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Men who have sex with men and women in Bangalore, South India, and potential impact on the HIV epidemic

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Key messages highlighting the main features of the paper:

1. Bisexual behaviour was common among this sample of men who seek sex with men in Bangalore.
2. Men who reported having sex with both men and women (MSMW) reported lower rates of HIV-related sexual risk behaviours with male partners than men reporting sex with men only (MSMO).
3. Inconsistent condom use by MSMW with both male and, in particular, female partners indicates a potential means of HIV transmission into the general population.
4. HIV prevention programs and services, particularly those targeting MSM, need to ensure that they reach bisexual men who potentially expose their male and female partners to HIV.

INTRODUCTION

Approximately 2.5 million people in India were living with HIV in 2006, with the predominant mode of HIV transmission through sexual activity. [1-2] At the national level, the overall HIV prevalence continues to suggest a concentrated HIV epidemic in India with, for example, a very high prevalence among men who have sex with men (MSM) (7.4%), which is more than 15 times the prevalence among ANC clinic attendees (0.48%). [2]

Several studies in India have shown that MSM are a highly complex and diverse group, many of whom may have frequent sexual relations with women. [3-9] A study in Andhra Pradesh found that 42% of MSM were married and that 50% reported sexual relations with a woman in the past three months. [10] Some men might turn to men for sex due to difficulties accessing females. On the other hand, given the stigma associated with homosexual behaviour and the Indian penal code, which until recently cited sodomy as an offence [11], the pressure to deny male-with-male sex is pronounced, and many MSM marry women. [12]

It has been reported that condom use by MSM with spouses tends to be low, even more so than with male partners, which suggests that through bisexual behaviour, men could link circuits of high risk male-with-male activity with the general female population. [13] Some studies have shown that the number of cases of women infected with HIV through heterosexual transmission within marriage is increasing in India, and that the behaviour reported by the husband was an important risk factor for infection among many of these women. [14] The frequency of bisexual behaviour among MSM, coupled with low condom use, high HIV prevalence and increased transmission efficiency of anal sex, means that the contribution of men who have sex with men and women (MSMW) to the HIV epidemic, through transmission to their female partners, could be substantial. [15]

Despite high rates of marriage among MSMW, prevention efforts have tended to consider bisexual and homosexual men as a single group, with less attention given to understanding the impact of their sexual relations with women. This may be in part because bisexual men tend not to identify socially with the MSM community.

There is evidence from Latin America that MSMW are more likely than MSMO to engage in insertive rather than receptive anal sex with other men; they also have unprotected sex with their female partners. [16-19] Some have argued that MSMW with a non-“gay” identity may be at higher risk of HIV infection because of a lack of peer support and limited access to prevention services that are available to MSM who are more open about their sexuality. [20]

In order to develop more effective preventive responses, we need to better understand sexual risk behaviour, and the extent to which bisexual behaviour serves as a bridge for infection into the heterosexual population. The definition of identity among men who have sex with men in India is very complex and is increasingly the focus of qualitative [12][21-22] and quantitative studies. [23-24] Elsewhere, we have explored identities of MSM, including transgenders, and how their sexual behaviour is related to identity. [23] The objective of the current study was to disentangle the risk behaviour of men who have sex with men only versus those who reported sex with men and women, which has important implications for both the HIV epidemic and prevention interventions in India. Firstly, we quantified differences in the characteristics and sexual risk of MSMW and men who have sex with men only (MSMO), and then explored differences in risk behaviour of MSMW with their female partners compared to that with their male partners.

METHODS

From July to August 2006, men/*Hijras* from Bangalore city were sampled using a two-stage cluster sampling method described in detail elsewhere. [23] In brief, following pre-survey mapping of cruising sites, time-location cluster (TLC) sampling was used for the selection of ‘floating’ populations in public-place cruising sites (locations where men seek other men for sex such as bus stops, train stations and public parks) to eliminate systematic bias of people with different levels of risk cruising at different days/times at a particular site. Conventional cluster sampling (CCS) was used for the sampling of *Hammams* (bath houses where transgendered persons sell sex to men) since the population under study is ‘stable’ in these locations. In total 12 Hammams and 112 public-place cruising sites were identified. Each of the 112 public-place cruising sites was divided into peak and off-peak periods and each cluster multiplied by the number of days sampled. A total of 5528 TLCs were defined, from which 77 were randomly selected. From a list of 12 Hammams, eight were chosen at random. Within each cluster the aim was achieve five interviews resulting in a total of 400 interviews. The objective of the survey was to measure changes in selected behaviour over two time periods in year 1 (2006), 3 and 5 of the intervention, calculating the sample size accordingly. [25] A power calculation was carried out to ensure the available sample size would provide enough power. In this example the outcome of interest was “ever reporting non-commercial sex with a man”, between MSMW and MSMO. The alpha level was set at 0.05, corresponding to a type 1 error, with a 5% probability. This resulted in 88% power in the survey. [26]

Men were eligible to participate in the study if they had sex with a man at least once in their lifetime and were at least 18 years of age. In our analysis, men were classified as MSMW if they reported sex with a female within a year prior to interview. In this paper, the term “MSM” is used to describe a behavioural phenomenon that encompasses both men and male-to-female transgenders (*Hijras*). Although *Hijras* do not socially and psychologically identify themselves as men, they are included in

this study for two reasons. Firstly, the program through which respondents were recruited targets men and *Hijras*, thereby creating a degree of overlap between their social networks; and, secondly, many *Hijras* engage in receptive anal intercourse. [23]

In India different categories of MSM, generally associated with different HIV-risk behaviours, are often used and interpreted as characterising different identities of MSM. Five categories of MSM identities, all of which have been described in previous publications [12, 23, 29] were defined by the local NGO at the outset of the study, and confirmed by a pilot study. The question asked in the interview was open-ended: '*How do you identify yourself?*' with possible answers being {*Hijra*, *Kothi*, *Double-Decker*, Bisexual, *Panthi* and 'no identity' }.

Mixing Western notions of identity (homo-heterosexual) is unlikely to be recognized by Indian men unless they are of higher or middle class and have been exposed to Western gay men or environments [12]. Despite this, bisexual was a term recognized and used by respondents during the pilot study. The interviewers were trained only to give examples of identities but not to probe the respondent or eliminate categories according to sexual behaviour.

Statistical Analysis

The association between sociodemographic characteristics and bisexual behaviour was examined using the Wald test for continuous variables and Pearson chi-square tests with Rao-Scott correction for categorical variables. [27] Each outcome was related individually to the outcome, bisexual behaviour. A logistic regression model was created, adjusting for sociodemographic variables known to be important risk factors (or confounders) for bisexual behaviour based on the published literature. In constructing the multiple regression models for the adjusted analyses, all important sociodemographic variables were included, with the variable with the smallest p-value chosen as the first independent variable in the multivariate model. There were no significant interaction terms and any missing data was excluded from the analysis. All statistical analyses took into account the survey design (clustering), in order to take into account the correlation between individuals when estimating variance and confidence intervals, using SVY commands in STATA, version 10. [28]

RESULTS

In total, 357 of the 572 men approached agreed to be interviewed giving a participation rate of 62%. Figure 1 shows the extent of lifetime and current (past year) bridging behaviour by partner type. Over half of the sample (55%) reported sex with men and women in their lifetime; 45% reported sex only with men, and 3% reported sex only with men and *Hijras*. No men reported having had sex only with *Hijras*.

Over the past year, 41% reported sex with men and women, of which 30% reported sex with men and women and 11% reported sex with all partner types - men, women and *Hijra*. On the other hand, 12% of those reporting lifetime bisexual behaviour reported sex only with men in the past year, while 2% reported sex only with men and *Hijras* (Figure 1).

In our analysis, men were classified as MSMW if they reported sex with a female (and male) within a year prior to interview. MSMO were defined as men who reported having sex with men only in the last year.

Sociodemographic Characteristics

Over a third of MSMW (38%) and MSMO (33%) were recruited into the survey in public parks, and 12% of MSMO were recruited in Hammams due to the higher proportion of *Hijras* in this group (Table 1). Those who reported bisexual behaviour in the last year were older on average than exclusive homosexuals. Age at first sex was significantly higher among MSMW than MSMO (19 vs. 17 years).

Most of the sample was Hindu and literate (71%) and this did not vary significantly between MSMW and MSMO. A third (34%) of all respondents had been married to a woman at some stage in their life. There were some differences among identities. More masculine identities such as *Panthis*, *Double-Deckers*, and bisexuals, were more likely to have ever been married (38%, 27% and 63% respectively) compared with 22% of *Kothis* and no *Hijra*. More details on characteristics of different identities have been published elsewhere [23].

The majority of MSMW were currently married (68%), and most married MSMW (66%) lived with their wife. Among men not reporting sex with a woman in the last year (MSMO), 3% were currently married.

Slightly fewer MSMW originated from Bangalore (47% vs 52%) and had ever had sex with another man outside Bangalore (25% vs. 28%). Considerably more MSMW concealed their same-sex behaviour from their families than MSMO (96% vs. 74%). Significantly fewer MSMW than MSMO perceived themselves to be at risk of contracting HIV (32% vs. 46%).

Table 1: Sociodemographic characteristics and behaviours of MSMW and MSMO

Characteristic	Total % (N=357)	MSMW * % (N=146)	MSMO % (N=211)	P-Value
Cruising site where recruited:¤				0.031
<i>Public Park</i>	35	38	33	
<i>Public Toilet</i>	19	21	18	
<i>Bus station</i>	18	16	18	
<i>Hammam</i>	8	2	12	
<i>Other including train station, cinema etc</i>	20	23	18	
Age (Median) ¤	(30)	(33)	(28)	<0.001
18-19	6	3	9	
20-29	51	34	62	
30-39	27	40	18	
40-75	16	23	11	
Median age at first sex with a man (years) ¤	18	19	17	0.007
Religion §				0.656
<i>Hindu</i>	71	72	70	
<i>Islam</i>	21	21	21	
<i>Christian</i>	8	6	9	
Literate: can read and write	71	74	68	0.265
Marital Status ¤				<0.001
<i>Currently married</i>	29	68	3	
<i>Separated/Divorced/Widowed</i>	5	3	6	
<i>Never married (including all Hijra)</i>	65	29	91	
Living Arrangements §				<0.001
<i>Living with Male Partner</i>	6	2	9	
<i>Living with Wife</i>	28	66	2	
<i>Living Alone/Friend/Hotel</i>	25	13	34	
<i>Living with Guru/Hijra</i>	10	0	17	
<i>Living with Family (no wife)</i>	31	18	39	
Born in Bangalore	49	52	47	0.331
Ever had sex with men outside Bangalore	27	25	28	0.382
Family does not know respondent has sex with men ‡	83	96	74	<0.001
Feel at risk of being infected with HIV	40	32	46	0.027
Had an HIV test ever	44	42	46	0.523
Self-reported sexual identity ¤				<0.001
<i>Hijra</i>	13	0	22	
<i>Kothi</i>	26	11	37	
<i>Panthi</i>	15	23	10	
<i>Double-Decker</i>	15	12	16	
<i>Bisexual</i>	23	43	9	
<i>No Identity</i>	8	11	6	
* MSMW refers only to men who had sex with men and women in the last year § May not add up to 100% as some respondents answered 'Other' ‡ A definition of 'family' was not given and may have been interpreted differently by different respondents. For example it may include wives, but be restricted to parents for others. ¤ These variables were all included in the multivariate analysis in Table 2 since significant differences in proportions were seen between MSMW and MSMO for they are also known to be important risk factors (or confounders) for bisexual behaviour based on the published literature. Living arrangements were not included in the final multivariate model as this variable did not remain significantly associated and widened the CIs.				

Sexual identity and bisexual behaviour (Table 1)

HIV intervention programs in India have tended to assert MSM identities typically described as passive (receptive) or active (insertive) in terms of sexual role in anal sex [21]. In brief, *Hijras* are male-to-female transgenders; *Kothis* have feminine characteristics and may cross-dress but remain biologically male; *Double-Deckers* and bisexuals are more masculine or neutral than *Kothis*; and *Panthis* have a masculine identity and may not self-identify as such although they are identified so by *Kothis* or *Hijras*. As previously described [23] and in the present study, self-reported sexual identity was strongly associated with having sex with women. Although MSMW frequently did not identify as bisexual: 43% self-identified as bisexual; 23% as *Panthis*, 12% as *Double-Decker*, 11% as *Kothi*, while 11% of MSMW did not self-identify with any group. No *Hijra* reported sex with women.

Sexual risk behaviour of MSMW and MSMO (Table 2)

As shown in Table 2, there was no significant difference between MSMW and MSMO in terms of the type of male partner they first had sex with, or reporting anal sex with known or unknown non-commercial partners.

Men who sold sex were less likely to be MSMW than those who did not sell sex; while those who had ever bought sex from males and *Hijras* were more likely to be MSMW. Men who reported ever having non-commercial (NC) male partners were more likely to be MSMW than those who did not. Men who reported receptive anal intercourse were less likely to be MSMW than those who had insertive anal sex, with both known and unknown non-commercial male partners.

Results of the multiple logistic regression model are shown in Table 2. After controlling for sociodemographic characteristics, the association between sex with men and women, and buying sex from male and *Hijra* sex workers, remained significant, as did selling sex and receptive sex with known non-commercial partners. On the other hand, the relationships between MSMW and non-commercial sex with men, as well as type of anal sex with known and unknown non-commercial male partners, were confounded, and after controlling for sociodemographic variables, such as marital status and sexual identity, did not remain significant.

Table 2: Sexual risk behaviour of bisexual (MSMW) versus homosexual (MSMO) men

Characteristic	Total N	% MSMW α	Univariate OR (95% CI)*	Univariate P-Value	Adjusted OR ρ (95% CI)	Adjusted P-value
Male first had sex with §:						
<i>Classmate/Friend/Colleague</i>	195	42	1		1	
<i>Relative</i>	47	32	0.65 (0.32-1.31)	0.220	0.76 (0.20-2.84)	0.681
<i>Paying client/Male sex worker</i>	23	65	2.58 (0.95-7.01)	0.062	3.80 (0.98-14.6)	0.053
<i>Stranger</i>	79	38	0.84 (0.51-1.40)	0.507	0.66 (0.30-1.45)	0.296
Ever sold sex to another man						
No	210	58	1		1	
Yes	147	17	0.15 (0.08-0.27)	<0.001	0.34 (0.12-0.96)	0.041
Ever had non-commercial (NC) male partners						
No	132	30	1		1	
Yes	224	48	2.16 (1.27-3.68)	0.005	1.13 (0.47-2.69)	0.787
Ever had anal sex with known NC men						
No	24	58	1		1	
Yes	167	48	0.66 (0.28-1.54)	0.327	0.70 (0.08-5.97)	0.736
Type of anal sex with known NC men \ddagger						
<i>Insertive</i>	64	70	1		1	
<i>Receptive</i>	61	28	0.16 (0.07-0.39)	<0.001	0.15 (0.03-0.69)	0.016
<i>Both insertive & receptive</i>	42	43	0.34 (0.13-0.77)	0.013	0.44 (0.06-3.08)	0.398
Ever had anal sex with unknown NC men						
No	14	43	1		1	
Yes	103	44	1.03 (0.36-2.96)	0.949	1.74 (0.28-10.7)	0.543
Type of anal sex with unknown NC men \ddagger						
<i>Insertive</i>	32	59	1		1	
<i>Receptive</i>	47	30	0.29 (0.11-0.78)	0.015	0.02 (0.00-2.92)	0.116
<i>Both insertive & receptive</i>	15	60	1.03 (0.34-3.07)	0.962	0.88 (0.63-1.24)	0.467
Ever bought sex from male sex worker						
No	245	28	1		1	
Yes	112	69	5.61 (3.34-9.42)	<0.001	4.06 (1.82-9.08)	0.001
Ever bought sex from <i>Hijra</i> sex worker						
No	298	36	1		1	
Yes	58	67	3.81 (1.94-7.51)	<0.001	5.47 (1.95-15.3)	0.002

§ Does not add up to 100% as some respondents answered 'Other'

α The percentage of MSMW only reporting each behaviour

* The reference category for the OR is MSMO with MSMW as the comparison group

ρ Odds ratio adjusted for age, age at first sex with a male, cruising site, marital status and sexual identity

\ddagger These questions were only answered by those respondents who had ever had sex with known/unknown NC men and therefore the total does not add up to the total number of individuals in the sample

Consistent condom use and mean number of monthly sex acts by different types of partner

Consistent condom use was defined as ‘*always*’ using a condom with that partner or partner type. There were no significant differences in rates of consistent condom use between MSMO and MSMW with different types of male partners, whether commercial or non-commercial (Figure 2).

Condom use was particularly low with wives (only 2% always used a condom with wives), even though the highest average number of monthly sex acts took place with wives (average 10 acts per month). Of those who had ever bought sex from a male sex worker (MSW), condoms were used consistently by 64% and 65% of MSMW and MSMO respectively. This was higher than condom use with FSWs (56%).

MSMW reported significantly fewer sex acts with known clients (5 per month) than MSMO (12 per month; $p=0.05$). However, the mean number of monthly sex acts with both unknown and known non-commercial male partners was similar for MSMW (2 and 3 respectively) and MSMO (2 and 4 respectively). Both MSMW and MSMO who bought sex reported an average of 3 sex acts per month with MSW ($p=0.82$). As shown in Figure 2, inconsistent condom use did not necessarily correspond with the partner with whom they have the least number of sex acts.

Sexual behaviour patterns of MSMW with female partners (Table 3)

Among MSMW, mean age at first sex with a woman (22 years) was higher than mean age at first sex with a man (19 years). This is consistent with the majority of MSMW reporting that their first sexual partner was male (66%). Most men reported vaginal sex with their wives (95%) and FSWs (100%), and few reported anal sex with wives (5%), although this proportion was higher for anal sex with FSWs (20%). Consistent condom use was lower for anal sex with both wives (0%) and FSWs (33%) than for vaginal sex (see Figure 2: 2% and 56% respectively), although numbers reporting anal sex with women were low. Twenty-two percent of all MSMW were currently having sex with other female partners (besides cohabiting females and FSWs).

Table 3: Bisexual behaviour of men who had sex with men and women in the past year

Variable	MSMW % (N=146)
Mean age at first sex with a woman (years)	22
Female first had sex with §:	
<i>Wife</i>	37
<i>Relative</i>	17
<i>FSW</i>	23
<i>Classmate/Friend/Colleague</i>	19
First sexual partner	
<i>Male</i>	66
<i>Female</i>	21
<i>Male and Female same year</i>	13
Type of sex with wife in the last month (N=103)	
<i>Vaginal</i>	95
<i>Anal</i>	5
Ever bought sex from a female sex worker (FSW)	42
Bought sex from a FSW in the last year (N=62)	31
Type of sex with FSW in the last year (N=45)	
<i>Vaginal</i>	100
<i>Anal</i>	20
Currently having sex with 'other' female partner	22
§ Does not add to 100% as some respondents answered 'Other'	

DISCUSSION

Men who have sex with men link circuits of high risk activity with the general population. Bisexual behaviour was commonly reported among men who seek sex with men in the public places sampled in this survey. The findings from this paper are consistent with other research findings from India, with proportions of MSM currently married to women ranging from 23% to 42%. [8, 10]

Some differences were found between sexual identity and behaviour reported in this study, compared to others. It has been previously reported in qualitative research in Chennai (India) that engaging in sex with women is a source of stigma within the *Kothi* community. [28] In this study 11% of MSMW self-identified as *Kothis* and only 43% as bisexual. Selection of participants based on self-identification as bisexual, rather than on the basis of current sexual practices, would thus have underestimated the true prevalence of bisexual behaviour.

MSMW reported lower rates of risky behaviour than MSMO, with lower proportions reporting selling sex to men, and receptive anal intercourse, in both unadjusted and adjusted analyses. This is likely a reflection of the many MSMO that are *Kothis* and *Hijras*, who have previously been shown to be more likely than other identities to sell sex. [23] However, a significant proportion of MSMW buy sex

from sex workers (male, female and *Hijra*), and of those who reported insertive and receptive anal sex with unknown non-commercial partners, 60% were MSMW. It was not possible to examine the frequency of sex acts by type (insertive, receptive or insertive/receptive) as the question was not asked in the interview; however it would be interesting to look at this in future.

Condom use by MSMW with their wives was extremely low. A study carried out recently in Bangalore showed a high HIV-1 prevalence in both MSMO (20%) and MSMW (19%), so the risk of HIV transmission to the wives of MSMW is high. [30] In addition, many MSMW reported sex with FSWs as well, with 20% reporting anal sex with an FSW in the past year. Given high HIV prevalence among FSWs [31], this indicates a significant risk of HIV infection through sex with FSW.

An interesting finding was that MSMO were younger than MSMW (median 28 vs. 33 years). This raises the question of whether some of the MSMO would go on to have sex with women, particularly through marriage. It would be worthwhile for future studies to examine this question in more detail, through for example examining the future intentions of young MSMO with regard to marriage or sex with other women.

A limitation of this study is that it included only men who seek sex with men in public places, and this may not reflect the population of MSM in the larger community. Furthermore, the overall participation rate was about 62%, which raises concerns over the representativeness of the study, and consequently the generalisability of the results. For example, many MSMW are unlikely to identify themselves as “MSM”, as reflected by the few respondents who had informed their families that they had had sex with men, and the substantial proportion married to women: it is likely that such men would have been less amenable to study participation. Nevertheless the study does highlight the diverse range of homosexual and bisexual behaviours among MSM in India, which may have significant implications for the risk of HIV transmission to female sexual partners. Changing behaviour in this bridging population could slow the progression of the HIV epidemic. Previous studies have critically examined the use of indigenous sexual ‘identities’ that have been popularised by HIV-prevention programs in India [21][23]. Although the politics of such categories is not the focus of the current paper, it is noted that bisexual behaviour among MSM is correlated with identity, with nearly half of MSMW self-identifying as bisexual.

In this regard, at least two prevention efforts must occur: one that focuses on MSM who identify as such, and another that reaches out to men who have male and female partners, but who may not identify as MSM or bisexual, and who seek sex in locations such as public parks. The latter group could be better reached by outreach workers with more behaviourally bisexual (and generally more

masculine) MSM identities, such as *Panthis* and bisexuals, rather than the often used *Kothi* and *Hijra* outreach workers. [32]

It is also important to focus on increasing condom use rates with the female partners of MSMW, who are generally perceived as low risk. This may be difficult to achieve and sustain, however, because the desire for children may compete with the concern to protect partners from HIV infection. Bridging to the general population will however continue to contribute to the HIV epidemic unless condom use with higher-risk partners becomes more consistent.

Word Count: 3214

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Figure 1: Lifetime and current (in the past year) bridging behaviour

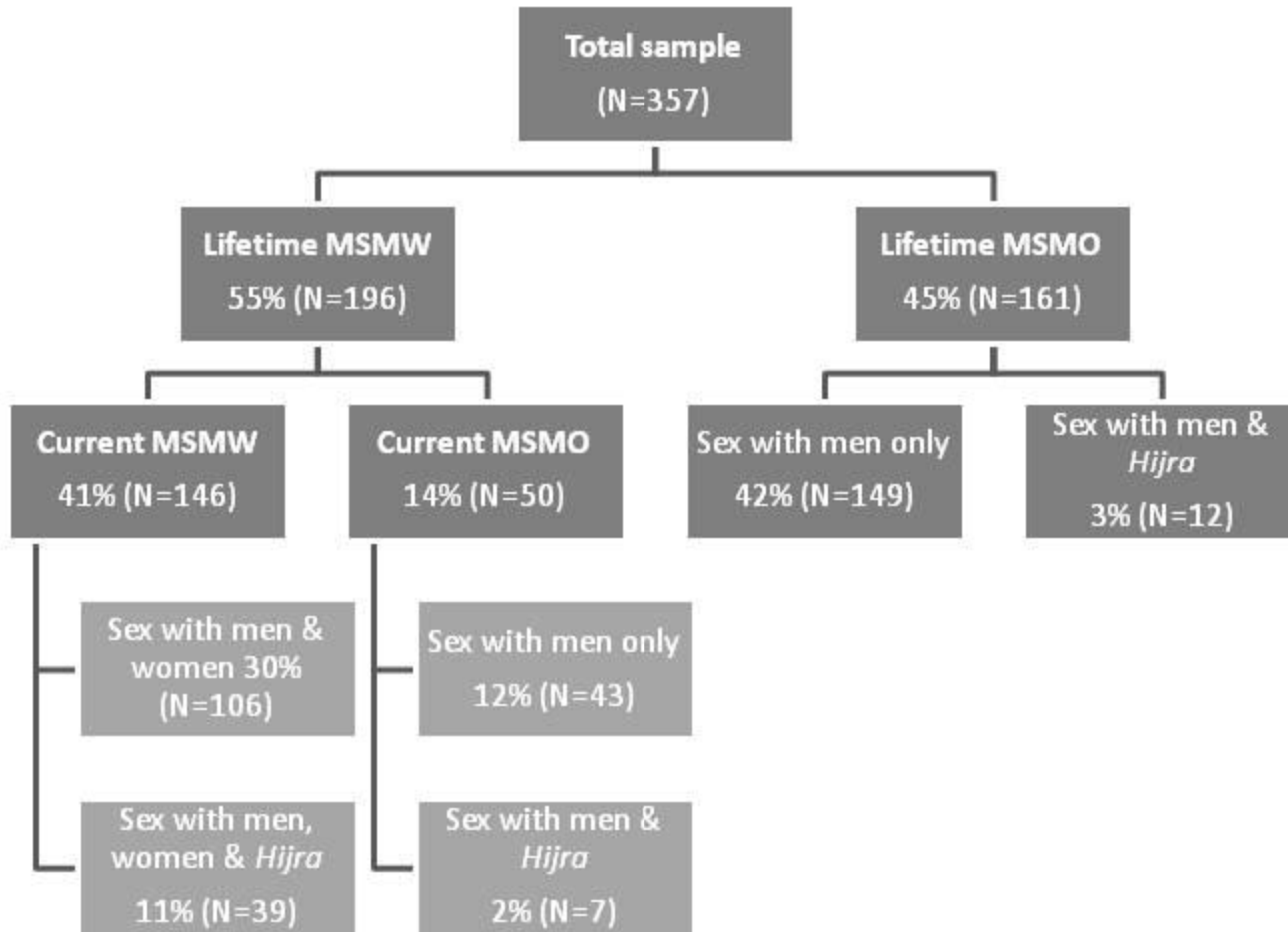


Figure 2: Percentage respondents reporting consistent condom use and mean number of monthly sex acts by different types of sexual partner for MSMW and MSMO

