Published in final edited form as:

AIDS Care. 2013 ; 25(9): . doi:10.1080/09540121.2012.750709.

Perceived Peer Engagement in HIV-related Sexual Risk Behaviors and Self-reported Risk-taking among Female Sex Workers in Guangxi, China

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Abstract

Searching for modifiable perceptions that are associated with sexual risk behaviors among female sex workers (FSWs) is considered a priority in HIV/STD preventions. Perception of peers' involvement in risk behaviors, a key correlate of individual risk behaviors, has barely been studied among FSWs. A self-administered questionnaire was completed by 1,022 FSWs in Guangxi, China, a country with rapid growth in both HIV epidemic and commercial sex. Multiple imputation using chained equation (MICE) was applied to handle missing values (1-10%) in the dataset. Regression analysis that focused on relationship between perceived peers' risk involvement and FSWs' risk-taking was performed on full datasets generated by MICE. FSWs who perceived more peer alcohol use was significantly more likely to have sex under the influence of alcohol. Those who perceived more unprotected sex among peers had a higher likelihood to use condom inconsistently with both stable and casual partners. Perceiving more peers engaging in sex after using alcohol was positively associated with having sex with clients who were intoxicated and/or high on drugs, and with having sex under the influence of alcohol. Perceived peer promiscuity, defined as having sex with any types of clients at any price offered, was positively associated with inconsistent condom use with casual partners, but negatively associated with having sex under the influence of alcohol. These data suggest the potential for intervention programs to address behavioral change among FSWs through modifying perceptions of peer involvement in sexual risk behaviors. Longitudinal studies are needed to confirm these findings and qualitative researches will be essential for the clarification of mechanisms behind associations found in the current study and for the actual design of effective norm-based interventions among FSWs.

Keywords

Perceived peer behaviors; HIV-related sexual risk behaviors; female sex workers; China

Introduction

Searching for potentially modifiable perceptions that are reliably associated with sexual risk behaviors is a priority in HIV/STDs prevention research (Sheeran, Abraham, & Orbell, 1999). Perceptions of peers' involvement in risky behaviors are among the strongest and most consistent correlates of individual risk behaviors (Brown et al., 2008; Curran, Stice, & Chassin, 1997). The social norm theory assumes that individuals' behaviors are strongly shaped by perceptions of behaviors performed by people with whom they share similar social boundaries and values (Hawkins, Catalano, & Miller, 1992; Scholly, Katz, Gascoigne, & Holck, 2005). A meta-analysis found that perceived peer condom use was a significant predictor for condom use in both cross-sectional and longitudinal analysis (Sheeran et al., 1999). Perceived behavior of peers, as suggested by studies among adolescents, was often more important than actual peer behavior in predicting respondents' risk involvement, even if such perceptions may be inaccurate (Arnett, 2007; Iannotti & Bush, 1992; Scholly et al., 2005).

Despite having been considered as one of the leading correlates of risk behaviors, perceptions of peer's involvement in sexual risks remain largely under-researched among female sex workers (FSWs), a population that carries disproportional burden of HIV and sexually transmitted diseases (STDs) across the world (Loza et al., 2010; Platt et al., 2007). Sex work is characterized by a number of risk factors that are associated with higher rates of sexual risk behaviors, making women in sex work most vulnerable to the infection and transmission of HIV/STDs (Inciardi, Surratt, & Kurtz, 2006; Sanders, 2006). In addition, influence from peers may be particularly salient to FSWs given their high alienation from the society and limited access to information delivered through government health care infrastructure (Ghimire, Smith, & van Teijlingen, 2011). Currently only one available study reported that female migrants who believed their peers to have engaged in a number of HIV/STD-related risk behaviors were more likely to participate in commercial sex (Yang et al., 2005). This apparent lack of studies on the role of perceived peers' behaviors among FSWs has created a shortage of knowledge regarding a potentially pivotal factor that could affect sexual risk behaviors in this population.

In recognition of this deficit in knowledge about the influence of perceived risk behaviors by peers on FSWs' own risk behaviors, and in response to the urgency of developing effective intervention programs guided by psychosocial theories among this population (Sheeran et al., 1999), the present study was developed to broaden our knowledge about how perceptions of peers' behaviors may be related to self-risk engagement among FSWs, through demonstration of data from FSWs in China. China has been witnessing a parallel expansion of its HIV epidemic fueled mainly by sexual transmission (Xia & Yang, 2005) and its commercial sex industry which has grown into a size that incorporated an estimated 6 to 10 million FSWs (Hong & Li, 2008). Like those in other countries, FSWs in China are extremely vulnerable to sexual risks due to economic deprivation and lack of protection from mainstream society. The prevalence of inconsistent condom use among them was generally high, and so was the prevalence of related risk factors such as alcohol use (Y. Chen et al., 2012).

Based on evidence from existing research and empirical knowledge, we proposed to study four perceptions that are relevant to HIV-related risks in the context of commercial sex: perceived peer alcohol use, perceived peer unprotected sex (i.e. sex without using a condom), perceived peer engagement in sex under the influence of alcohol, and perceived peer promiscuity. We assessed the relationship of these perceptions with a number of sexual risk behaviors including inconsistent condom use with both stable and casual partners,

having sex with clients who are intoxicated and/or high on drugs, and having sex under the influence of alcohol.

Method

Sampling and Survey Procedures

The data in the current study were collected from FSWs in Guangxi Zhuang Autonomous Region (Guangxi) in China. Participants were recruited from Beihai and Guilin, two of the most famous tourist cities in the region with a lucrative tourism industry. The two cities attract millions of tourists annually. It was estimated 2,000 FSWs worked in more than 150 commercial sex venues in each city (Guangxi CDC, 2009). Sampling and survey procedures were described in detail elsewhere (Y. Chen et al., in press). Briefly, ethnographic-mapping was first used to identify potential sampling areas and permission of recruiting participants was then obtained from the venue owners or gatekeepers. A sample of 1022 FSWs from 60 commercial sex venues agreed to participate, and completed a written informed consent prior to a self-administered survey. The average time for completing the questionnaire was 45 minutes and each participant received a small gift with a cash value equivalent to US \$4.50 upon the completion of the survey. Study protocol was reviewed and approved by the Institutional Review Boards at Wayne State University in the U.S. and Beijing Normal University in China.

Measures

Demographic Characteristics and Venue Types—Participants provided information on their age, ethnicity, types of hometown (rural vs. urban), education attainment, marital status and monthly income (in Chinese currency yuan). For the ease of interpretation, we categorized ethnicity into Han vs. non-Han (Han is the ethnical majority in China, accounting for more than 90% of the Chinese population), education attainment into “high school and above” versus “below high school”, and marital status into “ever married” versus “never married”. Venues from which participants were recruited were categorized into entertainment venues, personal service venues, and street-based (Yi et al., 2010).

Perceived Peer Behaviors—All questions regarding perceived peer risk involvement have the same response categories: “none”, “only a few”, “about half”, “more than half” and “almost all”, which were coded from 1-5. A higher score indicates a higher level of perceived peer involvement in that particular risk behavior.

Perceived peer alcohol use: Participants were asked how many of their peers (i.e. FSWs they knew) had been involved in drinking alcohol, being drunk, and drinking with clients (Cronbach’s alpha of .87). The mean of the three items formed a composite score ranging from 1-5.

Perceived peer unprotected sex: Participants were asked about condom use among their peers by responding to a single question: “how many of the FSWs you know use condoms when having sex with clients?” The score of this single item was reversed in the final analysis to match with other perceptions in direction.

Perceived peer sexual engagement under the influence of alcohol: This perception was assessed by one question: “how many of other FSWs had sex with clients after drinking alcohol?” with its response being used directly in the analysis.

Perceived peer promiscuity: Respondents were asked to indicate how many of their peers “had sex with any kind of clients who came up to them” or “agree to trade sex for any price

offered by clients” (Cronbach’s alpha .64). The mean of the two items formed a final composite score.

HIV-related Sexual Risk Behaviors—Inconsistent condom use was assessed using four items pertaining two types of partnership (stable and casual) during two different time frames (life time and recent three sexual encounters). Participants rated their overall frequency of condom use (never, occasionally, sometime, often, and always) with casual or stable partners, and counted the number of times (0-3) they had used condoms during their most recent three sexual episodes with casual or stable partners. The final responses were dichotomized into “1=Inconsistent use” and “0=Consistent use”. Inconsistent condom use was defined as not “always” using condoms during lifetime, or not using a condom “every time” during most recent three sexual episodes.

Having sex with clients who are intoxicated and/or high on drugs. Participants responded to the question “How often do you have sex with clients who are drunk and/or high on drugs” with a 5-point response (“never”, “occasionally”, “sometimes”, “often”, and “always”), which was then dichotomized into “ever=1” and “never=0” for the purpose of data analysis in the current study.

Having sex under the influence of alcohol was assessed with the question “Have you used alcohol before having sex with your sex partners?” with the answer “yes=1/no=0”.

Other Health Risk Behaviors and Perceptions

Drug use: Participants were asked if they have ever used any type of illicit drugs (including injection and non-injection drugs). Response was dichotomized with “yes” being coded as 1, “no” as 0.

Alcohol use: Alcohol use was measured by Alcohol Use Disorders Identification Test (AUDIT) (Saunders, Aasland, Babor, Delafuente, & Grant, 1993). The AUDIT score (Cronbach’s alpha=0.79) ranged from 0 to 40 with a higher score indicating a more severe alcohol use problem. Usually a cut-off value of 8 points was used to identify problem drinking.

Perceived self-susceptibility to HIV/STDs: Participants indicated how likely they would get HIV or STDs in the near future with a four-point scale ranging from “very likely” to “really unlikely” for both questions. The two items have a Cronbach’s alpha of 0.78. The mean of the two items formed a composite score ranging from 1-4.

Analysis

Data were analyzed using STATA, version 11. The proportion of missing values in the current dataset ranged from 0 to 10.2%. To minimize the potential impact of the missing value on the analysis, we used multiple imputation by chained equations (ICE) to generate full datasets (Azur, Stuart, Frangakis, & Leaf, 2011). As recommended by the existing literature, all of our variables were included in the imputation model and the bootstrap estimation was applied in case the normality assumption on posterior distribution was violated. We generated 10 datasets and calculated estimates and standard errors for unadjusted and adjusted odds ratios (OR) using Rubin’s rules (Rubin, 1987) to assess the associations between sexual risk behaviors and perceived peer risk involvement. Bivariate analysis was used to describe the distribution of different variables by sexual risk behaviors and to compare the original and the imputed datasets.

Results

The participants had a mean age of 24.89 years and an average monthly income of 2667.52 yuan (approximately equal to 400 US dollars). More than half (63.4%) of the participants had received no more than high school level education and two-thirds (71.5%) were never married. FSWs with an AUDIT score of 8 and greater accounted for 57.6% of our sample. The rate of inconsistent condom use with stable partners was 82.67% for life time and 66.21% for recent three sexual intercourses. The proportion of FSWs who engaged in inconsistent condom use with casual partners was 47.03% for life time and 33.44% for the recent three times. About one quarter of FSWs in the study had ever have sex with intoxicated clients or those who were high on drugs, and 36.27% had ever have sex under the influence of alcohol.

Differences in demographic and psycho/behavioral characteristics between women who engaged in various sexual risk behaviors and those who did not are presented in Table 1. A higher percentage of married FSWs reported inconsistent condom use with casual partners during their life time, and having sex with partners under the influence of alcohol. FSWs who had used drugs of any kind, or had an AUDIT score of 8 and above reported more participation in most of the sexual risk behaviors. Entertainment FSWs were more likely to use condoms inconsistently, and/or having sex with partners under the influence of alcohol, but less likely to accept clients who were intoxicated and/or high on drugs; FSWs working on the street were more likely to use condom inconsistently with casual partners during life time, but less likely to have sex under the influence of alcohol. More FSWs with lower monthly income reported inconsistent condom use while more FSWs with higher monthly income reported having ever accepted clients who were drunk or high on drugs. FSWs with less perceived self-susceptibility to HIV/STDs reported more involvement in various risk behaviors.

Table 2 shows the unadjusted ORs of sexual risk behaviors by perceived peer risk involvement for both the original and imputed datasets. The mean score and variation of each perception was also listed. Overall the bivariate associations appeared to be similar between the original and imputed datasets with no drastic change in signs and magnitudes. Multivariate associations between perceived peer risk involvement and sexual risk behaviors, adjusting for potential confounders, were presented in Table 3. FSWs who perceived more peer alcohol use was significantly more likely to have sex under the influence of alcohol (aOR: 1.29, 95% CI: 1.08-1.51). A higher level of perception of peers unprotected sex with clients was associated with higher rates of inconsistent condom use with stable partners during recent three times (aOR: 1.14, 95% CI: 1.01-1.27) and with casual partners during both life time (aOR: 1.36, 95% CI: 1.23-1.50) and recent three times (aOR: 1.50, 95% CI: 1.34-1.67). Perceived peer engagement in sex under the influence of alcohol was associated with increased likelihood of having sex with clients who were intoxicated and/or high on alcohol (aOR: 1.54, 95% CI: 1.19-1.79), as well as having sex under the influence of alcohol (aOR: 1.46, 95% CI: 1.19-1.79). FSWs who perceived more peer promiscuity had a higher likelihood of using condom inconsistently with casual partners during both life time (aOR: 1.29, 95% CI: 1.02-1.62) and recent three sexual intercourses (aOR: 1.39, 95% CI: 1.09-1.77), but was less likely to have sex under the influence of alcohol (aOR: 0.62, 95% CI: 0.48-0.81).

Discussion

This study has shown significant associations between different perceived peer risk involvement and a range of self-reported sexual risk behaviors. Each perception demonstrates a unique pattern of associations with different sexual risk behaviors. These

associations do not seem to be explained by differences in social demographic and other psycho/behavioral characteristics related to the risk behaviors. Findings from the current study demonstrate the complexity of the relationship between peer perception and risk behaviors, and provide important implications for behavioral HIV risk reduction interventions among FSWs.

Past studies among FSWs from low- and middle-income countries have shown positive associations between alcohol use and sexual risks including victimization of sexual violence and unprotected sex (Li, Li, & Stanton, 2010). The current study adds to our knowledge about the role of perceived peer alcohol use in this population. The data suggest that perceived alcohol use by peers was significantly associated with having sex under the influence of alcohol even after adjusting for FSWs' own alcohol use. This finding not only further alerts us about the intertwined relationship between alcohol use and sexual risks, but also implies a potential to reduce alcohol-related sexual risk behaviors through modifying perceptions of peer alcohol use.

The identification of positive associations between perceived peer unprotected sex and self-reported inconsistent condom use, and those between perceived peer engagement in sex after using alcohol and both alcohol-related sexual risk behaviors, confirm that the connection between perceived peer risk involvement and self-reported risk behaviors which have been identified consistently among other populations are also applicable to FSWs (Rai et al., 2003; Sheeran et al., 1999). Because perceptions of peer engagement in risk behaviors is predictive of respondents' own risk behaviors (Prinstein, Boergers, & Spirito, 2001), norm-based interventions that aim to reduce sexual risk behaviors among FSWs may work on boosting perceived peer involvement in safer sexual behaviors to help establish a positive norm which supports safer practice of sexual activities.

No research has studied perceived peer promiscuity or limited choice of clients among FSWs. Sexual promiscuity among FSWs, on the one hand, may imply an industry norm that accommodates with any types of clients, while on the other hand, it may also reflect limited power in choosing the clients. In the current study, we found perceived sexual promiscuity to be positively associated with inconsistent condom use with casual partners and negatively associated with having sex with partners under the influence of alcohol. Available data suggest that FSWs who do not have much choice for selecting clients are usually working at low-tier commercial sex venues, where access to alcohol is limited and occupational alcohol use is infrequent (Chersich et al., 2007; Harcourt & Donovan, 2005; Wojcicki & Malala, 2001). We thus speculated that both associations found in this study could be a reflection of limited choice of clients with the positive association implying a consequent lack of power in requesting for condom use. But more studies are needed to explore the reasons of sexual promiscuity among FSWs and further examine its role in sexual risk behaviors.

Among all the measures of sexual risk behaviors in the current study, inconsistent condom use with stable partners is least likely to be influenced by perceptions of peers. Studies have shown that sexual relationship with stable partners was considered as more intimate than that with casual partners (WHO, 2005). A person's behaviors may be more influenced by peer norms when others have expectations about what the person should do (Abraham, Sheeran, Spears, & Abrams, 1992), while condom use with stable partners, which is considered as a more "private" behavior (Sheeran et al., 1999), may have fallen out of the scope of such expectation and therefore, may not be as susceptible to established norms as other risk behaviors.

The study results should be interpreted with a number of limitations in mind. First, because of the illegality of commercial sex and a lack of official registration of FSWs, a convenience

sample was used and therefore, generalization and extrapolation of the findings should be made with caution. Second, the temporal relationship between perceptions of peers and sexual risk behaviors cannot be assessed due to the cross-sectional nature of the data. Third, the term “promiscuity” in the current study refers to FSWs’ limited power in selecting clients in sex trade, and it may not be interpreted literally as with other populations. Fourth, all data were self-reported and may be subject to social desirability bias.

Despite these limitations, this study delineates relationships between perceived peer risk involvement and sexual risk behaviors among FSWs. Information correcting misperceptions about peer norms may lead to a decrease in related risk behaviors (Scholly et al., 2005). Findings from this study provide some important implications for designing HIV-related risk reduction interventions that incorporates the components of perception modifications and peer influence. As the effect of perceptions may be moderated or mediated by other individual and contextual factors, future studies will benefit from exploring perceptions of peers from a multi-level approach, in order to clarify their relationships in the context of other factors of influence on sexual risk behaviors among FSWs.

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Table 1
Differentials in sexual risk behaviors by demographic and psycho/behavioral variables

Variables	Sexual risk behaviors					
	Condom use with stable partners (life time) (N=733)		Condom use with casual partners (life time) (N=925)		Having sex with clients intoxicated and/or high on drugs (N=952)	
	Inconsistent	p-value	Inconsistent	p-value	Ever	p-value
<i>Ethnicity</i>						
Han	83.5(522)	0.18	46.5(357)	0.63	22.7(181)	0.67
Non-Han	78(78)		48.6(71)		24.3(35)	
<i>Education</i>						
Below high school	83.1(384)	0.52	48.5(282)	0.21	21.3(127)	0.11
High school and above	81.2(212)		44.1(146)		25.9(89)	
<i>Marital Status</i>						
Never	81.9(399)	0.59	44(289)	0.01	22.6(152)	0.7
Ever	83.5(198)		54.1(140)		23.8(64)	
<i>Residence</i>						
Rural	84.29(338)	0.14	46.88(240)	0.82	22.20(115)	0.58
Urban	80.06(257)		46.10(183)		23.74(99)	
Ever used drug		0.02		<0.001		<0.001
No	81(476)		43.2(319)		20(152)	
Yes	89.6(120)		63.5(113)		34.3(62)	
<i>AUDIT levels</i>						
Low risk (0-7)	77.9(212)	0.01	36.5(131)	<0.001	23.6(86)	0.01
Risk drinking (8-15)	85.7(198)		53.2(149)		16.9(50)	
Heavy drinking (16-19)	92.1(82)		60(66)		27.4(30)	
Hazardous drinking (20-40)	87.9(58)		58.2(46)		32.1(26)	
<i>Venue types</i>						
Entertainment	87.38(360)	<0.001	58.42(274)	<0.001	17.87(89)	<0.001
Personal service	75.20(188)		29.38(109)		29.19(108)	
Street	81.69(58)		61.18(52)		23.81(20)	

Variables	Sexual risk behaviors			
	Condom use with stable partners (life time) (N=733)	Condom use with casual partners (life time) (N=925)	Having sex with clients intoxicated and/or high on drugs (N=952)	Having sex with partners under the influence of alcohol (N=1009)
	p-value	p-value	p-value	p-value
Mean (SE)				
Age		0.98	0.12	0.73
Inconsistent/Ever	25.27(0.28)			
Consistent/Never	25.25(0.54)	25.15(0.37)	24.95(0.47)	24.20(0.32)
Income		0.03	24.77(0.24)	25.20(0.27)
Inconsistent/Ever	2482.66(90.0)			
Consistent/Never	2951.95(236.64)	2376.82(89.83)	3526.76(215.37)	2814.97(120.56)
Perceived self-susceptibility to HIV/ STDs (range: 1-4)		0.01	2485.83(77.75)	2606.86(95.96)
Inconsistent/Ever	3.19(0.24)			
Consistent/Never	3.34(0.05)	3.13(0.03)	3.05(0.04)	3.11(0.03)
		3.27(0.03)	3.26(0.02)	3.29(0.02)

^a Row percentages (all n=1022);

* p<0.05,

** p<0.01,

*** p<0.001.

Table 2
Bivariate association (unadjusted odds ratio) between sexual risk behaviors and other variables by imputation status

	Inconsistent condom use with stable partners						Inconsistent condom use with casual partners						Having sex with clients who are intoxicated and/or high on drugs				Having sex with partners under the influence of alcohol			
	Life time			Recent three times			Life time			Recent three times			Original		Imputed		Original		Imputed	
	Original	Imputed		Original	Imputed		Original	Imputed		Original	Imputed		Original	Imputed	Original	Imputed	Original	Imputed	Original	Imputed
Perceived peer alcohol use behaviors (Mean=2.78, SD=1.15)	1.48***	1.49***		1.27**	1.27**		1.26**	1.24***		1.47***	1.42***		1.01	1.02		1.62***	1.61***		1.61***	
Perceived peer unprotected sex (Mean=2.51, SD=0.05)	1.15*	1.17*		1.18**	1.19**		1.39***	1.40***		1.49***	1.48***		0.80***	0.78***		0.95	0.94		0.94	
Perceived peer engagement in sex under influence of alcohol (Mean=1.70, SD=0.84)	1.31*	1.32*		0.96	0.97		1.18*	1.11		1.20*	1.15		1.65***	1.68***		1.64***	1.64***		1.64***	
Perceived peer sexual promiscuity (Mean=1.49, SD=0.69)	1.21	1.21		1.07	1.06		1.19	1.14		1.24*	1.18		1.61***	1.65***		1.00	0.99		0.99	

* p<0.05,
** p<0.01,
*** p<0.001.

Table 3

Multivariate association^a of sexual risk behaviors and perceived peer risk involvement

	Inconsistent condom use with stable partners (N=716)				Inconsistent condom use with casual partners (N=1022)				Having sex with clients intoxicated and/or high on drugs (N=1022)				Having sex with partners under the influence of alcohol (N=1022)			
	Life time		Recent three times		Life time		Recent three times		aOR		95% CI		aOR		95% CI	
	aOR ^b	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI	aOR	95% CI
Perceived peer alcohol use behaviors	1.31	[0.96-1.68]	1.16	[0.94-1.44]	0.92	[0.74-1.15]	1.07	[0.87-1.32]	0.91	[1.07-1.55]	1.29**	[1.08-1.51]				
Perceived peer unprotected sex	1.11	[0.96-1.28]	1.14*	[1.01-1.27]	1.36***	[1.23-1.50]	1.50***	[1.34-1.67]	0.90	[0.82-1.01]	0.91	[0.82-1.01]				
Perceived peer engagement in sex under influence of alcohol	1.10	[0.81-1.51]	0.85	[0.68-1.07]	1.03	[0.84-1.26]	1.01	[0.82-1.24]	1.54***	[1.19-1.79]	1.46***	[1.19-1.79]				
Perceived peer sexual promiscuity	1.14	[0.83-1.59]	1.15	[0.89-1.49]	1.29*	[1.02-1.62]	1.39**	[1.09-1.77]	1.14	[0.89-1.44]	0.62	[0.48-0.81]				

^a Associations based on multiple imputation.

^b Adjusted odds ratio are adjusted for age, logincome, ethnicity, education, marriage, residency, perceived self-susceptibility to HIV/STDs, drug use, AUDIT score, venue types.

* p<0.05,

** p<0.01,

*** p<0.001.