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Women Connected to at risk Indian Men who have sex with men: An Unexplored Network

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Abstract

Little is known about the women connected to Indian MSM and their impact on HIV risk. We surveyed 240 Indian MSM, who identified their social networks (n=7,092). Women (n=1,321) comprised 16.7% of the network, with 94.7% representing non-sexual connections. MSM were classified as having low, moderate, or high female network proportion. MSM with moderate female network proportion (8–24% total network) had significantly lowered odds of HIV seropositivity (AOR= 0.24, 95% CI= 0.1–0.6). This suggests moderate proportions of female connections could mediate HIV risk. HIV prevention interventions in India could consider the greater involvement of women among their target audiences.

Keywords

India; Men who have Sex with Men; Social Networks; Women; HIV

Introduction

HIV in India remains a concentrated epidemic among certain groups, including men who have sex with men (MSM). The National AIDS Control Organization estimates that there are 2.5 million (95% CI: 2–3.1 million) people in India living with HIV with a national adult HIV prevalence of 0.31% (1). Of the estimated 2.35 million MSM in India, HIV prevalence is estimated to range between 7% and 16.5% (1), a rate at least 15 times that of the general population (3). Overall HIV incidence in India is decreasing, a NACO estimate described a drop from 270,000 cases/year in 2000 to 120,000 cases/year in 2009 (1). Incidence among

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MSM is as high as 0.99% with a recent estimate of a median incidence of 0.4%. Cities with higher prevalence tended to have lower incidence rates, except Hyderabad, which had both a high prevalence and high incidence (12.5% and 0.88%) respectively (13).

The recent re-criminalization of homosexuality by the Indian Supreme Court further reiterates the importance of addressing health disparities in this marginalized population. Due to a heteronormative culture and social stigma regarding homosexuality, many Indian MSM enter marriages with women and engage in same sex relationships covertly (4). Many MSM in India also have sex with women, which may impact their HIV risk. A study of four high HIV prevalence states in India found that 37% of MSM in Andhra Pradesh were married to women (6). Additionally, this study found over a third of MSM paid to have sex with a woman and a third had regular female partners (6). Previous research shows a higher HIV prevalence and less HIV testing within married MSM than the overall MSM population (5) (10).

MSM are increasingly being targeted by HIV outreach efforts in India (4). Andhra Pradesh alone has at least 23 organizations dedicated to serving MSM (3). However, to date, little empirical research has been conducted to understand the women connected to MSM, as well as the potential risk associated with these social connections. In this study, we use network epidemiology to characterize women and their connections with MSM in order to determine whether their presence reduces or enhances HIV risk.

Methods

Setting and Participants

A cross sectional survey was conducted in Hyderabad, India from 2009–2010. In collaboration with two local non-governmental organizations, study staff identified MSM cruising venues (areas where MSM are known to congregate in evening hours, and where paid and unpaid sex is common). Two study team members scheduled recruiting visits through random sampling of venues and night visitation times. Inclusion criteria consisted of the following: 1) male between 18–39 years of age who visited one of 20 cruising venues, 2) reported anal/oral intercourse with a man in the past 12 months, 3) own and are in possession of at least one cell phone at the time of recruitment, 4) speak English or one of two local languages, and 5) willing and able to provide written informed consent for study participation. A full description of data collection methods have been described in further detail elsewhere (9). Institutional Review Boards and Human Ethics Committees in the United States and India approved research protocol and procedures.

Measures

MSM who met inclusion criteria were asked to come to an off-site office for an interview in which respondents completed a demographic and sociobehavioral questionnaire, provided specimens for an HIV test, and provided access to their cell phone contact lists. Contact lists were downloaded through a SIM card reader, and contact list networks were created for each respondent. Respondents were also asked to share demographic and behavioral information about contact list members. MSM were categorized by their primary sexual role, namely

receptive, insertive, or versatile. MSM were also classified into roughly equally representative tertiles based on the proportion of their network that was female, resulting in the categories of low, moderate, or high female network proportion. Low female network proportion was classified as having between 0–8 percent of their network being comprised of women (n=76); moderate network proportion was between 8–24 percent (n=79); and high network proportion was between 24–100 percent (n=74). Sociodemographic data on females within the network, such as their marital status and the nature of their relationship with the MSM respondent, were analyzed using information obtained from MSM study respondents. Data regarding other HIV behavioral determinants, such as condom encouragement and discouragement among peers, were also collected.

Data Analysis

HIV serostatus was treated as the dependent variable and network proportion as the independent variable. Chi-square analyses were conducted to examine the association between network proportion, other sociodemographic and risk characteristics and the dependent variable, HIV serostatus. Independent variables significantly associated with HIV serostatus were included in a multivariate logistic regression model. Additionally age and network size were included in the final model. All analyses were performed using the Stata Release 13 statistical software package.

Ethical Considerations

All procedures were approved by Institutional Ethics Committees at the University of Chicago in the United States and SHARE India in India. Key leaders in the local MSM community were consulted to ensure that protection of subject confidentiality was ensured. The study collected limited demographic information on third parties provided by the consented study respondents as is standard of social network analysis methodology. Consent was waived for third parties as is usually done in social network studies, because of “minimal risk” to the participants. Cell phone information was collected on password protected laptops encrypted and stored on a secure server in the United States. Once the network was constructed on a secure data management system with password protection and data encryption, the data was deidentified by destroying all cell phone and name data (personally identifiable information) from these machines as well as the machines at the data collection site. We convened a formal research consultation before data was analyzed and presented to ensure the data was deidentified. This data was kept in separate files from respondent information about alters. All analytic data was protected by a Federal Certificate of Confidentiality, and further analysis was conducted on deidentified data using secure servers in the United States.

Results

Respondent (n=240) contact lists included 7,912 contacts, of which 1,321 (16%) were women. The mean age of MSM in the network was 26.2 years; the mean age of women in the network was 29.9 years. The majority of respondents (82.5%) self-identified as Hindu. The primary sexual role was receptive (43.7%), followed by insertive (28.8%), and versatile

sex (27.5%). Within the contact network, 39% of individuals were married while 61% reported being unmarried (Table 1).

The majority of respondents reported never being married to a woman (79.4%) Among the study respondents who were married (n=59), there was no association with primary sexual role: 36.2% were receptive, 31% insertive, and 32.8% were versatile. Though there were a greater number of receptive MSM who were married, it is important to note that a greater proportion of insertive MSM were married compared to receptive MSM (32% and 23% respectively). Among the married MSM, 65.7% had a sexual encounter with their wife within the last month. Within the study participants who identified as never being married (n=146), 47.3% identified receptive as their primary sexual role, 26.7% reported insertive, and 26% reported versatile.

About half of respondents (56.3%) noted receiving money/gifts for sex in the previous three months. Additionally, 8.1% of women in the contact network (n=346) were described as receiving money/gifts for sex in the previous three months. Women in the contact network (n=1321) were mostly married (61.3%), while 37.3% were described as never being married. The majority of female contacts were kin (50.8%) or friends (32%). Only 5.2% of women were sex partners, demonstrating that the women in MSM networks are primarily non-sexual social relationships. Most MSM classified women in their networks as very close or moderately close (91.1%), indicating an important social role played by female contacts in the respondent network.

Ordinal logistic regression demonstrated that marital status, age, and primary sexual role were significantly associated with a higher female network proportion, whereas caste, religion, and status of receiving money for sex were not associated with a higher female network proportion. Unmarried men had a lowered odds of having a high female network proportion as compared to married men (AOR 0.23). Older MSM between the ages of 25–34 and 34–45 had a lowered odds of a high female network proportion as compared to men younger than 20 years of age. Though primary sexual role (insertive, receptive, or versatile) was not significantly associated with HIV status in a multivariate model, receptive MSM had a lowered odds of having a high female network proportion (AOR=0.67), while insertive MSM had a greater odds of a high female network proportion (AOR=2.7) when compared to the reference of versatile MSM. In accordance with this finding, our network consisted of a greater percentage of married versus unmarried MSM, among insertive men as compared to receptive men..

Bivariate analyses demonstrated significant associations ($p<0.05$) between HIV status, sexual role, and having received money for sex in the previous 3 months. Caste, religion, relationship type, and individual contact list network size, and frequency of meeting were not significantly associated with HIV serostatus. The depth of the relationship as categorized by the men as “very close”, “close”, and “not close” was also not significantly associated with HIV serostatus. In addition to network size, variables with significant bivariate associations with HIV status were included in the ultimate regression model. Final logistic regression models demonstrated that men who had a moderate female network proportion

(between 8–24%) resulted in significantly lower odds of HIV (AOR=0.24; 95% CI [0.1–0.6]. (Table 2)

Discussion

To date, research on HIV within MSM networks in India has primarily focused on the characteristics of the men themselves rather than the important social connections that drive risk within these networks (2)(5)(6). Our findings demonstrate a significant presence of women within the social networks of MSM, and suggest a unique association between a moderate presence of these women and HIV serostatus.

Extant literature on women connected to MSM primarily focuses on the heightened risk of infection to women involved in marriages to bisexual MSM (8). While our findings demonstrate a large female presence within the MSM network, the results also uncover a unique aspect of the composition of this network. Though evidence verifies that women are engaged in sexual relationships with MSM, both through marriage and transactional sex, there is a much stronger presence of women connected to MSM in social capacities, such as kin or friends. These results suggest that women have a salient presence within MSM social networks, and may play a significant role in mediating HIV risk for MSM.

Additionally our results indicated that certain characteristics, namely younger age, married status, and primary sexual role, were associated with a higher female network proportion, suggesting a diversity of factors impacting female network proportion. Understanding the factors affecting female network proportion unique to each MSM network is vital in determining which men are more likely to involve women in their decision-making. Identifying these factors could also aid in specifically directing health education initiatives towards subgroups of men and women that are more vulnerable.

Our study also demonstrates significantly lowered odds of HIV risk for men who had a moderate proportion of female network members, suggesting a possible protective effect of female connections on risk behavior and health outcomes. The reasons for this nonlinear relationship between female network proportion and HIV risk remain unclear. Our findings suggest that women could be important mediators of risk, either as better conduits of health information, as instruments of encouraging healthy behavior, or as providers of destigmatizing outlets for MSM. Having a low proportion of women in the MSM network may reflect a disadvantage in terms of emotional support. A higher male network proportion could also be associated with more sexual partners and potentially higher HIV risk. Men with few women in their network may be more embedded in sex venues that include other men. They may have limited connections to kin or to other women who may be less likely to be HIV infected.

While the low proportion of women in the network may confer HIV risk, the protective effects of women in the network may only be beneficial to a certain point. A higher proportion of women may reflect an increased embeddedness within heteronormative culture, reflecting an increased number of women who may be unsupportive or stigmatizing towards homosexuality. This environment may not carry the same HIV prevention messages

that are spread in the networks and sex venues in which many MSM in this study socialize. Additionally, distance from the MSM community may contribute to a lack of access or receipt of HIV prevention messages that specifically target MSM. It will be important to distinguish the subtle contextual roles women play in mediating risk factors and stigma in future research.

Men with a moderate proportion of women in their network may be more open to discussing sexuality with kin, which in turn may reduce HIV risk. A study on Asian and Pacific Islander men found that more family conversation regarding discrimination of homosexuality was associated with lower rates of unprotected anal intercourse (12). In a study of Black MSM communities in Chicago, a greater family network proportion was associated with lower odds of risky behaviors, such as sex-drug use (11). While our own research did not investigate the openness of discussing sexuality within the family, it is clear from the MSM respondents' accounts that women within the social network provide a strong source of emotional support, which may lead to more open communication regarding sexuality and less risky sexual behavior with other men. One limitation of our findings is that data regarding the duration of the relationship had not been assessed, nor had subset relationship roles within family (such as mother/sister/aunt/cousin) or type of sexual partner (i.e. main vs. casual sex partner). These omitted variables may have an interaction effect on HIV risk.

In this study, the depth of relationship closeness was not associated with HIV status, a finding that may suggest that focus on specific women based upon the closeness of the relationship may not have an impact on preventing HIV. Further research regarding the nature of the relationship between MSM and their female connections is required to better understand the dynamics of support and openness within female networks. For public health personnel working in HIV prevention, more attention should be paid to the potentially mediating roles that women play in the sexual lives of MSM. This may entail the development and pilot testing of intervention protocols that utilize women as instigators of behavioral change for men. This might also involve utilizing women as peer counselors or outreach workers in MSM communities. On a broad scale, expanding the focus of preventive and educational outreach efforts to include women could have a buffering impact on the HIV risk of MSM.

Due to the cross-sectional design of the study, it is impossible to make conclusions regarding causal relationships between network variables and health outcomes. This underscores the importance of prospectively following MSM and their female spouses, kin and sex partners to better understand the complex dynamics between MSM and the women in their lives. While including women in such research would add a new perspective, the process of interviewing women connected to MSM may be operationally challenging. Future research could utilize the anonymity provided by cell phone contact networks, which could eschew some of these challenges by ensuring the protection of privacy and confidentiality of study participants.

This study highlights the role that women play within MSM networks, and elicits the need for continued research and outreach to this population. The dynamics of social networks and

their effects on risk behavior and health outcomes are complex. Further research is required to elucidate the roles of women within MSM social support systems, the demographic and behavioral factors within MSM networks that could influence the proportion of women in MSM networks, and most importantly, the ways in which women can socially mediate HIV risk behaviors. Our findings highlight the potential untapped HIV risk reduction benefit from the presence of women in the social networks of MSM. If these findings are reproduced, future HIV prevention programs should consider the greater involvement of women in interventions targeting Indian MSM.

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Study Respondents

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TABLE 1

Indian Men who have sex with Men Communication Network Characteristics

<i>Sociodemographics</i>	Respondents	Total Network	Female Network
Age	N=240	N=7902	N=1318
<20	13 (5.4)	355 (4.5)	141 (10.7)
20–24	102 (42.5)	2040 (25.8)	315 (23.9)
25–34	91 (37.9)	3905 (49.4)	447 (33.9)
35–45	30 (12.5)	1367 (17.3)	309 (23.4)
>46	4 (1.7)	235 (3)	106 (8)
Religion			
Hindu	198 (82.5)	6505 (82.89)	1121 (85.3)
Muslim	25 (10.4)	957 (12.19)	95 (7.2)
Christian	17 (7.1)	383 (4.88)	99 (7.5)
Sikh	0	3 (0.04)	0
Caste			
Other Caste	63 (26.7)	1536 (28.9)	357 (32.8)
Scheduled Caste	52 (22)	756 (14.2)	176 (16.2)
Backward Caste	117 (49.6)	2920 (54.8)	534 (49)
Scheduled Tribe	4 (1.7)	114 (2.1)	22 (2)
Marital Status			
Married	59 (27.2)	2973 (38.3)	804 (61.3)
Never	155 (71.4)	4725 (61.0)	491 (37.5)
Previously	3 (1.4)	52 (0.7)	15 (1.2)
Money/gifts for sex			
Yes	134 (56.3)	2281 (37.7)	28 (8.1)
Primary Sexual Role			
Insertive	69 (28.8)	2432 (37.1)	-
Receptive	105 (43.7)	3256 (49.8)	-
Versatile	66 (27.5)	857 (13.1)	-
HIV Positive			
Low Female Proportion	27 (54)	-	-
Medium Female Proportion	10(20)	-	-
High Female Proportion	13 (26)	-	-
Total	50	-	-
<i>Relational Characteristics</i>	Respondents	Total Network	Female Network
Gender			
Female	-	1321 (16.7)	1321 (100)
Male	240 (100)	6591(83.3)	-
Depth of Relationship			
Very	-	3422 (49.6)	553 (42.3)
Moderately	-	2884 (41.8)	640 (48.9)
Not close	-	593 (8.6)	116 (8.8)

<i>Sociodemographics</i>	Respondents	Total Network	Female Network
Meeting Frequency			
Daily	-	1565 (19.79)	302 (22.9)
Weekly	-	1996 (25.24)	200 (15.2)
Monthly	-	2680 (33.89)	369 (28)
Every 6 months	-	939 (11.88)	216 (16.4)
> 6 months	-	555 (7.02)	197 (15)
Never	-	172 (2.18)	35 (2.5)
Last Sexual encounter			
1 day ago	-	36 (1.4)	234 (79.6)
1 week ago	-	365 (14.6)	5 (1.7)
1 month ago	-	919 (36.8)	16 (5.4)
Six months ago	-	892 (35.7)	29 (9.9)
1 year ago	-	214 (8.6)	3 (1)
>1 year ago	-	72 (2.9)	7 (2.4)
Relationship Type			
Sex Partner/Client	-	2754 (34.8)	70 (5.2)
Kin	-	749 (9.5)	671 (50.8)
Friend	-	4066 (51.4)	422 (32)
Work colleague	-	254 (3.2)	101 (7.7)
Other	-	87 (1.1)	57 (4.3)

* Some categories may not add up to total network size due to missing responses.

TABLE 2

Female Network Proportion and HIV status among Indian MSM (n=240)

Female Network Proportion	N (%)	Unadjusted OR	AOR	CI
Low (0–8%)	76 (33.2)	Ref	Ref	Ref
Moderate (8–24%)	79 (34.5)	0.27	0.24*	0.1–0.6*
High (24–100%)	74 (32.3)	0.41	0.62	0.3–1.5

* Significant in multivariate model, $p < 0.05$. Model includes age, network size, receiving money for sex, and MSM sex role.