HIV and Syphilis Testing Behaviors among Heterosexual Male Sex Workers in Uganda

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Abstract

Background : Few studies have described STI and HIV testing practices among heterosexual male sex workers (MSW) in Sub-Saharan Africa. Our study aimed to assess recent HIV and syphilis screening practices among MSW in Uganda.

Methods : Between August and December 2019, we conducted a cross-sectional study among 100 MSW and 240 female sex workers (FSW). Participants were enrolled through snowball sampling, and an interviewer-administered questionnaire used to collect data on HIV and syphilis in the prior 12 months. Integrated change model constructs were uses to assessed intentions, attitudes, social influences, norms and self-efficacy of 3-monthly Syphilis and 6-monthly HIV testing. Predictors of HIV and syphilis recent testing behaviors were estimated using negative binomial regression.

Results : We enrolled 340 sex workers of whom 100 (29%) were MSW. The median age was 27 years (interquartile range [IQR] 25–30) for MSW and 26 years [IQR], (23–29) for FSW. The median duration of sex work was 36 and 30 months for MSW and FSW, respectively. MSW were significantly less likely than FSW to have tested for HIV in the prior 12 months (50% vs 86%; p = 0.001). For MSW, non-HIV testing was associated with higher education (adjusted prevalence ratio [aPR] 1.66; 95% confidence interval [CI] 1.09-2.50), poor intention to seek HIV testing (aPR 1.64; 95% CI: 1.35-2.04), perception that 6-monthly HIV testing was not normative (aPR 1.33; 95% CI: 1.09-1.67) and low self-efficacy (aPR 1.41; 95% CI: 1.12-1.79). Non-syphilis testing was associated with low intention to seek testing (aPR 3.13; 95% CI: 2.13-4.55), low self-efficacy (aPR 2.56; 95% CI: 1.35-4.76), negative testing attitudes (aPR 2.33; 95% CI: 1.64-3.33), and perception that regular testing was not normative (aPR 1.59; 95% CI: 1.14-2.22).

Conclusions : Non-testing for HIV and syphilis was common among heterosexual MSW relative to FSW. Future studies should evaluate strategies to increase testing uptake for this neglected sub-population of sex workers.

Background

Male sex workers (MSW) are increasingly being recognized as a key population contributing to the global burden of HIV and other sexually transmitted infections (STI) (1–3). Overall, sex workers (SW) are 21 times as likely to acquire HIV than adults in the general population; MSW who have sex with men are 22 times as likely to be HIV-positive (2–4). HIV prevalence estimates among MSW and female sex workers (FSW) are comparable. Research has found high HIV prevalence among MSW: 5–31% in North America (5–7), 11.4–23% in South America (8, 9), and 14.5–43.6% in India (10–12). HIV burden among MSW is high in sub-Saharan Africa (SSA), with HIV prevalence of 26.3% and 50% in Kenya and Cote d'Ivoire, respectively (13, 14). This is comparable to HIV prevalence observed among FSW (36.9%) in this setting (15), and globally (11.8–30.7%) (15). Of the 800,000 new HIV infections that occurred in Eastern and Southern Africa in 2018, 25% were contributed by MSW and other key populations (4). Sex workers are a bridge population; up to 15% of HIV infections in the general population are attributed to sex work (16).

Limited data are available on heterosexual MSW, perhaps because MSW are usually less visible than FSW (17) and the perception that sex work by heterosexual men constitutes a small proportion of male commercial sex (3, 18). Additionally, risk of HIV acquisition through insertive penile-vaginal intercourse is lower than for insertive or receptive anal intercourse among MSW who have sex with men (19). However, in SSA where HIV disproportionately affects women, heterosexual MSW and their female clients are at risk of either acquiring or transmitting HIV (20). Non-condom use, anal sex, lack of access to healthcare services and restrictive policies work in synergy to increase risk of HIV and STI among MSW. Further, STI co-infection increases HIV acquisition and transmission risk (21, 22). The World Health Organization (WHO) recommends STI screening for sex workers every 3 months and HIV testing every 6–12 months (23, 24). Uptake of regular STI and HIV screening services is an important entry point for antiretroviral treatment (ART) and prevention services (oral pre-exposure prophylaxis [PrEP] and voluntary medical male circumcision [VMMC]) (23, 25).

The hidden MSW sub-population in Uganda is not well described. Anecdotal evidence (field reports and media articles) suggests the existence of heterosexual MSW (26). In northern Uganda, a community leader identified MSW who target wealthy women as a key challenge to HIV epidemic control (26). However, no published data is available on STI and HIV testing practices among heterosexual MSW in Uganda. Our study aimed to assess and compare recent HIV and syphilis screening practices among heterosexual MSW, relative to FSW, in selected urban centers in Uganda.

Methods

Study design and setting

Between August and December 2019, we conducted a cross-sectional survey of 100 MSW and 240 FSW in Kampala, the capital city of Uganda, and Mbarara municipality in Western Uganda (combined population 1,702,274) to describe recent HIV and syphilis screening practices. Study participants included heterosexual men and women ≥ 17 years engaged in sex work according to self-report of selling sex for goods or money for at least 6 months. A two-stage sampling design was used to recruit study participants.

Population and procedures

Before recruiting respondents, we conducted a mapping exercise to gain an understanding of typologies, hot spots, network connections and territorial management in Kampala City and Mbarara Municipality as previously reported (27). We observed from the mapping exercise that forms and strategies for male sex work included pimps, online advertising, social media and recreational venues. Women sold sex on the street and in lodges, bars/clubs and brothels (mainly in Kampala). We identified 2–3 MSW pimps through key informants (FSW, escort service manager and bar/club maids). They were given information about study aims and recruitment of MSW and provided with 2 paper coupons to recruit MSW.

Sex work hot spots constituted the primary sampling units (PSUs) for FSW. Using the different typologies, we established a sampling strategy for each study site. In Mbarara we randomly selected 12 PSUs consisting mainly of streets, lodges and bars/clubs, whereas in Kampala we randomly selected 20 PSUs consisting of streets, lodges, clubs/bars and brothels. Between 6 to 11 participants were enrolled from each PSU in each study site. Sampling began with 2 FSW at each PSU, identified through key informants (managers, club/bar maids and pimps). Recruits were given information about the study and 3 paper coupons to give to potential study participants. For both MSW and FSW, the coupon contained an identification number, contact information of the research team and duration of the survey in the study site. Respondents who presented a coupon after verification and met the eligibility criteria were consented to participate in the study and completed an interviewer-administered questionnaire.

Before the interview, respondents were asked about prior or current use of ART. Respondents who were taking ART or knew their HIV status were excluded from the study. At the end of the interview, each respondent received two coupons and information for peer recruitment. All study respondents received information about STI and HIV screening. The study was approved by the Higher Degrees Research and Ethics Committee, School of Public Health, Makerere University and the Uganda National Council for Science and Technology (HS 2403). All respondents provided written informed consent in their language of preference.

Study variables

The primary outcome variable was recent syphilis (≤ 6 months) and HIV (≤ 12 month) testing. Respondents were asked if they had ever taken a serological syphilis and HIV test (Yes = 1, No = 2) and the number of times tested in the last 12 months. A 65-item questionnaire validated among FSW in Benin (28) was used to obtain data on the primary outcome and the major explanatory variables of intention (INT), attitude (ATT), self-efficacy (SE), descriptive norm (MN) and social influences (SI) as previously reported (Muhindo R, et al, submitted).

Intention

Intention in this study was defined as readiness to take a syphilis serological test (SYP_INT) in the next 3 months and an HIV (HIV_INT) test in the next 6 months by asking respondents three items for each infection, e.g., “Are you going to be screened for syphilis in the next 3 months"? Answers ranged from 1 = ’Strongly disagree’ to 6 = ‘Strongly agree’ (Cronbach’s α = 0.96 for SYP_SYP and 0.95 for HIV_SYP).

Attitude

Attitudes towards 3-monthly syphilis testing (SYP_ATT) were assessed through three items asking respondents to what extent they agreed with statements such as, “For you getting tested for syphilis every 3 months, would reduce your risk of contracting HIV” (Cronbach’s α = 0.7). Answering options on a 6-point scale ranged from 1 = ‘Strongly disagree’ to 6 = ‘Strongly agree’. Attitudes towards 6-monthly HIV testing (HIV_ATT) were assessed by asking respondents five items about the benefits and disadvantages of being tested for HIV every 6 months (Cronbach’s α = 0.85).

Descriptive norms

Descriptive norms regarding 3-monthly syphilis testing (SYP_MN) were assessed by asking respondents three questions about whether FSW thought it was their moral obligation to test and how often they thought their peers were testing for syphilis every 3 months. Respondents were asked to what extent they agreed with statements like “Being tested for syphilis is a normal routine that many FSWs practice?” Answers on a 6-point scale ranged from 1 = ‘Strongly disagree’ to 6 = ‘Strongly agree’ (Cronbach’s α = 0.7). Three items on the same scale were used to assess descriptive norms to 6-monthly HIV testing (HIV_MN) (e.g. “based on what you know about your fellow FSWs and the practice of HIV testing, how many of them are being tested every six months?” Answering options ranged from 1 = ‘None’ to 6 = ‘All’ (Cronbach’s α = 0.78).

Self-efficacy

Self-efficacy for 6-monthly HIV testing (HIV_SE) was assessed by seven questions about their perceived level of confidence and ease of seeking 6-monthly HIV testing. Items included a range of barriers including stigma, discrimination, and fear of positive results, privacy and confidentiality. Questions included, “Do you feel able to go for an HIV test every six months, even if you are afraid of receiving a positive result?” (Cronbach’s α = 0.89). Answering options on a 6-point scale ranged from 1 = ‘Strongly disagree’ to 6 = ‘Strongly agree’.

Social Influence

Social norms regarding 6-monthly HIV testing (HIV_SI) were assessed on a 6-point scale (1 = ‘Disapprove strongly’ to 6 = ‘Approve strongly’) by asking respondents two questions on whether referent others (fellow FSWs and regular partners/clients) approved or expected them to test for HIV every six months (Cronbach’s alpha = 0.39). We also obtained socio-demographic data on education, marital status and dependents.

Statistical analysis

Analyses were performed using Stata version 12.0 (StataCorp, College Station, TX). We used Cronbach’s alpha to evaluate the reliability of items in the questionnaire that were used to assess the major explanatory variables (29). We computed medians of subscales SYP_INT (Cronbach’s α = 0.96), HIV_INT (Cronbach’s α = 0.95), SYP_ATT (Cronbach’s α = 0.70), HIV_ATT (Cronbach’s α = 0.85), SYP_MN (Cronbach’s α = 0.70), HIV_MN (Cronbach’s α = 0.78), and HIV_SE (Cronbach’s α = 0.89). The item for social influence (HIV_SI) (Cronbach’s α = 0.39) had a non-reliable scale and was excluded from further analysis. Item scores above the scale median were considered high. Frequency distributions and proportions were used to describe demographic characteristics, condom use and syphilis and HIV testing behaviors of MSW and FSW. Pearson’s chi-square (χ^2) tests were used to examine differences between major explanatory variables and gender. We evaluated predictors of self-reported frequency of recent HIV and syphilis testing (count data) using negative binomial regression (for over dispersed count data). We used a likelihood ratio test of alpha = 0 (dispersion parameter) to assess model fit and found no evidence of

over-dispersion. Crude and adjusted prevalence ratios (PR) and 95% confidence intervals (CI) were estimated. We considered two-sided P-values of 0.05 or less statistically significant.

Results

Population Characteristics

A total of 340 SW took part in the study, of whom 100 (29.4%) were heterosexual MSW. The median age was 27 years (interquartile range [IQR] 25–30) for MSW and 26 years [IQR], (23–29) for FSW (Table 1). The median duration of sex work was 36 and 30 months for MSW and FSW, respectively. Relative to FSW, MSW were more likely than FSW to have obtained secondary or high education (89% vs 45%; p = 0.001), and less likely to be biological parents (64% vs. 82%; p = 0.03). Most MSW (70%) had never married and only 11% engaged in full time sex work. They preferred female clientele aged 35 years or greater, whom they solicited through pimps, dating sites, social media and recreational venues. By contrast, FSW solicited clients on the street and in lodges, clubs, bars and brothels. Most MSW (61%) serviced 1 to 2 clients per week compared with 92% of FSW who had 5 or more clients per week. Condom use at last sex was less likely among MSW than FSW (16% vs. 66%; p = 0.001) (Table 2). Similarly, consistent condom use was reported by only 10% of MSW compared with 63% of FSW (p = 0.001).

Table 1
Socio-demographic characteristics

Variable	Male (N = 100) N (%) or median (IQR)	Female (N = 240) N (%) or median (IQR)	p-value
Variable			
Age (years)	27 (25–30)	26 (23–29)	0.22
Duration of sex work (months)	36 (24–60)	30 (13–48)	0.52
Biological children	1 (0–2)	1 (1–2)	0.01**
Other dependants	1 (0–2)	1 (1–2)	0.76
Education level			0.001**
None	0 (0)	25 (10.4)	
Primary	11 (11.0)	108 (45)	
Secondary	54 (54.0)	100 (41.7)	
Higher education	35 (35.0)	7 (2.9)	
MarItal status			0.001**
Married	7 (7.0)	12 (5)	
Separated	23 (23.0)	83 (34.6)	
Widow	0 (0)	9 (3.8)	
Never married	70 (70.0)	136 (56.4)	
Solicitation of clients			N/A
Street	0 (0)	154 (31.6)	
Home	0 (0)	9 (1.9)	
Lodge	0 (0)	171 (35.2)	
Bar/Club	40 (10.2)	123 (25.3)	
Brothel	0 (0)	29 (6.0)	
Dating site	55 (14.0)	0 (0)	
Pimp	60 (15.3)	0 (0)	
Dating site	48 (12.2)	0 (0)	
Social media (Facebook, histogram & whatsapp)	50 (12.8)	0 (0)	

Variable	Male (N = 100) N (%) or median (IQR)	Female (N = 240) N (%) or median (IQR)	p-value
Recreation venues (swimming pool, sausan, beaches & hotels)	49 (12.5)	0 (0)	
Escort service	30 (7.7)	0 (0)	
Client referrals	40 (10.2)	0 (0)	
Work place (Saloon, car washing bay)	20 (5.1)	0 (0)	
Description of sex worker			0.001**
Full time, no any other source of income	16 (16.0)	147 (61.2)	
Full time, supplement my income	11 (11.0)	24 (10.0)	
Part time, have other sources	69 (69.0)	66 (27.5)	
Part time, am student	4 (4.0)	3 (1.3)	
Average number of clients per week			0.001**
1–2	61 (61.0)	0 (0)	
3–4	29 (29.0)	20 (8.3)	
≥ 5	10 (10.0)	220 (91.7)	
Estimated age in years for female clients			
20–29	12 (6.1)	N/A	
30–34	42 (21.2)	N/A	
35–39	65 (32.8)	N/A	
≥ 40	79 (39.9)	N/A	
Mobility			0.02**
Work only in this town	39 (39.0)	185 (77.1)	
Move regularly in many towns in Uganda	52 (52.0)	50 (20.8)	
Even move outside Uganda	9 (9.0)	5 (2.1)	

Table 2
Condom use and STI/HIV testing behaviors

Variable	Male (N = 100) N (%)	Female (N = 240) N (%)	P-value
Variable			
Condom use at last sexual intercourse			0.001**
Yes	34 (34.0)	201 (83.8)	
No	66 (66.0)	39 (16.2)	
Condom use practice			0.001**
All the time will all clients	10 (10.0)	152 (63.0)	
Sometimes	90 (90.0)	88 (37.0)	
Ever had a serological test for Syphilis/STI			0.001**
Yes	32 (32.0)	150 (62.5)	
No	68 (68.0)	90 (37.5)	
Syphilis/STI serological testing frequency in the last 12 months			0.001**
00	81 (81.0)	114 (47.5)	
1	10 (10.0)	49 (20.4)	
2	3 (3.0)	30 (12.5)	
3	4 (4.0)	38 (15.8)	
≥ 4	2 (2.0)	9 (3.8)	
Ever tested for HIV			
Yes	80 (80.6)	230 (96.0)	0.02**
No	20 (20.0)	10 (4.0)	
HIV serological testing frequency in the last 12 months			0.001**
00	48 (50.0)	34 (14.0)	
1	8 (8.3)	46 (19.2)	
2	9 (9.4)	52 (21.7)	
3	20 (20.8)	75 (31.3)	

Variable	Male (N = 100) N (%)	Female (N = 240) N (%)	P-value
≥ 4	11 (11.5)	33 (13.8)	
History of HIV			N/A
I don’t know	38 (38.0)	8 (3.3)	
No	59 (59.0)	232 (96.7)	
Yes	3 (3.0)		
History of Syphilis			N/A
I don’t know	54 (54.0)	12 (5.0)	
No	20 (20.0)	91 (37.9)	
Yes	26 (26.0)	137 (57.1)	
History of Gonorrhoea			
I don’t know	4 (4.0)	13 (5.4)	
No	28 (28.0)	175 (72.9)	
Yes	68 (68.0)	52 (21.7)	

Table 3

Integrated Change Model Scores for Syphlis and HIV testing

Variable	Male (N = 97)	Female (N = 240)	P-value
SYP_INT			0.001
Score ≥ 9, median	18 (19)	152 (63.3)	
Score < 9, median	79 (81)	88 (36.7)	
HIV_INT			0.001
Score ≥ 15, median	23 (23.7)	158 (65.8)	
Score < 15, median	74 (76.3)	82 (34.2)	
SYP_ATT			0.001
Score ≥ 8, median	28 (28.9)	155 (64.6)	
Score < 8, median	69 (71.1)	85 (35.4)	
HIV_ATT			0.001
Score ≥ 25, median	11 (11.3)	180 (75.0)	
Score < 25, median	86 (88.7)	49 (25.0)	
SYP_MN			0.001
Score ≥ 8, median	32 (33.0)	162 (67.5)	
Score < 8, median	65 (67.0)	78 (32.5)	
HIV_MN			0.001
Score ≥ 16, median	18 (18.6)	167 (69.6)	
Score < 16, median	79 (81.4)	73 (30.4)	
HIV_SE			0.001
Score ≥ 30, median	37 (38.1)	143 (59.6)	
Score < 30, median	60 (61.9)	97 (40.4)	
SYP_SE			0.001

SYP_INT - intention to seek 3-monthly syphilis serological testin; HIV_INT - intention to seek 6-monthly HIV testing; SYP_ATT - attitude towards 3-monthly syphilis testing; HIV_ATT - attitude towards 6-monthly HIV testing; SYP_MN - perceived prevalence of the practice of 3-monthly testing; HIV_MN - perceived prevalence of the practice of 6-monthly HIV testing; HIV_SE - perceived self-efficacy to seek 6-monthly HIV testing

Variable	Male (N = 97)	Female (N = 240)	P-value
Score ≥ 3, median	39 (40.0)	202 (84.2)	
Score < 3, median	58 (60.0)	38 (15.8)	

SYP_INT - intention to seek 3-monthly syphilis serological testin; HIV_INT - intention to seek 6-monthly HIV testing; SYP_ATT - attitude towards 3-monthly syphilis testing; HIV_ATT - attitude towards 6-monthly HIV testing; SYP_MN - perceived prevalence of the practice of 3-monthly testing; HIV_MN - perceived prevalence of the practice of 6-monthly HIV testing; HIV_SE - perceived self-efficacy to seek 6-monthly HIV testing

Table 4

Negative binomial multivariable model for HIV testing in the prior 12 months

	Crude ratio (PR)			Adjusted ratio (PR)		
	PR (SE)	95% CI	p-value	PR (SE)	95% CI	p-value
Age category in years						
17–19	Reference					
20–24	1.18 (.3)	0.75–1.84	0.47	1.21 (.3)	0.78–1.89	0.39
25–29	1.24 (.3)	0.80–1.92	0.34	1.19 (.3)	0.76–1.86	0.45
30–34	1.28 (.3)	0.81–2.03	0.29	1.12 (.3)	0.69–1.82	0.65
35 +	1.07 (.2)	0.63–1.79	0.80	0.93 (.2)	0.54–1.60	0.79
Level of education						
None	Reference					
primary	0.97 (.2)	0.71–1.32	0.83	1.04 (.2)	0.76–1.43	0.79
secondary	0.89 (.1)	0.65–1.20	0.44	1.04 (.2)	0.755–1.44	0.81
Higher education	1.08 (.2)	0.76–1.53	0.65	1.66 (.3)	1.09–2.50	0.02*
Marital status						
Married	Reference					
Separated	1.24 (.2)	0.84–1.83	0.28	1.43 (.3)	0.95–2.14	0.08
Widow	1.24 (.4)	0.69–2.23	0.42	1.27 (.4)	0.69–2.35	0.45
Single	1.00 (.2)	0.68–1.49	0.96	1.22 (.3)	0.82–1.83	0.33
Have a regular boy friend	1.36 (.3)	0.92–2.00	0.13	1.35 (.3)	0.90–2.03	0.14
Town location						

Likelihood-ratio test of alpha = 0: chibar2 (01) = 0.0e + 00 Prob > = chibar2 = 0.500, Log likelihood = -517.0

	Crude ratio (PR)			Adjusted ratio (PR)		
Kampala	Reference					
Mbarara	0.95 (.1)	0.81–1.11	0.53	1.02 (.1)	0.86–1.22	0.81
Gender						
Male						
Female	1.56 (.1)	1.29–1.89	0.001*	0.97 (.2)	0.70–1.33	0.84
Condom use						
Yes			Reference			
No	0.66 (.1)	0.54–0.79	0.001*	0.86 (.1)	0.69–1.08	0.19
HIV_INT						
Score ≥ 15, median			Reference			
Score < 15, median	0.46 (.04)	0.39 - 0.55	0.001*	0.61 (.1)	0.49 - 0.74	0.001*
HIV_ATT						
Score ≥ 25, median			Reference			
Score < 25, median	0.55 (.05)	0.46 - 0 .65	0.001*	0.88 (.1)	0.69–1.12	0.30
HIV_MN						
Score ≥ 16, median			Reference			
Score < 16, median	0.54 (.04)	0.45–0.64	0.001*	0.75 (.1)	0.60–0 .92	0.007*
HIV_SE						
Score ≥ 30, median			Reference			
Score < 30, median	0.44 (.03)	0.37 - 0 .52	0.001*	0.71 (.1)	0.56 - 0.89	0.005*
Likelihood-ratio test of alpha = 0: chibar2 (01) = 0.0e + 00 Prob > = chibar2 = 0.500, Log likelihood = -517.0						

Table 5

Negative binomial multivariable model for syphilis testing in the prior 12 months

	Crude Ratio (PR)			Adjusted Ratio (PR)		
	PR (SE)	95% CI	p-value	PR (SE)	95% CI	p-value
Age category in years						
17–19	Reference					
20–24	1.59 (.8)	0.62–4.11	0.34	1.54 (.6)	0.73–3.27	0.26
25–29	1.59 (.8)	0.62–4.05	0.33	1.38 (.5)	0.65–2.91	0.40
30–34	1.49 (.7)	0.56–3.97	0.42	1.12 (.4)	0.49–2.52	0.78
35 +	1.26 (.7)	0.42–3.78	0.68	1.00 (.5)	0.41–2.46	0.98
Level of education						
None	Reference					
primary	0.88 (.3)	0.47–1.65	0.69	0.98 (.2)	0.62–1.56	0.95
secondary	0.75 (.2)	0.40–1.39	0.35	0.97 (.2)	0.61–1.55	0.91
Higher education	0.71 (0.3)	0.33–1.49	0.35	1.39 (.4)	0.73–2.66	0.32
Marital status						
Married	Reference					
Separated	0.84 (.3)	0.40–1.75	0.63	1.23 (.3)	0.71–2.13	0.45
Widow	1.17 (.7)	0.37–3.73	0.79	1.63 (.7)	0.71–3.74	0.25
Single	0.82 (.3)	0.39–1.69	0.59	1.23 (.3)	0.72–2.11	0.45
Have a regular boy/girl friend	1.12 (.4)	0.53–2.34	0.77	1.34 (.4)	0.79–2.27	0.28
Study site						

Likelihood-ratio test of alpha = 0: chibar2(01) = 0.17 Prob > = chibar2 = 0.340, Log likelihood = -344.47

	Crude Ratio (PR)			Adjusted Ratio (PR)		
Kampala	Reference					
Mbarara	0.69 (.1)	0.49–0.97	0.03*	1.06 (.2)	0.79–1.41	0.71
Gender						
Male			Reference			
Female	3.0 (.6)	1.99–4.55	0.001*	1.08 (.3)	0.64–1.84	0.75
Condom use						
Yes			Reference			
No	0.53 (.1)	0.37–0.78	0.001	0.89 (.2)	0. 64–1.27	0.54
SYP_INT						
Score ≥ 9, median			Reference			
Score < 9, median	0.16 (.02)	0.11–0.22	0.001	0.32 (.1)	0.22–0.47	0.001*
SYP_ATT						
Score ≥ 8, median			Reference			
Score < 8, median	0.22 (.03)	0.15–0.31	0.001	0.43 (.1)	0.30–0.61	0.001*
SYP_MN						
Score ≥ 8, median			Reference			
Score < 8, median	0.28 (.04)	0.19–0.39	0.001	0.63 (.1)	0.45–0.88	0.007*
SYP_SE						
Score ≥ 3, median			Reference			
Score < 3, median	0.12 (.03)	0.064–0.21	0.001	0.39 (.1)	0.21–0.74	0.004*
Likelihood-ratio test of alpha = 0: chibar2(01) = 0.17 Prob > = chibar2 = 0.340, Log likelihood = -344.47						

Syphilis and HIV testing

Compared to FSW, self-report of syphilis was less likely among MSW (26% vs. 57%; p = 0.001), as was testing for syphilis in the prior 6 months (6% vs. 19%; p = 0.001). Reasons cited by MSW for not testing -

fear (33%), not feeling sick (30%) and not beneficial (20%) – differed from FSW, for whom not being aware (40%), never thought about it (35%) and have no signs of illness (20%) influenced non-testing behavior. Similarly, preferences for syphilis testing venues differed by gender, with 78% of MSW preferring private clinics while FSW tested at public health clinics (49%), private clinics (35%) or during outreach campaigns (10%). HIV testing in the prior 12 months was less likely among MSW (50% vs 86%; p = 0.001), as was ever testing for HIV (80% vs. 96%; p = 0.02). In contrast to syphilis testing, MSW preferences for HIV testing were diverse: public clinics (34%), private clinics (29%), outreach campaigns (23%), and self-testing (8%). FSW preferred to test at public clinics (53%) and private clinics (45%).

Psychosocial Influences of regular Syphilis and HIV testing

We found that relative to FSW, MSW were significantly less likely to test for syphilis in the next 3 months (19% vs. 63%), test for HIV in the next six months (24% vs. 66%), believe in the benefits of regular testing for syphilis (29% vs. 65%) or HIV (11% vs. 75%), have self-efficacy to seek regular syphilis (40% vs. 84%) or HIV testing (38% vs. 60%) or perceive that regular syphilis (33% vs. 68%) or HIV testing (19% vs. 70%) was normative for SW (Pearson Chi-square $p < 0.001$ for all comparisons).

Associations with Syphilis and HIV Testing

We examined factors associated with syphilis and HIV testing in the prior 12 months. In multivariate analysis, after adjustment for age, level of education, marital status, study site, attitudes to testing and condom use practices, attainment of higher education (adjusted prevalence ratio [aPR] 1.66; 95% confidence interval [CI] 1.09–2.50; p = 0.02), poor intention to seek HIV testing (aPR 1.64; 95% CI: 1.35–2.04; $p < 0.001$), perception that 6-monthly HIV testing was not common (aPR 1.33; 95% CI: 1.09–1.67; p = 0.007) and poor self-efficacy (aPR 1.41; 95% CI: 1.12–1.79; p = 0.005) were associated with HIV non-testing.

In the multivariable model adjusting for age, level of education, marital status, and study site, low intention to seek syphilis testing (aPR 3.13; 95% CI: 2.13–4.55; $p < 0.001$), negative testing attitudes (aPR 2.33; 95% CI: 1.64–3.33; p = 0.004), perception that regular testing was not normative (aPR 1.59; 95% CI: 1.14–2.22; $p < 0.001$), and low self-efficacy (aPR 2.56; 95% CI: 1.35–4.76; p = 0.007) were associated with syphilis non-testing.

Discussion

To our knowledge, this is the first study to evaluate HIV and syphilis testing among heterosexual MSW in Uganda. In this cross-sectional study, MSW were significantly more likely to have attained higher education than FSW but less likely to test for HIV and syphilis or use condoms. MSW preferred testing in private health facilities whereas FSW preferred public health facilities. Among MSW, HIV non-testing was associated with higher education, poor self-efficacy, and poor testing norms and perceptions. Syphilis non-testing was associated with negative testing attitudes, low self-efficacy and low intention to seek testing.

Our finding that only 50% of MSW reported testing for HIV in the last 12 months is similar to prior studies from Asia (30–32). A study of heterosexual MSW in Singapore found that only 27% had tested for HIV or STIs in the past 6 months (30). In China, only 48.6% of MSW who have sex with men had tested for HIV (31, 32). In Kenya, a study found low prevalence (26%) of recent HIV testing among MSW (33). Work done in the Netherlands also found that majority of MSW (63%) reported no recent history of HIV or STI testing compared with compared to 32% FSW and 35% MSM (34). MSW are hidden key sub-population largely invisible to HIV programs (34). Entrenched social stigma, healthcare discrimination and criminalization of sex work limit access to, and uptake of, testing services (35, 36). Additionally, MSW may not identify as sex workers nor perceive themselves to be at risk of HIV and other STIs (3, 34, 37). These factors may account for the low testing norms, low self-efficacy and poor uptake of HIV testing we observed. Although higher levels of education have been associated with better health seeking behaviours (38, 39), better educated MSW in our study were less likely to test for HIV than FSW perhaps because of lack of HIV services targeted to MSW.

We found low uptake of recent syphilis testing which is consistent with prior studies of sex workers in Uganda, and elsewhere, that reported low syphilis testing behaviors (2, 3, 15, 27, 40). Syphilis is a less stigmatized disease than HIV in Uganda (41). One study found that the perception of syphilis as a genetic (inherited) disease was a barrier to testing among men (42). Our finding that testing rates were lower for syphilis than HIV could be explained by social and individual perceptions held about these diseases. Unlike HIV, syphilis is not perceived as a significant health threat (43). Additionally, FSW are more likely than MSW to receive information about syphilis testing during moonlight HIV counselling and testing (HCT) outreach campaigns and antenatal care. Testing attitudes and intentions are influenced by knowledge and personal evaluation of merits and demerits of regular syphilis testing (44, 45). Lack of knowledge, stigma and poor attitudes of health workers are barriers to utilization of STI services (46). The low intentions, negative attitudes and poor testing norms we observed among MSW suggest lack of comprehensive knowledge of syphilis, the benefits of regular testing and barriers to testing including stigma, discrimination and perceived attitudes of providers (37). These findings are consistent with studies showing that psychosocial factors including intentions, attitudes, norms and self-efficacy influence STI and HIV testing behaviors (47). They may also result from policy and programmatic focus on HIV and frequent stockouts of syphilis test kits in Uganda. Compared to HIV, where national testing guidelines (48) target the general population, syphilis guidelines focus on pregnant women (49). These policy choices could limit the opportunities for information on regular syphilis testing among MSW who are not targeted during testing campaigns for FSW (49, 50). Scaling up point-of-care (POC) testing for HIV and syphilis increases uptake of testing services by sex workers (51) and enables early treatment of both diseases (52, 53).

The strengths of our study include being the first study (to our knowledge) in Uganda to evaluate HIV and syphilis testing among heterosexual MSW and use of the integrated change model to guide to design and analysis of major explanatory with reliable item statements (Cronbach's $\alpha \geq 0.7$). Our study has limitations. The study design was cross-sectional, and our findings do not account for time trends in testing behaviors. Participants recruited from two large urban centers may not be representative of all

heterosexual MSW in Uganda. Social desirability and recall bias may have influenced self-report of HIV and syphilis testing behaviors. Nevertheless, studies with larger sample sizes and longer duration of follow up have reported similar findings. In conclusion, non-testing for HIV and syphilis was common among heterosexual MSW in Uganda. These data inform HIV and STI programming for sex workers which should scale-up dual HIV and syphilis POC testing for MSW. Future studies should evaluate strategies to increase testing uptake in this neglected sub-population of sex workers.

Abbreviations

FSW: female sex workers; HIV: human immunodeficiency virus; IQR: interquartile range; MSW: Male sex workers; PSU: primary sampling unit; STI: sexually transmitted infection; WHO: World Health Organization.

Declarations

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Author contributions

RM conceived the research idea, participated in the design of the study including coordination of data collection, and drafting of the manuscript. BC, RP, NK, JK, NM, AM, NKS and EN, all participated in refining the research idea, design including tools. RM, EN and NM participated in the statistical data analysis. RM, BC, and AM wrote the first draft. All authors contributed to interpretation of the results and the writing of the manuscript, and all approved the final manuscript.

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Availability of data and materials

The datasets used during the current study are available from the corresponding author on request. The questionnaire is included as supplementary information.

Ethics approval and consent to participate

The study was approved by the Higher Degrees, Research and Ethics Committee, School of Public Health, Makerere University and Uganda National Council for Science and Technology (HS 2403). All respondents provided written consent in English or their local language.

Competing interests

The author(s) declare that they have no competing interests.

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