Title
Gender inequality as a predictor of higher-risk sex among men in northern India

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Introduction

India's adult HIV prevalence is estimated at 0.36% of the total population, amounting to approximately 2.5 million people. This is the third largest HIV-positive population in the world, and the largest in Asia.[1] Further, studies indicate that HIV prevalence rates among high-risk populations such as injecting drug users, men who have sex with men and female sex workers range between 10-26%, and high HIV prevalence among these groups is a precursor to increased incidence among the general population.[2] Studies examining self-reported data from India have found that up to 14.6% of all sexually active women and 4.1% of men report having at least one STI symptom,[3] and that incidence of STIs, especially syphilis, gonorrhea and type 2 herpes is increasing.[4, 5] The increased transmissibility of HIV in the presence of STIs has been well documented by numerous studies, and high prevalence of STIs is recognized as a precursor to increased HIV incidence.[6]

While high HIV prevalence appeared to be confined in the eighties and nineties to southern India, 26 new districts with high HIV prevalence have been recently identified in northern India, including the states of Uttar Pradesh (UP) and Uttarakhand (which was a part of UP until 2000).[7] This is India's most populous region (with over 17% of the nation's population), lags far behind the national average in major economic and literacy indicators, and its women have less autonomy and worse health outcomes than in most other states.[8]

Earlier men's studies from India have shown that higher-risk sex (sex with non-cohabitating partners) takes place in special populations such as truck drivers.[9] Yet, recent studies estimate that up to 15-19% of married men and 15-47% of unmarried men

in the general population might be engaging in higher-risk sexual behaviors.[10, 11] Studies since the mid-nineties have suggested that HIV incidence has been increasing among married, monogamous Indian women in the general population, whose only risk factor was sexual contact with a husband who had acquired the infection primarily through higher-risk sex.[12] Studies have shown that the risk of having HIV/STIs increases for Indian women who live with abusive husbands; report being denied autonomy by their husbands; and report being concerned about husbands' extramarital relationships.[13, 14] A number of studies emphasize that reducing men's risky sexual behaviors is key to slowing HIV incidence in India.[12, 14]

Few studies have explored the link between men's gender equality attitudes and their own risk-taking behaviors. The patriarchal nature of Indian family structure instills differing sexual behavior norms for men and women; unmarried girls are expected to resist premarital sex in order to maintain their "purity", but it is tacitly acknowledged that men can engage in higher-risk sex for the sake of gaining "experience" and learning to be sexual decision makers.[15, 16] Studies have reported that the reasons men give for justifying higher-risk sex include their perceived right to have access to multiple sexual partners, and perceived superiority over spouses within marriage.[17, 18]

We hypothesize that men who believe that women should have less autonomy and rights than men are more likely to engage in higher-risk sexual activity, as compared to men who believe in gender equality. To examine the link between men's gender equality notions and their risky sexual behaviors, we used data from the National Family Health Survey (NFHS-3), the first nationally representative men's survey to collect this information in India.

Methods

The NFHS-3 was carried out in India in two phases from November 2005 to August 2006. As part of the nationally representative survey, a total of 74,369 men in the age group of 15-54 years were interviewed in 109,041 households across the country. For the current analyses, data were restricted to men from the states of UP (n=11,458) and Uttarakhand (n=983), and stratified analyses were conducted for married men (n=7,406) and unmarried men (n=4,834).

The outcome measure for this analysis was men's reported higher-risk sex, defined by the NFHS-3 as men's reported sexual intercourse with someone other than a spouse or cohabiting partner in the 12 months prior to the survey. For this analysis, if a man reported that any one of his last three sexual partners was someone other than a spouse or cohabiting partner, that man was considered as having had higher-risk sex.

The key explanatory variables in this study were married and unmarried men's reported measures of gender equality, assessed in terms of the following six constructs:

1. A series of seven questions in the survey asked men if they believed that a husband was justified in beating his wife under the following conditions: (1) if the husband suspected her of being unfaithful, (2) if she showed disrespect for in-laws, (3) if she went out without telling her husband, (4) if she neglected the children, (5) if she argued with him, (6) if she refused to have sex with him, and (7) if she burnt the food. Men who answered yes to any one of these were classified as believing that wife-beating was acceptable.

2. A series of three questions asked men if a husband had the right to take the following punitive actions against his wife if she refused to have sex with him: (1) refuse financial support to her, (2) use force for unwanted sex, and (3) have sex with other women. Men who answered positively to any one of these questions were considered as saying that men had a right to punish their wives if they refused to have sex with them.

3. Men were asked a series of three questions on whether a woman had the right to refuse sex with her husband under the following circumstances: (1) if the husband had an STD, (2) if the husband had relations with other women, and (3) if the wife was tired or not in the mood to have sex. Men answering no to any of these questions were classified as believing that women did not have the right to refuse sex with her husband.

4. Men were asked four questions on who they thought should make the following decisions: (1) making household purchases for daily needs, (2) purchasing major household items, (3) making a decision on how many children to have, and (4) having the final say on visits to family or relatives. Men who felt that decisions should be made by women alone or jointly with their husbands were considered as believing that women should have high decision-making power, while men who felt that husbands alone should make decisions were classified as believing that women should have low decision-making power.

5. Men were asked who should have a final say on how a wife's earnings should be spent. Men who felt that women alone or jointly with their husbands should have this say were considered to believe that women should have financial autonomy. Men who felt that husbands alone should have the final say were considered to believe that women should not have financial autonomy.

6. Men's family violence history was measured by a single question that asked men if their fathers ever beat their mothers. Men who responded in the affirmative were considered to have a history of violence in their families.

Other measures used were independent variables reported in the literature to influence higher-risk sex among men: alcohol use; mobility (whether men spent more than a month away from home in the year prior to the survey); and HIV knowledge. Men were asked if they had heard of HIV, and those who answered in the affirmative were asked the following six questions: can the risk of getting AIDS be reduced by 1) not having sex at all, 2) always using condoms during sex, 3) having only one sex partner; and whether 4) a healthy person can have AIDS, 5) one can get AIDS from mosquito bites, and 6) one can get AIDS from sharing food with an infected person. A "yes" to questions 1-4 and "no" to questions 5 and 6 were deemed correct answers and given a score of one. Men scoring at the median (3) or higher were classified as having high HIV knowledge; those who score less than 3 or had not heard of HIV were classified as having low HIV knowledge.

Socio-demographic measures expected to influence the outcome included men's age; urban versus rural residence; education; standard of living index; religion; caste; employment status; and whether or not a married respondent's partner lived with him.

Descriptive analyses were first conducted to explore the relationship between higher-risk sex and each of the gender equality and socio-demographic variables. Parallel models were then built separately for married and unmarried men as follows. Logistic regression models including all socio-demographic factors - deemed as important study controls – were fitted to investigate the factors that predict reported higher-risk sex. Then, secondary predictors of interest and gender equality variables were added in a step-wise manner to the models and log-likelihood tests were conducted to assess whether the addition of each of these variables helped to predict the outcome. To account for the complex survey design, the state level individual sampling weight and clustering variable (primary sampling unit) were taken into account. Statistical analyses were conducted using Intercooled Stata version 9.

Results

Of the 12,441 men surveyed in UP and Uttarakhand states, 28 men who did not respond to the question asking about whether or not they had sex, and 173 married men who reported not having sex in the year prior to the survey, were excluded from the analysis. This resulted in a final sample size of 12,240 men: 7,406 married men and 4,834 unmarried men.

Table 1 compares reported prevalence of higher-risk sex for married and unmarried men. Of the 7,406 married men in the survey who reported being sexually active in the past 12 months, 99 men (1.3%) reported having had higher-risk sex. Of these 99 men, 34 men (30%) used condoms during higher-risk sex. Of the 4,834 unmarried men in the survey, 482 men (11%) reported having had higher-risk sex. Of these 482 men, 160 men (29%) reported using condoms during higher-risk sex. Of the 4,352 unmarried men that reported not having higher-risk sex in the 12 months prior to the survey, 4,315 men (99.2%) had not had sex at all, and only 37 men (0.8%) reported having had sexual intercourse with a cohabiting partner.

Married and unmarried men's socio-demographic characteristics and risk factors are shown in Table 2. As expected, most unmarried men (85%) were young, in the age group of 15-25 years. In contrast, over 50% of married men were in the age group of 26-39 years. More unmarried men (36%) than married men (28%) lived in urban areas, possibly a reflection of greater migration among unmarried men to cities in search of employment. While an overwhelming majority of married men (96%) were employed, less than two-thirds of unmarried men reported being employed. More unmarried men (77%) than married men (70%) had HIV knowledge, which is likely a reflection of unmarried men being younger and more educated.

Married and unmarried men's reported measures of gender equality are shown in Table 3. While 40% of married men indicated that wife-beating was justified, a little under half of unmarried men felt the same way. Over 9 in 10 men (both married and unmarried) felt that a man did not have the right to punish his wife if she refused to have sex with him. A little under 90% of all men believed that a woman had the right to refuse having sex with her husband. A fifth of married men reported that their fathers physically abused their mothers, and one-fourth of unmarried men reported the same. Over two-thirds of all men indicated that women should have high decision-making power in the household, and 93% of all men believed that a woman should have the right to spend her earnings how she wishes.

The results of the final logistic regression model are shown in Table 4. After controlling for socio-demographic factors and secondary predictors of interest, at least four of the six gender equality dimensions under consideration demonstrated a statistically significant relationship with men's reported higher-risk sex. Married men who believed that wife-beating was acceptable were significantly more likely to report higher-risk sex [OR=1.93 (1.10-3.37)], compared with married men who thought wife-beating was never acceptable. Married men with the highest estimated odds of having had higher-risk sex were those who believed that women did not have the right to refuse having sex with their husbands [OR=2.16 (1.05-4.48)]. Among unmarried men, those who felt that husbands had the right to punish wives who refused to have sex with them had a higher estimated odds of reporting higher-risk sex [OR=1.87 (1.19-2.95)], as compared to unmarried men who felt that husbands should not have this right. Family

violence history was a predictor of men's higher-risk sex, both among married men [OR=1.83 (1.06-3.17)] as well as among unmarried men [OR=1.93 (1.45-2.58)]. Two of the gender equality dimensions, decision-making power and men's perceptions on financial autonomy for women, were significant in bivariate analyses, but neither retained significance in the final model.

Among the secondary predictors of interest, alcohol use and mobility were significantly and positively associated with married as well as unmarried men's higher-risk sex (see Table 4). Unmarried men who had HIV knowledge were significantly more likely to report having had higher-risk sex [OR=2.00 (1.39-2.89)], as compared to those who did not have HIV knowledge.

Among the socio-demographic variables, married as well as unmarried younger men were more likely to report having had higher-risk sex as compared to men in the oldest age group (40-54 years). Being employed was significantly associated with having had higher-risk sex among unmarried men only [OR=1.78, (1.33-2.37)]. None of the other socio-demographic variables were significantly associated with men's reported higher-risk sex in the final logistic regression model (see Table 4 footnote).

Discussion

A very small proportion of surveyed married men (1.3%) reported having had higher-risk sex. Among unmarried men, a higher proportion (11%) reported engaging in higher-risk sex. These findings are contrary to those from other studies in northern India that reported roughly 15-19% prevalence of higher-risk sex among married men, and 15-47% among unmarried men.[10, 11] It is pointed out that strong cultural taboos regarding pre-marital and extra-marital sex result in under-reporting of such sexual behaviors among respondents, and studies among Indian men and women have shown that such reporting bias is far less in culturally specific interactive interviews than in face-to-face interviews such as the NFHS-3.[19] Among unmarried men, over 99% of men who were sexually active indicated that they had sex with someone other than a cohabiting partner. This is consistent with findings from other Indian studies that demonstrate that given restrictive socio-cultural norms, almost all sexual activity among unmarried Indian men is with higher-risk, rather than with cohabiting partners.[15]

Despite low reported prevalence of higher-risk sex among surveyed married men, these data come from the first Indian men's survey that is representative at both the national and state level. Specifically, results from this study demonstrate that among both married and unmarried men in northern India, at least four of the six gender equality measures under consideration were found to independently associated with men's higher-risk sex. This is an important finding given that 40-50% of Indian men do not believe in at least some gender equality notions, and these men are also more likely to engage in higher-risk sex. This could provide an explanation to findings from studies in India that have found increasing HIV incidence among married monogamous Indian women.

For unmarried men, no significant association was found between views on wife-beating and their higher-risk behaviors. This may be due to the fact that they had no current relationship context which they could associate with while answering these questions. However, married men who felt that wife-beating was acceptable were significantly more likely to engage in higher-risk sex, as compared to men who felt that wife-beating was never acceptable. This finding has important implications for STI/HIV transmission and prevention. A number of studies have demonstrated that forced sex associated with domestic violence can cause abrasions in the vaginal wall, thereby increasing the transmissibility of HIV and other STIs, if one of the partners is infected.[6] Studies point out that monogamous Indian women who report abuse by their husbands have higher HIV and STI prevalence rates as compared to women who are not abused.[13, 14] This study possibly provides an answer as to why this is so, by showing that married men who view wife-abuse as acceptable are also more likely to engage in higher-risk sex, thereby putting themselves and their wives at increased risk of HIV/STI contraction.

For both married and unmarried men, family violence history was a predictor of engaging in higher-risk sex. Previous studies have shown that men who either witnessed abuse at home or were victims of abuse in childhood are more likely in turn to be perpetrators of violence against their partners.[20] Given the links between domestic violence and increased HIV/STI transmission, and given the findings from this study that men with a history of family violence are more likely to engage in higher-risk sex, these men are at increased risk of acquiring STIs/HIV through higher-risk sex and passing on the infection to their regular partners.

Findings from this study have important implications for HIV/STI prevention programs in India. Studies examining men's HIV prevention interventions in India have found that sustained behavior change communication strategies that reinforced messages of monogamy, condom use with sexual partners, and provision of government-provided condoms significantly reduced men's sex-worker visits and increased their condom use during higher-risk sex.[21] Studies recommend that existing interventions directed toward women should include partner notification and counseling services for both couples and husbands.[22, 23] Given the findings of this study, policy measures aimed at increasing gender equality acceptance among men may be a crucial component in curbing the spread of HIV/STIs in India, since gender equality acceptance is likely to lead to a reduction in men's higher-risk sexual behaviors.

Table 1: Self-reported higher-risk sex among currently married and unmarried men living in the north Indian states of Uttar Pradesh and Uttarakhand

Married men		Unmarried men	
Higher-risk sex	**n (weighted %)**	**Higher-risk sex**	**n (weighted %)**
No[a]	7,307 (98.7)	No[c]	4,352 (89)
Yes[b]	99 (1.3)	Yes[b]	482 (11)
Total	7,406 (100)	Total	4,834 (100)

[a] Had sexual intercourse within past 12 months exclusively with spouse or cohabiting partner

[b] Had sexual intercourse within past 12 months with someone other than spouse or cohabiting partner

[c] Had sexual intercourse within past 12 months exclusively with cohabiting partner (n=37) or did not have sex in past 12 months (n=4,315)

Table 2: Socio-demographic characteristics and secondary predictors (by weighted percentage) of married and unmarried men living in Uttar Pradesh and Uttarakhand

	Married men (n=7,406)	**Unmarried men** (n=4,834)
Socio-demographic variables		
Age		
15-25 years	17	85
26-39 years	51	10
40-54 years (Ref.)	32	5
Residence		
Urban	28	36
Rural (Ref.)	72	64
Highest level of education		
Primary	15	12
Secondary	46	64
Secondary plus	13	11
None (Ref.)	26	13
Standard of living index		
High	39	46
Medium	38	35
Low (Ref.)	23	19
Religion		
Muslim	15	16
Other	1	1
Hindu (Ref.)	84	83
Caste		
Privileged (upper) caste	27	30
Other backward caste	47	46
Scheduled caste/tribe (Ref.)	26	24
Employment status		
Employed	96	62
Unemployed (Ref.)	4	38
Secondary predictors		
Alcohol consumption		
Almost daily	2	1
At least once a week	4	2
Less than once a week	28	12
Never consumed (Ref.)	66	85
Mobility		
Yes	13	16
No (Ref.)	87	84
HIV knowledge level		
High	70	77
No or low (Ref.)	30	23

Table 3: Self-reported measures of gender equality (by weighted percentage) of married and unmarried men living in Uttar Pradesh and Uttarakhand

	Married men (n=7,406)	**Unmarried men** (n=4,834)
Attitude to wife-beating		
Acceptable	40	46
Never acceptable (Ref.)	60	54
Man has right to punish wife if she refuses to have sex with him		
Yes	7	8
No (Ref.)	93	92
Woman has right to refuse sex with husband		
No	11	13
Yes (Ref.)	89	87
Family violence history		
Yes	20	24
No (Ref.)	80	76
Woman should have high decision-making power		
Yes	68	69
No (Ref.)	32	31
Woman should have financial autonomy		
Yes	93	93
No (Ref.)	7	7

Table 4: Odds ratios[a] and 95% confidence intervals from final logistic regression model[b] investigating the likelihood of reporting having had higher-risk sex, among married and unmarried men living in Uttar Pradesh and Uttarakhand

	Married men (n=7,406)	**Unmarried men** (n=4,834)
Gender equality dimensions		
Attitude to wife-beating		
Acceptable	1.93* (1.10-3.37)	0.94 (0.69-1.26)
Never acceptable (Ref.)	1.0	1.0
Man has right to punish wife if she refuses to have sex with him		
Yes	0.63 (0.21-1.84)	1.87* (1.19-2.95)
No (Ref.)	1.0	1.0
Woman has right to refuse sex with husband		
No	2.16* (1.05-4.48)	1.03 (0.67-1.58)
Yes (Ref.)	1.0	1.0
Family violence history		
Yes	1.83* (1.06-3.17)	1.93** (1.45-2.58)
No (Ref.)	1.0	1.0
Woman should have high decision-making power		
Yes	1.65 (0.87-3.12)	0.86 (0.642-1.15)
No (Ref.)	1.0	1.0
Woman should have financial autonomy		
Yes	0.82 (0.34-1.99)	0.91 (0.60-1.40)
No (Ref.)	1.0	1.0
Secondary predictors		
Alcohol use		
Almost daily	11.80** (3.77-36.87)	8.72* (2.28-33.40)
At least once a week	7.52** (3.09-18.28)	4.92** (2.63-9.20)
Less than once a week	2.51* (1.38- 4.58)	3.41** (2.54-4.56)
Never (Ref.)	1.0	1.0
Mobility		
Yes	2.35* (1.26-4.36)	1.36* (1.01-1.84)
No (Ref.)	1.0	1.0
HIV knowledge		
High	1.09 (0.54-2.20)	2.00** (1.39-2.89)
No or low (Ref.)	1.0	1.0
Socio-demographic variables		
Age		
15-25 years	6.05* (2.08-17.55)	1.95* (1.01-3.79)
26-39 years	3.29* (1.28-8.47)	2.67* (1.26-5.65)
40-54 years (Ref.)	1.0	1.0
Employment		
Yes	0.44 (0.18-1.04)	1.78** (1.33-2.37)
No (Ref.)	1.0	1.0

[a] Reported at p<0·001, p<0·05, and p<0·1

[b] Controlling for other socio-demographic factors not significant in final model: residence, education, standard of living, religion, caste, and wife living with respondent (last variable for married men only).
*p<0·05**, p<0·001

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