication in 2002. Both methadone and buprenorphine are first-line, evidence-based treatments for OUD and are effective in reducing overdose deaths and opioid craving (24). Whereas methadone remains highly regulated and requires frequent clinic visits, buprenorphine can be prescribed by any qualified provider, making it an ideal treatment in ambulatory settings, including HIV primary care settings. Until recently, the requirement to obtain a waiver to prescribe buprenorphine was a substantial barrier to treating OUD (57, 58). This requirement was eliminated in January 2023, however there remain barriers at the individual provider level and institutional level that need to be addressed (59-61). A recent publication listed opportunities

to encourage buprenorphine prescribing in HIV care settings at the individual, institutional, and national levels (62), which are crucial to increasing access to OUD treatment for WWH.

In this analysis, WWH had lower odds of SU treatment utilization compared with women without HIV despite similar sociodemographic characteristics, and treatment was not associated with improved HIV care continuum outcomes. Multiple studies have shown that integration of OUD treatment into HIV care settings is feasible and improves both HIV and OUD outcomes (25, 63-66). Our findings may reflect heterogenous approaches to treating various types of SU within HIV and non-HIV care settings. We do not know the level of integration of HIV/SU services or availability of wraparound services at most clinical sites where WIHS participants received care. We assessed individual-level factors associated with SU treatment, but further research is needed to better understand systems and structural factors that may contribute to our findings, including understanding the landscape of SU and wraparound services offered to women at HIV clinics.

Notably, there were regional differences in SU treatment, with women in Southern WIHS sites having the lowest odds of receiving SU treatment. Prior studies have found similar geographic disparities to accessing SU treatment. For example, one study showed that the Southeast US had the largest gaps in county-level OUD rates and capacity for treatment at opioid treatment programs that accept Medicaid (67). Similarly, Southern states have lower rates of counties with at least one outpatient SUD facility that accepts Medicaid compared with other regions of the country (68). These geographic disparities in access to SU treatment may be explained by the lack of Medicaid expansion in many Southern states and have important policy implications. Together, our findings call for policies that support increased funding and infrastructure for SU treatment programs in Southern states, especially for Medicaid enrollees.

At the individual level, alcohol use was associated with lower odds of SU treatment, potentially reflecting a high-risk group of women, especially if they are co-utilizing alcohol and opioids. Finally, we found that despite nearly 90% of women visiting any health care provider and/or their HIV provider, these were not associated with SU treatment, highlighting opportunities for improved linkage to SU care or integration of HIV/SU care for women.

To inform future implementation efforts to integrate SU treatment into other health care settings, we examined co-utilization of different health services, including HIV care, mental health care, and SU treatment services, including drug, alcohol, and tobacco cessation treatments. We found relatively low engagement in mental health care and tobacco cessation treatments, and individuals with SU seeking drug treatment may benefit from integrating mental health and tobacco cessation services into SU treatment settings. High levels of engagement in HIV services among women with HIV and current SU may suggest opportunities for linkage to care or to integrate SU treatment services into HIV care settings. Notably, women with current SU and heavy alcohol drinking who did not utilize SU treatment also did not receive alcohol treatment. This could potentially indicate that women with concurrent drug and alcohol use are a high-risk group of individuals to prioritize for integrated alcohol and drug treatment programs. Additional research is needed to better understand how to optimize treatment of concurrent substance use and alcohol use disorders.

Study Limitations

Our study has limitations. SU and treatment utilization were self-reported in questionnaires, which may lead to response or desirability bias, as well as potential misclassification. We were unable to distinguish SUD, as defined by DSM-V Criteria, limiting our ability to identify the true denominator of women who need treatment. Our study did not

capture the extent of housing instability or sexual practices among WWH and women without HIV, which could influence ongoing SU and HIV transmission. Finally, the mean age of this cohort was >50 years, thus our findings may not be generalizable to younger WWH, and since the WIHS recruits from mostly urban settings, our findings may not be generalizable to other parts of the US.

Future directions

In 2019, WIHS merged with the Multicenter AIDS Cohort Study (MACS) to form the MACS/WIHS-Combined Cohort Study (MWCCS) (69), offering the ability to analyze sex/gender-disaggregated data from multiple sites in a population of individuals aging with HIV. A substudy called the Study of Treatment and Reproduction outcomes (STAR), focused on reproductive-age women with and without HIV, is also ongoing and will provide data from younger women (70). In future analyses, we will leverage MWCCS data to understand population-specific factors associated with SU treatment utilization in men and women with/without HIV.

CONCLUSION

In the WIHS cohort, SU treatment utilization was higher than previously reported, suggesting the resilience of a population of older, Black women known to face stigma and barriers to health care. However, disproportionately low uptake of SU treatment despite recent engagement with a healthcare provider in a medically and socially complex population provides an opportunity to invest in the integration of wraparound services and buprenorphine into HIV and primary care settings.

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Table 1. Demographic, sociobehavioral, and clinical characteristics among Women's Interagency HIV Study (WIHS) participants enrolled in all study sites from 2013-2020, by HIV serostatus (n=2559).

Participant Characteristics	Total N=2559 N (%)	Women without HIV N=757 N (%)$^\diamond$	Women living with HIV N=1802 N (%)$^\diamond$	P-value[¶]
Age, years				
Mean (SD)	51.7 (9.5)	50.6 (9.9)	52.2 (9.2)	**< 0.001**
Race				
Non-Hispanic Black	1835 (71.7)	544 (71.9)	1291 (71.6)	
Other	724 (28.3)	213 (28.1)	511 (28.4)	0.91
WIHS Region				
New York	728 (28.5)	227 (30.0)	501 (27.8)	
Washington DC	315 (12.3)	94 (12.4)	221 (12.3)	
California	354 (13.8)	111 (14.7)	243 (13.5)	
Illinois	316 (12.4)	88 (11.6)	228 (12.7)	
South	846 (33.1)	237 (31.3)	609 (33.8)	0.58
Marital Status				
Married/Partner	623 (27.4)	196 (30.0)	427 (26.3)	
Unmarried/no partner	1654 (72.6)	458 (70.0)	1196 (73.7)	0.08
Highest level of education				
≤ High school graduation	1523 (65.1)	423 (63.0)	1100 (66.0)	
> High school graduation	816 (34.9)	248 (36.7)	568 (34.1)	0.18
Employed (full-time or part-time)				
No	1473 (63.0)	386 (57.4)	1087 (65.3)	**<0.001**
Yes	864 (37.0)	286 (42.6)	578 (34.7)	
Annual household income				
≤ $24000	1613 (72.1)	434 (67.4)	1179 (74.1)	
> $24000	623 (27.9)	210 (32.6)	413 (25.9)	**0.002**
Health Insurance*				
No	108 (4.7)	88 (13.2)	20 (1.2)	
Yes	2212 (95.3)	580 (86.8)	1632 (98.8)	**<0.001**
Ever jailed/incarcerated				
No	1447 (56.6)	393 (51.9)	1054 (58.5)	
Yes	1112 (43.5)	364 (48.1)	748 (41.5)	**0.002**
Ever reported physical abuse				
No	1597 (62.4)	436 (57.6)	1161 (64.4)	
Yes	962 (37.6)	321 (42.4)	641 (35.6)	**0.001**
Ever reported sex abuse				
No	1881 (73.5)	536 (70.8)	1345 (74.6)	
Yes	678 (26.5)	221 (29.2)	457 (25.4)	**0.04**
Ever had sex for drugs, money, shelter (baseline visits)				
No	1508 (64.5)	409 (60.9)	1099 (65.9)	
Yes	831 (35.5)	263 (39.1)	568 (34.1)	**0.02**
Depressive symptoms [1]				
No	1613 (69.7)	471 (70.7)	1142 (69.3)	
Yes	700 (30.3)	195 (29.3)	505 (30.7)	0.51
Alcohol use				
Abstain	1242 (53.5)	297 (44.4)	945 (57.1)	**<0.001**

0-7 drinks/week	846 (36.4)	274 (41.0)	572 (34.6)	
>7 drinks/week	235 (10.1)	98 (14.7)	137 (8.3)	
Tobacco use				
Never	703 (30.0)	168 (25.0)	535 (32.1)	
Former	718 (30.7)	200 (29.8)	518 (31.0)	
Current	920 (39.3)	304 (45.2)	616 (36.9)	**<0.001**
Marijuana use in last year				
No	1865 (72.9)	517 (68.3)	1348 (74.8)	
Yes	694 (27.1)	240 (31.7)	454 (25.2)	**<0.001**
Injection of drugs in last year				
No	2516 (98.3)	743 (98.2)	1773 (98.3)	
Yes	43 (1.7)	14 (1.9)	29 (1.6)	0.67
Seen health care provider since last visit				
No	349 (15.0)	180 (27.0)	169 (10.2)	
Yes	1971 (85.0)	488 (73.1)	1483 (89.8)	**<0.001**
Seen psychiatrist or counselor since last visit				
No	1379 (70.0)	340 (69.7)	1039 (70.1)	
Yes	592 (30.0)	148 (30.3)	444 (29.9)	0.87
HIV care in last 6 months [2]				
No	177 (10.8)	n/a	177 (10.8)	
Yes	1470 (89.3)	n/a	1470 (89.3)	n/a
HIV RNA <200c/mL[2]				
No	244 (15.2)	n/a	244 (15.2)	
Yes	1358 (84.8)	n/a	1358 (84.8)	n/a
CD4 >200 cells/μL[2]				
No	112 (6.9)	n/a	112 (6.9)	
Yes	1502 (93.1)	n/a	1502 (93.1)	n/a
ART use[2]				
No	147 (8.2)	n/a	147 (8.2)	
Yes	1655 (91.8)	n/a	1655 (91.8)	n/a

* Insurance = health insurance, ADAP, and/or Ryan White Program

◊ Percentages are column percentages unless otherwise noted and may not total 100 due to rounding

¶ Chi-square test performed for categorical variables, Wilcoxon rank sum for non-normally distributed continuous variables, and t-tests for normally distributed continuous variables

1 As defined as Center for Epidemiologic Studies-Depression (CESD) score >= 16

2 Among women with HIV only

Table 2. Patterns of co-utilization of substances, including tobacco and alcohol, shown as percentages among WIHS participants with current SU (n=367).

Type of Substance (n)	Crack/ Cocaine (%)	Current Tobacco Use (%)	Marijuana (%)	Opioids (%)	Heavy Alcohol Use, >7 drinks/week (%)	Methampet- amines (%)	Tranquilizers (%)	Other Amphetamines (%)
Crack/Cocaine (262)								
Current Tobacco Use (272)	56.8							
Marijuana (191)	41.7	43.2						
Opioids (147)	15.5	32.1	15					
Heavy Alcohol Use, >7 drinks/week (77)	19.3	16.5	14.2	4.3				
Methamphetamines (24)	4.1	6	4.6	2.5	2			
Tranquilizers (24)	3.5	4.3	5.2	2.5	1.1	1.6		
Other amphetamines (7)	0.5	1.1	1.4	1.4	0	1.1	0.8	

Table 3. Proportion of women with current substance use (n=367), who utilized any treatment in the past year, by number of substances used.

A.		
Number of Substances Used (crack/cocaine, methamphetamines, other amphetamines, opioids, and tranquilizers)	**Proportion of Women with Current SU, N (%)**	**Proportion Who Utilized Any SU Treatment in the Past 1 Year**
1	290 (79.0)	176 (60.7)
2	63 (17.2)	35 (55.6)
3	8 (2.2)	4 (50.0)
4	6 (1.6)	2 (33.3)
5	-	-

B.		
Number of Substances Used (above substances + marijuana)	**Proportion of Women with Current SU, N (%)**	**Proportion Who Utilized Any SU Treatment in the Past 1 Year**
1	140 (38.2)	93 (14.5)
2	184 (50.1)	55 (29.9)
3	30 (8.2)	14 (46.7)
4	8 (2.2)	3 (37.5)
5	5 (1.4)	2 (40.0)

To calculate number of substances used, we included crack/cocaine, methamphetamines, other amphetamines, opioids, and tranquilizers in Panel A. We included the same substances as well as marijuana for Panel B.

Table 4. The association between HIV status, participant characteristics, and current substance use among WIHS participants in crude and adjusted regression models (n=2559)

Participant Characteristics	Current Substance Use N=367 N (%)◊	No Current Substance Use N=2192 N(%)◊	Odds of Current Substance Use (within past 1 year)	
			Unadjusted OR (95% CI)	Adjusted OR (95% CI)
HIV status				
Negative	137 (37.3)	620 (28.3)	REF	REF
Positive	230 (62.7)	1572 (71.7)	**0.66 (0.53-0.83)**	**0.75 (0.56-0.995)**
Age, years				
Mean (SD)	53.0 (8.5)	51.5 (9.6)	**1.18 (1.05-1.33)^**	1.13 (0.95-1.34)^
Race				
Non-Hispanic Black	247 (67.3)	1588 (72.5)	**0.78 (0.62-0.99)**	**0.61 (0.45-0.83)**
Other	120 (32.7)	604 (27.6)	REF	REF
WIHS Region				
New York	83 (22.6)	645 (29.4)	0.76 (0.57, 1.03)	1.30 (0.87, 1.94)
Washington DC	26 (7.1)	289 (13.2)	**0.53 (0.34, 0.83)**	0.82 (0.48, 1.41)
California	84 (22.9)	270 (12.3)	**1.85 (1.35, 2.52)**	**2.23 (1.48, 3.36)**
Illinois	52 (14.2)	264 (12.0)	1.17 (0.82, 1.67)	1.37 (0.89, 2.11)
South	122 (33.2)	724 (33.0)	REF	REF
Marital Status				
Married/Partner	93 (26.4)	530 (27.5)	0.95 (0.73-1.22)	
Not married/No partner	259 (73.6)	1395 (72.5)	REF	--
Highest level of education				
≤ High school graduation	250 (69.8)	1273 (64.3)	**1.29 (1.01-1.64)**	**0.67 (0.49-0.92)**
> High school graduation	108 (30.2)	708 (35.7)	REF	REF
Employed (full-time or part-time)				
No	300 (84.0)	1173 (59.2)	**3.62 (2.69-4.87)**	**1.96 (1.34-2.85)**
Yes	57 (16.0)	807 (40.8)	REF	REF
Annual household income				
≤ $24000	302 (88.1)	1311 (69.3)	**3.27 (2.33-4.60)**	1.51 (0.998-2.29)
> $24000	41 (12.0)	582 (30.7)	REF	REF
Health Insurance[1]				
No	28 (8.0)	80 (4.1)	**2.05 (1.31-3.20)**	
Yes	323 (92.0)	1889 (95.9)	REF	--
Ever jailed or incarcerated				
No	86 (23.4)	1361 (62.1)	REF	REF
Yes	281 (76.6)	831 (37.9)	**5.35 (4.14-6.92)**	**2.50 (1.81-3.45)**
Ever reported physical abuse				
No	176 (48.0)	1421 (64.8)	REF	
Yes	191 (52.0)	771 (35.2)	**2.0 (1.60-2.50)**	--
Ever reported sexual abuse				
No	235 (64.0)	1646 (75.1)	REF	REF
Yes	132 (36.0)	546 (24.9)	**1.69 (1.34-2.14)**	0.92 (0.68-1.26)
Ever had sex for drugs, money, shelter				
No	129 (36.0)	1379 (69.6)	REF	REF
Yes	229 (64.0)	602 (30.4)	**4.07 (3.21-5.15)**	**2.35 (1.74-3.16)**
Depressive symptoms[2]				
No	188 (53.9)	1425 (72.6)	REF	REF

Yes	161 (46.1)	539 (27.4)	**2.26 (1.79-2.86)**	**1.40 (1.05-1.86)**
Alcohol use				
Abstain	152 (43.2)	1090 (55.3)	REF	REF
0-7 drinks/week	105 (29.8)	741 (37.6)	1.02 (0.78-1.33)	1.29 (0.95-1.77)
>7 drinks/week	95 (27.0)	140 (7.1)	**4.87 (3.57-6.64)**	**3.79 (2.59-5.55)**
Tobacco use				
Never	28 (7.8)	675 (34.0)	REF	REF
Former	54 (15.1)	664 (33.5)	**1.96 (1.23-3.13)**	0.81 (0.48, 1.37)
Current	276 (77.1)	644 (32.5)	**10.33 (6.90-15.47)**	**3.84 (2.42-6.10)**
Marijuana use in past year				
No	176 (48.0)	503 (23.0)	REF	
Yes	191 (52.0)	1689 (77.1)	**3.64 (2.90-4.58)**	--
Seen health care provider since last visit				
No	67 (19.1)	282 (14.3)	REF	
Yes	284 (80.9)	1687 (85.7)	**0.71 (0.53-0.95)**	--
Seen psychiatrist or counselor since last visit				
No	240 (68.4)	1488 (75.6)	REF	
Yes	111 (31.6)	481 (24.4)	**1.43 (1.12-1.83)**	--
HIV care in last 6 months [3]				
No				
Yes	36 (16.5)	141 (9.9)	REF	
	182 (83.5)	1288 (90.1)	**0.55 (0.37-0.82)**	--
HIV RNA <200c/mL[3]				
No	56 (27.2)	185 (13.3)	**2.43 (1.72-3.43)**	
Yes	150 (72.8)	1205 (86.7)	REF	--
CD4 >200 cells/μL[3]				
No	21 (9.9)	91 (6.5)	1.58 (0.96-2.61)	
Yes	191 (90.1)	1311 (93.5)	REF	--
ART use[3]				
No	26 (11.3)	121 (7.7)	1.53 (0.98-2.39)	
Yes	204 (88.7)	1451 (92.3)	REF	--

OR: odds ratio, ART: combination antiretroviral therapy

◊ Percentages are column percentages unless otherwise noted and may not total 100 due to rounding

1 Health insurance, ADAP and/or Ryan White insurance

2 As defined as Center for Epidemiologic Studies-Depression (CESD) score >= 16

3 Among women with HIV only. A separate adjusted model among women with HIV only was also performed, and these results are reported in the text.

^ 10 year increments

Table 5. Types of substance use treatment programs utilized in the past year among WIHS participants, by substance type.

Current substance type	Number reporting current use (N)	Any treatment (%)	Inpatient detoxifi-cation (%)	Outpatient treatment (%)	Half-way house (%)	Prison/ jail-based treatment (%)	Narcotics Anonymous (%)	Alcoholics Anonymous (%)	Methadone (%)	Buprenorphine /naloxone (%)	Other (%)
Any drug use	870	19.2	5.2	2.9	1.5	0.3	6.2	3.2	11.4	1.0	1.0
Any drug use, excluding marijuana use alone	367	42.2	12.0	6.8	3.5	0.8	12.3	6.0	26.7	2.5	1.9
Crack/cocaine*	262	28.2	14.9	5.0	5.0	1.2	13.4	6.5	8.4	2.3	2.3
Methamphetamines*	24	25.0	16.7	0.0	4.2	0.0	4.2	8.3	8.3	4.2	4.2
Other amphetamines*	7	57.1	14.3	0.0	14.3	0.0	14.3	8.3	42.9	0.0	0.0
Tranquilizers*	24	25.0	12.5	0.0	8.3	4.2	8.3	12.5	16.7	0.0	4.2
Opioids	147	77.6	12.2	12.9	3.4	2.0	15.0	7.5	67.4	5.4	1.4

	Q1: 0-2.1
	Q2: 2.2-5.3
	Q3: 5.4-13.3
	Q4: 13.4-77.6

Values are reported as row percentages and shaded by quartile, with darker cells representing the lowest quartile of utilization and lighter cells representing the highest quartile.

*Number of participants reporting concurrent opioid use: crack/cocaine (n= 57), methamphetamines (n=9), other amphetamines (n=5), tranquilizers (n=9).

Table 6. **The association between HIV status, participant characteristics, and substance use treatment utilization in the past year among WIHS participants with current substance use in crude and adjusted regression models (n=367)**

Participant Characteristics	Substance use treatment utilization (within past 1 year)		Odds of Substance Use Treatment Utilization (in the past year)	
	SU treatment N=155 N (%)[◊]	No SU treatment N=212 N(%)[◊]	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
HIV status				
Negative	62 (40.0)	75 (35.4)	REF	REF
Positive	93 (60.0)	137 (64.6)	0.82 (0.54-1.26)	0.57 (0.31-1.04)
Age, years				
Mean (SD)	54.2 (8.1)	52.1 (8.7)	**1.34 (1.05-1.73)[^]**	0.90 (0.64-1.29)[^]
Race				
Non-Hispanic Black	90 (58.1)	157 (74.1)	**0.49 (0.31-0.76)**	0.66 (0.37-1.18)
Else	65 (41.9)	55 (25.9)	REF	REF
WIHS Region				
New York	57 (36.8)	26 (12.3)	**9.44 (4.93-18.05)**	**4.65 (2.00-10.79)**
Washington DC	7 (4.5)	19 (9.0)	1.59 (0.60-4.22)	1.55 (0.49-4.92)
California	33 (21.3)	51 (24.1)	**2.79 (1.48-5.23)**	**2.56 (1.19-5.52)**
Illinois	35 (22.6)	17 (8.0)	**8.86 (4.25-18.50)**	**6.41 (2.75-14.93)**
South	23 (14.8)	99 (46.7)	REF	REF
Marital Status				
Married/Partner	40 (27.2)	53 (25.9)	1.07 (0.66-1.73)	
Not married/No partner	107 (72.8)	152 (74.2)	REF	--
Highest level of education				
≤High school	111 (74.0)	139 (66.8)	1.41 (0.89-2.25)	
> High school	39 (26.0)	69 (33.2)	REF	--
Employment (full-time or part-time)				
No	132 (88.0)	168 (81.2)	1.70 (0.93-3.11)	
Yes	18 (12.0)	39 (18.8)	REF	--
Annual household income				
≤ $24000	126 (86.9)	176 (88.9)	0.83 (0.43-1.60)	
> $24000	19 (13.1)	22 (11.1)	REF	--
Health Insurance[1]				
No	6 (4.1)	22 (10.7)	**0.36 (0.14-0.90)**	0.43 (0.13-1.38)
Yes	140 (95.9)	183 (89.3)	REF	REF
Ever jailed or incarcerated				
No	36 (23.2)	50 (23.6)	REF	
Yes	119 (76.8)	162 (76.4)	1.02 (0.63-1.66)	--
Ever reported physical abuse				
No	78 (50.3)	98 (46.2)	REF	
Yes	77 (49.7)	114 (53.8)	0.85 (0.56-1.29)	--
Ever reported sexual abuse				
No	105 (67.7)	130 (61.3)	REF	
Yes	50 (32.3)	82 (38.7)	0.76 (0.49-1.17)	--
Ever had sex for drugs, money, shelter				
No	54 (36.0)	75 (36.1)	REF	
Yes	96 (64.0)	133 (63.9)	1.00 (0.65-1.55)	--

| Depressive symptoms[2]				
No	84 (57.5)	104 (51.2)	REF	REF
Yes	62 (42.5)	99 (48.8)	0.78 (0.51-1.19)	0.95 (0.55-1.64)
Alcohol use				
Abstain	94 (64.0)	58 (28.3)	REF	REF
0-7 drinks/week	31 (21.1)	74 (36.1)	**0.26 (0.15-0.44)**	**0.35 (0.19-0.66)**
>7 drinks/week	22 (15.0)	73 (35.6)	**0.19 (0.10-0.33)**	**0.24 (0.12-0.48)**
Tobacco use				
Never	6 (4.0)	22 (10.6)	REF	REF
Former	23 (15.3)	31 (14.9)	2.72 (0.95-7.79)	2.40 (0.66-8.37)
Current	121 (80.7)	155 (74.5)	**2.86 (1.13-7.28)**	**3.35 (1.07-10.45)**
Marijuana use in past year				
No	104 (67.1)	72 (34.0)	REF	REF
Yes	51 (32.9)	140 (66.0)	**0.25 (0.16-0.39)**	**0.31 (0.18-0.54)**
Seen health care provider since last visit				
No	23 (15.8)	44 (21.5)	REF	REF
Yes	123 (84.3)	161 (78.5)	1.46 (0.84-2.55)	1.10 (0.52-2.33)
Seen psychiatrist or counselor since last visit				
No	89 (61.0)	151 (73.7)	REF	REF
Yes	57 (39.0)	54 (26.3)	**1.79 (1.14-2.82)**	**2.46 (1.34-4.50)**
HIV care in last 6 months[3]				
No	9 (10.6)	27 (20.3)	REF	
Yes	76 (89.4)	106 (79.7)	2.15 (0.96-4.83)	--
HIV RNA <200c/mL[3]				
No	18 (22.5)	38 (30.2)	0.67 (0.35-1.29)	
Yes	62 (77.5)	88 (69.8)	REF	--
CD4 >200 cells/μL[3]				
No	7 (8.5)	14 (10.8)	0.77 (0.30-2.01)	
Yes	75 (91.5)	116 (89.2)	REF	--
ART use[3]				
No	9 (9.7)	17 (12.4)	0.76 (0.32-1.78)	
Yes	84 (90.3)	120 (87.6)	REF	--

OR: odds ratio, ART: combination antiretroviral therapy

◊ Percentages are column percentages unless otherwise noted and may not total 100 due to rounding
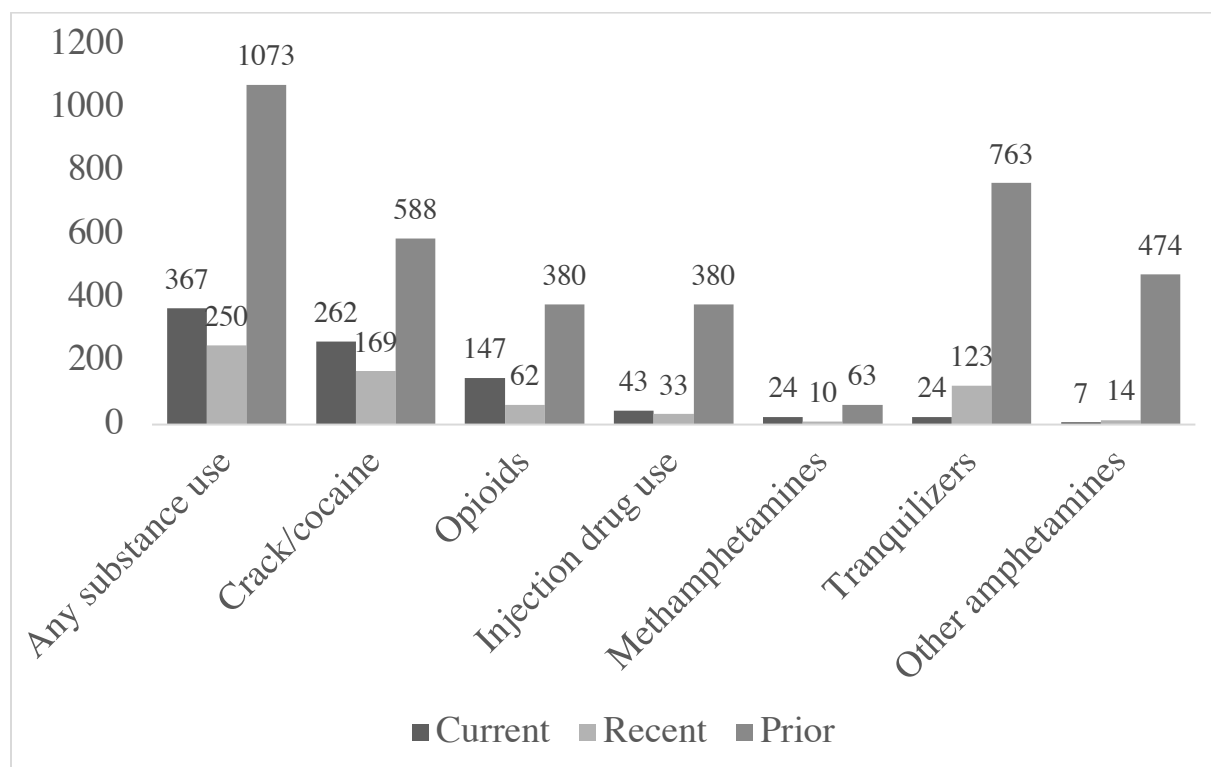
1 Health insurance, ADAP and/or Ryan White insurance

2 As defined as Center for Epidemiologic Studies-Depression (CESD) score >= 16

3 Among women with HIV only. A separate adjusted model among women with HIV only was also performed, and these results are reported in the text.
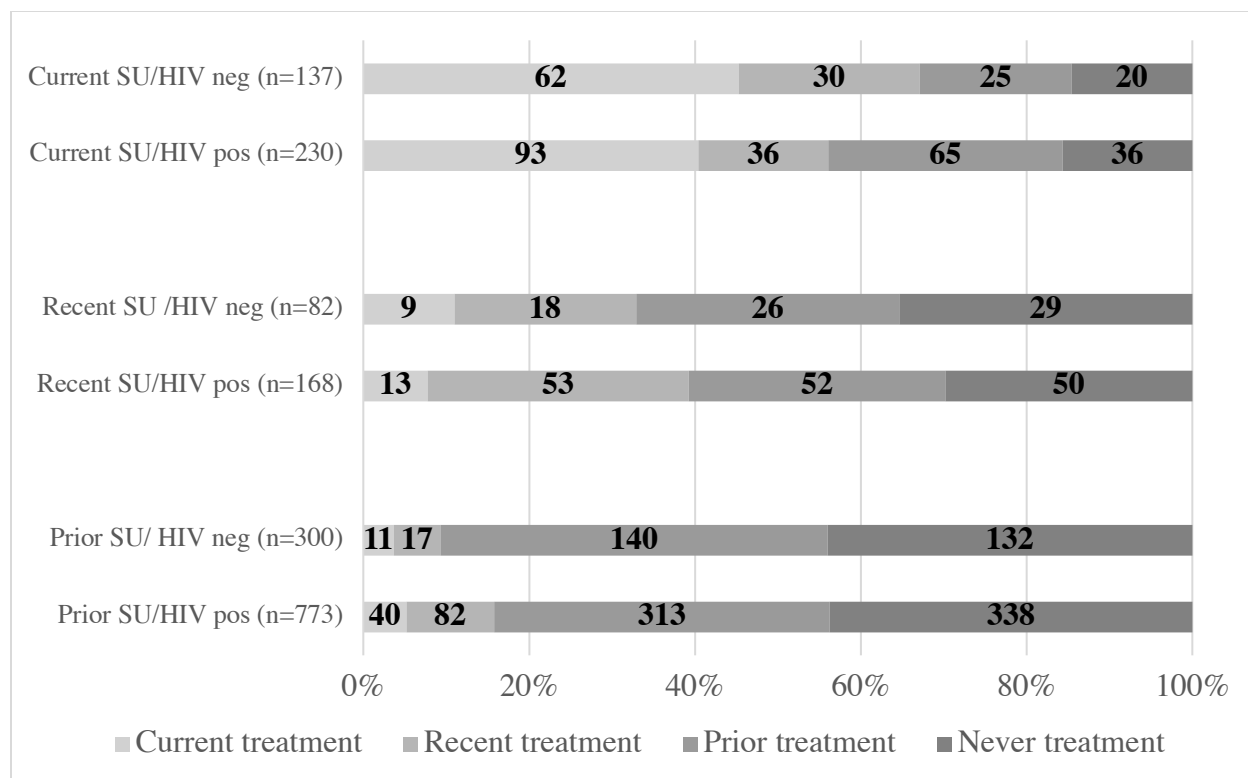
^ 10 year increments
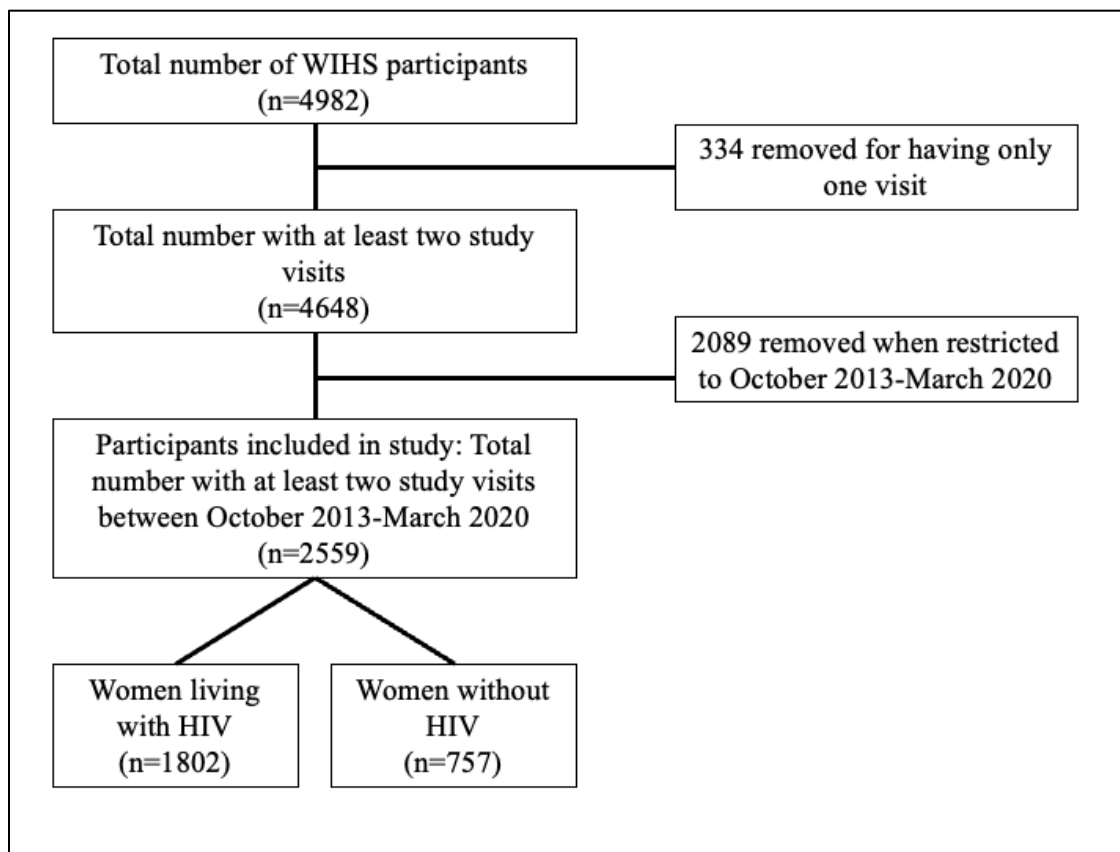
Figure 1. Flow diagram showing WIHS participant selection for this study.
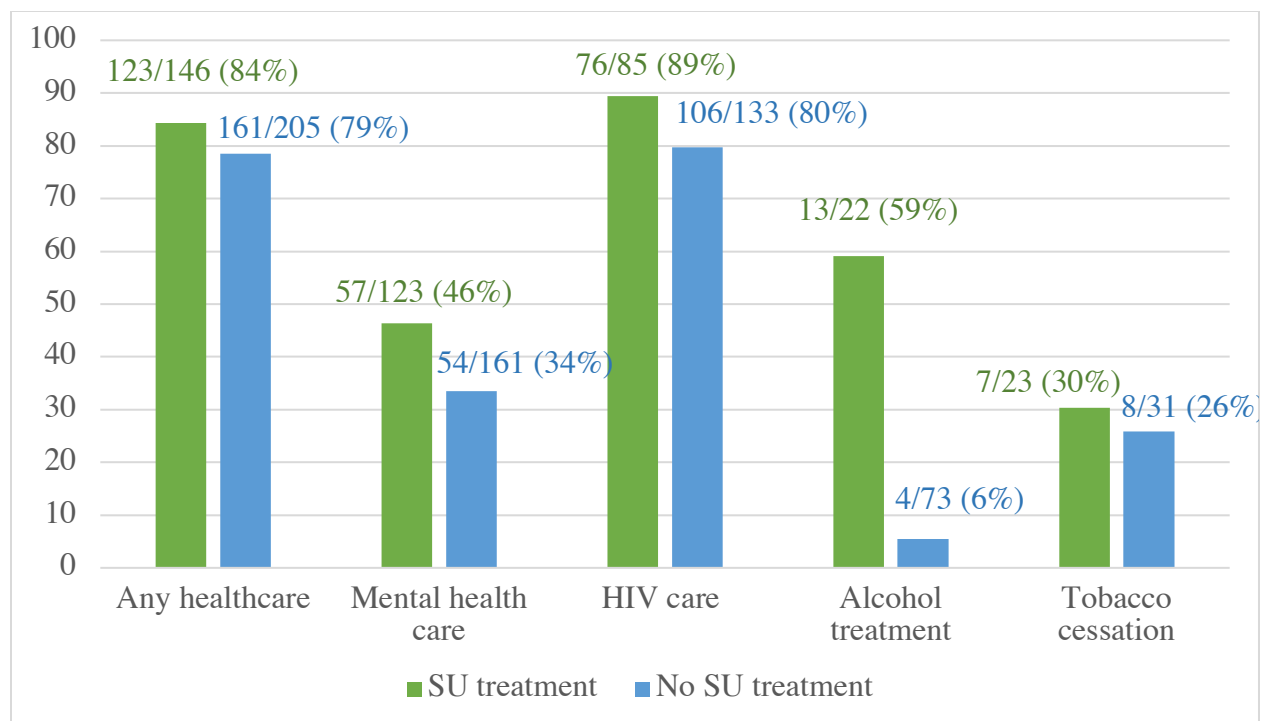
Figure 2. Current (<1 year), recent (1-4.9 years), and prior (≥5 years) substance use among WIHS participants (n=2559), by substance type, 2013-2020.

Figure 3. **Current, recent, and prior SU treatment among women with current, recent, and prior SU, stratified by HIV serostatus.** Current SU or treatment is within the past year. Recent SU or treatment is in the past 1-4.9 years. Prior SU or treatment is ≥5 years ago. Counts are reported with bar graphs showing proportion of current, recent, prior, or never treatment among those reporting substance use.

Figure 4. Patterns of co-utilization of health services among women with current substance use, by utilization of substance use treatment.