Psychosocial Stressors and Sexual Health Among Southern African American Women Who Have Sex with Women

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Abstract

Purpose: We examined the association of psychosocial stressors (depressive symptoms, incarceration, and intimate partner violence [IPV]) with sexual behaviors, sexually transmitted infection (STI) history, and STI diagnoses among African American women who have sex with women (AAWSW).

Methods: This was a secondary analysis from a study of AAWSW ≥ 16 years. Multivariable Poisson regression estimated risk ratios (RRs) for the association between depressive symptoms, incarceration, and IPV and sexual behaviors, STI history, and STI diagnosis at enrollment, adjusting for age and sexual orientation identity.

Results: Of 165 AAWSW, the mean depressive symptom score was 1.0 (SD ± 0.8); 22.4% reported incarceration and 62.4% reported IPV. Depressive symptoms were associated with alcohol/drug use at last sexual encounter (RR = 1.52, 95% confidence interval [CI]: 1.18–1.95) and STI diagnosis (RR = 1.19; 95% CI: 1.05–1.34). Incarceration was associated with STI history (RR = 1.28; 95% CI: 1.07–1.53). IPV was associated with alcohol/drug use during sex with women (RR = 1.42; 95% CI: 1.05–1.92) and STI history (RR = 1.42, 95% CI: 1.13–1.78), particularly trichomoniasis (RR 2.50; 95% CI: 1.52–4.12). Among AAWSW reporting sex with men ($n = 144$), depressive symptoms were associated with sex in exchange for money/drugs (RR = 1.98; 95% CI: 1.17–3.34) and alcohol/drug use during sex with men (RR = 1.24; 95% CI: 1.05–1.46). Incarceration was associated with sex in exchange for money/drugs with men (RR = 5.21; 95% CI: 1.86–14.57); IPV was associated with sex in exchange for money/drugs (RR = 5.04; 95% CI: 1.18–21.50) and alcohol/drug use during sex with men (RR = 1.66; 95% CI: 1.14–2.41).

Conclusion: Providers and public health programs should address both psychosocial stressors and STI risk among AAWSW.

Keywords: African American, depressive symptoms, intimate partner violence, incarceration, sexually transmitted infections, women who have sex with women

Introduction

ACCORDING TO THE 2011–2013 National Survey of Family Growth, 17.4% of U.S. women aged 18–44 years reported a lifetime history of sex with female partners.¹ Traditionally considered at low risk for sexually transmitted infections (STIs),^{2,3} recent data show that women who have sex with women (WSW) and women who have sex with women and men (WSWM) are at risk for acquiring STIs.^{4,5} In fact, WSWM may be at greater risk for STIs than women who only have sex with men (WSM).⁶

African American (AA) WSW, particularly those in the U.S. South, are at greater risk for STIs such as trichomoniasis, chlamydia, and gonorrhea relative to their White counterparts.^{7–9} Researchers posit that AAWSW (including AAWSWM) experience a “triple jeopardy” as a result of their exposure to racism, sexism, and heterosexism.¹⁰ Indeed, studies show that AAWSW experience stigma and discrimination within the AA community based on their sexual orientation,^{11,12} within the lesbian, gay, bisexual, transgender, and queer (LGBTQ) community based on their race/ethnicity,¹³ and within both communities based on their gender.¹⁰ This

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“multiple minority stress,”^{10,13} namely the excess stress to which individuals from multiple stigmatized social categories,¹⁴ such as LGBTQ people of color,¹⁵ experience may, in turn, play a central role in shaping sexual health disparities among AAWSW relative to their White and heterosexual counterparts. Also contributing to the high burden of STIs among AAWSW is the social and economic marginalization faced by AA women, especially in the U.S. South.^{16,17}

Within this context, the association of psychosocial stressors such as depressive symptoms, incarceration, and intimate partner violence (IPV) with sexual behaviors, STI history, and STI diagnoses among AAWSW is not well known. Depressive distress is high among AAWSW.¹⁸ Physical and sexual abuse have been associated with higher rates of depressive symptoms in HIV-positive women,¹⁹ and depressive symptoms have, in turn, been independently associated with sexual risk behaviors.²⁰ Furthermore, incarceration, which affects AA women disproportionately,²¹ including AAWSW,²² has been linked to unprotected sex with men and women and a history of transactional sex among AAWSW.²³ In a recent U.S. National Inmate Survey, WSW, including those who self-identified as lesbian or bisexual, represented 36% of women in jail and 42% of women in prison.²² Lesbian or bisexual women in prisons had higher odds of being AA than heterosexual women (OR=1.2; 95% confidence interval [CI]=1.0–1.4).

Regarding IPV, a systematic review found that lifetime sexual assault victimization may be as high as 85% among lesbian and bisexual women.²⁴ In another study, lesbian or bisexual veterans were significantly more likely to report lifetime IPV than heterosexual women.²⁵ Compared to White women and women from other racial/ethnic backgrounds, AA women are most at risk for severe IPV.^{26,27} In addition, IPV among lesbian and bisexual women occurs within the context of heterosexism and homophobia and may thus contribute to their experiences of “minority stress.”²⁶ Of note, outing, or the threat of informing others that the victim is gay or lesbian is a tactic often used by batterers in female same-sex relationships to control their partners.²⁶ Similarly, heterosexism may prevent lesbian and bisexual women from leaving abusive relationships due to fear of negative responses from family, religious organizations, social services, or battered women’s organizations.²⁶

Given the limited literature on the social determinants of AAWSW’s health in general and sexual health in particular, we sought to examine the association between psychosocial stressors (depressive symptoms, incarceration, and IPV) and sexual behaviors, STI history, and STI diagnoses among a sample of AAWSW in the U.S. South, where the majority of AAWSW reside²⁸ and resources to prevent STIs in underserved populations may be scarce.²⁹ We hypothesized that psychosocial stressors would be positively associated with participation in sexual risk behaviors, STI history, and STI diagnoses. Our findings will help to inform future research on this understudied topic and the development of interventions that promote the sexual health of AAWSW.

Methods

Study participants

The present study was a secondary analysis of data from the Women’s Sexual Health Project (WSHP), which enrolled AAWSW at the Jefferson County Department of Health

(JCDH) STI clinic in Birmingham, AL between August 2011 and October 2013. Written informed consent was obtained from all participants in the WSHP study; minors aged 16–17 years provided assent. Women aged ≥16 years reporting a history of sex (oral, vaginal, and/or anal) with another woman during the past 12 months were eligible. Exclusion criteria were being non-English speaking, pregnancy (multiple cervical swabs were obtained which could increase the risk of premature rupture of membranes), and breastfeeding (which may influence the vaginal microbiota and, in turn, affect bacterial vaginosis testing results). The primary objective of the WSHP was to explore partnership characteristics among AAWSW and evaluate their association with STI risk.⁸ Secondary objectives were to determine the prevalence of STIs and predictors of infection. In addition to enrolling eligible walk-ins at the STI clinic, AAWSW were recruited using flyers posted at LGBTQ-serving venues in the Birmingham metropolitan area and on the University of Alabama at Birmingham (UAB) campus. A total of 171 AAWSW met study inclusion criteria and were invited to participate; 6 declined, and 165 were enrolled (response rate: 96.5%). Enrolled participants received \$25 cash for their participation.

The WSHP study and this secondary analysis were approved by the UAB Institutional Review Board (IRB) (Protocol #F110609002) and by the JCDH. The Human Research Protection Program at Brown University and the Office of Human Research Administration at the Harvard T.H. Chan School of Public Health found this secondary analysis of deidentified data to be exempt from IRB review.

Data collection

Data were collected from WSHP participants at the JCDH STI clinic. At enrollment, participants completed a detailed, interviewer-administered questionnaire, which included questions on sociodemographic characteristics (i.e., age, marital status, education, employment status, cohabitation status, and annual income), sexual orientation identity, psychosocial stressors (i.e., depressive symptoms, IPV, and incarceration history), healthcare factors, sexual behaviors with female and male sexual partners, and lifetime history of HIV/STIs. Participants completed a pelvic examination with testing for trichomoniasis, chlamydia, gonorrhea, HIV, syphilis, and herpes simplex virus type-2 (HSV-2). Those who tested positive for any STI were treated according to the 2010 Centers for Disease Control and Prevention’s STI treatment guidelines.³⁰

Measures

Study outcomes for this analysis included sexual behaviors at last sexual encounter with female (and male) sexual partners, lifetime sexual behaviors with female (and male) sexual partners, lifetime history of STIs, and STI diagnoses at WSHP enrollment. Only women indicating a lifetime history of sex with men ($n=144$) responded to items about lifetime sexual behaviors with male sexual partners. Two sexual behaviors at last sexual encounter were examined: (1) “Had you been using alcohol or drugs the last time you had sex?” and (2) “Did you use protection during the last time you had sex?” For lifetime sexual behaviors, respondents were asked whether they had ever had sex “in exchange for money/drugs,” “under the influence of alcohol,” or “under the influence of drugs” with female (and

male) partners, respectively. Sex under the influence of alcohol or drugs was combined into a single outcome variable. For lifetime sexual behaviors with women, respondents indicated whether they ever used dental dams or condoms on sex toys during sex with women, which were combined into a single outcome variable. For lifetime sexual behaviors with men, respondents indicated whether they ever used condoms when engaging in vaginal or anal sex with men, respectively, which were combined into a single outcome variable.

Participants also reported whether they had a lifetime history of gonorrhea, chlamydia, HIV, trichomoniasis, syphilis, or genital HSV-2. Results were used to generate four lifetime STI history variables: bacterial STI (gonorrhea, chlamydia, or syphilis), viral STI (HIV, HSV-2), parasitic STI (trichomoniasis), and any lifetime STI, which included the aforementioned STIs. At WSHP enrollment, STI testing was performed to assess for gonorrhea, chlamydia, trichomoniasis, and serological evidence of syphilis, HSV-2, and HIV. Women who reported a previous HIV diagnosis were not retested, and no other women tested positive for HIV. These results were used to generate four STI diagnosis variables: bacterial STI (gonorrhea, chlamydia, or serological evidence of syphilis), serological evidence of HSV-2, parasitic STI (trichomoniasis), and any STI, which included the aforementioned STIs. The proportion of missing data was 1.2% ($n=2$) for alcohol/drug use at last sexual encounter, 12.7% ($n=21$) for exchange of sex for money/drugs with female sexual partners, 6.1% ($n=10$) for alcohol/drug use during sex with female sexual partners, 8.5% ($n=14$) for dental dam/condom use during sex with female partners, and 0.61% ($n=1$) for serological evidence of HSV-2.

Three psychosocial stressors served as primary predictors: depressive symptoms during the past week, lifetime incarceration, and lifetime IPV. Depressive symptoms were measured using six items from the Center for Epidemiologic Studies Depression Scale³¹ (i.e., “During the past week, I felt lonely”). Items were measured on a four-point scale, with response options ranging from 0 “rarely or none of the time (<1 day)” to 3 “most or all of the time (5–7 days).” A higher mean score (between 0–3) indicated greater depressive symptoms. Lifetime incarceration was assessed by asking respondents, “Have you ever been incarcerated for more than 24 hours?” Lifetime IPV was assessed by asking participants “Have you ever been threatened with or experienced a physical violence attempt, experienced physical violence from an intimate partner, and ever experienced sexual assault?”^{32,33} Based upon these variables, a single binary outcome variable pertaining to lifetime exposure to any type of IPV was generated and used in all analyses.

Statistical analyses

The percentage distribution of sociodemographic, healthcare, and psychosocial factors among AAWSW was examined. The percentage distribution of sexual behaviors at last sexual encounter with female and male sexual partners, lifetime sexual behaviors with female and male sexual partners, lifetime STI history, and STI diagnosis at enrollment was also assessed. Multivariable Poisson regression was used to estimate risk ratios (RRs) for each outcome variable in relation to each exposure (depressive symptoms, incarceration, and IPV). Regression analyses were adjusted for age and sexual orientation identity, which we conceptualized a priori as potential confounders based on the scientific litera-

ture.^{10,15} All statistical analyses were conducted using STATA 14.2 (StataCorp LP, College Station, TX).

Results

A total of 165 AAWSW were enrolled in WSHP between August 2011 and October 2013. Table 1 shows the percentage

TABLE 1. PERCENTAGE DISTRIBUTION OF SOCIODEMOGRAPHIC CHARACTERISTICS, HEALTHCARE FACTORS, AND PSYCHOSOCIAL FACTORS AMONG AFRICAN AMERICAN WOMEN WHO HAVE SEX WITH WOMEN IN THE U.S. SOUTH ($N=165$)

Variable	n or mean	% or SD
Age (years)		
17–21	35	21.2
22–25	47	28.5
26–30	37	22.4
31–59	46	27.9
Sexual orientation identity		
Heterosexual	2	1.2
Bisexual	73	44.2
Lesbian	84	50.9
Don’t know/questioning	6	3.6
Lifetime sex with men: yes	144	87.3
Marital status		
Married	3	1.8
Separated, divorced, or widowed	32	19.4
Never married	130	78.8
Cohabitation status		
Living with a female sexual partner	39	23.6
Living with a male sexual partner	9	5.5
Living with male and female sexual partners	1	0.6
Not living with a sexual partner	116	70.3
Educational attainment		
<High school	32	19.4
High school diploma or GED	55	33.3
Some college/associate’s degree/vocational school or more	78	47.3
Individual annual income		
<\$10,000	102	62.2
\$10,000–19,999	36	22.0
≥\$20,000	26	15.9
Employment status		
Employed	65	39.4
Student	44	26.7
Unemployed	56	33.9
Has health insurance: yes	84	50.9
Has primary care provider: yes	67	40.6
Past week depressive symptoms (mean)	1.0	0.8
Any lifetime intimate partner violence ^a experience: yes	103	62.4
Ever incarcerated: yes	37	22.4

Percentages may not add to 100% due to rounding. The proportion of missing data was 0.61% ($n=1$) for individual annual income.

^aIncludes physical violence threat (29.7%), attempt (38.2%), and exposure (38.8%) and sexual assault exposure (41.2%).

GED, general education development.

TABLE 2. PERCENTAGE DISTRIBUTION OF SEXUAL BEHAVIORS, SEXUALLY TRANSMITTED INFECTION HISTORY, AND SEXUALLY TRANSMITTED INFECTION DIAGNOSES AMONG AFRICAN AMERICAN WOMEN WHO HAVE SEX WITH WOMEN IN THE U.S. SOUTH ($N=165$)

Variable	n	%	95% CI
Sexual behaviors at last sexual encounter with sexual partner of any sex			
Used alcohol or drugs at last sexual encounter	45	27.6	21.2–35.0
Used any protection at last sexual encounter	48	29.1	22.6–36.6
Lifetime sexual behaviors with female sexual partners			
Ever exchanged sex for money or drugs	7	4.9	2.3–9.9
Ever used alcohol or drugs during sex	96	61.9	54.0–69.3
Ever used dental dams/condoms on sex toys during sex	87	57.6	49.5–65.3
Lifetime sexual behaviors with male sexual partners ^a			
Ever exchanged sex for money or drugs	16	11.1	6.9–17.5
Ever used alcohol or drugs during sex	73	50.7	42.5–58.9
Ever used condoms during vaginal/anal sex	127	88.2	81.7–92.6
Lifetime STI history			
Any STI	111	67.3	59.7–74.1
Bacterial STI (gonorrhea, chlamydia, or syphilis)	70	42.4	35.0–50.2
Viral STI (HIV or HSV-2)	16	9.7	6.0–15.3
Parasitic STI (trichomoniasis)	62	37.6	30.5–45.3
STI diagnosis at enrollment			
Any STI	93	56.4	48.6–63.8
Bacterial STI (gonorrhea, chlamydia, or serological evidence of syphilis)	9	5.5	2.8–10.2
Serological evidence of HSV-2	76	46.3	38.8–54.1
Parasitic STI (trichomoniasis)	33	20.0	14.5–26.9

STI categories are not mutually exclusive. The proportion of missing data was 1.2% ($n=2$) for used alcohol or drugs at last sexual encounter, 12.7% ($n=21$) for exchanged sex for money or drugs with female sexual partners, 6.1% ($n=10$) for used alcohol or drugs during sex with female sexual partners, 8.5% ($n=14$) for dental dam/condom use during sex with female sexual partners, and 0.61% ($n=1$) for serological evidence of HSV-2.

^aOnly applies to women reporting lifetime sex with men ($n=144$).

CI, confidence interval; STI, sexually transmitted infection; HSV-2, herpes simplex virus type 2.

distribution of sociodemographic characteristics, healthcare factors, and psychosocial stressors. Of these AAWSW, 144/165 (87.3%) reported a history of sex with men. Approximately half of the women (84/165, 50.9%) self-identified as lesbian and 44.2% as bisexual. The majority (78.8%) had never been married. Less than half (47.3%) had completed some college education, obtained an associate's degree, or attended vocational school. Approximately two-thirds (62.2%) had an annual income <\$10,000; 33.9% were unemployed. The mean depressive symptom score was 1.0 (SD ± 0.8). A large percentage (62.4%) reported lifetime IPV and 22.4% reported an incarceration history.

Table 2 shows the percentage distribution of sexual behaviors (lifetime and at last sexual encounter), STI history, and STI diagnoses at WSHP enrollment. A majority (61.9%) reported ever using alcohol/drugs during sex with women. Among women reporting a history of sex with men ($n=144$), 50.7% reported alcohol/drug use during sex with men and 11.1% reported sex in exchange for money/drugs with men. Approximately one fourth of the women (27.6%) reported alcohol/drug use at their last sexual encounter with any partner. STI history was common (67.3%), particularly with regards to bacterial STIs (42.4%) and trichomoniasis (37.6%). Only 7.3% of women reported genital HSV-2 although 46.3% had serologic evidence of infection. Over half (56.4%) of the women were diagnosed with an STI at WSHP enrollment, most commonly HSV-2 (46.3%) and trichomoniasis (20.0%).

Table 3 shows adjusted RRs for the association between psychosocial stressors (depressive symptoms, IPV, and incarceration) and sexual behaviors, STI history, and STI diagnoses at WSHP enrollment, adjusting for age and sexual orientation identity. AAWSW with depressive symptoms had a 52% higher risk (RR = 1.52; 95% CI: 1.18–1.95) of alcohol/drug use at last sexual encounter with a female or male sexual partner than women who did not have depressive symptoms. AAWSW with depressive symptoms also had a 19% higher risk of an STI diagnosis at WSHP enrollment (RR = 1.19; 95% CI: 1.05–1.34) compared to women with no depressive symptoms. Among AAWSW reporting a history of sex with men ($n=144$), those with depressive symptoms had a 98% higher risk of exchange of sex for money/drugs with men (RR = 1.98; 95% CI: 1.17–3.34) and a 24% higher risk of ever using alcohol/drugs during sex with men (RR = 1.24; 95% CI: 1.05–1.46) relative to women without depressive symptoms.

AAWSW with a history of incarceration had a 28% higher risk of having a history of STIs (RR = 1.28; 95% CI: 1.07–1.53) compared to women with no incarceration history (Table 3). Among AAWSW reporting a history of sex with men, those with a history of incarceration had 5.21 times the risk of ever exchanging sex for money/drugs with men (RR = 5.21; 95% CI: 1.86–14.57) relative to women who had never been incarcerated. Compared to AAWSW with no IPV history (Table 3), those reporting IPV had a 42% higher risk of using alcohol/drugs during sex with women

TABLE 3. ADJUSTED RISK RATIOS FOR SEXUAL BEHAVIORS, SEXUALLY TRANSMITTED INFECTION HISTORY, AND SEXUALLY TRANSMITTED INFECTION DIAGNOSES IN RELATION TO PSYCHOSOCIAL FACTORS AMONG AFRICAN AMERICAN WOMEN WHO HAVE SEX WITH WOMEN IN THE U.S. SOUTH (N=165)

Outcome	Depressive symptoms RR (95% CI)	Incarceration RR (95% CI)	Any intimate partner violence RR (95% CI)
Sexual behaviors at last sexual encounter with sexual partner of any sex			
Used alcohol or drugs at last sexual encounter	1.52 (1.18–1.95)	1.20 (0.65–2.21)	1.11 (0.65–1.89)
Used any protection at last sexual encounter	1.05 (0.78–1.41)	0.91 (0.51–1.61)	1.26 (0.76–2.10)
Lifetime sexual behaviors with female sexual partners			
Ever exchanged sex for money or drugs	1.83 (0.84–4.00)	3.13 (0.71–13.88)	2.12 (0.38–11.73)
Ever used alcohol or drugs during sex	1.11 (0.97–1.27)	1.20 (0.90–1.60)	1.42 (1.05–1.92)
Ever used dental dams/condoms on sex toys during sex	1.08 (0.92–1.27)	1.21 (0.87–1.69)	1.26 (0.93–1.69)
Lifetime sexual behaviors with male sexual partners ^a			
Ever exchanged sex for money or drugs	1.98 (1.17–3.34)	5.21 (1.86–14.57)	5.04 (1.18–21.50)
Ever used alcohol or drugs during sex	1.24 (1.05–1.46)	1.27 (0.92–1.75)	1.66 (1.14–2.41)
Ever used condoms during vaginal/anal sex	0.96 (0.89–1.05)	1.07 (0.96–1.20)	1.02 (0.90–1.16)
Lifetime STI history			
Any STI	1.04 (0.93–1.17)	1.28 (1.07–1.53)	1.42 (1.13–1.78)
Bacterial STI (gonorrhea, chlamydia, or syphilis)	0.91 (0.73–1.12)	1.23 (0.86–1.77)	1.42 (0.98–2.06)
Viral STI (HIV or HSV-2)	0.96 (0.53–1.74)	1.04 (0.43–2.54)	1.49 (0.60–3.73)
Parasitic STI (trichomoniasis)	1.16 (0.93–1.44)	1.34 (0.91–1.98)	2.50 (1.52–4.12)
STI diagnosis at enrollment			
Any STI	1.19 (1.05–1.34)	1.15 (0.94–1.41)	1.25 (0.97–1.61)
Bacterial STI (gonorrhea, chlamydia, or serological evidence of syphilis)	1.65 (0.81–3.33)	1.44 (0.31–6.76)	0.27 (0.05–1.53)
Serological evidence of HSV-2	1.14 (0.98–1.33)	1.25 (0.97–1.62)	1.34 (0.99–1.81)
Parasitic STI (trichomoniasis)	1.14 (0.82–1.58)	0.90 (0.41–1.99)	1.84 (0.94–3.63)

STI categories are not mutually exclusive. Boldface indicates statistically significant ($P < 0.05$) difference between exposed and comparison groups. The proportion of missing data was 1.2% ($n = 2$) for used alcohol or drugs at last sexual encounter, 12.7% ($n = 21$) for exchanged sex for money or drugs with female sexual partners, 6.1% ($n = 10$) for used alcohol or drugs during sex with female sexual partners, 8.5% ($n = 14$) for dental dam/condom use during sex with female sexual partners, and 0.61% ($n = 1$) for serological evidence of HSV-2. Separate models were estimated for each outcome in relation to each exposure. Models were adjusted for age group and sexual orientation identity.

^aOnly applies to women reporting lifetime sex with men ($n = 144$).

RR, risk ratio.

(RR = 1.42; 95% CI: 1.05–1.92). They also had 1.42 times the risk of a lifetime STI history (RR 1.42, 95% CI: 1.13–1.78), including 2.5 times the risk of a lifetime history of trichomoniasis (RR 2.50; 95% CI: 1.52–4.12). Among AAWSW reporting a history of sex with men, those with a lifetime history of IPV had five times the risk of ever exchanging sex for money/drugs with men (RR = 5.04; 95% CI: 1.18–21.50) and a 66% higher risk of ever using alcohol/drugs during sex with men (RR = 1.66; 95% CI: 1.14–2.41) than those without a lifetime IPV history. Depressive symptoms, incarceration, or IPV were not associated with dental dam/condom use on sex toys with female sexual partners or condom use during vaginal or anal sex with male partners, diagnosis of bacterial STI or trichomoniasis at WSHP enrollment, or serologic evidence of HSV-2.

Discussion

To our knowledge, this is the first study to examine the association between psychosocial stressors (i.e., depressive symptoms, incarceration, and IPV) and sexual behaviors, STI history, and STI diagnoses in a sample of AAWSW in the U.S. South. Several statistically significant associations were observed. Patient-reported depressive symptoms were associated with alcohol/drug use at last sexual encounter

with a female or male sexual partner and STI diagnosis at enrollment. Among AAWSW reporting sex with men, depressive symptoms were also associated with exchange of sex for money/drugs and alcohol/drug use during sex with male sexual partner(s). Given the high incidence of depressive symptoms and positive association with sexual risk behaviors and STI diagnoses among AAWSW, healthcare providers and public health programs should screen for and treat both depression and STIs among AAWSW, which may in turn improve sexual health outcomes.

Incarceration was also strongly associated with exchange of sex for money/drugs with male sexual partner history and, to a lesser extent, a history of any STI among AAWSW in our sample. The link between incarceration and transactional sex is not surprising because of the high risk of criminal charges and incarceration faced by commercial sex workers³⁴ and the limited employment options of former inmates,³⁵ which may lead previously incarcerated women to engage in commercial sex. Furthermore, a disproportionate number of inmates are AA²¹ and WSW,²² and currently and formerly incarcerated women are at greater risk of HIV and STIs compared to those with no history of incarceration.³⁴ Although HIV transmission between women is unlikely,⁹ sex with men is not uncommon among AAWSW,⁷ as noted in this study, and can facilitate HIV/STI transmission and

acquisition. Curtailing incarceration and increasing employment options among AAWSW with a history of incarceration may, in conjunction with STI counseling, testing, and treatment, help reduce STI risk in this vulnerable population.

Finally, a history of IPV was associated with the exchange of sex for money/drugs with male sexual partner(s) and a history of trichomoniasis. To a lesser extent, IPV was also associated with alcohol/drug use during sex with female and male sexual partners and a lifetime history of any STI. Adjusting for age and sexual orientation identity, the association between IPV and trichomoniasis was the only association between a psychosocial stressor and a specific STI that reached statistical significance. This finding is similar to a prior study of AA women randomly assigned to an HIV/STI prevention intervention or control condition; among intervention participants, those with a history of IPV were more likely to test positive for trichomoniasis than those with no IPV history.³⁶ This finding is clinically significant, as trichomoniasis has been shown to increase both HIV acquisition and transmission among women, particularly AA women.³⁷ It is possible that women in an abusive relationship are uncomfortable negotiating condom or other barrier method use with their sexual partner(s).^{38,39} Further studies are needed to understand the temporal relationship between IPV and trichomoniasis in AAWSW. Regardless, providers should be aware that IPV is common in AAWSW and should routinely screen for IPV, substance abuse, and STIs, especially trichomoniasis.

Limitations

This study has several limitations. The majority of data was obtained by self-report during an interviewer-administered questionnaire and may be limited by recollection or social desirability bias. In addition, due to time constraints, several questions in the survey (i.e., “Had you been using alcohol or drugs the last time you had sex?”) did not go into further detail to determine how much alcohol (i.e., binge-drinking vs. having 1–2 drinks) or what types of drugs (marijuana vs. harder drugs such as cocaine or opioids) were used during sexual activities. Furthermore, a notable percentage (62.2%) of participants reported an annual income less than \$10,000; findings from this study may not be generalizable to AAWSW with higher incomes. In addition, a large proportion of women (72.1%) were aged ≤30 years and could have a different risk profile than women aged >30 years. However, we were unable to conduct a stratified analysis of women aged ≤30 and >30 years due to the small number of women in the >30 years group ($n=46$), which limited our power to detect associations between psychosocial stressors and sexual health outcomes in this age group.

The results of this study should also not be interpreted as evidence that depressive symptoms, IPV, and/or incarceration *cause* sexual risk behaviors or STIs in AAWSW as all data were cross-sectional. Thus, we cannot conclude that alleviating depression, incarceration, and IPV will definitively improve the sexual health of AAWSW. However, our findings do demonstrate strong associations among psychosocial stressors, sexual risk behaviors, STI history, and STI diagnoses. Furthermore, our study’s small sample size did not allow us to test the interaction between social support and psychosocial stressors and sexual health outcomes. In this heterogeneous cohort, it is possible that social support, in-

cluding partnered status and living arrangements, would modify the above results; the role of social support and other potential moderators deserves future study. In addition, the IPV variable included any lifetime IPV, which was not temporally specific (i.e., remote, past, or ongoing IPV), and did not include information regarding the frequency, duration, or severity of the IPV. Along these lines, due to the small sample size, survey questions on physical violence and sexual assault history were combined into one IPV variable that was included in all analyses. It is possible that physical violence may have had different effects on the study outcomes than sexual assault history; this should be examined in further detail in future studies.

Finally, the study questionnaire did not include the complete, 20-item Center for Epidemiological Studies Depression (CES-D) depressive symptoms index³¹ (where a cut point score of 16 or greater indicates clinically relevant depressive symptoms) and instead used an abbreviated six-item version. Abbreviated CES-D versions have been useful when lengthy interviews are not possible (i.e., the elderly),⁴⁰ and in settings that threaten interview rapport (i.e., marginalized populations),⁴¹ however, they may overestimate depressive symptoms. Because an abbreviated CES-D version was used in this study, the depressive symptom score for participants was analyzed as a continuous variable, with higher scores indicating higher levels of depressive symptoms. If the 20-item CES-D version had been used, the scores could have been re-coded into a categorical variable where 0–15 was below the cut point for depressive symptoms and 16 or greater was above the cut point. This could have helped to determine which participants needed to be referred for further evaluation of depressive symptoms.

Conclusion

In summary, our findings contribute to a growing body of literature describing complex associations between psychosocial stressors and suboptimal sexual health outcomes for AAWSW.^{18,23,24} The high prevalence of psychosocial stressors among AAWSW and the positive association of these stressors with sexual risk behaviors, STI history, and STI diagnoses underscore the need for healthcare providers and public health programs to address depressive symptoms, incarceration, and IPV in addition to sexual risk behaviors and STIs to promote optimal sexual health among AAWSW. Coordinated care efforts between primary care providers, infectious disease specialists, mental healthcare providers, and social workers may help to mitigate STI risk among AAWSW by comprehensively addressing their psychosocial risk factors. Policy makers and healthcare facilities should dedicate additional resources to ensuring such coordinated care efforts, which should be tailored to the specific needs of AAWSW in the U.S. South. Healthcare and social services that address the psychological and social context in which sexual risk behaviors occur are paramount to improving the sexual health of AAWSW and other marginalized populations.

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Disclaimer

The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

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