

High Prevalence of Forced Sex Among Non-Brothel Based, Wine Shop Centered Sex Workers in Chennai, India

Vivian F. Go · Aylur K. Srikrishnan · Corette Breeden Parker · Megan Salter · Annette M. Green · Sudha Sivaram · Sethulakshmi C. Johnson · Carl Latkin · Wendy Davis · Suniti Solomon · David D. Celentano

Published online: 14 July 2010
© Springer Science+Business Media, LLC 2010

Abstract Sexual violence has been shown to increase women's risk of HIV infection. India is a country where the HIV epidemic is growing among women and intimate partner violence (IPV) is pervasive. This study examined prevalence of and factors associated with forced sex among female sex workers (FSWs) in Chennai, India. We conducted a probability survey among FSWs in 24 slum venues and identified predictive factors for recent forced sex using univariate and multivariable proportional odds models. Among 522 FSWs, 28% reported having forced sex with one partner and 35% with 2+ partners. In the final multivariable model, women who had a high number of partners who had a strong tendency to drink alcohol before sex were more likely to have experienced forced sex, and women who had both unprotected sex with a nonspousal partner and >20 days of alcohol consumption in the last 30 days were more likely to have experienced forced sex. Discussion about family violence with larger social networks was independently associated with lower odds of forced sex among FSWs. HIV interventions for FSWs and

their clients aimed at reducing alcohol consumption and encouraging condom use could be enhanced by violence prevention interventions to facilitate discourse about sexual violence.

Keywords Violence · Women · HIV/AIDS · India · Sex workers

Introduction

Nearly 25% of women globally experience sexual violence by an intimate partner in their lifetime [1]. Sexual violence increases a woman's risk of HIV infection directly through forced sex with an infected partner and indirectly through association with high risk behaviors, including alcohol and drug use, inconsistent condom use, and multiple sex partners [2–6]. In turn, women who have a greater number of sexual partners are more likely to experience sexual coercion [7, 8]. Female sex workers (FSWs), therefore, may be particularly vulnerable to sexual violence [9–11]. Zierler et al. found that women in the US who had exchanged sex for money or drugs were over four times more likely to have experienced rape in their lifetime than those who had not [12]. In China, 15% of FSWs reported coercive sex within the past 6 months [13], and 25% of FSWs in Canada reported rape over an 18 month period [10]. FSWs who experience forced sex are more likely to be HIV positive [14].

In India, the prevalence of intimate partner violence (IPV) against women is particularly high. A recent national survey found that 35% of married Indian women had experienced IPV in their lifetime [15]. Among FSWs in rural Goa, 9% had experienced sexual violence, and 27% had been coerced into unsafe sexual activity by a client over the past year [16]. The prevalence of HIV among Indian FSWs is high [17], and

V. F. Go (✉)
Department of Epidemiology, Infectious Diseases Program,
Johns Hopkins University Bloomberg School of Public Health,
615 North Wolfe Street, Suite E-6610, Baltimore, MD, USA
e-mail: vgo@jhsph.edu

A. K. Srikrishnan · S. C. Johnson · S. Solomon
YRG Centre for AIDS Research and Education, Chennai, India

C. B. Parker · A. M. Green
Research Triangle Institute, Research Triangle Park, NC, USA

M. Salter · S. Sivaram · C. Latkin · W. Davis · D. D. Celentano
Department of Epidemiology, Infectious Diseases Program,
Johns Hopkins University Bloomberg School of Public Health,
615 North Wolfe Street, Baltimore, MD, USA

associations between HIV risk and sexual violence among FSWs in India have been observed [18]. Among FSWs in West Bengal, HIV positive status was significantly associated with sexual violence [19].

Certain individual factors including younger age, higher education, and higher household income appear to provide some measure of protection against sexual violence by intimate partners [15, 20–26]. The presence of social networks can also be protective against IPV [27, 28], while social isolation and depression are associated with increased rates of sexual coercion [29, 30]. Among sex workers in India, non-brothel based sex workers are less likely to have social support and more likely to be at high risk for HIV compared to their brothel-based counterparts [31].

In addition to individual and social contexts that are protective against or associated with IPV, sexual violence has been linked to alcohol consumption by a woman or her sexual partner [32–38]. Alcohol can increase the incidence of IPV by affecting cognitive and physical functioning in a way that reduces self-control and leaves individuals less capable of negotiating a non-violent resolution to conflicts within relationships and by intensifying underlying stressors that create tension and conflict between partners [39–41]. Individual and societal beliefs that alcohol causes aggression can reinforce and encourage drinking-related violence and provide an excuse for violent behavior [42]. Alcohol-related disinhibition among both women and their partners can be associated with increased sexual risk behaviors such as inconsistent condom use [37, 43, 44].

The interaction of alcohol and violence is particularly evident in the realm of commercial sex work. Sex workers often use alcohol and drugs, sometimes provided by clients, to relieve stress and to help them cope with their work [45]. Among FSWs, associations between forced sex and client alcohol use [46] have been found. In a study among 100 sexually and physically abused sex workers in Chennai, India, alcohol played a central role in incidents of violence. Nearly all respondents (99%) reported that their intimate partners had been under the influence of alcohol in the most recent episode of violence, and most encountered clients who were violent and who had consumed alcohol prior to sex. Over a third (39%) also reported consuming alcohol prior to meeting clients [47].

Within the socioeconomic context of sex work, a powerful connection appears to exist for both women and their partners between alcohol use and sexual violence and sexual risk behavior. We consider alcohol to be a facilitating factor directly affecting men's propensity toward violence and women's ability to escape it. For example, if a man drinks alcohol before having sex, underlying stress is more likely to be intensified thereby increasing the likelihood of violence. In contrast, the presence of a social

support network can mitigate sexual violence by increasing sex workers' self efficacy to resolve conflicts or to avoid or escape violent situations or by a network member directly intervening to prevent violent situations.

For FSWs in Chennai, India, the nexus of sexual violence, limited social networks, and excessive alcohol consumption may be especially potent. In India, women in general and FSWs in particular are vulnerable to sexual violence. In Chennai, FSWs are typically street-based and often work alone without the immediate social network that is available to brothel-based sex workers. Furthermore, the clients of FSWs in Chennai are typically patrons of wine shops with which FSWs become affiliated and are generally heavy drinkers. Given the high prevalence of sexual violence among sex workers in India and limited data on the potential relationships of social networks and alcohol use with sexual violence in this setting, we conducted a study among FSWs who sold or exchanged sex with wine shop patrons in Chennai, India. We interviewed FSWs who were participants in a larger HIV risk reduction trial as they entered the study about experiences with forced sex, the presence and size of their social networks, their personal alcohol use, the alcohol use of their clients, and selected socio-demographic and behavioral factors. We hypothesized that for FSWs in Chennai, India, whose customers are wine shop patrons, the absence of a social support network and the presence of alcohol use by client and/or FSW would be associated with an increased prevalence of experienced forced sex. Clarifying potential connections between social networks, alcohol use, and forced sex could aid in the development of programs that address sexual violence and its association with HIV infection among sex workers [48].

Methods

Variables

Variables considered in our analyses were based on a review of the literature of factors associated with sexual violence. At the individual level of the participant (FSW), we included socio-demographic variables (age, education, income, marital status, religion) and behavioral variables (number of days the participant consumed alcohol in last 30 days, age when the participant first had sex, number of people the participant had sex with in the last 3 months, and total number of unprotected sex acts with non-spouse/non-live-in partner). At the relational level, we assessed age differences between partners, partner types, unprotected sex with spousal and non-spousal partners, and partners' tendencies to drink alcohol before sex in the last ten times partner and participant had sex. At the social

support network level, we examined the number of people with whom the participant spoke about alcohol in the past 3 months and the number of people with whom the participant spoke about family disputes or violence in the family in the past 3 months.

Study Setting

This study was conducted in 2002 in Chennai, Tamil Nadu State, India, as part of the National Institute of Mental Health (NIMH) Collaborative HIV/STD Prevention Trial, a two-arm cluster randomized, community-level trial that was conducted in five countries between 2002 and 2007. The aim of the trial was to evaluate the efficacy of an intervention based on the diffusion of innovations theory [49], using Community Public Opinion Leaders (C-POLs) who were trained to disseminate HIV prevention messages within venues that were social congregating points for high-risk populations in each country [50]. In Chennai, wine shops in low-income “slum” communities were selected as venues for the intervention based on exploratory epidemiological studies demonstrating that they were frequented by FSW populations at high risk of HIV infection [51–53].

Study Design

This larger NIMH study was a two-arm phase III community-randomized controlled trial involving between 20 and 40 independent community venues in five selected countries where high-risk members of the target population could be accessed. The design and methods of the overall trial have been detailed elsewhere [53]. For this trial, FSWs in India were recruited for baseline and follow-up interviews and repeated collection of blood and urine specimens to assess biological outcomes. The analyses reported here are based on data from the baseline assessment.

Considerations for Sample Size

Data from pre-baseline epidemiological studies were used to compute the sample size and to estimate power for detecting effects within and across sites of the overall trial using primary biological and behavioral endpoints. In determining the sample sizes for each country site, the venue unit of randomization was taken into account because a component of variation would be attributable to venues. Specific power calculations provided by Murray [54] for group-nested cohort designs were used to compute sample sizes (e.g., number of venues and number of participants per venue) for each site using the epidemiological study data.

Venue Selection

Wine shops in India are community-based, licensed commercial establishments that sell alcohol for consumption on the premises or on a take-out basis. Wine shops are patronized primarily by men; FSWs rarely visit wine shops, instead soliciting clients through male brokers who patronize wine shops. Typically, several women will be found near a small cluster of wine shops, therefore linking certain women who engage in sexual bartering to a specific cluster of wine shops is possible.

Wine shops were identified as a potential venue based on three main criteria: opportunities for social interaction in bars, physical distance between shops to reduce intervention contamination, and feasibility of conducting the study. To evaluate these criteria, we conducted in-depth interviews ($n = 42$) with wine shop employees, male patrons, and FSWs. Our ethnographic study found that wine shops near key landmarks such as bus stations, train stations, and soliciting sites of FSWs had higher rates of patronage.

Following the ethnographic interviews, we obtained a list of licensed wine shops from the government. From this list of over 700 wine shops, we purposively selected 100 based on venue identification criteria. In order to meet our sampling criteria (described above), these 100 wine shops were divided into 24 clusters of 4–5 shops each.

Participant Sampling

Selected participants were high-risk women who frequented the area around the wine shops. In each cluster, an index sex worker was identified by non-governmental organizations that work with sex workers and asked to recruit the first round of participants who then recruited more participants. We attempted to recruit all FSWs in the immediate neighborhood of the intervention and control venues. This snow-ball sampling technique was used to identify 25 eligible women in each of the 24 clusters for a targeted total of 600 participants. To be eligible, participants had to be aged 18–40 years, frequent the chosen venue at least three times per week, and be capable of providing voluntary informed consent at the time of the interview.

Data Collection

Participants were offered free transportation and interviewed at an assessment site with private, soundproof rooms. Based on our pilot of the questionnaire, which found that women did not have a gender preference for interviewers, interviewers were both male and female. Using a computer-assisted personal interview (CAPI)

method, one of four interviewers administered a 30-min interview to consenting participants. Two interviewer supervisors attended a 2-week training before conducting a 2-week classroom and field-based training of interviewers. Interviewers were trained on interviewer skills, questionnaire administration, laptop operation, and protocol implementation and participated in role-plays and practice interviews.

Statistical Analysis

Sex was defined in our survey as either vaginal or anal penetrative sex, and these terms were described in the preamble to the section in the questionnaire on sexual behavior. To measure forced sex, we asked “In the last 3 months, did [sexual partner] force you to have sex?” This was followed-up with a probe: “By force, I mean you had sex when you did not want to because you were afraid to refuse.” Within our definition, “force” could include threats, pressure, and/or physical force. We assessed forced sex for up to the five most recent partners (regular, casual, and commercial) in the past 3 months. Using the information provided on forced sex with each partner, an ordinal outcome was constructed for each FSW having the following three categories: (1) no forced sex; (2) forced sex with one partner; (3) forced sex with 2+ partners. We restricted our analysis to women who had at least two partners in the past 6 months.

Predictive factors for forced sex were identified using proportional odds models in which two log odds were modeled simultaneously, namely, the log odds of forced sex with two or more partners and the log odds of forced sex with one or more partners. Initially, individual potential predictors were assessed for association with forced sex in univariate models. A multivariable model was then fit with all of the univariate predictors found to be significant at $\alpha = 0.10$, including their two-way interactions. Two-way interactions were then removed if they were not at $\alpha = 0.05$. Finally, single variables were eliminated if they were not significant at $\alpha = 0.05$ or through an interaction term. The effects of the variables that remain in the model did not change when any of the other non-significant variables were included. The univariate results and the final, reduced multivariable model are presented.

Generalized estimating equations (GEE) parameter estimates and their empirical standard error estimates were used in all analyses to account for the correlation of data on FSWs within wine shop clusters. Analyses were conducted using the GENMOD procedure in SAS Version 9.1 (SAS Institute, Cary, NC). The MULTLOG procedure in SUDAAN 10 (RTI International, Research Triangle Park, NC) was used to consider various covariance structures.

Ethics

The research protocol, questionnaire, and consent forms were reviewed and approved by several ethical review committees: Indian Council on Medical Research, YRG CARE’s IRB, the Johns Hopkins Bloomberg School of Public Health’s Committee on Human Research, the IRB at Research Triangle Institute, and the National Institutes of Health’s Office for Protection from Research Risks.

Results

From April to June 2003, 607 of 610 sampled women were interviewed (99% response rate). Among women who had at least two sexual partners in the past 3 months ($n = 522$), a total of 63% (331/522) reported having forced sex with at least one partner. Of these, 56% (185/331) reported forced sex with two or more partners. All were sex workers, and the vast majority (96.4%) exchanged money for sex in the past 3 months. The mean age was 31.7 (SD = 5.85), and 44% were divorced, separated, or widowed (Table 1).

Table 1 shows the univariate odds ratios for factors in association with forced sex. Under the proportional odds assumption, the odds ratio for the independent (predictor) variable shown in Table 1 is assumed to apply to either of the odds being modeled, that is, the odds for forced sex with two or more partners and the odds for forced sex with one or more partners. It reflects an “average” of the effect of the predictor across the two types of odds. Women reporting a higher number of partners who had a strong tendency to drink alcohol before sex were more likely to have experienced forced sex in the past 3 months (OR for 2+ partners versus none: 2.09, 95% CI 1.37, 3.18). Unprotected sex with a non-spousal partner (OR: 2.80, 95% CI 1.70, 4.62) and consumption of alcohol during 20 of the last 30 days (OR for 20+ versus 0–9 days: 1.92, 95% CI 1.10, 3.36) were associated with a higher odds for forced sex. In addition, a decreased odds for forced sex was associated with talking to at least one person about violent experiences in the family, including both IPV and child abuse (OR for 1–5 persons versus none: 0.58, 95% CI, 0.41, 0.84) and talking to at least one partner about STD prevention (OR: 0.59, 95% CI, 0.39, 0.91).

The parameter estimates for the final multivariable model are shown in Table 2. The only significant interaction was that between unprotected sex with a non-spousal partner and alcohol consumption. Specifically, women who reported unprotected sex with a non-spousal partner and more than 20 days of alcohol consumption in the last 30 days were much more likely to have experienced forced sex as compared to women who reported neither (OR: 2.66, 95% CI 1.13, 6.29). Among women who did not report

Table 1 Baseline characteristics and univariate proportional odds model results for forced sex (with two or more partners; with any partners) among sex workers in Chennai, India

Independent variable	Total number (%) w/characteristic N = 522	Number (%) reporting no forced sex N = 191	Number (%) reporting forced sex by one partner N = 146	Number (%) reporting forced sex by two or more partners N = 185	Proportional odds model OR [95% CI]
<i>Demographics</i>					
<i>Age</i>					
18–25	86 (17)	30 (35)	28 (33)	28 (33)	Reference
26–34	229 (44)	80 (35)	64 (28)	85 (37)	1.10 [0.70, 1.73]
35+	207 (40)	81 (39)	54 (26)	72 (35)	0.95 [0.62, 1.47]
<i>Marital status</i>					
Married or live with partner	251 (48)	93 (37)	77 (31)	81 (32)	Reference
Never married, single	41 (8)	17 (42)	11 (27)	13 (32)	1.16 [0.85, 1.59]
Divorced, widowed, separated	230 (44)	81 (35)	58 (25)	91 (40)	
<i>No. years of school completed</i>					
0	154 (30)	58 (38)	41 (27)	55 (36)	Reference
1–5	185 (35)	65 (35)	50 (27)	70 (38)	1.11 [0.75, 1.63]
6–9	138 (26)	51 (37)	44 (32)	43 (31)	0.95 [0.62, 1.46]
10+	45 (9)	17 (38)	11(24)	17 (38)	
<i>Behavioral risk</i>					
<i>Regularly earn money</i>					
No	422 (81)	161 (38)	123 (29)	138 (33)	Reference
Yes	100 (19)	30 (30)	23 (23)	47 (47)	1.65 [0.94, 2.90]
<i>No. sexual partners in last 3 months</i>					
2	113 (22)	43 (38)	38 (34)	32 (28)	Reference
3–4	146 (28)	53 (36)	45 (31)	48 (33)	1.14 [0.75, 1.74]
5–10	153 (29)	55 (36)	41 (27)	57 (37)	1.26 [0.81, 1.97]
11+	110 (21)	40 (36)	22 (20)	48(44)	1.45 [0.93, 2.25]
<i>Any unprotected sex with non-spousal partner in last 3 months</i>					
No	124 (24)	69 (56)	30 (24)	25 (20)	Reference
Yes	397 (76)	121 (31)	116 (29)	160 (40)	2.80 [1.70, 4.62]
<i>No. days alcohol consumed in last 30 days</i>					
0–9	231 (44)	95 (41)	66 (29)	70 (30)	Reference
10–19	139 (27)	52 (37)	44 (32)	43 (31)	1.10 [0.66, 1.85]
20+	152 (29)	44 (29)	36 (24)	72 (47)	1.92 [1.10, 3.36]
<i>Spoke with any reported partner about HIV/STD prevention in last 3 months</i>					
No	261 (50)	75 (29)	83 (32)	103 (40)	Reference
Yes	261 (50)	116 (44)	63 (24)	82 (31)	0.59 [0.39, 0.91]
<i>No. people spoke with about family disputes/violence in last 3 months</i>					
0	203 (39)	51 (25)	67 (33)	85 (42)	Reference
1–5	220 (42)	91 (41)	56 (25)	73 (33)	0.58 [0.41, 0.84]
6+	99 (19)	49 (50)	23 (23)	27 (27)	0.42 [0.23, 0.78]
<i>No. partners with strong tendency to drink alcohol before sex</i>					
0	108 (21)	50 (46)	34 (32)	24 (22)	Reference
1	147 (28)	51 (35)	51 (35)	45 (31)	1.54 [0.95, 2.48]
2+	267 (51)	90 (34)	61 (23)	116 (44)	2.09 [1.37, 3.18]

unprotected sex with a non-spousal partner, consuming alcohol more than 20 days did not increase the odds of forced sex. In addition to the interaction term, the number

of partners with a strong tendency to drink alcohol before sex and the number of people with whom a participant spoke about family disputes or violence in last 3 months

Table 2 Multivariate proportional odds model results for forced sex (with two or more partners; with any partners) among sex workers in Chennai, India

Independent variable combinations	OR [95% CI]
<i>Any unprotected sex with non-spousal partner in last three mos?</i>	
No. days alcohol consumed in last 30 days	
No	
0–9	Reference
10–19	0.60 [0.24, 1.48]
20+	0.36 [0.11, 1.13]
Yes	
0–9	1.42 [0.82, 2.46]
10–19	1.71 [0.82, 3.56]
20+	2.66 [1.13, 6.29]
No. people spoke with about family violence in last three mos	
0	Reference
1–5	0.61 [0.44, 0.86]
6+	0.41 [0.22, 0.75]
No. partners with strong tendency to drink alcohol before sex	
0	Reference
1	1.43 [0.91, 2.25]
2+	1.87 [1.38, 2.54]

Under the proportional odds assumption, the odds ratios apply to either of the two odds ratios being modeled—the odds ratio for forced sex by two or more partners relative to forced sex by one or less partners and the odds ratio for forced sex by any partner relative to forced sex by no partners. A significant interaction was found between unprotected sex with a non-spousal partner and alcohol consumption of the sex worker

remained significant in the final model. Talking with 1–5 people reduced the odds of forced sex by 39% (OR: 0.61), and talking with six or more people reduced the odds by 59% (OR: 0.41). Speaking about HIV/STD prevention was not significant after inclusion of the other predictors and was deleted from the final model.

Discussion

A large proportion (63%) of FSWs in our study experienced forced sex in the past 3 months. Of these, more than half (56%) experienced forced sex with two or more partners in the past 3 months. Although direct comparisons are difficult due to variations in definitions and time frames, the proportion of FSWs experiencing forced sex appears to be higher than reported in a previous study in India in which 9% of FSWs reported forced sex in the past year [16] and in a general population study of married women in India (35% lifetime IPV) [15]. As hypothesized, alcohol consumption by FSW and client and lack of social support networks were associated with an increased rate of forced sex among FSWs.

Our study underscores the complex interrelationship of alcohol use, sex work, violence, and HIV risk that has been highlighted in previous studies [35, 37, 55, 56] and noted in a qualitative study among sex workers in Chennai, in which sexual coercion and forced group sex in the context of alcohol use posed formidable barriers for condom use negotiation [56]. Within our sample of sex workers, risk for forced sex was increased among women who reported a high number of partners with a strong tendency to consume alcohol before sex and among women who had unprotected sex with a non-spousal partner in the past 3 months and consumed alcohol on more than 20 days in the last 30 days. These results confirm the associations between both partner alcohol consumption and violence [55, 57] and women's alcohol consumption and violence [45, 58] that have been found in previous studies. Currie et al. found that 91% of FSWs sampled reported that a partner's use of alcohol and drugs were the cause of, or resulted in, violence against them, and 58% stated that their own drug use or intoxication had contributed to their victimization [59]. While our results do not allow us to determine whether use of alcohol impacted the ability to negotiate safer sex, whether high risk sexual behaviors are a marker for sex with potentially violent partners, or whether unprotected sex is an outcome of forced sex, they do support the link between a woman's consumption of alcohol, unprotected sex with a non-spousal partner, and her experiencing violence in the form of forced sex.

As hypothesized, presence of a larger social network was independently associated with decreased odds of forced sex. This finding corroborates a previous study on the role of social support in IPV [28]. Studies have shown that street-based sex workers are at increased risk for violence compared to brothel-based sex workers due to social and physical isolation [31, 60]. Our study found that relative to no discussion, talking with 1–5 people about violence in the family reduced the odds of forced sex by 39%, and talking with six or more people reduced the odds by 59%. Social support, particularly from a woman's family, may indicate that she is valued, enhance her self esteem, and be a source of practical assistance during violent experiences or afterwards [27]. Women who are willing to discuss violence with increasingly more family and friends may be more empowered than their counterparts and thereby able to find strategies to avoid violent clients. Another possible explanation for this finding is that women who have larger support networks around violence have established network norms to refuse violent clients or those who are inebriated.

Our findings should be considered in the context of several limitations. Because all behavioral data, including reports of forced sex, rely on self-report, associations of high-risk behavior and forced sex may be underestimated

across risk behaviors. When answering questions about sensitive behaviors, participants may have given what they perceived to be socially desirable responses. While differential misclassification of the exposure may have occurred, this bias is expected to dilute the estimates of association between risk behaviors and forced sex and thereby result in conservative estimates. In addition, recall of sexual violence in the 3 month period may not be accurate; however, the inaccuracies will likely also result in non-differential misclassification, since the misclassification is not related to exposures or to the outcome [61]. Furthermore, many studies on violence against women use a recall period of 1 year [62, 63]; our use of a shorter recall period of 3 months is likely to reduce potential recall inaccuracies compared to other studies. Finally, the use of a snow-ball technique to recruit hard-to-reach populations may limit the generalizability of the results of this study to street-based sex workers in Chennai and in other cities in India.

Results from this study support the need for interventions and health messages to FSWs that focus on reducing the harms associated with consuming alcohol and the potential effect that alcohol use has on riskier sex, especially among FSWs in India. At the same time interventions of this type must account for the stress of the profession and the proximity to the wine shop environment that is a FSW livelihood [64, 65]. Given that sexual violence and condom use are largely controlled by clients and partners of FSWs in India and in most of the world, programs and policies which target men and which promote increased condom use and reduced sexual violence and include efforts to reduce alcohol consumption prior to visiting sexual workers are urgently needed. Further research is also needed to understand the broader context of unprotected sex in this population of FSWs. Forced sex is one of many factors associated with unprotected sex, and unprotected sex, whether consented or not, is a risk factor for HIV/AIDS. Finally as violence against women in India is normative [23, 31, 66–69], public health campaigns against domestic violence are also critical.

Programs that bolster existing support of FSW networks and provide emotional and social support to FSWs may reduce forced sex. In time, these support groups could also act as a powerful lobby for victims of violence. In India most sex workers are non-brothel based [70], and several studies have shown that street-based FSWs are at higher risk for alcohol and drug use, violence, and STDs than those working indoors [60, 71, 72]. Sex work is illegal in India, and our previous qualitative work found that police are almost uniformly apathetic when FSWs approach them for help with violent clients. Organizing non-brothel based FSWs to work in close proximity to other FSWs, as was done with great success in Calcutta [73], may empower them to refuse sex with the knowledge that others are

nearby to provide support. Ultimately, findings from this study emphasize the critical need to strengthen efforts to prevent forced sex and to address the inextricable links between sex work, sexual violence, condom use, alcohol use, and HIV.

Acknowledgments The study was supported by a grant (1U10 MH61543) from the National Institute of Mental Health, National Institutes of Health (NIH).

References

1. World Health Organization. Summary report: WHO multi-country study on women's health and domestic violence against women. Initial results on prevalence, health outcomes, and women's responses. Geneva, Switzerland: World Health Organization; 2005.
2. Campbell JC, Baty ML, Ghandour R, Stockman J, Francisco L, Wagman J. The intersection of violence against women and HIV/AIDS. In: Institute of Medicine, editor. Violence and prevention in low- and middle income countries: finding a place on the global agenda. Washington, DC: The National Academic Press; 2008. p. 149–66.
3. Kalichman SC, Williams EA, Cherry C, Belcher L, Nachimson D. Sexual coercion, domestic violence, and negotiating condom use among low-income African American women. *J Womens Health*. 1998;7(3):371–8.
4. Molitor F, Ruiz JD, Klausner JD, McFarland W. History of forced sex in association with drug use and sexual HIV risk behaviors, infections with STDs and diagnostic medical care. Results from the Young Women Survey. *J Interpers Violence*. 2000;15:262–78.
5. Wingood GM, DiClemente RJ, Raj A. Identifying the prevalence and correlates of STDs among women residing in rural domestic violence shelters. *Women Health*. 2000;30(4):15–26.
6. Peterson ZD, Janssen E, Heiman JR. The association between sexual aggression and HIV risk behavior in heterosexual men. *J Interpers Violence*. 2009;25(3):538–56.
7. Howard DE, Wang MQ. Psychosocial correlates of US adolescents who report a history of forced sexual intercourse. *J Adolesc Health*. 2005;36(5):372–9.
8. Upchurch DM, Kusunoki Y. Associations between forced sex, sexual and protective practices, and sexually transmitted diseases among a national sample of adolescent girls. *Womens Health Issues*. 2004;14(3):75–84.
9. El-Bassel N, Simoni JM, Cooper DK, Gilbert L, Schilling RF. Sex trading and psychological distress among women on methadone. *Psychol Addict Behav*. 2001;15(3):177–84.
10. Shannon K, Kerr T, Strathdee SA, Shoveller J, Montaner JS, Tyndall MW. Prevalence and structural correlates of gender based violence among a prospective cohort of female sex workers. *BMJ*. 2009;339:b2939.
11. Goodyear MD, Cusick L. Protection of sex workers. *BMJ*. 2007;334(7584):52–3.
12. Zierler S, Witbeck B, Mayer K. Sexual violence against women living with or at risk for HIV infection. *Am J Prev Med*. 1996;12(5):304–10.
13. Wang B, Li X, Stanton B, et al. Sexual coercion, HIV-related risk, and mental health among female sex workers in China. *Health Care Women Int*. 2007;28(8):745–62.
14. El-Bassel N, Witte SS, Wada T, Gilbert L, Wallace J. Correlates of partner violence among female street-based sex workers:

- substance abuse, history of childhood abuse, and HIV risks. *AIDS Patient Care STDS*. 2001;15(1):41–51.
15. Silverman JG, Decker MR, Saggurti N, Balaiah D, Raj A. Intimate partner violence and HIV infection among married Indian women. *JAMA*. 2008;300(6):703–10.
 16. Shahmanesh M, Wayal S, Cowan F, Mabey D, Copas A, Patel V. Suicidal behavior among female sex workers in Goa, India: the silent epidemic. *Am J Public Health*. 2009;99(7):1239–46.
 17. Chandrasekaran P, Dallabetta G, Loo V, Rao S, Gayle H, Alexander A. Containing HIV/AIDS in India: the unfinished agenda. *Lancet Infect Dis*. 2006;6(8):508–21.
 18. Singh TN, Kananbala S, Thongam W, Devi KhS, Singh NB. Increasing trend of HIV seropositivity among commercial sex workers attending the Voluntary and Confidential Counseling and Testing Centre in Manipur, India. *Int J STD AIDS*. 2005;16(2):166–9.
 19. Sarkar K, Bal B, Mukherjee R, et al. Sex-trafficking, violence, negotiating skill, and HIV infection in brothel-based sex workers of eastern India, adjoining Nepal, Bhutan, and Bangladesh. *J Health Popul Nutr*. 2008;26(2):223–31.
 20. Field CA, Caetano R. Ethnic differences in intimate partner violence in the US general population: the role of alcohol use and socioeconomic status. *Trauma Violence Abuse*. 2004;5(4):303–17.
 21. Hoffman K, Demo DH, Edwards JN. Physical wife abuse in a non-western society: an integrated theoretical approach. *J Marriage Fam*. 1994;56:131–46.
 22. Jasinski JL, Asdigian NL, Kantor GK. Ethnic adaptations to occupational strain: work-related stress, drinking, and wife assault among Anglo and Hispanic husbands. *J Interpers Violence*. 1997;12(6):814–31.
 23. Jejeebhoy SJ, Cook RJ. State accountability for wife-beating: the Indian challenge. *Lancet*. 1997;349(Suppl 1):s110–2.
 24. Kessler R, Ustun T. The World Mental Health (WMH) survey initiative version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *Int J Methods Psychiatr Res*. 2004;13(2):93–121.
 25. Kim K, Cho Y. Epidemiological survey of spousal abuse in Korea. In: Viano EC, editor. *Intimate violence: interdisciplinary perspectives*. Washington, DC: Hemisphere Publishing Corp; 1992. p. 277–82.
 26. Schmidley D. *The foreign-born population in the United States: 2002 March*. Washington, DC: Census Bureau; 2003.
 27. Counts D, Brown J, Campbell J. *Sanctions and sanctuary*. Boulder: Westview Press; 1992.
 28. International Clinical Epidemiologists Network. *Domestic violence in India: a summary report of a multi-site household survey*. Washington, DC: International Centre for Research on Women; 2000.
 29. Smit J, Myer L, Middelkoop K, et al. Mental health and sexual risk behaviours in a South African township: a community-based cross-sectional study. *Public Health*. 2006;120(6):534–42.
 30. Krug EG, Dalhberg LL, Mercy JA, Zwi AB, Lozano R, editors. *Sexual violence*. In: *World report on violence and health*. Geneva; World Health Organization; 2002.
 31. Dandona R, Dandona L, Gutierrez JP, et al. High risk of HIV in non-brothel based female sex workers in India. *BMC Public Health*. 2005;5:87.
 32. Cunradi CB. Drinking level, neighborhood social disorder, and mutual intimate partner violence. *Alcohol Clin Exp Res*. 2007;31(6):1012–9.
 33. Fife RS, Ebersole C, Bigatti S, Lane KA, Huber LR. Assessment of the relationship of demographic and social factors with intimate partner violence (IPV) among Latinas in Indianapolis. *J Womens Health (Larchmt)*. 2008;17(5):769–75.
 34. Jeyaseelan L, Kumar S, Neelakantan N, Peedicayil A, Pillai R, Duvvury N. Physical spousal violence against women in India: some risk factors. *J Biosoc Sci*. 2007;39(5):657–70.
 35. Krishnan S. Gender, caste, and economic inequalities and marital violence in rural South India. *Health Care Women Int*. 2005;26(1):87–99.
 36. Varma D, Chandra PS, Thomas T, Carey MP. Intimate partner violence and sexual coercion among pregnant women in India: relationship with depression and post-traumatic stress disorder. *J Affect Disord*. 2007;102(1–3):227–35.
 37. Chersich MF, Luchters SM, Malonza IM, Mwarogo P, King'ola N, Temmerman M. Heavy episodic drinking among Kenyan female sex workers is associated with unsafe sex, sexual violence and sexually transmitted infections. *Int J STD AIDS*. 2007;18(11):764–9.
 38. Zablotska IB, Gray RH, Koenig MA, et al. Alcohol use, intimate partner violence, sexual coercion and HIV among women aged 15–24 in Rakai, Uganda. *AIDS Behav*. 2009;13(2):225–33.
 39. Room R, Babor T, Rehm J. Alcohol and public health. *Lancet*. 2005;365(9458):519–30.
 40. Shillington AM, Cottler LB, Compton WM III, Spitznagel EL. Is there a relationship between “heavy drinking” and HIV high risk sexual behaviors among general population subjects? *Int J Addict*. 1995;30(11):1453–78.
 41. Loi MV, Huy VT, Minh NH, Clement J. *Gender-based violence the case of Vietnam*. Washington, DC and Hanoi: World Bank and Institute of Sociology; 1999.
 42. Field CA, Caetano R, Nelson S. Alcohol and violence related cognitive risk factors associated with the perception of intimate partner violence. *J Fam Violence*. 2004;19:249–53.
 43. Davis KC, Schraufnagel TJ, George WH, Norris J. The use of alcohol and condoms during sexual assault. *Am J Mens Health*. 2008;2(3):281–90.
 44. Li Q, Li X, Stanton B. Alcohol use and sexual risk behaviors and outcomes in China: a literature review. *AIDS Behav* 2009 [Epub ahead of print].
 45. Du Mont J, McGregor MJ. Sexual assault in the lives of urban sex workers: a descriptive and comparative analysis. *Women Health*. 2004;39(3):79–96.
 46. Kumar MS. A rapid situation assessment of sexual risk behaviour and substance use in sex workers and clients of sex workers in Chennai (Madras), south India. Geneva: World Health Organization, MSD/MER; 2003.
 47. Panchanadeswaran S, Johnson SC, Go VF, et al. Violence against women in India: a descriptive profile of abused female sex workers. *J Health Popul Nutr* (in press).
 48. Klein R. Sickening relationships: gender-based violence, women's health, and the role of informal third parties. *J Soc Pers Relat*. 2004;21(1):149–65.
 49. Rogers EM. *Diffusion of innovations*. 4th ed. New York: Free Press; 1995.
 50. van Griensven F, Kalichman SC. Design and concepts of the NIMH Collaborative HIV/STD Prevention Trial. *AIDS*. 2007;21(Suppl 2):S1–2.
 51. Go VF, Solomon S, Srikrishnan AK, et al. HIV rates and risk behaviors are low in the general population of men in southern India but high in alcohol venues: results from 2 probability surveys. *J Acquir Immune Defic Syndr*. 2007;46(4):491–7.
 52. National Institute of Mental Health. Selection of populations represented in the NIMH Collaborative HIV/STD Prevention Trial. *AIDS*. 2007;21(Suppl 2):S19–28.
 53. National Institute of Mental Health. Methodological overview of a five-country community-level HIV/sexually transmitted disease prevention trial. *AIDS*. 2007;21:S3–18.
 54. Murray D. *Design and analysis of group-randomized trials*. Oxford, UK: Oxford University Press; 1998.
 55. Kumar S, Jeyaseelan L, Suresh S, Ahuja RC. Domestic violence and its mental health correlates in Indian women. *Br J Psychiatry*. 2005;187:62–7.

56. Panchanadeswaran S, Johnson SC, Sivaram S, et al. Intimate partner violence is as important as client violence in increasing street-based female sex workers' vulnerability to HIV in India. *Int J Drug Policy*. 2008;19(2):106–12.
57. Chowdhury AN, Ramakrishna J, Chakraborty AK, Weiss MG. Cultural context and impact of alcohol use in the Sundarban Delta, West Bengal, India. *Soc Sci Med*. 2006;63(3):722–31.
58. Pauw I, Brener L. 'You are just whores—You can't be raped': barriers to safer sex practices among women street sex workers in Cape Town. *Cult Health Sex*. 2003;5(6):465–81.
59. Currie S, Laliberte N, Bird S, Rosa N, Sprung C. Assessing the violence against street-involved women in the Downtown Eastside/Strathcona community. Vancouver: Ministry of Women's Equality, DEYAS, and Watari; 1995.
60. Church S, Henderson M, Barnard M, Hart G. Violence by clients towards female prostitutes in different work settings: questionnaire survey. *BMJ*. 2001;322(7285):524–5.
61. Gordis L. *Epidemiology*. 4th ed. Philadelphia: Saunders Elsevier; 2009.
62. Garcia-Moreno C, Jansen HA, Ellsberg M, Heise L, Watts CH. Prevalence of intimate partner violence: findings from the WHO multi-country study on women's health and domestic violence. *Lancet*. 2006;368(9543):1260–9.
63. Jewkes R, Nduna M, Levin J, et al. Impact of stepping stones on incidence of HIV and HSV-2 and sexual behaviour in rural South Africa: cluster randomised controlled trial. *BMJ*. 2008;337:a506.
64. Gossop M, Powis B, Griffiths P, Strang J. Female prostitutes in south London: use of heroin, cocaine and alcohol, and their relationship to health risk behaviours. *AIDS Care*. 1995;7(3):253–60.
65. Romero-Daza N, Weeks M, Singer M. "Nobody gives a damn if I live or die": violence, drugs, and street-level prostitution in inner-city Hartford, Connecticut. *Med Anthropol*. 2003;22(3):233–59.
66. Go VF, Sethulakshmi CJ, Bentley ME, et al. When HIV-prevention messages and gender norms clash: the impact of domestic violence on women's HIV risk in slums of Chennai, India. *AIDS Behav*. 2003;7(3):263–72.
67. Martin SL, Kilgallen B, Tsui AO, Maitra K, Singh KK, Kupper LL. Sexual behaviors and reproductive health outcomes: associations with wife abuse in India. *JAMA*. 1999;282(20):1967–72.
68. Miller B. Wife beating in India: variations on a theme. In: Counts D, Brown J, Campbell J, ed. *Santions and sanctuary: cultural perspectives on the beating of wives*. Boulder, CO: Westview; 1992.
69. Rao V. Wife-beating in rural south India: a qualitative and econometric analysis. *Soc Sci Med*. 1997;44(8):1169–80.
70. National AIDS Control Organization. National baseline high risk and bridge population behavioural surveillance survey-2001, Part-I (FSW and their clients). New Delhi: National AIDS Control Organisation; 2004.
71. Persaud NE, Klaskala W, Tewari T, Shultz J, Baum M. Drug use and syphilis co-factors for HIV transmission among commercial sex workers in Guyana. *West Indian Med J*. 1999;48(2):52–6.
72. Pyett PM, Warr DJ. Vulnerability on the streets: female sex workers and HIV risk. *AIDS Care*. 1997;9(5):539–47.
73. Jana S, Bandyopadhyay N, Mukherjee S, Dutta N, Basu I, Saha A. STD/HIV intervention with sex workers in West Bengal, India. *AIDS*. 1998;12(Suppl B):S101–8.