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# Transactional Sex among Men Who Have Sex with Men: Differences by Substance Use and HIV Status

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**Abstract** Exchanging money, drugs, and other goods for sex has been associated with sexual risk behaviors and increased STIs/HIV. While female sex work is well described, data on men who exchange sex for money or goods are more limited. This paper examined the prevalence and correlates of transactional sex among young men who have sex with men, especially focusing on substance use and HIV status. We conducted a cohort study of 511 participants recruited between August 2014 and December 2017 in Los Angeles, CA. Eligible participants were: (1) between 18 and 45 years of age; (2) male; and (3) if HIV-negative, reported condomless anal intercourse with a male partner in the past 6 months. By design, half were HIV-positive and half HIV-negative. At baseline and semi-annual follow-up visits, computer-assisted self-interviews were used to collect information on demographics, sexual behaviors including transactional sex which was defined as exchange of money, drugs, or a place to stay for anal intercourse. Laboratory testing was conducted for current STI/HIV status. The average age of participants was 31.4 years with 43% identifying as African American, followed by

36% as Hispanic/Latino. The prevalence of recent transactional sex across 1486 study visits was 17% ( $n = 255$ ), with 74% of those reporting exchanging sex for drugs. The prevalence of transactional sex was higher among those who reported unstable housing (32 vs. 11%;  $p$  value  $< .01$ ), concurrent sexual partnerships (26 vs. 9%;  $p$  value  $< .01$ ), and transgender sex partners (40 vs. 15%;  $p$  value  $< .01$ ). Those who reported receiving money, drugs, or shelter for sex were also more likely to report giving money, drugs, shelter for sex than men who did not report exchange sex (77 vs. 11%;  $p$  value  $< .01$ ). Based on multivariable analyses after adjusting for age and race/ethnicity, HIV viral load was independently associated with transactional sex [adjusted odds ratio (AOR) = 1.4; 95% confidence interval (CI) 1.1–1.7] per  $\log_{10}$  increase]. Additionally, those testing positive for an STI were nearly twice as likely to report transactional sex as compared to those without STIs (AOR = 1.9; 95% CI 1.2–3.5). These findings underscore the relatively high prevalence of transactional sex and its potential role in ongoing HIV transmission among this cohort of high-risk HIV-negative and HIV-positive men who have sex with men.

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## Introduction

Female sex work is well described; yet, data on men who sell sex for money or goods are limited and often conflicting. Transactional sex among men is less visible

and more stigmatized when compared to female sex work given that most transactional sex among men involves male clients, with female clients encompassing a very small proportion of transactional events among men [1–3]. Further exaggerating the hidden nature of transactional sex among men is that most men do not view these transactions as sex work and describe it more as an informal practice, situational, ‘escorting,’ or even a ‘form of care work, akin to being a therapist or masseuse’ [1, 4–6].

The estimated prevalence of *ever* having transactional sex among men who have sex with men in industrialized countries ranges from 16 to 20% [7–9]. This is likely an underestimate of the true prevalence given the general tendency to under-report sexual behaviors, especially behaviors considered to be discrepant from perceived sexual norms [10–12]. Further complicating the issue is the manner in which payment for sex work is defined. For instance, in an online survey of men who identified as gay or bisexual, 17% reported ever having been paid for sex [9]. By design, the investigators did not define ‘payment’ for sex a priori, thus leaving the definition of payment open to interpretation and limiting specificity in what was considered transactional sex. In other studies where payment was defined, it was often described as a broad category including sex exchanged for ‘money, drugs, goods, clothing, shelter, or protection,’ with few studies attempting to define the various typologies of transactional sex among men [7]. These differences may be relevant, especially from a sexual risk behavior perspective given that men who engage in transactional sex as their source of income or shelter may be considerably different from those who engage in transactional events for the purpose of obtaining drugs.

In addition to the occupational HIV-related risks, factors consistently associated with male transactional sex include homelessness, inconsistent condom use, HIV serodiscordant partnerships, and substance abuse [7, 8, 13–20]. Moreover, these factors interact with each other synergistically to further increase STI/HIV vulnerability. Economic need is known to significantly increase sex without a condom, increase number of transactional partners, sexual role versatility, and riskier sex based on client preferences [1, 18, 19, 21]. Indeed, data show a higher burden of sexually transmitted infections (STIs) including HIV among men who report transactional sex when compared to other men who have sex with men (MSM) not engaged in transactional sex [16, 22–24].

Other methodologic issues that limit our understanding of transactional sex among men relate to the fact that men who engage in transactional sex are a heterogeneous, poorly defined group and often included as a subset of studies focused on MSM, part of larger studies that include female sex workers, or include transgender women [18, 24–26]. Furthermore, studies of male transactional sex in relation to HIV risk behaviors not only combine transactional events from food, shelter, and economic support, with drugs, but few studies explore these behaviors by HIV status [1, 9, 13, 16, 22]. For example, a study of drug-injecting MSM found that being paid for sex and in particular the number of paying sex partners was independently associated with HIV status, with those who reported the highest number of sex partners having a higher likelihood of HIV infection [16]. However, the number of HIV-positive participant in this study was too small ( $n = 27$ ) to allow for stratified analyses which would help to further differentiate the specific risk profiles and behavioral context of transactional sex by HIV status. Therefore, the objective of this analysis was to examine the prevalence and correlates of current transactional sex among men, including the role of substance use, other sexual risk behaviors, and how these factors may be modified by HIV status.

## Methods

### Study Population and Design

Participants in this study were those enrolled in the NIH/National Institute of Drug Abuse (NIDA) funded mSTUDY—a longitudinal study designed to assess the epidemiological and immunological impact of substance use and HIV on minority MSM. Study enrollment started in August 2014 (and is still ongoing) and participants were recruited from a community-based organization providing a broad spectrum of services for the lesbian, gay, bisexual, and transgender community and a community-based university research clinic both located in Los Angeles, CA. All participants in the mSTUDY between August 2014 and December 2017 were eligible and included in this analysis. Inclusion criteria were as follows: (1) between 18 and 45 years of age, (2) male, (3) if HIV-negative, reported condomless anal intercourse (AI) with a male partner in the past 6 months, (4) capable of providing informed consent, and (5) willing and able to return to the study every 6 months

to complete study-related activities including questionnaires, clinical assessments, and biological specimen collection. By design, participants were recruited to include half HIV-positive and half HIV-negative men and inclusion criteria for the two groups were slightly different in that HIV-negative men reported condomless AI with a male partner in order to be eligible while HIV-positive men did not have this eligibility requirement. These differences were related to the objectives of the parent study for this analysis (mSTUDY), which was to examine the role of substance use in both HIV transmission (i.e., among HIV-positives) and acquisition (i.e., among high-risk HIV-negatives). While this may have the potential to create a difference in sexual risk behaviors in the two study groups, the data presented later in this manuscript demonstrate that the differential inclusion criteria still allowed us to enroll HIV-positive and negative men who reported high-risk sexual behaviors.

### Study Procedures and Data Collection

After providing written informed consent, study participants completed a computer-based questionnaire. The questionnaire collected information on transactional sex as well as demographics, sexual risk behaviors, and substance use. Transactional sex was based on a question that asked participants if in the past 3 months, a partner has “given you money, drugs, or a place to stay in exchange for anal sex with you.” Those who responded yes to this question were then presented with a list of drugs and were allowed to choose multiple drugs from this list (i.e., select all that apply). The list of drugs—for exchanges where drugs were involved—included methamphetamine, cocaine powder, crack cocaine, ecstasy, heroin, poppers, and prescription pain medications. Those who reported receiving at least one drug during the exchange were categorized as having received drugs for sex. Those who reported no drugs during the exchange were categorized as having transactional sex for non-drug goods including money and a place to stay. Also unique to this data was our ability to examine transactional events where the participant was a ‘client’ in the exchange. Participants were asked if in the past 3 months, they have “given a partner money, drugs, or shelter in exchange for anal sex.” Again, those who responded yes to this question were presented with the same list of drugs noted above. In this way, we were able to create variables for the participant receiving money, drugs, or shelter for sex, participant giving

money, drugs, or shelter for sex, whether the exchange was for drugs or non-drug goods, and for those reporting exchanges involving drugs, the specific type of drugs reported in the exchange.

At each study visit, participants also provided biological specimen for STI/HIV testing. Urine samples as well as rectal and pharyngeal swabs were collected for chlamydia and gonorrhea testing using nucleic acid amplification testing (NAAT) technology (Aptima Combo 2®, GenProbe, San Diego, CA). Additionally, blood samples were collected for syphilis and HIV testing (for HIV-negatives) and HIV-1 RNA levels (for HIV-positives). Syphilis testing was conducted using the rapid plasma regain test (RPR), with confirmatory testing done with the *Treponema pallidum* particle agglutination test (TPPA) while HIV testing was based on standard antibody testing (ELISA) with Western blot confirmation. Syphilis disposition (i.e., primary, secondary, or early latent syphilis) was also obtained for each participant and based on standard of care health department investigation of syphilis cases as specified by the Centers for Disease Control STD prevention and Treatment guidelines [27]. All participants were scheduled to return every 6 months, and the study questionnaire and the laboratory tests were repeated at the follow-up visits. The study was approved by the Institutional Review Board at the University of California Los Angeles.

### Analytic Strategy

Descriptive statistics including means, range, and frequency distributions were performed for baseline visits as well as by total visits. The primary outcome for this analysis was whether participants received money, drugs, or shelter for sex. Exchanges where the participant reported giving money, drugs, or shelter for sex were included as a covariate (independent variable) in our analysis in order to examine the role of reciprocal sex work, where the participant reports both giving and receiving resources in exchange for sex. In addition to the total sample, descriptive statistics were also performed by transactional sex group (i.e., outcome variable of receiving money, drugs, or shelter for sex). Differences between participants/visits where transactional sex is reported as compared to no transactional sex were evaluated using Chi-square methods for categorical variables adjusting for the effect of the subject (i.e., repeated measures) and F-statistic for type 3 test of fixed effects (also adjusting for subject effects) [28, 29].

Because participants could have repeated visits over the study period, we used hierarchical regression models with generalized estimating equations (GEE) in order to account for the within subject correlations [29, 30]. We fit models with random intercepts and time effects to accommodate the repeated measures gathered from each participant and to allow participant-specific changes in the responses over time. This allowed us to investigate the association between report of transactional sex as noted at each visit (i.e., outcome) and other fixed effect variables such as race/ethnicity as well as time-varying repeated measures such as number of sex partners or STI co-infections at each visit. Variables tested for inclusion in the multivariable models were based on univariate analyses or specified a priori as risk factors based on the existing literature. All analyses were conducted using SAS version 9.4 (SAS Inc., Cary, NC).

## Results

### Characteristics of Study Population

Between August 2014 and December 2017, a total of 511 participants were enrolled in the mSTUDY with as much as 3.1 years of follow-up data, representing a total of 1486 visits. Among the 511 participants, 395 (77%) had at least one follow-up visit during the data inclusion period for this study. Additionally, when we limited this to the 440 participants who would have been in the study for at least 6 months, we found that 90% had at least one follow-up visit (395/440) with a median follow-up time of 1.5 years and interquartile range (IQR) of 0.6 to 2.1 years. At baseline, the average age of participants was 31.4 years with 43% identifying as African American, followed by 36% Hispanic/Latino (Table 1). Nearly half of the 511 participants reported being unemployed and 35% reported experiencing unstable housing in the 6 months prior to study enrollment. By design, nearly half of the study participants ( $n = 259$ ) were HIV-positive. At baseline, HIV-positive patients were slightly older, were more likely to report being unemployed, and have a history of incarceration (Table 1).

### Prevalence of Transactional Sex

The prevalence of transactional sex as reported across all study visits was 17% ( $n = 255$ ) (Table 2). The

prevalence of transactional sex was higher in visits where participants reported unemployment (24 vs. 12%;  $p$  value  $< .01$ ) as well as unstable housing (32 vs. 11%;  $p$  value  $< .01$ ). Differences in prevalence of transactional sex were also noted by sexual behaviors. Among visits where participants reported concurrent sexual partnerships, 26% reported transactional sex as compared to 9% when no partner concurrency was reported ( $p$  value  $< .01$ ). Additionally, the prevalence of transactional sex was higher when participants reported transgender sex partners (40 vs. 16%;  $p$  value  $< .01$ ) and having new sex partners (23 vs. 6%;  $p$  value  $< .01$ ). Reciprocal sex work was also high in that during visits where participants reported receiving money, drugs, or shelter for sex, they were also more likely to report giving money, drugs, shelter for sex (77 vs. 11%;  $p$  value  $< .01$ ).

Analyses stratified by HIV status showed some differences in factors associated with transactional sex by HIV status. Among HIV-negative participants, bridging across sexual networks was relatively high with higher prevalence of transactional sex reported at visits where participants reported having had sex with both male and female partners (vs. men only) as well as transgender sex partners (Table 2). No differences were noted in PrEP use, with the prevalence of transactional sex being 19% during visits where PrEP was reported as compared to 18% for no PrEP use. Among HIV-positive participants, those who reported transactional sex had higher HIV-1 RNA levels as compared to those who did not report transactional sex (median HIV-1 RNA  $\log_{10}$ copies/mL = 2.0 and 1.3, respectively,  $p$  value = 0.02).

### Prevalence of Regular Transactional Sex

Those who reported transactional sex at every visit were defined as having 'regular' transactional sex. Among participants who reported transactional sex and restricting to those with at least one follow-up visit ( $n = 105$  participants), we found that 17% ( $n = 18$ ) reported transactional sex at every visit with the remainder reporting transactional sex at some but not all visits (data not shown). In comparing participants who reported regular transactional sex to those who reported occasional transactional sex, we found no differences in terms of age, race/ethnicity, employment, or HIV status. However, those who reported regular transactional sex were more likely to be homeless as compared to those who reported occasional sex work (72 vs. 48%;  $p$

**Table 1** Baseline characteristics among mSTUDY participants, by HIV status (8/2014–12/2017).

	Total ( <i>n</i> = 511) <sup>a</sup>		HIV-positive ( <i>n</i> = 259) <sup>a</sup>		HIV-negative ( <i>n</i> = 252) <sup>a</sup>		<i>P</i> value
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	
Socio-demographic characteristics							
Age, mean (SD)	31.4 (7.0)		33.8 (6.6)		29.1 (6.6)		< .01
Race/ethnicity							0.08
African American	221	43.3	107	41.3	114	45.2	
Hispanic/Latino	182	35.6	92	35.5	90	35.7	
Other	39	7.6	16	6.2	23	9.1	
White	69	13.5	44	17.0	25	9.9	
Education							0.07
<High School	63	12.5	39	15.4	24	9.5	
High School Graduate	184	36.4	95	37.6	89	35.3	
>High School Graduate	258	51.1	119	47.0	139	55.2	
Unemployed	228	46.1	142	57.0	86	35.0	< .01
Unstable housing, past 6 months <sup>b</sup>	180	35.2	91	35.1	89	35.3	0.96
Ever incarcerated	198	39.0	114	44.4	84	33.5	0.01
Sexual behaviors							
Gender of sex partners, lifetime							0.39
Male only	244	48.5	125	49.2	115	46.2	
Male and Female	259	51.5	129	50.7	134	53.8	
Transgender sex partners, past 6 months	39	7.7	10	3.9	29	11.5	< .01
Number of male sex partners, past 6 months (median, IQR)	4 (2–10)		4 (1–10)		4 (2–8)		0.02
Intimate partner violence, past 12 months <sup>c</sup>	94	18.8	49	19.4	45	18.2	0.74
Concurrent sexual partnership, past 6 months	232	49.4	106	45.1	126	53.6	0.07

*SD* standard deviations, *IQR* interquartile range

<sup>a</sup> Sum may not equal total due to missing information

<sup>b</sup> Defined as not having a regular place to stay in the past 6 months

<sup>c</sup> Defined as being hit, kicked, or slapped by a lover, boyfriend/girlfriend when that person meant to hurt you physically

value = 0.06) and were more likely to be diagnosed with an STI (39 vs. 17%; *p* value = 0.04).

### Substance Use and Transactional Sex

Analysis including all visits where transactional sex was reported (*n* = 255) showed that the majority (74%) of these events involved exchange of sex for drugs with the remaining 26% reporting exchanges that for non-drug goods including money or shelter. Participants could select all drugs that applied to the event (i.e., they could report more than one drug) and the most commonly reported drug was methamphetamine (60%), followed by poppers (35%), prescription pain medications/sedatives (15%), cocaine (13%), ecstasy (13%), and

crack (13%). In examining differences between visits where transactional sex for drugs was reported as compared to non-drug goods, we found that a higher proportion of visits where transactional sex for drugs was reported also reported being unemployed (67 vs. 37%; *p* value < .01), reported unstable housing (58 vs. 38%; *p* value < .01), reported concurrent partnerships (74 vs. 55%; *p* value < .01), and were HIV-positive (56 vs. 33%; *p* value < .01) (Fig. 1).

### Factors Associated with Transactional Sex

Based on multivariable analyses factors associated with transactional sex varied by HIV status. Among HIV-positive participants after adjusting for age and

**Table 2** Prevalence of transactional sex across study visits among mSTUDY participants, by HIV status (8/2014 to 12/2017)

	Total (n = 1486 visits)		HIV-positive (n = 750 visits)		HIV-negative (n = 736 visits)		P value <sup>a</sup>
	n	%	n	%	n	%	
<b>Total</b>	255	17.2	128	17.1	127	17.3	–
<b>Socio-demographic characteristics</b>							
Age at study visit, mean (SD)	30.8 (6.7)		32.4 (6.1)		28.2 (7.0)		0.14
Received \$/drugs/shelter in exchange for anal sex	31.7 (7.1)		34.1 (6.7)		29.5 (6.4)		
Did not receive \$/drugs/shelter in exchange for anal sex							
Race/ethnicity							0.26
African American	102	16.1	37	12.5	65	19.2	
Hispanic/Latino	86	16.9	58	20.6	28	12.2	
Other	29	22.0	8	15.4	21	26.3	
White	38	18.1	25	20.7	13	14.6	
Unemployed							0.02
Yes	147	24.0	83	22.1	64	26.9	
No	102	12.3	44	12.6	58	12.1	
Unstable housing, past 6 months <sup>b</sup>							< .01
Yes	135	32.0	59	30.7	63	34.1	
No	120	11.3	69	12.4	38	10.1	
Ever incarcerated							0.35
Yes	127	22.2	60	18.9	67	26.4	
No	126	13.9	68	15.8	58	12.1	
<b>Sexual behaviors</b>							
Gender of sex partners, past 6 months							0.37
Male only	222	16.2	121	16.6	101	15.6	
Male and female	33	29.7	7	30.4	26	29.6	
New sex partner, past 6 months							< .01
Yes	226	22.7	113	24.5	113	21.1	
No	29	5.9	15	5.2	14	7.0	
Transgender anal sex partner, past 6 months							0.31
							< .01

Table 2 (continued)

	Total (n = 1486 visits)		HIV-positive (n = 750 visits)		HIV-negative (n = 736 visits)		P value <sup>a</sup>
	n	%	n	%	n	%	
Received \$/drugs/shelter in exchange for anal sex, past 3 months							
Yes	42	39.6	11	42.3	31	38.8	
No	213	15.4	117	16.2	96	14.6	
Intimate partner violence, past 12 months <sup>c</sup>							
Yes	77	32.6	39	30.7	38	34.9	
No	174	14.2	87	14.2	87	14.1	< .01
Concurrent sexual partnership, past 6 months							
Yes	154	25.9	75	28.4	79	23.9	
No	68	8.7	34	8.0	34	9.4	< .01
Gave \$/drugs/shelter for sex, past 3 months <sup>f</sup>							
Yes	110	76.9	56	78.9	54	75.0	
No	143	10.7	71	10.5	72	10.9	< .01
HIV-related factors							
HIV-serostatus							
HIV-positive	128	17.1	-	-	-	-	
HIV-negative	127	17.3	-	-	-	-	
PrEP use, past 6 months <sup>h</sup>							
PrEP use	-	-	-	-	53	18.5	0.70
No PrEP use	-	-	-	-	74	16.5	
HIV-1 RNA level, median (IQR), copies/mL <sup>h,h</sup>							
Received \$/drugs/shelter in exchange for anal sex	-	-	2.0 (1.2-4.2)	-	-	-	
Did not receive \$/drugs/shelter in exchange for anal sex	-	-	1.3 (1.2-3.2)	-	-	-	
STI (laboratory testing)							
Any STI (Chlamydia, Gonorrhea, or Early Syphilis)							
Yes	63	24.0	42	26.9	21	19.6	0.04
							0.10



Table 2 (continued)

	Total (n = 1486 visits)		P value <sup>a</sup>		HIV-positive (n = 750 visits)		P value <sup>a</sup>		HIV-negative (n = 736 visits)		P value <sup>a</sup>	
	n	%	Received \$/drugs/shelter in exchange for anal sex, past 3 months		n	%	Received \$/drugs/shelter in exchange for anal sex, past 3 months		n	%	Received \$/drugs/shelter in exchange for anal sex, past 3 months	
			n	%			n	%			n	%
No	189	15.6			83	14.1			106	17.1		
Chlamydia (urine, rectal, or throat)			0.30				0.21				0.88	
Positive	29	23.2			18	28.6			11	17.7		
Negative	221	16.6			106	15.8			115	17.4		
Gonorrhea (urine, rectal, or throat)			0.19				0.07				0.87	
Positive	34	27.6			23	30.7			11	22.9		
Negative	215	16.2			100	15.2			115	17.1		
Early Syphilis (primary, secondary, or early latent syphilis)			0.55				0.61				0.84	
Yes	13	24.5			11	24.4			2	25.0		
No	239	16.9			114	16.4			125	17.4		

*IQR* interquartile range, *PrEP* pre-exposure prophylaxis

<sup>a</sup> *p* value adjusts for the effect of the subject (i.e., multiple observations for the same participant)

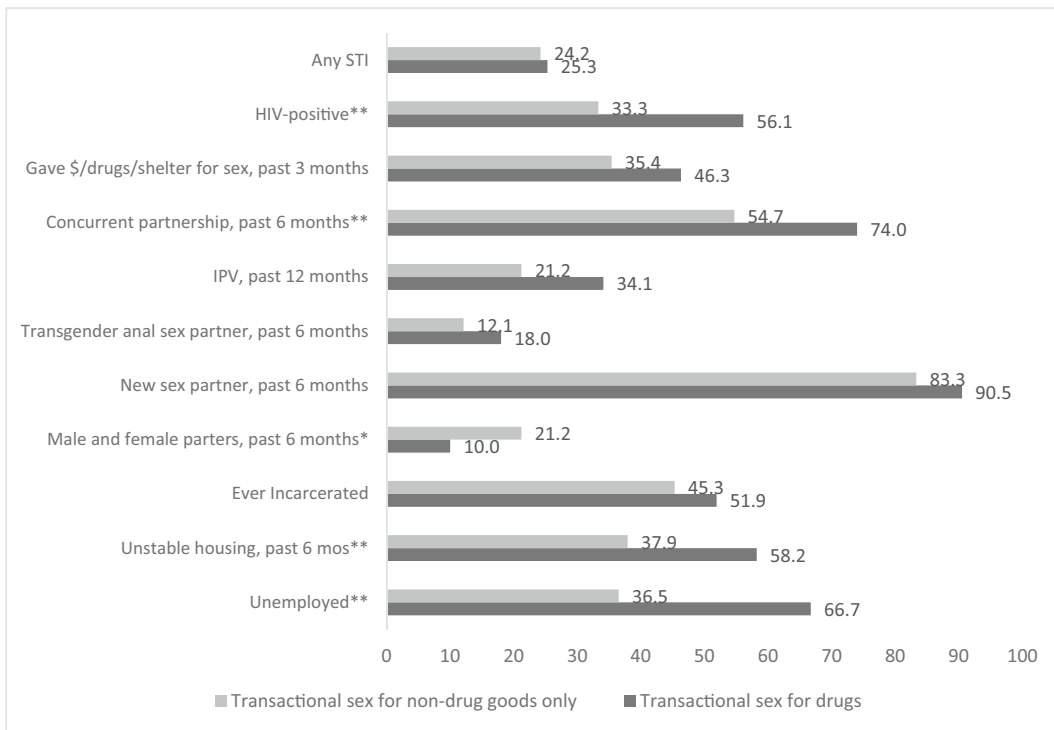
<sup>b</sup> Defined as not having a regular place to stay in the past 6 months

<sup>c</sup> Defined as being hit, kicked, or slapped by a lover, boyfriend/girlfriend when that person meant to hurt you physically

<sup>d</sup> Among HIV-negative participants

<sup>e</sup> Among HIV-positive participants

<sup>f</sup> Exchanges where the participant reported *giving* money, drugs, or shelter for sex as compared to the outcome of interest which involves exchanges where participants reported *receiving* money, drugs, or shelter for sex



**Fig. 1** Prevalence of sociodemographic characteristics and sexual behaviors among mSTUDY participants reporting transactional sex ( $n = 255$ ), by type of exchange (8/2014 to 12/2017). \* $p$  value

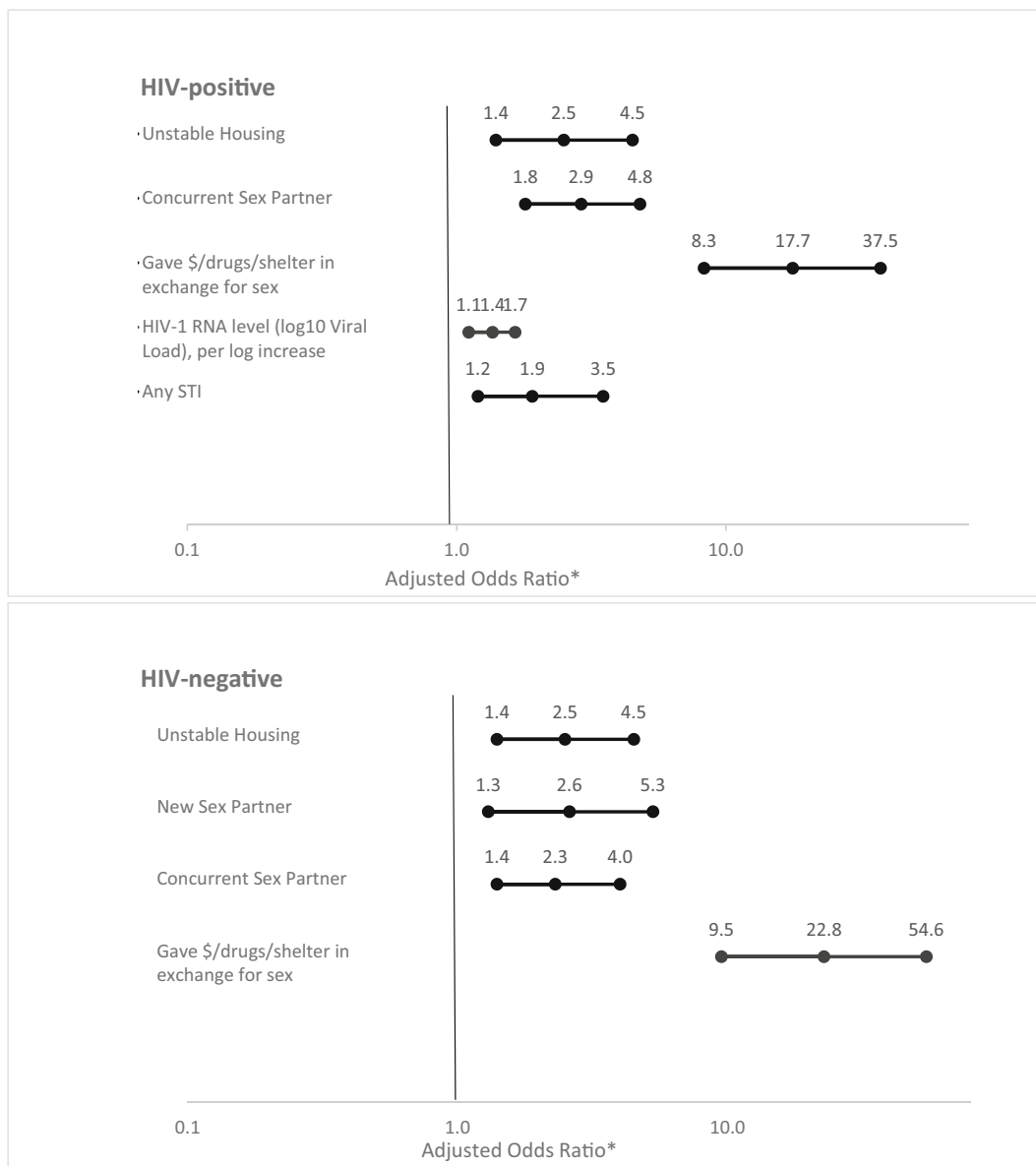
$< .05$ ; \*\* $p$  value  $< .01$ . Note: Transactional sex was defined as whether participant reported receiving drugs or non-drug goods in exchange for sex

race/ethnicity, those who reported unstable housing were 2.5 times more likely to report receiving money, drugs, or shelter for anal sex as compared to those who did not report unstable housing [adjusted odds ratio (AOR) = 2.5; 95% confidence interval (CI) 1.4–4.5] (Fig. 2). Additionally, concurrent sexual partnerships (AOR = 2.9; 95% CI 1.8–4.8) and reciprocal transactional events (i.e., when participants reported also giving money, drugs, or shelter for sex) were also positively associated with transactional sex (AOR = 17.7; 95% CI 8.3–37.5) (Fig. 2). Biomarkers associated with transactional sex included HIV-1 RNA levels and STI testing results. Specifically, HIV viral load was positively associated with transactional sex, with every log increase in HIV-1 RNA levels, there was a 40% increase in the odds of transactional sex (AOR = 1.4; 95% CI 1.1–1.7). Additionally, those who tested positive for an STI were nearly twice as likely to report transactional sex as compared to those who did not have an STI (AOR = 1.9; 95% CI 1.2–3.5). Likewise, among HIV-negative participants after adjusting for age and race/ethnicity reporting unstable housing, concurrent sexual partnerships and reciprocal transactional events were positively

associated with transactional sex (Fig. 2). In addition, those who reported a new sex partner in the past 6 months were more likely to report transactional sex as compared to those who did not report a new sex partner (AOR = 2.6; 95% CI 1.3–5.3).

**Discussion**

Findings from this study indicate that a high proportion of this cohort of younger MSM reported having recent practice of transactional sex. We found that the majority of transactional events involved an exchange of drugs (methamphetamine in particular), with few men reporting transactional events that did not involve drugs. The relatively large study population and equal distribution of HIV-negative and positive participants allowed us to identify factors associated with transactional sex while considering the different risk profiles for both HIV transmission and acquisition. Furthermore, this is one of the few studies to offer a typological classification of transactional sex based on whether transactions were for drugs or other non-drug goods,



**Fig. 2** Multivariable regression analysis examining factors associated with transactional sex among mSTUDY participants, by HIV status (8/2014 to 12/2017). \*Based on multivariable model

adjusting for age, race/ethnicity, and all other variables listed in the figure; outcome for model was whether participant reported *receiving* money, drugs, or shelter for sex

as well as the structural and sexual network characteristics associated with each type of transaction. Finally, the longitudinal nature of our study allows a unique identification of those who practice transactional sex consistently over time.

Our findings indicate that transactional sex was reported at 17% of study visits. While this may appear comparable to other studies that report prevalence estimates ranging between 16 and 20% [7–9], these studies report

on lifetime experience or ‘ever’ having had transactional sex and not recent experiences. The few studies that do report on recent history of transactional sex among men report estimates of 5% which is substantially lower than estimates from our study [8, 31]. This difference may partly be explained by differences in the study populations with our participants representing a relatively young, ethnically diverse group of men selected based on behaviors that place them at high risk for HIV

transmission or acquisition. As well, studies defining transactional sex as one's job—where payment is equated with money—resulted in lower estimates of transactional sex as compared to our broader definition which was inclusive of exchanges that involved money or provided for other specific needs such as drugs or shelter. This lends additional support to the idea that most men do not view these transactions as sex work [4].

Additionally, unique to our data is our ability to examine transactional events by HIV status. We find that even though the prevalence of transactional sex does not vary significantly by HIV status, factors associated with these events are different. In particular, our finding that among HIV-positive participants, those with a higher HIV viral load and those with a current STI infection are more likely to report transactional sex suggest that the potential for HIV transmission is significant. This finding could indicate that HIV-positive men who report transactional sex may need programs to address assurance of basic safety needs, such as stable housing and food insecurity prior to programs that focus on retention in care, adherence to HIV medication, and other strategies that harness the power of treatment as prevention. This may also help identify those for the potential to drive ongoing transmission of HIV as not only are these men more likely to be viremic, they are also more likely to have high-risk sexual encounters given the increased likelihood of STIs.

Among both HIV-positive and negative participants, having concurrent partnerships—sexual partnerships that overlap in time—was associated with transactional sex. Given evidence of less condom use among male sex workers during sexual encounters outside of transactional events [8, 22], this would suggest that non-trade partners, especially main partners, would be at increased risk for STIs/HIV. In fact, we find that a nontrivial proportion of participants who reported transactional sex also reported main partnerships (24%) though this was less than those who did not report transactional sex (36%). This implies that the increase in concurrent partnerships seen among those who report transactional sex may be attributable to the nature of sex work and reflects higher rates of partner turn-over.

Sex work may be an economic necessity for people who use drugs regularly. Other studies have shown that transactional sex is associated with substance use [7, 32, 33], though this is one of the first to demonstrate that exchanges for the purpose of obtaining drugs are driving these transactions. Furthermore, the transactions

involving drugs may be higher risk than non-drug/survival sex transactions given that a higher proportion report other sexual risk behaviors such as concurrent partnerships and are more likely to be HIV-positive. Transactions involving methamphetamine (and other club drugs) are not surprising, though it should be noted that a non-trivial proportion also reported transactions involving prescription opioids/sedatives, drugs that have a more intense withdrawal syndrome that can motivate sexual exchange behaviors [34]. Regardless of the type of drug used, it is important to continue to recognize the role of substance use treatment in STI/HIV prevention.

Interestingly, we also found that those who reported both male and female sex partners were more likely to report transactional events for non-drug goods, though this association was not independent of other potentially confounding factors such as HIV status. A larger sample size would help to further clarify this, though preliminarily our data seem to suggest that this is not an example of 'situational' sexuality [35]. Meaning, the need for basics such as shelter provides the 'situation' in which a person may consider exchanges that do not follow their everyday sexual script (i.e., 'gay for pay') [35, 36]. In exploring the relationship between type of transactional event and reported sexual identity (vs. behavior), we found that men who identified as bisexual also reported a higher proportion of transactional sex for non-drug goods (vs. drug-based exchanges). These data imply the potential for bridging and STI/HIV transmission beyond sexual networks of MSM.

The findings of this study should be interpreted in light of some of the limitations. Assessment of sexual risk behaviors, transactional sex, and substance use was based on self-report. Although minimized by computer-assisted interview, participants nevertheless may be reluctant to disclose information regarding socially stigmatized or illegal activities, resulting in response bias and a potential underestimation of these behaviors [37, 38]. Additionally, there may be under-reporting due to participants not recognizing that some sex is actually transactional. Our use of computer-assisted self-interviews for the collection of the survey data may have helped to improve the validity of the self-reported information, while the use of biomarker data (such as STI results and HIV viral load) may also help to validate reported behaviors [39]. This study was based on participants recruited from community-based sexual health clinic and a university-based research clinic and may not be generalizable to other populations.

The prevalence of transactional sex among this cohort of high-risk HIV-negative and HIV-positive MSM was relatively high. Furthermore, we are able to shed light on a less studied drug-related factor that challenges our effort to limit infections among this high-risk population. The concentrated rates of STIs/HIV further demonstrate the vulnerability of this group in terms of both STI/HIV acquisition and transmission. These findings highlight the fact that current sexual health services and HIV prevention strategies may be inadequate and these data may help conceptualize targets for appropriate prevention interventions targeted to this group.

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