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A Profile of HIV Risk Factors in the Context of Sex Work Environments among Migrant Female Sex Workers in Beijing, China

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Abstract

Migrant female sex workers (FSWs) are one of the most at-risk populations for HIV in China. This study demonstrates how multiple risk factors are situated and vary by types of sex work environments in a sample of 348 migrant FSWs in Beijing. Participants reported high rates of clients' refusal to use condoms (76%), unsafe sex with both clients (32%), non-paid regular partners (e.g., boyfriend or husband) (76%), and a STI symptom (79%) last year. Only 22% of FSWs had been tested for HIV. Risk factors were compared by three types of sex work environments: (1) entertainment establishments, (2) personal services sectors, and (3) street-based venues, including roadside brothels. Street-based FSWs, compared to the other FSWs, were more likely to be older, married with children, migrate from rural areas, and be arrested by police, and less likely to be educated, have contact with prevention services, be knowledgeable about HIV, and be tested for HIV. The FSWs in entertainment establishments were more likely than street-based FSWs to have reported being physically, verbally, and/or sexually abused by clients. Multiple discriminant analysis distinguished a profile of two different groups of risk factors: (1) police arrest, lack of protection from violence, access to prevention and health care, and HIV knowledge, and (2) verbal and physical abuse and clients' refusal of condom use. In the massive internal migration in China, disadvantages in economic sectors drive women to become involved in sex work. HIV prevention strategies must target socio-structural factors embedded in sex work environments.

Keywords

migrants; female sex workers; sex work environment; China; HIV prevention

China's open door policy in 1978 toward market-driven economic development led to massive migration from rural to urban areas. In Beijing, an estimated 5.4 million of the 17.4 million city residents in 2007 were migrants (Juan, 2007). Large-scale urbanization also resulted in the reemergence of the sex work industry and a resurgence of sexually transmitted infections (STIs) (Chen et al., 2007; Gil et al, 1996). There are an estimated 10 million FSWs in China (Yang et al., 2005c), and about four to six million have STIs (Qian,

Vermund, & Wang, 2005). Since the establishment of the National System of STD Surveillance in 1998 in China, annual STI incidence rates increased about fourfold, from 12.3 cases/100,000 in 1989 to 50.7/100,000 in 1998, with average annual incidence rates of 17.3% in total, 18.3% in men, and 23.3% in women (Chen, Gong, Liang, & Zhang, 2000). Of the 5,635 HIV/AIDS cases reported in Beijing in 2008, 75.1% were in internal migrants, 21% were in city residents, and 3.9%, in foreigners. Sexual transmission surpassed injection drug use for the first time in 2007 as the primary mode of HIV transmission in Beijing, accounting for 54.6% of HIV cases (Xinhua, 2008a). The estimated HIV prevalence among FSWs in Beijing is 0.5% (Xinhua, 2008b).

As sexual transmission is currently the primary driver of the HIV epidemic in China, the potential spread of HIV via the expanded sexual networks among migrant “floating” populations along with urbanization is of particular concern (Anderson et al., 2003; Yang et al., 2005c). In Li and colleagues' study (2004) of migrants in Beijing, mobility, assessed by the total years of migration and the number of migratory cities, was highly correlated with sexual risk. There have been consistent findings that female migrants reported higher STI rates than male migrants in China (Detels et al., 2003; Liu et al., 2005; Mao & Sun, 1999; Sun, 1997). One of the reasons for this disparity may be women's relative disadvantage to men in socio-economic status, facilitating women's entry into the sex work industry and exposure to other health risks (Huang, 2001; Ren, 1999; Yang & Xia, 2006). While research in China highlights migration as a risk factor, contextual analysis of the effects of migration, such as social exclusion, separation from social capital, institutional barriers, and “host-town” urban cultures, has not been sufficiently addressed in extant research of HIV prevention field (Apostolopoulos & Sonmez, 2007; Herdt, 1997; Hong et al., 2006; Hong, Li, Yang, Fang, & Zhao, 2009; Yang, Derlega, & Luo, 2007).

There has been little scientific attention to the impact of sex work environmental structure on HIV risk factors in China (Hong & Li, 2008; Pirkle, Soundardjee, & Stella, 2007; Xia & Yang, 2005; Yang et al., 2005b). Empirical research among FSWs globally has addressed the importance of understanding the ecological context of sex work environment and its interaction with individual characteristics, and the need to develop multi-level prevention strategies for this population. Although cognitive-behavioral prevention approaches (e.g., HIV knowledge and self-efficacy) are important, limitations in individual-level approaches are apparent among FSWs since their HIV risk is largely affected by socio-economic, environmental, and legal factors (Morisky, Stein, Chiao, Ksobiech, & Malow, 2006; Shannon et al., 2009). Availability and use of condoms and access to STI health care have been found to be significantly associated with sex work environments (Chiao, Morisky, Ksobiech, Masson, & Malow, 2007; Larios et al., 2009), especially their policies and managers' engagement in prevention (Hananberg & Rojanapithayakorn, 1998; Kerrigan et al., 2003; Morisky et al., 1998; 2006; Morisky, Pena, Tiglaio, & Lui, 2002). The degree of exposure to HIV risk and sex work harms varies across different physical environments, types of sex services, and legal situation (for a review, see Harcourt, 2005; Rekart, 2005). “Street” or “outdoor” FSWs, who are isolated from occupational supportive and protective systems, reported high vulnerability to violence (Church, Henderson, Barnard, & Hart, 2001; Romeo-Daza, Weeks, & Singer, 2005), HIV risk-related behaviors, including injection drug use and unprotected sex (Church et al, 2001; El-Bassel & Witte, 2001; Seib, Fisher, and Najman, 2008; Pyett & Warr, 1997), and police arrest/violence (Rhodes et al., 2008; Shannon et al., 2008).

Several studies in China found that HIV risk behaviors were associated with sex work settings and identified a typology of sex work environments (Choi & Holroyd, 2007; Fang et al., 2007; Rogers et al., 2002). For example, Huang and colleagues (2004) classified seven categories of FSWs based on demographic characteristics, work environment, relationships

with managers, and income level: (1) self-employed (second wife or courtesan), (2) karaoke, (3) personal hygiene services (massage or beauty parlor), (4) street-based (solicit in street or construction site). Choi and Holroyd (2007) proposed a social hierarchy of sex work – from low-class (street) to middle-class (hair/beauty salons, massage parlors, saunas, and karaoke bars) to high-class (nightclubs and hotels) – and its relationship to HIV risk and prevention strategies. In this study, we explored via a survey how different types of sex work settings are associated with migrant FSWs' sociodemographic backgrounds, working conditions, and various health risk factors, and how these variables are clustered based on the settings in which they work.

Method

Participants and Procedures

This study was conducted as a part of a needs assessment in the FSW community. The Aizhixing Institute of Health established a drop-in center for FSWs in a low to middle-income neighborhood in a northwestern district of Beijing, with a population of 2.6 million (Beijing Municipal Bureau of Statistics, 2005), many of whom are migrants (Jacka, 2006). The drop-in center provides FSWs with various services, including peer support, condom distribution, and regular STI check-ups. In order to develop an appropriate intervention strategy for FSWs, we conducted participatory intervention mapping in the study community (Bartholomew et al., 2006). The Aizhixing Institute established a partnership with various sex work venues via current FSW volunteers and “mommies” (i.e., managers of FSWs), who contacted the owners in sex work establishments and informed FSWs about this study. A cross-sectional survey was conducted between November 2008 and January 2009. A short period of recruitment minimized sampling selection bias since FSWs are highly mobile, and many migrant women came to Beijing to earn money during the non-agricultural season in their rural hometowns. Building rapport with the communities enabled us to recruit a diverse FSW sample from “KTV” (i.e., karaoke) bars (36%), saunas/bathhouses (19%), roadside brothels/streets (17%), nightclubs (11%), footbath/hair salons (10%), and hotels (7%). A few FSWs (less than < 10) refused to participate in this study.

Eligibility for study participation was being a female over 18 year old, migrant, and involved in sex work at time of survey. Sex work was defined as a transactional sexual exchange for money from clients, regardless of one's own perception of “sex work.” To ensure participants' safety and privacy, the survey was conducted in a private space at the work site or at the drop-in center. Although the survey was self-administered, a trained interviewer was available to clarify any questions that participants had. Written informed consent was obtained prior to the interview. As an incentive, the participants received a quilt upon completing the interview. The survey questionnaire was developed in Chinese, reviewed by FSW volunteers in terms of sensitivity and language appropriateness, and then translated into English; the first author checked the content validity of the English translation. The study protocol was guided by the funding institution, and approval was obtained from the New York State Psychiatric Institute/ Columbia University Department of Psychiatry Institutional Review Board.

Measures

To categorize the types of sex work environments, we first reviewed the typologies from the literature on sex work environments in China and other countries (Buzdugan, Halli, & Cowan, 2009; Harcourt & Donovan, 2005). Second, we adapted those categories based on the findings from our fieldwork and proposed three groups: (1) entertainment establishments, including “KTV” and nightclubs (“Et-FSWs” hereafter); (2) personal services, including hair salons, footbath, sauna, and massage parlors (“Ps-FSWs”); and (3)

street-based (e.g., long-distance truck stations and streets) and roadside brothels (“Sb-FSWs”). With respect to “Sb-FSWs”, as noted above, a substantive difference in vulnerability to violence and HIV/STIs exists between FSWs working “in the streets” and “alongside the streets”. Our classification does not distinguish between the two settings because our ethnography revealed that FSWs working in the streets often worked in roadside brothels and those working in roadside brothels often worked in the streets. Such physical proximity increased during preparation for the Olympic Games, which was the time when we conducted this study; due to frequent policing, most of the street-FSWs moved to brothels.

The survey assessed various domains: (1) demographic characteristics; (2) migration history (e.g., origin of migration, family separation, and length of stay in Beijing); (3) history of sex work (e.g., length and types of sex work involvement) and working conditions (e.g., police arrest); (4) reproductive health care (e.g., STI knowledge, symptoms, testing, and treatment); (5) sex practices with clients and non-paid regular partners (e.g., boyfriend or husband); (6) HIV testing and prevention resources (e.g., media, community-based organization (CBO) outreach workers, co-workers, friends, and family members); and (7) the use of illicit drugs, including marijuana, MDMA, ketamine, amphetamine, heroine, and “magu” (i.e., combination of amphetamine and caffeine). All behaviors were assessed within the three months prior to survey. HIV knowledge was measured by 14 true/false items and found to be reliable in this study sample (Kuder-Richardson (K-R) 20 Coefficient = .78). We assessed various domains about harms, including stolen property, lower than negotiated fee, verbal, physical, and forced unwanted sexual practices (e.g., anal or oral sex), forced drinking, forced sex (e.g., rape), and violence protection. A global assessment of satisfaction with their sex work was conducted via a 4-point Likert scale (very dissatisfied to very satisfied) and with questions about their perception of sex work, “Do you consider what you are doing is a job or occupation as same as other jobs”, followed up with “Why did you feel this way”?

Data Analysis

In this descriptive study, we compared the study variables among three types of sex work environments: Et-, Ps-, and Sb-FSWs. Univariate analyses were conducted to examine frequencies, central tendency, and variability. There were no missing data responses. Chi-square tests and Analysis of Variance (ANOVA) examined differences among the three groups. Subgroup analyses were conducted for chi-square tests and Bonferroni post-hoc tests for ANOVA to determine where significant differences lie. After the comparison, we conducted Multivariate Analysis of Variance (MANOVA) using Multiple Discriminant Analysis (MDA) to determine which variables relating to HIV risk distinguish the three types of FSWs. For this analysis, our primary research questions were, “How are the risk factors grouped across the three types of sex work environments and to what extent do the discrimination functions classify the groups accurately?” MDA produces discriminant function (DF) scores which are used to predict to which group a case belongs (McLachlan, 2004). We conducted a simultaneous MDA, entering all independent variables found to be significant in univariate analyses. The Wilks' Lambda statistic was used to test the significance of the DF at $p < .05$. We reported the structure matrix with the highest loading and used a cut-off loading of 0.30. The group centroids were used to determine the group distinction. Lastly, in order to assess the utility of a MDA model, we used classification accuracy, which compares predicted group membership to the actual group membership, based on a discriminant solution for all of the other cases. It is a more realistic estimate of the accuracy rate because MDA often inflates accuracy rates when the cases classified are the same cases used to derive the discriminant functions. All data analyses were performed using SPSS 15.0.

Results

Sociodemographic Characteristics

A total of 348 migrant FSWs from 20 of China's 31 provinces responded to the survey. As shown in Table 1, a significantly different sociodemographic profile was found across the three groups. Participants ranged in age from 19 to 45 years old. Sb-FSWs were significantly older than Et-FSWs and Ps-FSWs (median age = 35, 28, 27, respectively). The educational level of the three groups differed: 87% of Et-FSWs completed middle or high school, compared to 76% of Ps-FSWs and 41% of Sb-FSWs. With respect to migration, 58% of Et-FSWs came from a rural area, compared to 76% of Ps-FSWs and 88% of Sb-FSWs. While Sb-FSWs were the oldest group, they reported the shortest stay in Beijing. The majority (91%) of Sb-FSWs were either married (55%) or divorced (21%), and had a child (83%), whereas 45% of Et-FSWs and 44% of Ps-FSWs were married or divorced, with about half (46%) of each group having a child. Of those who had a child, 12% currently lived with a child in Beijing. Overall, no differences in length of sex work or sex work involvement before migrating to Beijing were found across the three groups. The Sb-FSWs reported significantly lower income than the other groups. With regard to occupational satisfaction, Sb-FSWs were less likely to consider sex work to be a “job” and be satisfied with sex work compared to the other two groups ($p < .001$ for both).

Context of Sex Work Environment

Table 2 presents risk factors and sex work harms among the three environments. Overall, about a third (32%) reported inconsistent condom use (i.e., either never or sometimes) with clients. About three-quarters (76%) reported situations where their clients refused to use a condom (e.g., disliked condoms and drunkenness). Rates of clients' refusal of condom use were significantly higher among Sb-FSWs compared to the other groups. When clients refused to use a condom, more than half (56%) of FSWs refused to have sex with them and 32% persuaded clients to use a condom; however, 10% responded that their condom use was “dependent upon” the situation or they “didn't care about” clients' refusal. Sb-FSWs reported higher rates of inconsistent condom use with regular partners than Et- and Ps-FSWs (85%, 77%, 70%, respectively), although use was low across all three groups.

Sex work harms were prevalent, including verbal abuse (71%), clients' refusal to pay negotiated fee (57%), being forced to engage in unwanted sexual practices (48%), forced sex (48%), physical abuse (29%), and being robbed of personal belongings (26%). Verbal (81%) and physical abuse (36%) was more frequent among Et-FSWs; forced sex (66%) was more frequent among Ps-FSWs than the other two groups. While half of Et-FSWs (48%) and 36% of Ps-FSWs received help from their “mommies” or managers regarding protection from violence, only three Sb-FSWs reported such protection. Sb-FSWs reported that they lacked skills in how to protect themselves from violence: 41% dealt with violence by themselves; 22% did not know how to handle violence; 21% felt abandoned or despair. The policing of sex workers was another sex work-related harm experienced by participants: 62% of Sb-FSWs reported that they had been arrested compared to 30% of Et-FSWs and 15% of Ps-FSWs ($p < .001$).

HIV and STI-Related Factors

Table 3 presents the variables relating to HIV prevention and STI symptoms and treatment. Overall, FSWs were relatively knowledgeable about HIV. However, there were significant differences in HIV knowledge across the three FSW groups; St-FSWs had a lower level of HIV knowledge compared to the other two FSW groups. With respect to HIV information sources, Sb-FSWs were less likely to receive HIV information through the media (e.g., newspapers, magazines, and the Internet), and community-based organization outreach than

the Et-FSWs and Ps-FSWs (21%, 38% vs. 65%, respectively). Twenty-eight percent were very worried about being infected with HIV, with a higher proportion of Sb-FSWs reporting this (36% vs. 27% of Ps-FSWs and 26% of Et-FSWs). Despite their concern with HIV infection, only 22% reported that they had been tested for HIV in the past year; Sb-FSWs (12%) were less likely than Et-FSWs (18%) and Ps-FSWs (33%) to be tested ($p < .01$). The majority of FSWs (79%) reported having at least one STI symptom in the past year. Ps-FSWs were more likely to have STI symptoms than Et-FSWs and Sb-FSWs (89% vs. 77%, 69%, respectively). STI symptoms most frequently reported were vaginal discharge (52%), discomfort in genital area (37%), and lower abdominal pain during non-menstruation (30%). A small number of FSWs ($n=28.8\%$) reported using drugs, and 71% of those were Et-FSWs.

Multiple Discriminant Analysis

We selected the variables found to be significant in univariate analyses for MDA. Wilks' lambda statistic for function 1 was $\chi^2 = 197.6$, $df = 22$, $p < .001$ and for function 2 was $\chi^2 = 73.3$, $df = 10$, $p < .001$. Table 4 presents the structure matrix of structure coefficients (i.e., discriminant loadings) and values of group centroids of the three groups of FSWs. The variables strongly associated with discriminant Function 1 were police arrest (.517), not receiving help from "mommies" for violence protection (.409), not receiving HIV prevention education from CBOs (.405), being forced to have sex (.394), lack of HIV knowledge (.369), and not getting treatment for STIs at a hospital (.334). The variables associated with Function 2 were verbal abuse (.415), physical abuse (.332), and clients' refusal of condom use (.304). The variables of having an STI symptom in the last year (.216) and not having been tested for HIV (.254) were below the criteria of .30. Figure 1 shows the functions at group centroids (i.e., multivariate means): Et-FSWs ($F1 = -.137$, $F2 = .431$), Ps-FSWs ($F1 = -.568$, $F2 = -.651$), and Sb-FSWs ($F1 = 1.419$, $F2 = -.308$). It appears that Function 1 discriminates mostly between Sb-FSWs vs. Et-FSWs and Ps-FSWs, whereas Function 2 in the vertical direction discriminates between Et-FSWs vs. Ps-FSWs and Sb-FSWs. Sb-FSWs were scored higher than centerline (0) on Function 1, while Et-FSWs higher than centerline on Function 2. In terms of classification accuracy, 63.5% of the original grouped cases were correctly classified in the model. The cross-validated accuracy rate was 58.3%, and the criteria for classification accuracy were satisfied.

Discussion

This study demonstrates how various HIV risk factors of migrant FSWs are situated, grouped, and varied in different types of sex work environments in a low- to middle-income neighborhood in Beijing. Overall, the FSWs in this study differed on key demographic characteristics from those reported in previous studies of FSWs in Beijing and other parts of China. Compared to most FSWs in other studies who were young in their 20s and unmarried (Hong & Li, 2008; Rou et al., 2007; Yang et al., 2005a), the FSWs in this study were relatively older and were married with children. Such differences may reflect the characteristics of the migrant FSWs in this study community. While two-thirds of the participants always used a condom with clients, the majority experienced clients' refusal of condom use. The finding that when clients refused condom use, some FSWs' safer sex decisions were dependent upon situations (often by higher economic gain) or took risk ("didn't care") suggests the need to raise collective awareness of HIV/STI prevention as a primary concern for them. FSWs were also at risk of HIV/STIs in their sexual relationships outside of sex work. As found in other studies among FSWs (see Hong & Li, 2008), inconsistent condom use in this study sample was higher with non-paid regular partners than with paid clients. Therefore, interventions promoting gender empowerment for safer sex needs to be developed and targeted to both clients and partners.

Importantly, various forms of sex work-related violence and harms, in particular STI symptoms, were highly prevalent among the participants. Less than half of them, however, had access to protection supports or health care systems; most dealt with those problems by themselves. The frequent policing of the sex work industry marginalizes FSWs, compounding FSWs' difficulties in obtaining peer support and accessing HIV/STI prevention and treatment/care services (Tucker & Ren, 2008). The low rates of drug use in this sample might be due to regional factors as most participants came from regions where injection drug use has not been reported as a major HIV transmission mode. The low rates of drug use suggest an opportunity for early intervention before FSWs begin to use drugs as maladaptive coping with sex work-related social-psychological stressors. Thus, in order to intervene to reduce such cumulative risk factors, multi-level prevention strategies must be implemented.

Different risk profiles were found across the three groups. Coming from a rural area with less education, Sb-FSWs appeared to be the most marginalized – they had the least access to HIV prevention resources and the lowest HIV knowledge scores. While migrant women might choose sex work as a way to achieve rapid financial gains to support their families in their home towns, Sb-FSWs, who earned less income than those in the other sex work environments, were also at risk for being arrested by police. Sb-FSWs' higher exposure to those exogenous risk factors (e.g., lower educational attainment, lack of access to health services, and frequent arrest by police) might increase psychosocial distress, which in turn, might increase their HIV risk behaviors. In contrast, Et-FSWs were more likely to have been exposed to risk factors that might occur in transactional sex – physical and verbal abuse and other harms by their clients while providing sex services. These context-dependent risk factors may disempower FSWs in safer sex negotiations that are under the control of clients: Clients who are drunk, violent, or lose control often humiliate FSWs. The unequal nature of the relationship between clients and FSWs can heighten situationally-induced HIV risks (Rekart, 2005). As noted in the literature on HIV vulnerability in women (Lin, McElmurry, & Christiansen, 2007; Logan, Cole, & Leukefeld, 2002) and structural-level HIV protective and risk factors among FSWs (Morisky et al., 2002, 2006), neither condom promotion nor HIV prevention self-efficacy will ensure actual condom use unless FSWs' unequal power relationships with men and policies toward condom use in the sex work environment are addressed. Thus, effective HIV prevention interventions should include male clients as well as owners and managers/mommies of sex work establishments.

The findings from the MDA suggest that there are different clusters of risk factors situated among the three types of sex work environments; therefore, prevention needs to be tailored to the context of sex work environments. One profile of risk reflects structural risk factors resulting from criminalization, lack of access to protection, community-based prevention services, and health care; this profile was highly scored in Sb-FSWs. The other risk profile indicates sex work-related violence and power imbalance with clients; this profile was highly scored in Et-FSWs. Ps-FSWs reported lowest on those two profiles compared to the other groups. The first clustered risk profile suggests the need for structural interventions focused on the 3As – availability, accessibility/affordability, and acceptability – combined with strengthening community-based prevention capacity for FSWs (Blankenship, Bray, & Merson, 2000). The second profile suggests the importance of incorporating sex work harm-reduction, in particular occupational safety, where sex workers and owners/managers together have control over reducing exposure to violence and contextual risk and ensuring FSWs' health and rights.

Although existing socio-structural research of sex work supports our findings, there are limitations in this study. First, the study was conducted from a drop-in center in a low- to middle-income neighborhood in a northwestern district of Beijing and participants were

recruited through target and chain-referral sampling rather than random sampling. Therefore, the study sample might be not representative of all FSWs in Beijing, limiting the generalizability of study findings to other FSW populations. Second, this study was designed as a needs assessment to identify proxy risk factors of HIV/STIs and violence; assessment of sexual behavior, including characteristics of clients and non-paid sex partners, was limited. The complexity of transactional sex exchanges between FSWs and clients should be explored further to improve understanding of the contextual risk factors (e.g., intimacy and trust of clients) and migration process. Sex worker identity is another important area for research. As suggested by our study findings, the perception of sex work (identity) as occupational resiliency from hardship as a protective factor needs to be explored. Discriminant analysis is a useful method to examine variables that discriminate between groups for profiling, but there are limitations of this analytic approach. Unlike exploratory factor analysis or cluster analysis, a variable of group is determined beforehand, and the number of functions is driven from that of the group. It is possible that different profiles (e.g., factor structures or clusters) might result if an independent variable is not specified or other dependent variables are added. In principle, MDA in the study is a post-hoc, not a prior prediction; therefore, prediction of classification is unknown. Future research needs to cross-validate the clusters of risk factors from this study with diverse FSW populations and settings (e.g., rural areas and places of high HIV prevalence).

Despite study limitations, this descriptive study has important public health implications. Sex work is a fluid occupation influenced by economic conditions. Due to the illegal nature of sex work and FSWs' geographical mobility, it is difficult to sustain outreach, education, and counseling programs targeted at the individual level among these mobile populations. This is all the more reason to focus on the context of HIV risk and develop structural interventions for the sex work industry. Environmental-based interventions might be more effective and feasible among FSWs since structural interventions aim to change the foundations of social structure of HIV vulnerability and socio-cultural norms of prevention rather than focus on individual behavioral change (Gupta et al., 2008). Thus, when a sex worker comes to a sex work venue where a structural intervention is being implemented, she will be exposed to HIV prevention.

Research also needs to focus on migrant FSWs' networks in terms of kinship, origin of migration, social ties, and protective resources so as to better deliver HIV prevention programs (Liao, Schensul, & Wolffers, 2003; Wong & Leung, 2008). While migrants would have easier access to health care systems in their rural hometowns than in their urban workplaces, health care systems for sexual health might not be well-established in their hometowns. To overcome inadequate health promotion resources in rural areas, effective structural HIV prevention interventions and sexual training should be integrated into existing social welfare and medical systems (Wu et al., 2007). This type of effort would facilitate a harm-reduction approach to HIV/STI prevention among FSWs. HIV prevention interventions among FSWs need to be incorporated into comprehensive reproductive health promotion programs rather than only for disease prevention. To achieve the sustainability of policy-driven effective interventions, there should be a coordinated approach among all sectors, including civil society, community-based organizations, and FSWs, to implement women's rights-based structural interventions. Otherwise, we will continue to promote and reinforce an ecology of risk that enhances FSWs' vulnerability to HIV and other STIs.

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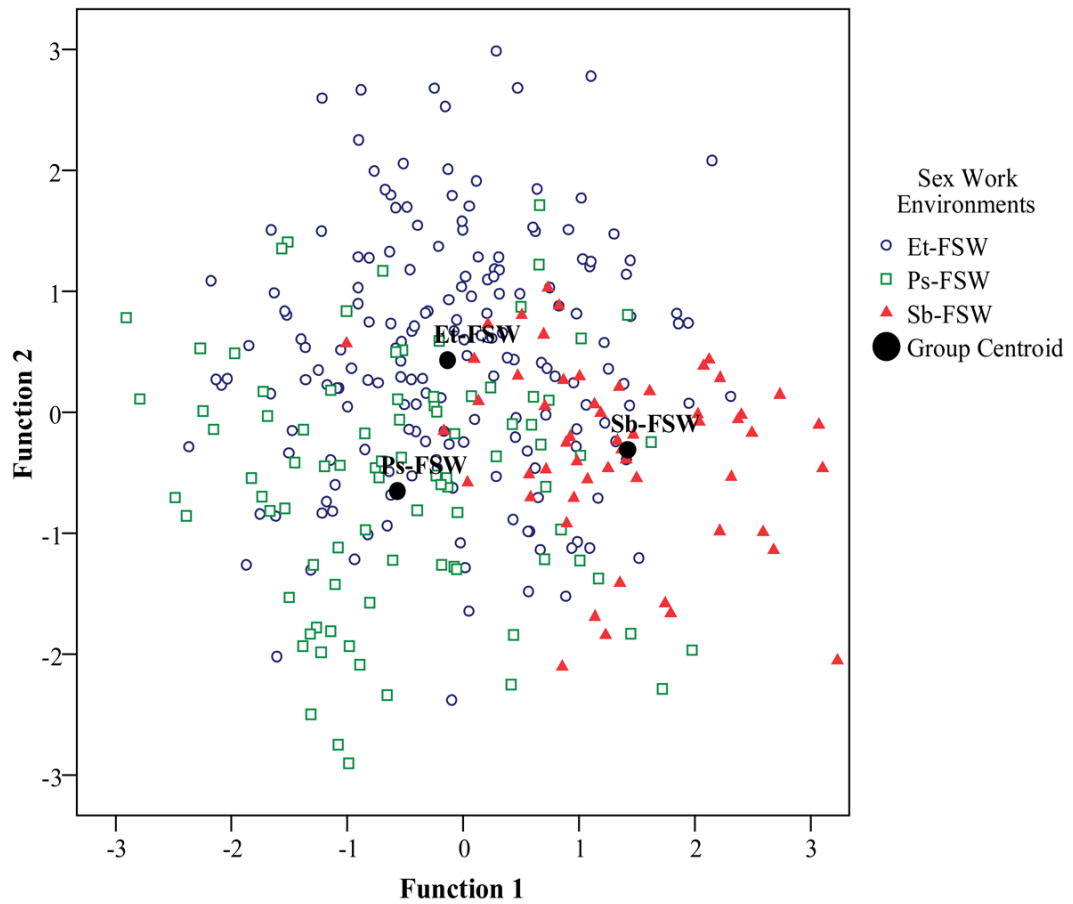


Figure 1. Discriminant Functions of Types of Sex Work Environments. Function 1 includes police arrest, no help from “mommies” for violence protection, not having been outreached by CBO, being forced to have sex, HIV knowledge, and not getting treatment for STIs in hospital. Function 2 includes verbal abuse, physical abuse, and clients' refusal to use a condom. Functions at Group Centroids are Et-FSWs ($F1 = -.137$, $F2 = .431$), Ps-FSWs ($F1 = -.568$, $F2 = -.651$), and Sb-FSWs ($F1 = 1.419$, $F2 = -.308$).

Table 1

Sociodemographic Characteristics and Sex Work Background

	Total (N=348)		Entertainment (N=191)		Personal Service (N=99)		Street-Brothel (N=58)		χ^2 / F
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)		
Age (M,SD)	29.0 (6.1)	28.4 (5.5)	27.2 (5.2)	34.2 (6.9)	30.6***				
Median	28	28	27	35					
Education					64.1***				
No school	12 (3.4)	1 (0.5)	2 (2.0)	9 (15.5)					
Primary school	71 (20.4)	24 (12.6)	22 (22.2)	25 (43.1)					
Middle school	169 (48.6)	103 (53.9)	47 (47.5)	19 (32.8)					
Completed high school	96 (27.6)	63 (33.0)	28 (28.3)	5 (8.6)					
Origin of migration					26.5***				
Rural town	236 (67.8)	110 (57.6)	75 (75.8)	51 (87.9)					
County level city	84 (24.1)	58 (30.4)	22 (22.2)	4 (6.9)					
Provincial capital	28 (8.0)	23 (12.0)	2 (2.0)	3 (5.2)					
Length of stay in Beijing					10.9*				
Less than 6 months	49 (14.1)	25 (13.1)	9 (9.1)	15 (25.9)					
6 – 12 months	63 (18.1)	30 (15.7)	22 (22.2)	11 (19.0)					
More than 1 year	236 (67.8)	136 (71.2)	68 (68.7)	32 (55.2)					
Relationship status					36.7***				
Single	105 (30.2)	61 (31.9)	38 (38.4)	6 (10.3)					
Cohabitation	70 (20.1)	45 (23.6)	17 (17.2)	8 (13.8)					
Married	90 (25.9)	36 (18.8)	22 (22.2)	32 (55.2)					
Divorced	83 (23.9)	49 (25.7)	22 (22.2)	12 (20.7)					
Have a child	180 (51.7)	87 (45.5)	45 (45.5)	48 (82.8)	26.8***				
Currently living with a child	22 (12.2)	12 (13.8)	3 (6.7)	7 (14.6)	1.74				
Length of sex work					7.2				
Less than 6 months	86 (24.7)	43 (22.5)	24 (24.2)	19 (32.8)					
6 – 12 months	89 (25.6)	42 (22.0)	31 (31.3)	16 (27.6)					

	Total (N=348)		Entertainment (N=191)		Personal Service (N=99)		Street-Brothel (N=58)		χ^2 / F
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)		
More than 1 year	173 (49.7)	106 (55.5)	44 (44.4)	23 (39.7)					
Sex work before Beijing	38 (10.8)	17 (8.8)	12 (12.5)	9 (15.2)					2.2
Monthly income ^a									48.6 ^{***}
Less than 150 USD	27 (7.8)	6 (3.1)	11 (11.1)	10 (17.2)					
150- less than 450 USD	118 (33.9)	56 (29.3)	28 (28.3)	34 (58.6)					
450- less than 750 USD	98 (28.2)	72 (37.7)	21 (21.2)	5 (8.6)					
More than 750 USD	105 (30.2)	57 (29.8)	39 (39.4)	9 (15.5)					
Sex work as "job"	200 (57.5)	125 (65.4)	60 (60.6)	15 (25.9)					29.1 ^{***}
Occupational satisfaction ^b (M,SD)	2.1 (0.8)	2.3 (0.8)	2.1 (0.5)	1.6 (0.9)					9.6 ^{***}

Note.

^a 1000 Chinese Yuan Renminbi (CNY) = 150 US Dollars (USD);

^b 4 point Likert scale: 1 = Not at all satisfied to 4 = Very much satisfied.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 2

Safer Sex Practices, Sex Work Related Harms and Help Seeking

	Total (N=348)		Entertainment (N=191)		Personal Service (N=99)		Street-Brothel (N=58)		χ^2 / F
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)		
Condom use w/ clients									
Always	237 (68.1)	130 (68.1)	68 (68.7)	39 (67.2)					
Sometimes	100 (28.7)	55 (28.8)	30 (30.3)	15 (25.9)					
Never	11 (3.2)	6 (3.1)	1 (1.0)	4 (6.9)					
Clients refused condom use	265 (76.1)	135 (70.7)	81 (81.8)	49 (84.5)	7.2*				
What to do with clients' refusal									
Refused having sex	149 (56.2)	82 (60.7)	41 (50.6)	26 (53.1)					
Persuaded condom use	85 (32.1)	44 (32.6)	27 (33.3)	14 (28.6)					
Dependent upon situation	22 (8.3)	6 (4.4)	11 (13.6)	5 (10.2)					
Didn't care	9 (3.4)	3 (2.2)	2 (2.5)	4 (8.2)					
Condom use w/ regular partners	n=290	n=159	n=84	n=47	16.7**				
Always	69 (23.8)	37 (23.3)	25 (29.8)	7 (14.9)					
Sometimes	98 (33.8)	59 (37.1)	31 (36.9)	8 (17.0)					
Never	123 (42.4)	62 (39.6)	28 (33.3)	32 (68.1)					
Sex work-related harms									
Belongings stolen	90 (25.9)	48 (25.1)	24 (24.2)	18 (31.0)	1.2				
Didn't get or less paid	199 (57.2)	119 (62.3)	55 (55.6)	25 (43.1)	6.9*				
Unwanted sexual practices	167 (48.0)	89 (46.6)	55 (55.6)	23 (39.7)	4.0				
Verbally abused	248 (71.3)	154 (80.6)	65 (65.7)	29 (50.0)	22.5***				
Physically abused	100 (28.7)	69 (36.3)	23 (23.2)	8 (13.8)	12.9**				
Forced sex	166 (47.7)	87 (45.5)	65 (65.7)	14 (24.1)	26.1***				
Asked for help									
Boss or mommy	131 (37.6)	92 (48.2)	36 (36.4)	3 (5.2)	75.4***				
Co-workers	29 (8.3)	13 (6.8)	10 (10.1)	6 (10.3)					
Dealt with problem by myself	139 (39.9)	73 (38.2)	42 (42.4)	24 (41.4)					

	Total (N=348)		Entertainment (N=191)		Personal Service (N=99)		Street-Brothel (N=58)		χ^2 / F
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)		
Didn't know what to do	18 (5.2)	3 (1.6)	2 (2.0)	13 (22.4)					
Abandoned to despair	31 (8.9)	10 (5.2)	9 (9.1)	12 (20.7)					
Arrested by police	109 (31.3)	58 (30.4)	15 (15.2)	36 (62.1)					37.6 ^{***}

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 3
 HIV Knowledge, Source of HIV Information, HIV Testing, STI Symptoms and Care, and Illicit Drug Use

	Total (N=348)		Entertainment (N=191)		Personal Service (N=99)		Street-Brothel (N=58)		χ^2 / F
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)		
HIV knowledge – total (M,SD) ^a	10.2 (2.8)	10.5 (2.5)	10.6 (2.8)	8.7 (3.1)	10.8***				
About transmission	6.8 (1.9)	6.9 (1.8)	7.1 (1.9)	5.9 (5.9)	7.8***				
About prevention	3.4 (1.3)	3.5 (1.2)	3.5 (1.4)	2.7 (1.5)	7.5**				
Sources of HIV information									
Newspaper/magazine	182 (52.3)	104 (54.5)	58 (58.6)	20 (34.5)	9.3**				
Internet	101 (29.0)	61 (31.9)	35 (35.4)	5 (8.6)	14.4***				
Community health outreach	148 (42.5)	72 (37.7)	64 (64.6)	12 (20.7)	33.0***				
Co-workers	105 (30.2)	58 (30.4)	34 (34.3)	13 (22.4)	2.5				
Worry about HIV infection (M,SD)	2.6 (1.1)	2.6 (1.1)	2.5 (1.2)	2.8 (1.1)	1.3				
Very much worried	97 (27.9)	49 (25.7)	27 (37.4)	21 (36.2)					
Somewhat worried	105 (30.2)	63 (33.0)	25 (25.3)	17 (29.3)					
Little worried	62 (17.8)	32 (16.8)	21 (21.2)	9 (15.5)					
Not at all	84 (24.1)	47 (24.6)	26 (26.3)	11 (19.0)					
HIV testing last year	75 (21.6)	35 (18.3)	33 (33.3)	7 (12.1)	12.4**				
STI symptoms last year	275 (79.0)	147 (77.0)	88 (88.9)	40 (69.0)	9.8**				
Discomfort in genital area	128 (36.8)	63 (33.0)	37 (37.4)	28 (48.3)					
Vaginal discharge	181 (52.0)	103 (53.9)	62 (62.6)	16 (27.6)					
Vaginal dryness and smell	70 (20.1)	57 (29.8)	32 (32.3)	16 (27.6)					
Lower abdominal pain	105 (30.2)	35 (18.3)	23 (23.2)	12 (20.7)					
Painful urination	53 (15.2)	27 (14.1)	14 (14.1)	12 (20.7)					
Care for STI symptoms above	n=275	n=147	n=88	n=40	26.4***				
Treated at registered hospital	116 (42.2)	66 (44.9)	43 (48.9)	7 (17.5)					
Treated at unregistered clinic	23 (8.4)	6 (4.1)	7 (8.0)	10 (25.0)					
Bought medicines	119 (43.3)	67 (45.6)	31 (35.2)	21 (52.5)					
Ignored	17 (6.2)	8 (5.4)	7 (8.0)	2 (5.0)					

	Total (N=348)		Entertainment (N=191)		Personal Service (N=99)		Street-Brothel (N=58)		χ^2 / F
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)		
Illicit drug use	28 (8.0)	20 (10.5)	7 (7.1)	1 (1.7)					ns

Note.

^aPossible highest scores are 14 for total, 9 for transmission, and 5 for prevention;

^b 4 point Likert scale: (1 = Not all worry to 4 = Very much worry).

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 4

Variables Associated with Discriminant Functions among Three Sex Work Environments

	Function 1	Function 2
Arrested by Police	.517 *	.114
No help from mommy for violence protection	.409 *	-.399
Not been contacted with CBO prevention outreach	.405 *	.366
Forced to have sex	-.394 *	-.228
HIV Knowledge	-.369 *	.104
Not treated for STI at hospital	.334 *	.045
Had a STI symptom last year	-.216	-.187
Verbal abuse	-.251	.415 *
Physical abuse	-.164	.332 *
Client's refusal to use condom	.079	.304 *
Not been HIV tested	.220	.254
Functions at Group Centroids		
Et-FSW	-.137	.431
Ps-FSW	-.568	-.651
Sb-FSW	1.419	-.308

Note. Function structure coefficients > .30 are in boldface.

* denotes the largest absolute correlations between each variable and any discriminant function.