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Factors associated with HIV testing and treatment among young Black MSM and trans women in three jail systems

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ABSTRACT

Black men who have sex with men (BMSM) and transgender women (BTW) are disproportionately affected by incarceration and HIV. We assessed factors associated with HIV testing and viral suppression among 176 incarcerated BMSM and BTW in Chicago, IL; Los Angeles, CA; and Houston, TX. In multivariable logistic regression, having a sexual orientation of bisexual, heterosexual, or other vs. gay or same-gender loving was associated with higher odds of testing in custody (aOR 8.97; 95% CI 1.95 - 41.24). Binge drinking (aOR 0.19; 95% CI 0.04 - 0.92) and being unemployed prior to incarceration (aOR 0.03; 95% CI 0.00 - 0.23) were associated with lower odds of testing; participants in Los Angeles were also more likely to be tested than those in Chicago. Being housed in protective custody (aOR 3.12; 95% CI 1.09-9.59) and having a prescription for ART prior to incarceration (aOR 2.58; 95% CI 1.01-6.73) were associated with higher odds of viral suppression when adjusted for site and duration of incarceration, though the associations were not statistically significant in the full multivariable model. Future research should examine structural and process level factors that impact engagement in HIV testing and treatment among detained BMSM and BTW.

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Men who have sex with men; transgender women; HIV testing; ART adherence; jail health care; black/African American

Introduction

Black men who have sex with men (BMSM) are disproportionately affected by HIV (CDC Report No. 3, 2019) and incarceration (Bland et al., 2012; Brewer et al., 2014a; Wohl et al., 2000). Though few population-based estimates are available for transgender women, evidence suggests that Black transgender women (BTW) are also disproportionately affected by both HIV and incarceration (Center for American Progress & Movement Advancement Project, 2016), with an overall estimated HIV prevalence of 44% from a recent meta-analysis (Becasen et al., 2019). A recent evaluation of the HIV Care Continuum among BTW from Black Pride events in six US cities found that incarceration was significantly associated with having undiagnosed HIV infection and unsuppressed HIV viral load (Bukowski et al., 2018).

Overall, estimates suggest that approximately 14% of people living with HIV in the United States are unaware of their infection (Centers for Disease Control and Prevention Report No. 3 (CDC), 2019) and approximately 40% of new infections in the U.S. are transmitted by

persons unaware of their HIV status (Patel et al., 2020). Thus, interventions that increase HIV testing and viral suppression are urgently needed. The period surrounding incarceration may be associated with sexual and substance use behaviors that increase the risk of HIV transmission; therefore, linking incarcerated and soon-to-be-released BMSM and BTW to care is a crucial opportunity to reduce HIV transmission (de Voux et al., 2012; Epperson et al., 2010; Khan et al., 2009). However, a systematic review of the HIV care cascade for people living with HIV (PLWH) before, during, and after incarceration reported that 65% of PLWH received ART, and only 40% had an undetectable viral load during their incarceration (Iroh et al., 2015). Various studies have found that BMSM receive inadequate healthcare in jails and prisons, as well as inconsistent access to HIV prevention resources like condoms and HIV testing (Braithwaite & Arriola, 2003; Levy et al., 2014; Harawa et al., 2018). In the general population, insufficient access to care is cited as the largest barrier to reducing HIV transmission (Matacotta et al., 2020). Furthermore, frequent criminal justice

involvement has been shown to disrupt HIV care management for young BMSM and is associated with delayed diagnosis of HIV for individuals unaware of their status (Duffus et al., 2009; Schneider et al., 2017).

Voluntary opt-in HIV screening protocols in correctional settings have varying levels of participation and can miss individuals who may benefit from HIV testing (Jafa et al., 2009). The Centers for Disease Control and Prevention (CDC) recommends that opt-out screening should be offered to BMSM and BTW during incarceration (CDC, 2009). However, the extent to which opt-out testing is effectively put in practice likely varies widely across institutions and geographic locations, and its implementation and impact on HIV outcomes among BMSM and BTW have not been formally evaluated. This study examined factors associated with HIV testing and viral suppression among young BMSM and BTW in three urban jail systems to improve our understanding of who is reached by current efforts to diagnose and treat HIV in custody.

Methods

Study design and data collection. We surveyed 178 young BMSM and BTW who were incarcerated in three of the four largest jail systems in the United States: Cook County Jail in Chicago, IL, Harris County Jail in Houston, TX, and Men's Central Jail in Los Angeles, CA. Researchers conducted confidential computer-based surveys with study participants within each of the jails.

Eligibility and recruitment process. Individuals who met the following criteria were eligible for the study: 1) Black or African-American race, 2) assigned male sex at birth, 3) 18–34 years of age at jail entry, 4) incarcerated for at least 24 h, 5) reported sex with a male in the previous 2 years, and 6) not sentenced to prison time. Potential participants were identified by a recruiter from two sources: 1) incarcerated individuals from prior cohort studies conducted by the investigative team who had previously given permission to access their records for the purpose of future research; and 2) individuals identified through screening methods that varied by site.

In Chicago, participants were recommended for the study by health care providers and clinic staff within the jail, through sexual and gender minority outreach groups to the protective custody unit, and through self-referral based on word of mouth. In Houston, participants were recruited by a health care provider, who predominately saw patients with HIV, after they were seen in the jail's clinic. Unlike Houston and Chicago, participants in Los Angeles were not reached by health staff referrals, but

instead were identified from a list of individuals housed in protective custody, a unit specifically designed for sexual and gender minorities. Of those offered participation, 38/50 (76%) in Houston, 64/69 (93%) in LA, and 77/88 (88%) in Chicago enrolled in the study. Written informed consent was obtained from all participants. All procedures were approved by the Institutional Review Boards at each participating location.

Outcome variables. The outcomes for analysis were self-reported receipt of HIV testing in custody among HIV negative individuals and HIV viral suppression among HIV positive individuals. HIV testing was assessed among individuals who reported no prior HIV diagnosis with the question, "Did you obtain an HIV test while incarcerated?" Viral suppression was defined as a response of "undetectable" to the following question: "To the best of your knowledge, is your viral load currently detectable, undetectable, or something else?" Responses other than "undetectable" – including those without a recent viral load – were classified as detectable viral loads.

Independent variables. Prior to analysis, independent variables were chosen based on conceptual relevance, prior literature, and pertinence to future interventions. Transgender women were defined as those who were assigned male sex at birth and reported their current gender identity as female or transgender male to female. Age was analyzed as <25 vs. ≥25 years since the study was specifically interested in outcomes among emerging adults as compared to older adults, given prior observed age disparities in HIV care continuum outcomes (Ghidei et al., 2013). Individuals were coded as having health insurance if they reported any type of insurance: unsubsidized private insurance, subsidized private insurance, Veteran's Administration, Medicaid (including Medi-Cal, CountyCare, or Harris Health, Medicare, or other type of insurance. Housing insecurity was defined as having been homeless at any point during the 60 days prior to incarceration. Lifetime frequency of incarceration was assessed as a count of the total episodes of incarceration (held in jail, prison, or a detention facility) and was categorized as 1, 2–5, and ≥6. Duration of current incarceration was dichotomized about the median as less than or equal to eight weeks vs. greater than eight weeks. Recent bacterial STI was defined as reporting a healthcare provider diagnosis of chlamydia, syphilis, or gonorrhea within the 12 months prior to the interview. Substance use was defined as any self-reported use of cocaine, methamphetamine, MDMA, GHB, ketamine, LSD, mushrooms, PCP, heroin, pain killers, opiates, prescription stimulants, and/or other prescription medications for the purpose of getting high in the 60 days prior to incarceration.

Binge drinking was defined as any self-reported episodes of drinking six or more standard drinks on one occasion in the 60 days prior to incarceration. Prior HIV care engagement was defined as reporting an HIV medication prescription at the time of detention. Participants also reported whether they were currently taking HIV medication during their time in custody. We *a priori* chose to include an indicator for site in all models to account for procedural and population differences across locations and to examine differences across sites. Additionally, duration of incarceration was included in all models because of the increasing probability of testing and viral suppression with increasing time in jail.

Statistical Analysis. Bivariate associations between sociodemographic, behavioral, and clinical variables and care continuum outcomes were assessed via Pearson chi-square tests or Fisher's exact tests when appropriate. Variables that were associated with outcomes of interest with a *p*-value of 0.2 or lower in bivariate analysis (in addition to site and duration of incarceration as adjustment variables) were included in the logistic regression models. For each variable, site-adjusted and multivariable logistic regressions were conducted for each outcome, where site-adjusted models included the predictor of interest, duration of incarceration, and site. The multivariable models for each outcome included all of the predictors with *p* < 0.2 in the bivariate analyses, duration of incarceration, and site. The testing models excluded Houston participants due to the small number of HIV-negative individuals (*n* = 6). Statistical significance was set at the alpha = 0.05 level and all tests were two-sided. Data was analyzed using R statistical software version 3.6.2 (R Foundation for Statistical Computing, Vienna, Austria).

Results

Sociodemographics. Of the 178 participants, two did not provide any information on their HIV status and were excluded from analysis. The remaining 176 identified as Black/African American, of whom 20% identified as multiracial and 5% identified as Hispanic or Latinx. Sixty-six percent identified as cisgender men and 34% identified as transgender or another gender identity. Seventy-seven percent identified as gay, bisexual, or same gender loving. Over half of the participants (56%) reported low socioeconomic status (SES): 35% had not graduated high school and 46% were unemployed prior to incarceration. Thirty-nine percent reported experiencing homelessness in the 60 days prior to incarceration. Most (87%) participants reported at least one prior incarceration, and 50% reported more

than 6 incarcerations. Demographic characteristics are summarized in Table 1.

HIV testing and viral suppression. The sample included 76 individuals who reported being HIV-negative. Of these, two were excluded from the testing analysis because they reported being required by the jail or courts to receive an HIV test. Of the remaining 74 HIV-negative individuals, 48 (65%) had been offered an HIV test and 37 (50%) had received a voluntary HIV test during their current incarceration. One hundred individuals reported being HIV positive prior to incarceration. Of those, 62 had an ART prescription prior to detention, 65 (65%) reported that their most recent viral load was undetectable, and 79 (79%) reported receiving ART during their current incarceration (Table 1).

Results from site-adjusted and multivariable logistic regression are shown in Table 2. In the multivariable analysis, HIV-negative individuals in Los Angeles had higher odds of receiving an HIV test during incarceration (aOR 8.20; 95% CI 1.87-36.1) compared to participants in Chicago. The odds of receiving a test were higher for HIV-negative individuals who identified as bisexual, straight, or other compared to those who identified as gay or same gender loving (aOR 8.97; 95% CI 1.95-41.2). HIV negative individuals who were unemployed, on disability, or on worker's compensation in the 60 days prior to incarceration had lower odds of receiving a test compared to those who were employed part-time or full-time (aOR 0.03; 95% CI 0.00-0.23). Individuals who reported any binge drinking in the 60 days prior to incarceration also had lower odds of receiving a test than those who reported no binge drinking (aOR 0.19; 95% CI 0.04-0.92). Among HIV positive participants, being housed in protective custody (aOR 3.12; 95% CI 1.09-9.59) and having a prescription for ART prior to incarceration (aOR 2.58; 95% CI 1.01-6.73) were associated with higher odds of viral suppression when adjusted for site and duration of incarceration, though the associations were not statistically significant in the full multivariable model.

Discussion

This study is one of the first to examine HIV testing and treatment outcomes among incarcerated young BMSM and BTW. Previous work has suggested that BMSM face significant barriers to receiving appropriate HIV care in correctional facilities and, among those diagnosed with HIV in jail, Black detainees are more likely to be further along in disease progression than those of other race/ethnicities (de Voux et al., 2012; Levy et al., 2014; Stein et al., 2013). In our study, 79% of

Table 1. Sociodemographic Characteristics and HIV Testing and Treatment among Black/African American MSM and Transwomen (n = 176)

| | Total n (%) | HIV-negative (N = 76) | | p | HIV-positive (N = 100) | | p |
|--|----------------|---------------------------|----------------------|--------------------|-------------------------|----------------------|-------------------|
| | | Received HIV Test in Jail | | | Undetectable Viral Load | | |
| | | Yes(n = 39) n (%) | No (n = 37) n (%) | | Yes (n = 65) n (%) | No (n = 35) n (%) | |
| Age | | | | 0.37 | | | 0.49 |
| < 25 years | 63 (35.8) | 15 (38.5) | 18 (48.6) | | 18 (27.7) | 12 (34.3) | |
| ≥ 25 years | 113 (64.2) | 24 (61.5) | 19 (51.4) | | 47 (72.3) | 23 (65.7) | |
| Hispanic or Latino | | | | 1.00 ^b | | | 0.42 ^b |
| Yes | 9 (5.1) | 2 (5.1) | 1 (2.7) | | 3 (4.6) | 3 (8.6) | |
| No | 167 (94.9) | 37 (94.9) | 36 (97.3) | | 62 (95.4) | 32 (91.4) | |
| City | | | | <0.01 ^b | | | 0.39 |
| Chicago | 75 (42.6) | 9 (23.1) | 23 (62.2) | | 27 (41.5) | 16 (45.7) | |
| Houston | 38 (21.6) | 4 (10.3) | 2 (5.4) | | 19 (29.2) | 13 (37.1) | |
| LA | 63 (35.8) | 26 (66.7) | 12 (32.4) | | 19 (29.2) | 6 (17.1) | |
| Gender | | | | 0.07 | | | 0.60 |
| Male | 116 (65.9) | 27 (69.2) | 18 (48.6) | | 45 (69.2) | 26 (74.3) | |
| TGW/Other | 60 (34.1) | 12 (30.8) | 19 (51.4) | | 20 (30.8) | 9 (25.7) | |
| Sexual Orientation | | | | 0.02 ^b | | | 0.90 ^b |
| Straight/ heterosexual | 24 (13.8) | 9 (23.1) | 8 (21.6) | | 5 (7.9) | 2 (5.7) | |
| Gay/same gender loving | 93 (53.4) | 10 (25.6) | 21 (56.8) | | 38 (60.3) | 24 (68.6) | |
| Bisexual | 43 (24.7) | 17 (43.6) | 6 (16.2) | | 14 (22.2) | 6 (17.1) | |
| Other | 14 (8) | 3 (7.7) | 2 (5.4) | | 6 (9.5) | 3 (8.6) | |
| Education | | | | 0.36 | | | 0.19 |
| Less than high school | 62 (35.2) | 13 (33.3) | 18 (48.6) | | 20 (30.8) | 11 (31.4) | |
| High school or equivalent | 45 (25.6) | 14 (35.9) | 9 (24.3) | | 11 (16.9) | 11 (31.4) | |
| Some college or higher | 69 (39.2) | 12 (30.8) | 10 (27.0) | | 34 (52.3) | 13 (37.1) | |
| Employment status^a | | | | <0.01 ^b | | | 0.68 |
| Unemployed | 81 (46) | 15 (38.5) | 25 (67.6) | | 26 (40.0) | 15 (42.9) | |
| Part time | 36 (20.5) | 13 (33.3) | 4 (10.8) | | 11 (16.9) | 8 (22.9) | |
| Full time | 46 (26.1) | 11 (28.2) | 5 (13.5) | | 20 (30.8) | 10 (28.6) | |
| Disability/Worker's Compensation | 13 (7.4) | 0 (0.0) | 3 (8.1) | | 8 (12.3) | 2 (5.7) | |
| Monthly Income^a | | | | 0.21 ^b | | | 0.74 ^b |
| under \$1000 | 98 (56) | 20 (51.3) | 24 (66.7) | | 36 (55.4) | 18 (51.4) | |
| \$1000 – \$2999 | 58 (33.1) | 14 (35.9) | 8 (22.2) | | 21 (32.3) | 15 (42.9) | |
| \$3000 – \$4999 | 10 (5.7) | 4 (10.3) | 1 (2.8) | | 4 (6.2) | 1 (2.9) | |
| \$5000 or more | 9 (5.1) | 1 (2.6) | 3 (8.3) | | 4 (6.2) | 1 (2.9) | |
| Any health Insurance | | | | 0.73 ^b | | | 0.56 |
| No | 26 (14.8) | 4 (10.3) | 5 (13.5) | | 10 (15.4) | 7 (20.0) | |
| Yes | 150 (85.2) | 35 (89.7) | 32 (86.5) | | 55 (84.6) | 28 (80.0) | |
| Housing Insecurity^a | | | | 0.58 | | | 0.25 |
| No | 107 (60.8) | 24 (61.5) | 25 (67.6) | | 35 (53.8) | 23 (65.7) | |
| Yes | 69 (39.2) | 15 (38.5) | 12 (32.4) | | 30 (46.2) | 12 (34.3) | |
| Binge Drinking | | | | 0.16 | | | 0.81 |
| No | 92 (52.6) | 21 (53.8) | 14 (37.8) | | 38 (58.5) | 19 (55.9) | |
| Yes | 83 (47.4) | 18 (46.2) | 23 (62.2) | | 27 (41.5) | 15 (44.1) | |
| Any Drug Use^a | | | | 0.26 | | | 0.86 |
| No | 70 (39.8) | 15 (38.5) | 19 (51.4) | | 23 (35.4) | 13 (37.1) | |
| Yes | 106 (60.2) | 24 (61.5) | 18 (48.6) | | 42 (64.6) | 22 (62.9) | |
| Total lifetime Incarcerations | | | | 0.41 | | | 0.58 |
| 1 | 23 (13.2) | 4 (10.5) | 8 (21.6) | | 8 (12.3) | 3 (8.8) | |
| 2–5 | 76 (43.7) | 13 (34.2) | 12 (32.4) | | 35 (53.8) | 16 (47.1) | |
| ≥6 | 75 (43.1) | 21 (55.3) | 17 (45.9) | | 22 (33.8) | 15 (44.1) | |
| Duration of Current Incarceration | | | | 0.25 | | | 0.21 |
| ≤ 8 weeks | 89 (50.9) | 17 (43.6) | 21 (56.8) | | 30 (46.9) | 21 (60.0) | |
| > 8 weeks | 86 (49.1) | 22 (56.4) | 16 (43.2) | | 34 (53.1) | 14 (40.0) | |
| Housing status in jail | | | | 0.71 | | | 0.01 |
| General population | 44 (25.1) | 5 (12.8) | 3 (8.1) | | 18 (27.7) | 18 (52.9) | |
| Protective custody | 131 (74.9) | 34 (87.2) | 34 (91.9) | | 47 (72.3) | 16 (47.1) | |
| HIV test offered during incarceration | | | | <0.01 | | | NA |
| No | 23 (31.5) | 0 (0.0) | 23 (67.6) | | – | – | |
| Yes | 50 (68.5) | 39 (100.0) | 11 (32.4) | | – | – | |
| STI diagnosis, past 12m | | | | 0.08 | | | 0.22 |
| No | 105 (60) | 23 (59.0) | 28 (77.8) | | 38 (58.5) | 16 (45.7) | |
| Yes | 70 (40) | 16 (41.0) | 8 (22.2) | | 27 (41.5) | 19 (54.3) | |
| Pre-detention ART prescription (HIV positive) | | | | – | | | 0.03 |
| No | 30 (32.6) | – | – | | 16 (25.4) | 14 (48.3) | |
| Yes | 62 (67.4) | – | – | | 47 (74.6) | 15 (51.7) | |
| Receiving HIV Medication in Jail (HIV positive) | | | | – | | | 0.01 |
| No | 14 (14.0) | – | – | | 6 (9.2) | 8 (22.9) | |

(Continued)

Table 1. Continued.

| | Total n (%) | HIV-negative (N = 76) | | p | HIV-positive (N = 100) | | p |
|-----|----------------|---------------------------|----------------------|---|-------------------------|----------------------|---|
| | | Received HIV Test in Jail | | | Undetectable Viral Load | | |
| | | Yes(n = 39) n (%) | No (n = 37) n (%) | | Yes (n = 65) n (%) | No (n = 35) n (%) | |
| Yes | 79 (79.0) | – | – | | 57 (87.7) | 22 (62.9) | |

^a60 days prior to incarceration^bp-value by Fisher Exact test

Note: Column totals may not sum to total due to missing data

Table 2. Results from Multivariable Logistic Regression: Factors associated with HIV Testing and Viral Suppression

| | HIV Test in Jail (HIV negative) ¹ | | Undetectable Viral Load (HIV positive) | |
|---|---|-------------------------------------|---|-------------------------------------|
| | Site-Adjusted Models ² AOR (95% CI) | Multivariable Model AOR (95% CI) | Site-Adjusted Models ² AOR (95% CI) | Multivariable Model AOR (95% CI) |
| Gender identity | | | | |
| Transgender male-to-female or Other | 0.81 (0.27, 2.54) | 0.42 (0.08, 1.97) | – | – |
| Cisgender male | REF | REF | | |
| Sexual Orientation | | | | |
| Straight, Bisexual, or Other | 3.81 (1.31, 12.05)* | 8.97** (1.95, 41.24) | – | – |
| Gay/Same-gender loving | REF | REF | | |
| Employment ³ | | | | |
| Unemployed/Disability/ Worker's Compensation | 0.12 ** (0.03, 0.40) | 0.03*** (0.00, 0.23) | – | – |
| Part-time/Full-time | REF | REF | | |
| STI in past 12 months | 2.43 (0.79, 7.97) | 2.74 (0.56, 13.52) | – | – |
| Binge drinking in past 12 months | 0.67 (0.23, 1.90) | 0.19* (0.04, 0.92)* | – | – |
| City | | | | |
| Chicago | REF | REF | REF | REF |
| LA | 5.30** (1.94, 15.55) | 8.20** (1.87, 36.06) | 1.88 (0.64, 6.03) | 1.21 (0.25, 5.80) |
| Houston | – | – | 0.87 (0.34, 2.23) | 1.51 (0.41, 5.62) |
| Duration of Current Incarceration | | | | |
| ≤ 8 weeks | REF | REF | REF | REF |
| > 8 weeks | 1.80 (0.64, 5.07) | 2.79 (0.66, 11.82) | 1.43 (0.58, 3.51) | 2.17 (0.72, 6.55) |
| Education | | | | |
| < HS | – | – | REF | REF |
| High School or Equivalent | – | – | 0.54 (0.16, 1.76) | 0.29 (0.07, 1.29) |
| Some College or greater | – | – | 1.59 (0.57, 4.45) | 1.23 (0.33, 4.53) |
| Housed in protective custody | – | – | 3.12* (1.09, 9.59) | 3.04 (0.94, 10.53) |
| Pre-detention ART prescription (HIV positive) | – | – | 2.58* (1.01, 6.73) | 2.50 (0.87, 7.22) |
| Receiving ART in Jail (HIV positive) | – | – | 2.91 (0.88, 9.57) | 2.69 (0.73, 9.90) |

¹Excluding participants living in Houston²Includes each predictor, site, and duration of incarceration³In 6 Months prior to incarceration

*p < 0.05, **p < 0.01, ***p < 0.001

HIV positive participants reported receiving ART in custody but only 65% reported an undetectable viral load, and only about half of HIV negative participants obtained testing. Furthermore, 40% of participants in our study reported a STI diagnosis in the past year, indicating potential risk for HIV transmission and emphasizing the need and opportunities to engage this population in HIV/STI prevention and care during

and after incarceration. Not surprisingly, engagement in HIV care (measured as having a prescription for ART) prior to incarceration was associated with viral suppression during incarceration. However, nearly one third of HIV positive participants were not engaged in care prior to incarceration, which highlights an opportunity for focused efforts to engage previously unengaged individuals in HIV care during incarceration.

Differences in HIV care protocols across the three sites may account for observed differences across locations. Whether an HIV test was offered and whether it was accepted by participants if offered may reflect different barriers operating at individual and/or system levels. Offering HIV tests routinely is likely to be largely impacted by system or provider level factors, whereas acceptance of a test is more likely to be due to individual factors, such as perceived risk and stigma. Participants in LA were more likely than those in Chicago to be offered an HIV test (76% vs. 55%) and to obtain a test if offered (90% vs. 56%). It is possible that the manner, setting, and/or timing in which HIV testing was offered created an environment more conducive to testing in LA. For example, all individuals from LA were housed in protective custody in one specific location. This may have created social norms within that group, including reduced HIV stigma, homophobia, and transphobia, that supported increased testing (Dolovich, 2012). Social networks and their impact on perceived stigmas among detainees were not assessed in this study, but could be relevant factors that impact HIV testing rates in jail settings. Prioritizing HIV testing as part of routine services in jail as opposed to risk-based testing may help to remove stigma associated with HIV testing. Further research should be conducted to examine the impact of protective custody and social jail setting on HIV testing, HIV care engagement, and viral suppression.

It is unclear why reporting a sexual orientation other than gay or same-gender loving was associated with greater likelihood of receiving an HIV test. This may be related to the fact that non gay-identified individuals are less likely to test in community settings, differences in how or to whom testing was offered to, or perceived infection risk. Individual and system factors associated with testing availability and uptake among sexual and gender minorities in criminal justice settings should be explored in future research.

Findings should be interpreted in light of several limitations. First, the generalizability of the findings is limited by recruitment strategies and site-specific differences. The fact that the recruitment process varied by site complicates between-site comparisons. Additionally, the sample largely consisted of individuals in protective custody or those who were HIV positive; HIV-negative BMSM and BTW in general custody are likely underrepresented. BTW are most likely overrepresented in this sample as they are more likely than MSM to be seen by jail clinic staff for hormone treatment and reside in protective custody. Second, the small sample size limited statistical power and the number of variables that could be included in the multivariable models, as well

as tests of interactions by site or stratified analysis. Other potentially relevant psychosocial, behavioral, or service delivery factors that could explain site differences should be explored in future research. Third, site variability in sample size, HIV prevalence, and housing status presented challenges during the analysis. Finally, outcome measures were assessed via self-report and not verified through biological testing or medical record review.

Conclusion

Despite these limitations, this study provides insights about HIV testing and viral suppression among two of the most vulnerable populations in the criminal justice setting. Overall, only a little over half of individuals in the study received HIV testing or treatment despite having a median custody stay of eight weeks. This highlights missed opportunities and a need to better engage young BMSM and BTW in HIV testing and treatment while they are incarcerated and in peri-detention. Results suggest that unemployment and binge drinking prior to incarceration were associated with lower likelihood of HIV testing during incarceration. Further research focused on the variation of HIV testing coverage across the three sites looking at structural and micro-level variables that could not be accounted for in this study, including experienced or perceived stigma, is warranted. These findings highlight crucial opportunities for improving engagement in HIV prevention and care continua among incarcerated BMSM and BTW.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

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Declaration of interest

The authors declare they have no conflict of interest.

Author contribution statement

NA conceptualized the analysis plan with JS and AH, critically interpreted the results, and wrote the first draft of the manuscript. RF critically evaluated the results and significantly revised the initial version, and all following edits of the manuscript. NH obtained funding for the study, served as PI for the Los Angeles site, designed the survey, and critically reviewed the manuscript. NDV conducted the statistical analysis, created the final tables, wrote the statistical analysis section, and contributed to the interpretation of the results. RI managed the data for the three study sites, contributed to the statistical analysis, and contributed to the interpretation of the results. KF obtained funding for the study, served as PI for the Houston site, designed the survey, and critically reviewed the manuscript. AK served as a co-I for the Chicago site and contributed to the survey development. ADP led the data collection and management for the Houston site. JS obtained funding for the study, served as PI for the Chicago site, designed the survey, conceptualized the analysis plan, and critically reviewed the manuscript. AH conceptualized the analysis plan, oversaw the statistical analyses, and critically revised the first and subsequent drafts of the manuscript.

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