Factors Associated With Syphilis Testing and a History of Syphilis Infection Among a Sample of Transgender Women in Jamaica

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Background: Globally, social inequalities contribute to elevated sexually transmitted infections (STIs) rates among transgender women. High syphilis prevalence has been documented among transgender women in Latin America. Little is known, however, of syphilis testing uptake among transgender women in Jamaica, where homosexuality is criminalized. The study objective was to understand factors associated with opting-in for syphilis testing and a syphilis infection history among transgender women in Jamaica.

Methods: We conducted a cross-sectional tablet-based survey of 137 transgender women between March and November 2015 in Jamaica. Bivariate analyses were used to assess differences across sociodemographic, intrapersonal, interpersonal, and structural factors based on syphilis infection history. We conducted univariable and multivariable logistic regression to determine the odds ratio for opting-in for syphilis testing for all factors associated with testing uptake at a *P* value of less than 0.05 in bivariate analyses, controlling for sociodemographic characteristics.

Results: Among 137 participants, 83 (60.6%) opted in for syphilis screening and 8 (9.6%) had positive rapid test results. One quarter of participants (n = 26; 25.2%) reported being HIV positive. Opting-in for syphilis testing was associated with the following: 1 health (HIV-positive serostatus: adjusted odds ratio [AOR], 4.33; 95% confidence interval [CI], 1.31–14.26), 1 intrapersonal (perceived STI risk: AOR, 1.58; 95% CI, 1.04–2.40), 1 interpersonal (childhood sexual abuse: AOR, 2.80; 95% CI, 1.03–7.62), and 1 structural (incarceration: AOR, 0.27; 95% CI, 0.11–0.71) factor.

Conclusions: This study identified factors (HIV-positive serostatus, perceived STI risk, childhood sexual abuse, no incarceration history) associated with syphilis testing uptake among transgender women. Findings can inform multilevel STI testing, prevention, and care strategies tailored for transgender women in Jamaica.

Globally, transgender women are at elevated risk for sexually transmitted infections (STIs).[1] *Transgender women* is a term used to refer to people labeled male at birth who identify as girls or women; transgender can also include persons on the male-to-female or transfeminine spectrum. Social and structural inequities, such as stigma, violence, and health care discrimination,[1–4] elevate transgender women's exposure to STI and may limit STI testing access and uptake.[5] For instance, experiences of health care discrimination may create barriers to future engagement with health care providers and institutions, including accessing STI testing and sexual health services. A systematic review across 10 low- and middle-income countries reported a pooled HIV prevalence among transgender women (n = 7179) of 17.7%, nearly 49 times higher than national estimated prevalence.[6] Limited Jamaican data identified an HIV prevalence of 52.9% among 17 transgender women included in a larger study of men who have sex with men (n = 449).[7] There has been less attention to the prevalence and testing of other STIs among transgender women in low- and middle-income countries,[3] including Jamaica, amid reports of pervasive stigma toward transgender women.[7]

In a review of syphilis prevalence among at-risk populations in Latin America and the Caribbean, the highest syphilis prevalence was among transgender persons, ranging from 6.5% to 43.0%.[4] Data reported on transgender women in the Dominican Republic indicate that syphilis infection prevalence ranged from 3.5% to 6.9%.[8] Diagnosing and treating other STI, such as syphilis, reduces the risks of HIV acquisition and onward HIV and STI transmission.[3,9] Asymptomatic testing, in particular, may link individuals to curative treatment and prevent secondary complications.[10] The study objective was to examine factors associated with opting in for syphilis testing among a sample of transgender women in Jamaica. This information can inform contextually appropriate STI testing, prevention, and care strategies tailored for transgender women.

MATERIALS AND METHODS

A cross-sectional tablet-based survey of transgender women was conducted in collaboration with an AIDS service organization (Jamaica AIDS Support for Life) in Kingston, Ocho Rios, and surrounding areas in Jamaica between March and November 2015. Nonrandom chain referral and snowball sampling methods were used to recruit participants; sexually and gender-diverse persons were hired as peer research assistants who shared study information with (a) persons accessing HIV prevention services from Jamaica AIDS Support for Life and (b) peer researcher and participant social networks. Study participants could invite up to 5 additional participants through sharing study coupons within their social networks. To reduce bias, we hired diverse peer research assistants by age, gender, and sexual orientation and limited the number of persons each participant could invite. We aimed to recruit 150 transgender

women; using G*Power software,[11] a sample size of 119 was calculated as adequate for logistic regression (odds ratio [OR], 2.0; $P < 0.05$; power, 0.90).

Surveys were administered by peer research assistants to participants in a location determined by the participant (e.g., AIDS service organization, home) using android tablets, with the surveys administered through FluidSurveys software. Inclusion criteria were as follows: self-identified transgender women, 18 years and older, and residing in Jamaica. Upon survey completion, participants were provided with a coupon with their survey identification code for voluntary, free, rapid serological syphilis testing at the local AIDS service organization (Jamaica AIDS Support for Life). SD BIOLINE Syphilis 3.0 solid-phase immunochromatographic assay tests were used to detect antibodies of all isotypes (IgG, IgM, IgA) against *Treponema pallidum* in whole-blood serum; this test has documented sensitivity (99.3%) and specificity (99.5%).[12,13] Those with a positive rapid test result were considered to have a lifetime history of syphilis for the purpose of this analysis. All participants with a positive rapid test result obtained using BIOLINE Syphilis 3.0 received further testing at Jamaica AIDS Support for Life sent to the National Public Health Laboratory who used *T. pallidum* particle agglutination serological assays. Positive *T. pallidum* particle agglutination and TRUST titers of 8 and higher are considered current/active syphilis infection. However, we did not collect confirmatory test results from the National Public Health Laboratory as part of this study, and, therefore our measure of syphilis may include those with a history of and/or current/active syphilis. Participants were offered a phone card equivalent to US$4 after completing rapid syphilis testing; coupon identification codes for rapid testing uptake/results were linked with survey results. Participants were also offered free HIV testing; results are reported elsewhere.[14] We received research ethics approval from the University of Toronto, Canada, and the University of the West Indies, Mona Campus, Jamaica.

Measures

The main outcome variable was opting in for a syphilis test as part of a research study. We assessed *sociodemographic* variables: age and monthly income, relationship status, gender(s) of partners, and sex work involvement. HIV status was measured by combining self-reported HIV status with laboratory test results from participants who chose to complete an HIV test after survey administration; there were no significant differences across sociodemographic or other variables between participants with a self-reported HIV-positive status and those with HIV-positive laboratory test results (HIV testing findings are published elsewhere[14]). *Intrapersonal* factors included perceptions of STI risk on a 4-point Likert scale (no, low, medium, high risk). *Interpersonal* factors included the following: lifetime histories (self-reported yes/no) of forced sex, physical abuse, and/or childhood sexual abuse; getting drunk or high while having sex; types of sex by gender of sexual partners; and number of lifetime sexual partners. *Structural* factors included the following: transgender stigma, assessed using an adapted version of the Homophobia Scale by Diaz et al.[15] to measure enacted (Cronbach $\alpha = 0.77$) and perceived (Cronbach $\alpha = 0.61$) transgender stigma, replacing "because of your homosexuality" with "because you are transgender" for each item; HIV-related stigma using a 10-item perceived HIV-related stigma scale by Steward et al.[16] (Cronbach $\alpha = 0.89$, range 0–100); and incarceration perceived to be due to transgender identity, measured dichotomously with the question: "Have you ever been in jail for being transgender?"

Analyses

We conducted descriptive analyses and bivariate correlations using χ^2 and t tests between all variables and syphilis testing. We conducted bivariate analyses comparing those screening positive and negative for syphilis. We then conducted univariable and multivariable backward stepwise logistic regression to determine the OR for opting in for syphilis testing for all factors associated with testing uptake at a P value of less than 0.05 in bivariate analyses, controlling for sociodemographic characteristics significantly associated in bivariate analyses. We report the adjusted ORs (AORs) and 95% confidence intervals (CIs). Missing responses were excluded from the analyses. All statistical analyses were performed using STATA (version 12.0).

RESULTS

Participant Characteristics

More than half (n = 83; 60.6%) of participants opted in for syphilis testing; of these, 8 (9.64%) screened positive for a lifetime syphilis infection, and each person with a lifetime syphilis infection was HIV positive. One quarter of participants (n = 26; 25.2%) were HIV positive. Most sociodemographic characteristics were similar between participants who opted in (n = 83) and those who opted out (n = 54) for syphilis testing (Table 1). Participants reported both male and female sexual partners and a variety of types of sex with men (oral and anal) and women (including oral, anal, and vaginal). Only HIV-positive serostatus and lifetime number of sexual partners were statistically significantly different between participants testing positive (n = 8) and those testing negative (n = 75) for a lifetime syphilis infection, whereby a higher proportion of those screening positive for syphilis were HIV positive ($P < 0.001$) and had a higher mean number of lifetime sexual partners ($P < 0.05$; Table 1).

Factors Associated With Opting-in for Syphilis Testing

Age, monthly income, sex work, and number of lifetime sexual partners were not significantly associated with opting in for syphilis testing and therefore were not included in regression analyses (Table 2). In multivariable analyses controlling for relationship status, HIV-positive participants were 4-fold more likely to opt in for syphilis testing (AOR, 4.33; 95% CI, 1.31–14.26) than HIV-negative participants. An intrapersonal factor, perceived risk of STIs (AOR, 1.58; 95% CI, 1.04–2.40), and one interpersonal factor, childhood sexual abuse history (AOR, 2.80; 95% CI, 1.03–7.62), were associated with increased odds of opting in for syphilis testing. Incarceration history (AOR, 0.27; 95% CI, 0.11–0.71) was a structural level factor associated with opting out of syphilis testing.

DISCUSSION

This study highlights a high prevalence of lifetime syphilis infection (9.64%) and HIV (25.24%) among a sample of transgender women in Jamaica. This syphilis infection prevalence is substantially higher than the World Health Organization 2012 global estimates for either women (0.48%; 95% CI, 0.3%–0.7%) or men (0.5%; 95% CI, 0.4%–0.6%).[17] Although this high prevalence of lifetime syphilis infection may be in part due to sampling error given our voluntary, nonrandom sampling strategy, it nonetheless suggests that syphilis testing uptake (60.58%) rates may be suboptimal among transgender women in Jamaica. In the context of these high prevalences of HIV and lifetime syphilis

TABLE 1. Correlates and Prevalence of Syphilis Testing and a Syphilis Infection History Among Transgender Women in Jamaica Participating in a Cross-sectional Tablet-Based Survey (n = 137)

Variables	Tested for Syphilis (n = 83)	Did Not Test for Syphilis (n = 54)	P*	Syphilis Positive (n = 8)	Syphilis Negative (n = 75)	P*
Age (n = 130), y	23.88 (3.85), n = 81	24.86 (5.50), n = 49	0.234	25.50 (3.26), n = 8	23.70 (3.90), n = 73	0.211
Monthly income (n = 114), US$	218.65 (374.65), n = 71	216.74 (232.75), n = 43	0.976	188.58 (350.78), n = 7	221.94 (379.64), n = 64	0.825
Relationship status (n = 136)	n = 83	n = 53	0.005			0.219
Married or living together	18 (22)	9 (17)		2 (25)	16 (21)	
Dating–not living together	28 (34)	10 (19)		1 (13)	27 (36)	
Casual dating	11 (13)	3 (6)		9	11 (15)	
No current partner	18 (22)	13 (25)		4 (50)	14 (19)	
Multiple partners/polyamorous	8 (10)	18 (34)		1 (13)	7 (9)	
Gender of sexual partners (check all that apply)						
Male	79 (95)	52 (96)	0.755	8 (100)	71 (95)	0.503
Female	4 (5)	5 (9)	0.305	1 (13)	3 (4)	0.286
Transgender	0	0	—	0	0	—
Sex work involvement	44 (53)	27 (50)	0.730		14 (19)	
HIV-positive status (n = 103)	22 (27)	4 (7)	0.005	8 (100)	14 (19)	<0.001
Perceived risk of STI	2.65 (1.0)	2.20 (0.88)	0.010	2.88 (1.13)	2.63 (1.02)	0.520
Ever experienced forced sex	20 (67)	44 (41)	0.013	5 (63)	41 (55)	0.672
Ever experienced physical abuse	44 (53)	18 (34)	0.030	5 (63)	39 (52)	0.572
Sexual abuse during childhood	26 (31)	7 (13)	0.014	3 (38)	23 (31)	0.692
Get drunk or high when having sex	27 (73), n = 37	30 (97), n = 31	0.008	4 (67), n = 6	23 (74), n = 31	0.704
Types of sex with male, check all that apply						
Oral sex	58 (70)	34 (63)	0.400	5 (63)	53 (71)	0.632
Anal sex	58 (70)	43 (80)	0.205	5 (63)	53 (71)	0.632
Types of sex with women, check all that apply						
Oral sex	9	7	0.706	2	7	0.176
Vaginal sex	83 (100)	54 (100)	—	8 (100)	75 (100)	—
Anal sex	5	4	0.749	0	5	0.451
No. lifetime sexual partners (n = 136)	22.74 (31.16) n = 82	14.20 (15.57) n = 54	0.064	43.88 (53.68), n = 8	20.46 (27.32), n = 74	0.043
Perceived transgender stigma	14.92 (3.46)	13.69 (3.14)	0.037	15.13 (3.27)	14.89 (3.50)	0.859
Enacted transgender stigma	15.65 (4.79)	15.65 (5.34)	0.998	18.63 (6.23)	15.33 (4.53)	0.064
HIV-related stigma	75.66 (19.14), n = 80	84.43 (13.02), n = 53	0.004	80.63 (11.03), n = 8	75.11 (19.81), n = 72	0.443
Incarcerated for being transgender	14 (17)	17 (32)	0.005	3 (38)	11 (15)	0.101

Values are presented as frequency (%) or mean (SD). Percentages calculated from non-missing responses for each variable

*P value calculated using χ^2 or t test.

TABLE 2. Logistic Modeling of Factors Associated With Syphilis Testing Among Transgender Women in Jamaica Participating in a Cross-sectional Tablet-based Survey (n = 137)

Variables	Unadjusted Logistic Regression Analyses		Adjusted Logistic Regression Analyses*	
	OR (95% CI)	*P*	OR (95% CI)	*P*
Relationship status				
Married or living together (reference)	1			
Dating–not living together	1.03 (0.35–3.05)	0.952		
Casual dating	0.76 (0.19–2.98)	0.692		
No current partner	0.67 (0.22–1.99)	0.469		
Multiple partners/polyamorous	0.19 (0.06–0.60)	0.005		
HIV status	4.51 (1.46–13.94)	0.009	4.33 (1.31–14.26)	0.016
Perceived risk of STIs	1.76 (1.21–2.58)	0.003	1.58 (1.04–2.40)	0.033
Ever experienced forced sex	2.63 (1.29–5.35)	0.008	Not selected	
Ever experienced physical abuse	2.03 (1.00–4.12)	0.049	Not selected	
Sexual abuse during childhood	3.06 (1.22–7.68)	0.017	2.80 (1.03–7.62)	0.043
Get drunk or high when having sex	0.36 (0.19–0.67)	0.001	Not selected	
Perceived transgender stigma	1.14 (1.02–1.26)	0.018	Not selected	
HIV-related stigma	0.97 (0.94–0.99)	0.004	Not selected	
Incarceration for being transgender	0.44 (0.20–0.99)	0.049	0.27 (0.11–0.71)	0.008

$P < 0.001$; 72.06% correct classification of cases.

*Adjusted for relationship status.

infection, it is likely that a considerable number of transgender women may have undiagnosed and untreated syphilis.

Transgender women living with HIV were more likely to opt in for a syphilis test in this study, suggesting that Jamaican HIV care providers may be providing integrated HIV and STI education and care, as recommended by the World Health Organization.[3] We also found a high prevalence of HIV infection among those with a positive lifetime syphilis test result, corroborating prior research that reported high coinfection of HIV and syphilis with transgender women in the Dominican Republic[8] and other contexts.[1] Specifically, we found that 30.77% (8/26) of HIV-positive transgender women in our study also had a positive lifetime syphilis history. These results are higher than the 9.5% reported by Kalichman et al.[9] in their review of 37 studies of syphilis prevalence among persons living with HIV. However, these results must be interpreted cautiously, taking into account that our rapid syphilis screening detects both past and current syphilis infection. Future studies are needed that use confirmatory syphilis and HIV testing to elucidate an accurate prevalence of coinfection.

Some of the factors that were significantly associated with opting in for syphilis testing, such as HIV status and perceived risk of STI, may be generalizable across other transgender populations and settings. Other factors, such as childhood sexual abuse and incarceration due to being transgender, may be uniquely experienced within the Jamaican context where transgender persons report widespread violence from multiple sources, including their families and the police.[18,19] Prior literature has discussed how a history of childhood sexual abuse is associated with elevated HIV infection prevalence and risk factors,[20] and in our study, we found that a history of childhood sexual abuse was associated with opting in for syphilis testing. Participants who perceived themselves at risk for STI were also more likely to opt in for syphilis testing. This suggests that some persons with elevated vulnerabilities for STI may be appropriately assessing their risk and accessing syphilis testing. Given that having multiple partners was associated with reduced odds of opting in to syphilis testing, whereas perceived STI risk was associated with increased odds of opting in for syphilis testing, future studies should assess how transgender women in Jamaica perceive and evaluate their STI risk.

Incarceration perceived to be due to transgender identity was associated with an almost 75% reduction in the odds of syphilis testing uptake, implying that incarceration histories may reduce willingness to access clinic-based services. This is particularly concerning given that studies have shown that previous incarceration is associated with HIV infection among transgender women.[21] This finding suggests opt-in clinic–based syphilis testing may miss the opportunity to provide testing for transgender women at elevated risk.

Contrary to the few other studies that have shown that syphilis prevalence among transgender persons may vary by partner type[22] and the high level of evidence to suggest that condomless anal intercourse is a driver of HIV vulnerability among transgender women globally,[23] we did not find that gender of partner(s) or type of sex (anal, vaginal, or oral) were associated with syphilis prevalence. Future studies with larger samples may use a combination of sexual risk practice questions (e.g., condom use and type of sex) to further explore this association and develop transgender women–specific syphilis prevention guidelines.

Given that medical transition (e.g., through hormones or surgery) is not a requirement for transgender women's gender identities, nor is it accessible in low- and middle-income countries that lack human rights protections for transgender women,[24] we did not ask about surgical status. However, the Centers for Disease Control[25] suggest that providers caring for transgender women should have knowledge of their patients' current anatomy and patterns of sexual practices in order to provide adequate STI and HIV prevention education. Understanding competence and knowledge regarding transgender issues and gender affirmative care is another area for future research with health care providers in Jamaica.

There are several study limitations. Nonrandom sampling limits the generalizability of findings; however, we successfully recruited more than 100 transgender women in Jamaica, a hard-to-reach population as substantiated by the pervasiveness of stigma and violence reported. Given the small sample size, we were statistically underpowered to examine factors associated with positive syphilis test results. Future studies should incorporate STI symptom questions and participant's knowledge of past syphilis infection to understand the role of symptoms in STI testing uptake. It is plausible that syphilis-related factors, such as knowledge of past syphilis and suspicion of current infection (e.g., physical symptoms and diagnosis of a partner), may significantly increase or decrease uptake. The cross-sectional design precludes examining causality and self-reported measures could lead to recall and social desirability bias. In particular, our study would be strengthened by

the inclusion of confirmatory syphilis testing results to detect active syphilis infection, given that our serological syphilis testing detects both past and current syphilis infection. Stratification by the recentness of syphilis infection, as informed by TRUST titer, would strengthen future analyses. Despite these limitations, to our knowledge, this is among the first studies to examine syphilis testing and a history of syphilis infection among transgender women in Jamaica.

Our results suggest the utility of a social ecological approach that addresses health (HIV serostatus), intrapersonal (risk perception), interpersonal (violence), and structural (incarceration) factors that influence uptake of sexual health services such as syphilis testing.[26,27] These findings also support recent calls-to-action to address STI vulnerability in addition to HIV vulnerability.[28] Future research should assess whether opt-out point-of-care syphilis testing, versus opt-in clinic-based testing, may facilitate increased testing uptake.[29,30] This research has broader implications for the design of HIV and STI testing programs at a population level. Interventions to enhance access to syphilis testing and care may necessitate service delivery model changes and attention to social ecological contexts that influence health and human rights of transgender women in Jamaica.

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