

Pro-Alcohol-Use Social Environment and Alcohol Use among Female Sex Workers in China: Beyond the Effects of Serving Alcohol

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Abstract

The current study was designed to fill the literature gap by examining the roles of the pro-alcohol social environment in alcohol use among female sex workers (FSWs) in China. In this study, a total of 1,022 FSWs were recruited through community outreach from both alcohol-serving and nonalcohol-serving commercial sex venues in Guangxi, China. The pro-alcohol social environment was measured in four areas: institutional norms, institutional practices, risk perceptions and peer norms. The measures of the pro-alcohol social environment were significantly associated with the venues' alcohol-serving practices, with FSWs from those venues reporting a more positive pro-alcohol social environment

than their counterparts from nonalcohol-serving venues. However, these pro-alcohol social environment measures were independently predictive of alcohol use after controlling for venues' alcohol-serving practices and other demographic characteristics. Public health interventions need to target environmental–structural factors through altering pro-alcohol-use social norms and practices at both institutional and individual levels among FSWs in China.

Introduction

Alcohol use is a context-specific and prevalent behaviour (Li et al. 2010). Generally, alcohol use was associated with personal traits, social contexts and physical milieus (Ahern et al. 2008; Beck et al. 2008; Gruenewald et al. 2002). Personal traits include both demographic characteristics (e.g., sex, ethnicity, socio-economic status, education) and personal characteristics (e.g., psychosocial status, attitude toward alcoholism) (Ahern et al. 2008; Beck et al. 2008; Brennan et al. 1986; Gruenewald et al. 2002). Social context refers to individual, situational and motivational characteristics that influence drinking behaviours (e.g., peer influences and sex seeking) as well as social/environmental correlates (e.g., drinking norms, alcohol-use-related policies) (Ahern et al. 2008; Beck et al. 2008). In addition, availability of alcohol may shape drinking practices and increase incidence, prevalence of alcohol use and other alcohol-use-related problems within communities (Stockwell and Gruenewald 2001).

Alcohol use has been considered an integral part of commercial sex, involving both sex workers and their clients (Kumar 2003; Wojcicki 2002). Both female sex workers (FSWs) and their clients use alcohol as a means to facilitate sexual trades (Li et al. 2010a). Alcohol use among FSWs and clients during their sexual encounters is widespread worldwide, with 81.2% to 100% of FSWs ever using alcohol, and about three quarters of FSWs using alcohol during the past month (Li et al. 2010a). Alcohol use among clients of FSWs is also prevalent. A study conducted in Thailand reported that 76% of clients drank during most commercial sex encounters (VanLandingham et al. 1993).

Risk of alcohol use would be elevated in certain situations or contexts, such as taverns and nightclubs (Wojcicki 2002; World Health Organization [WHO] 2008). Contextual factors are particularly critical to alcohol use in commercial sex (Li et al. 2010a). Existing studies have confirmed that FSWs who worked in alcohol-serving venues (e.g., nightclubs) drank more compared to their counterparts from nonalcohol-serving venues. For instance, de Graaf et al. (1995) reported that FSWs who worked in clubs drank a higher level of alcohol than those working on the street, in brothels and in homes. In Kenya, alcohol problems were more prevalent among FSWs working in nightclubs and bars (Yadav et al. 2005).

Excessive alcohol consumption has also been confirmed as one of the most influential behavioural risk factors for negative health outcomes, including both physical and mental health problems (Li et al. 2010a; WHO 2008). For instance, in a study conducted by Potterat et al. (2004), both acute and chronic alcohol use were among the leading causes of death among FSWs. A review of global literature on alcohol use among FSWs and their clients documented a significant association between alcohol use and mental health problems, including depression, suicidal ideation and post-traumatic stress disorders (PTSD) (Li et al. 2010a).

Despite a growing number of studies on contexts of alcohol use and its negative effect on sexual and other health risks among FSWs, there are some limitations in the existing literature. First, most studies have looked only at the physical environment or physical factors (e.g., whether the venues serve alcohol) that were associated with alcohol-use problems among FSWs (Ao et al. 2011; Wojcicki 2002). Data are scarce regarding the role of the social environment characterized by pro-alcohol use among this at-risk population's alcohol use. We defined this type of environment in the current study as one in which certain conditions may prompt people's alcohol use in their living and working contexts. Second, most studies used some general, simple and often non-standardized measures of alcohol use, such as lifetime and current alcohol use, alcohol use in the past week, or number of drinks per day (Kalichman et al. 2007; Li et al. 2010a). These measures make it difficult to compare

findings across studies. Finally, most studies regarding alcohol use among FSWs were conducted in Western or African countries (Ao et al. 2011; Chersich et al. 2007; de Graaf et al. 1995; Morojele et al. 2006). Limited studies have been conducted in Asian countries including China, where both alcohol use and commercial sex are prevalent (Hong et al. 2007; Morisky et al. 2010).

As in other Asian countries, commercial sex in China is primarily establishment-based. An estimated 10 million FSWs in China operate in a complex commercial sex hierarchy during the first decade of the 21st century (Hong and Li 2008; Huang et al. 2004). Women who work in the higher-level sex venues (nightclubs) are usually able to charge more for their services and work in more favourable places, while women working at the bottom of the hierarchy (the streets) usually earn less pay and face considerably higher risks, including sexually transmitted diseases (STD)/HIV infections (Roger et al. 2002). Under the supervision and arrangement of the gatekeepers (managers or owners of the venues, as well as “mammies, or pimps”), FSWs typically encounter their clients in either entertainment establishments (e.g., karaoke [KTV], nightclubs, dance halls, discos and bars) or personal service sectors (e.g., saunas, hair salons, massage parlours, barbershops, restaurants and mini-hotels) (Fang et al. 2007; Yang et al. 2005). The Chinese government considers commercial sex one of the “social evils” and periodically conducts fierce crackdowns on the sex industry (Roger et al. 1996). FSWs in China face strong discrimination and stigmatization from society. Both FSWs and clients are subject to fines and incarceration if arrested by the police (WHO 2001). Because of the nature of their work, this working cohort is highly mobile and is often engaged in a series of health-risk behaviours, including substance abuse and risky sexual behaviours (Fang et al. 2007; Roger et al. 2002). Although female drinking is strongly condemned in traditional Chinese culture, limited studies have documented the high prevalence of alcohol use among FSWs in China. One study indicated that one third of FSWs had become intoxicated at least once a month in the last six months (Hong et al. 2007).

Despite the general recognition that alcohol availability at work may contribute to higher alcohol-use problems among FSWs, to date few studies have investigated how factors embedding within pro-alcohol use environment (such as institutional norms and practices, risk perceptions and peer norms) affect drinking behaviours among FSWs in China. Therefore, we conducted the current study with the following research questions: (1) What is the prevalence of alcohol use among the FSWs in China? (2) Do measures of the pro-alcohol-use social environment independently contribute to alcohol-use problems among FSWs beyond the alcohol-serving practices of the venues?

Method

Study Site

The current study was conducted in 2008–2009 in two tourist cities (Beihai and Guilin) of the Guangxi Zhuang Autonomous Region (Guangxi). Guangxi is located in southwest China and is one of the five autonomous and multi-ethnic administrative regions in China. Because of Guangxi’s central location, it has historically been a transport hub for trade, commerce and tourism in southwest China. As two of the most famous tourism spots, attracting 4–10 million tourists to each city every year, Beihai and Guilin were selected as our study sites. Beihai is located in the southern coast of Guangxi, with a population of 1.36 million including 550,000 urban residents. Guilin is situated in northeast Guangxi, with a population of 1.34 million including an urban population of 620,000. Because of the booming economy and lucrative tourism industry in Guilin and Beihai, commercial sex flourishes in both cities. An estimated 2000 FSWs work in more than 150 commercial sex venues in each city (Guangxi Center for Disease Control and Prevention [CDC] 2009).

Recruitment and Data Collection Procedure

Prior to data collection, the research team conducted ethnographic mapping to identify commercial sex venues in sampling areas. Identified sexual venues included entertainment establishments (e.g., KTV, nightclubs and bars), personal service sectors (e.g., saunas, hair salons, massage parlours, road-side restaurants and mini-hotels) and the street. Upon the completion of the ethnographic mapping, owners/managers or other gatekeepers of these venues were contacted for their permission

to conduct research in their premises. Once we obtained permission from the gatekeepers, several trained outreach health workers from the local CDC approached the women in these establishments to ask for their participation. Eligible participants were (a) women who worked in these establishments, (b) who did not deny involvement in commercial sex, and (c) who were willing to provide written informed consent to participate in the study. An estimate of 25% of the venues and 30% of the women who were approached refused to participate. A final sample of 1,022 women were recruited from 60 entertainment establishments and completed a self-administered questionnaire. Among the participants, 983 provided valid responses on alcohol-use-related measures.

The survey was conducted in separate rooms or private spaces in the venues or sites where participants were recruited. During the survey, only the interviewer, who provided assistance when necessary, was allowed to stay with the participant. For a small number of women (less than 5%) with a low level of literacy, interviewers read questions to participants. The questionnaire took about 45 minutes to complete. Each participant received a small gift with a cash value equivalent to 4.50 US dollars. The study protocol was approved by the Institutional Review Boards at Wayne State University in the United States and Beijing Normal University in China.

Measures

Demographic information: Participants were asked to provide information on their age, ethnicity, residency (rural or urban household registration), educational attainment, marital status, length of working in the city (in months), working venue and monthly income (in Chinese currency, *yuan*). For the purpose of data analysis in the current study, we categorized ethnicity into Han or non-Han, educational attainment into no more than middle school or at least middle school, marital status into ever married or never married, and home residency into rural or urban. Venues were classified as alcohol-serving or nonalcohol-serving, based on whether the serving of alcohol was part of routine business practices. Alcohol-serving venues in the current study included restaurants, bars, nightclubs and KTVs; nonalcohol-serving venues included mini-hotels, streets, massage parlours, hair salons and saunas.

Pro-alcohol-use social environment: A scale to measure various factors in social environments characterized by pro-alcohol use was developed based on findings in the existing literature regarding social and environmental contexts of alcohol use (Li et al. 2010a; Shuper et al. 2010). The scale consists of four domains with a total of 12 items. The first domain (three items, Cronbach alpha = 0.6) assesses the institutional norms regarding alcohol use with three dichotomous items (clients ask you to drink, mammy [pimp] or other gatekeepers require you drink, and mammy or other gatekeepers have a quota on alcohol sales for you at work). The second domain (Cronbach alpha = 0.6) evaluates institutional practices related to alcohol use with three dichotomous items (part of your work is to drink with clients, FSWs will gain commission from the sales of alcohol, and usually drink at work). The third domain (Cronbach alpha = 0.7) measures the risk perceptions among FSWs with three dichotomous questions (drinking will make clients happier, you will make more money if you drink and clients will tip more if you drink with them). The fourth domain (Cronbach alpha = 0.8) assesses peer norms/influences by asking how many of the FSWs they knew drank alcohol, got intoxicated or drank with clients, on a 5-point scale (none, some, about half of them, most, almost all of them). For the purpose of data analysis in the current study, responses were dichotomized into two groups: "less than half of them" versus "at least half of them." A composite score was calculated for each of these four subscales of the "pro-alcohol-use social environment" by summing up all positive responses to items in each subscale, with a higher composite score indicating a more positive measure of the pro-alcohol social environment. The Cronbach alpha for the pro-alcohol-use social environment was 0.9 for the current study sample.

Alcohol use: Women's alcohol use in the past year was measured by the Alcohol Use Disorders Identification Test (AUDIT) (Babor et al. 2001; Saunders et al. 1993). The AUDIT has been developed from a WHO six-country collaborative project with ten items covering three domains of drinking behaviors (hazardous alcohol use, dependence symptoms and harmful alcohol use). The AUDIT is a widely used, standardized screening instrument to assess individuals' hazardous as well

as harmful alcohol consumption and has been validated in the Chinese culture (Gao 2000; Li et al. 2003). The range of AUDIT scores is from 0 to 40, with a higher score indicating more severe alcohol-use problems. The Cronbach's alpha for the ten AUDIT items was 0.8 for the current study sample. To create a categorical measure of alcohol-use problems in the current study, we employed a scoring system with four risk levels of alcohol consumption: level one refers to "low-risk," with AUDIT scores 0–7; level two refers to "risk drinking," with AUDIT scores 8–15; level three refers to "heavy drinking" with AUDIT scores 16–19; and level four refers to "hazardous drinking," with AUDIT scores 20–40 (Babor et al. 2001). For the purpose of data analysis, we further dichotomized AUDIT scores by a cut-off point of eight (Babor et al. 2001; Steinbauer et al. 1998) to separate women who had problematic alcohol use (AUDIT scores ≥ 8) versus those who did not (AUDIT scores < 8).

Data Analysis

First, a chi-square (for categorical variables) and an independent t-test (for continuous variables) were employed to assess the differences in participants' demographic characteristics, alcohol-use behaviours, and measures of the pro-alcohol-use social environment between the alcohol-serving venues and nonalcohol-serving venues (Tables 1 and 2). Second, a chi-square test was employed to assess the association between various dichotomous measures of the pro-alcohol-use social environment and four risk levels of alcohol use (as determined by the ranges of AUDIT scores) (Table 3). Third, a multivariate binary logistic regression model was employed to further examine the independent association between alcohol use and the social environment characterized by pro-alcohol use. The dichotomized AUDIT scores served as the dependent variable in the regression model. The independent variables included composite scores of four subscales of measures of the pro-alcohol-use social environment (institutional norms, institutional practices, risk perceptions and peer norms), alcohol-serving practices of the venues and key demographics (age, education, income and marital status). Adjusted odd ratios (aORs) for the logistic regression model and their 95% confidence intervals (95% CIs) were used to depict independent relationships between dependent and independent variables (Table 4). All statistical analyses were performed using SAS 9.2.

Results

Key Demographic Characteristics by Alcohol-Serving Practices

As shown in Table 1, the average age of the participants ($N = 983$) was 24.4 ($SD = 6.1$), and most of them (62.7%) had less than a middle school education. Most were of Han ethnicity (84.0%), more than half were from rural areas (55.2%) and 73.8% were never married. They had worked in the cities on average of 44.0 (median = 36.0; $IQR = 42.0$) months, and earned 2,720 (median = 2,000; $IQR = 2,000$) yuan (approximately 380 US dollars at the time of survey) a month. About 60% (588/983) of FSWs worked in venues that served alcohol (restaurants, bars, nightclubs, KTVs). FSWs who worked in alcohol-serving venues were more likely to be younger, never married, have a higher educational attainment and earn lower incomes ($p < .05$).

Pro-Alcohol-Use Social Environment by Alcohol Serving Practice

Table 2 showed associations between measures of the pro-alcohol-use social environment and alcohol-serving practices of the venues. For items in the institutional norms subscale, 65.2% of FSWs had ever been asked by clients to drink, and 89.8% worked in alcohol-serving venues compared to 27.7% working in nonalcohol-serving venues ($p < .0001$). Nearly one half (46.3%) of the FSWs reported being required to drink alcohol by their mummies or other gatekeepers, and 11.0% reported that their mummies or other gatekeepers had a quota for them on alcohol sales at work. In the institutional practice subscale, nearly half of participants reported that they drank during working time, or part of their work was to drink with clients. Significantly more FSWs who worked in alcohol-serving venues than those working in nonalcohol-serving venues (17.9% vs. 8.6%; $p < .0001$) reported that they would gain a commission from sales of alcohol. On the risk perception subscale, nearly one third of FSWs believed that they could make more money by

drinking, and 55.4% believed that clients would tip them more for drinking with them. Similarly, more than half of FSWs reported that drinking would make their clients happier. All items on the peer norm scale in the alcohol-serving venues had statistically significantly higher rates than those in the nonalcohol-serving venues ($p < .0001$). About 60.4% of FSWs reported that at least half of FSWs they knew drank alcohol at work, one third reported at least half of FSWs they knew became intoxicated, and half indicated that at least half of FSWs they knew also drank with clients during work. The mean AUDIT score was 9.1 (SD = 7.4) for the study sample. FSWs who worked in alcohol-serving venues had a significantly higher AUDIT score compared to FSWs who worked in nonalcohol-serving venues (13.1 vs. 3.9; $p < .0001$).

Table 1. Demographic information among FSWs by whether serving alcohol at work

	Alcohol-Serving Venue ^a		
	Total	Yes	No
N (%)	983 (100.0%)	588 (59.8%)	395 (40.2%)
Age (Mean, SD)	24.4 (6.1)	22.7(4.6)	27.0 (7.1)****
Ethnicity			
Han	84.0%	83.2%	85.3%
Non-Han	16.0%	16.8%	14.7%
Residency			
Urban	44.8%	47.4%	40.9%
Rural	55.2%	52.6%	59.1%
Marital status			
Never	73.8%	81.3%	62.5%****
Ever	26.2%	18.7%	37.5%
Education			
≤Middle school	62.7%	58.2%	69.4%****
>Middle school	37.3%	41.8%	30.6%
Income (1,000 yuan ^b , mean, SD)	2.7 (2.4)	2.5 (1.6)	3.1 (3.1)****
Length of working (in months, mean, median, IQR)	44.0 (36.0, 42.0)	42.1 (36.0, 42.0)	46.7 (36.0, 44.0)

FSWs = female sex workers; SD = standard deviation; IQR = interquartile range; KTVs = karaoke.

^aAlcohol-serving venues in the current study included restaurants, bars, nightclubs and KTVs; nonalcohol-serving venues included mini-hotels, streets, massage parlours, hair salons and saunas.

^b1,000 yuan is equivalent to 153.85 US dollars.

* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

Pro-Alcohol-Use Social Environment and Alcohol Use

As shown in Table 3, all measures of the pro-alcohol-use social environment significantly differed by the four risk levels of alcohol use, as determined by the AUDIT scores ($p < .0001$). For instance, among FSWs who reported drinking at work, only 18.0% were in the low-risk category, but 67.8% fell in the risk drinking category, 71.5% fell in the heavy-drinking category, and 77.8% were considered as

hazardous-drinkers ($p < .0001$). The same pattern has been seen in all other items, with statistically significant associations between these measures and risk levels of alcohol-use problems ($p < .0001$).

Table 2. Pro-alcohol-use social environment among FSWs by whether serving alcohol at work

		Alcohol-Serving Venue ^a		
		Total	Yes	No
N (%)		983 (100.0%)	588 (59.8%)	395 (40.2%)
Pro-alcohol-use social environment				
Institutional norms	Clients ask me to drink	65.2%	89.8%	27.7%****
	Mammies require the FSWs to drink alcohol	46.3%	68.6%	12.5%****
	Mammies have the quota on alcohol for the FSWs	11.0%	14.6%	5.6%****
Institutional practices	Part of my work is to drink with clients	57.4%	90.3%	8.4%****
	Drinking during working time	47.7%	76.8%	1.9%****
	FSWs will gain a percentage from the sales of alcohol	14.1%	17.9%	8.6%****
Risk perceptions	Drink will make clients happier	54.3%	76.8%	20.0%****
	Making more money by drinking	32.4%	45.0%	13.2%****
	Clients will give the FSWs tips for drinking with them	55.4%	75.3%	25.8%****
Peer norms	At least half of the FSWs they know...			
	Drink alcohol	60.4%	83.0%	26.5%****
	Become intoxicated	32.5%	49.0%	7.8%****
	Drink with other clients	51.3%	79.7%	9.0%****
AUDIT (score) (mean, SD)		9.1 (7.4)	13.1 (6.3)	3.9 (4.7)****

FSWs = female sex workers; SD = standard deviation; KTVs = karaoke.

^aAlcohol-serving venues in the current study included restaurants, bars, nightclubs, and KTVs; nonalcohol-serving venues included mini-hotels, streets, massage parlours, hair salons and saunas.

* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

As Table 4 depicts, when accounting for the alcohol-serving practice and key demographic characteristics (age, marital status, income and education), problematic alcohol use remained significantly associated with measures of the pro-alcohol-use social environment, including institutional practices (aOR = 1.40; 95% CI = 1.06, 1.85; $p = .02$), risk perceptions (aOR = 1.35; 95% CI = 1.05, 1.74; $p = .02$) and peer norms (aOR = 1.26; 95% CI = 1.02, 1.56; $p = .04$). Institutional norms showed a marginally statistically significant association with alcohol use in the model (aOR = 1.28; 95% CI = 1.00, 1.65; $p = .06$). In addition, women who worked in alcohol-serving venues were six times more likely to report problematic alcohol use (Table 4).

Discussion

Our study is one of the first attempts to examine the association between factors of working environment and alcohol use among FSWs in China. Our data indicate that the measures of the pro-alcohol social environment had good validity, as they were significantly associated with both the

Table 3. The pro-alcohol-use social environment by AUDIT among FSWs

		Risk Levels by AUDIT Score				
		Total	0–7	8–15	16–19	20–40
N (%)		983 (100.0%)	438 (44.6%)	332 (33.8%)	123 (12.5%)	90 (9.2%)
Pro-alcohol-use social environment						
Institutional norms	Clients ask me to drink	65.2%	38.7%	83.7%	87.8%	89.8%****
	Mammies require the FSWs to drink alcohol	46.3%	20.0%	62.8%	65.8%	83.3%****
	Mammies have the quota on alcohol for the FSWs	11.0%	6.5%	12.3%	12.2%	23.3%****
Institutional practices	Part of my work is to drink with clients	57.4%	24.7%	79.2%	83.7%	90.0%****
	Drinking during working time	47.7%	18.0%	67.8%	71.5%	77.8%****
	FSWs will gain a percentage from the sales of alcohol	14.1%	8.6%	17.2%	17.1%	22.2%****
Risk perceptions	Drink will make clients happier	54.3%	27.9%	72.8%	74.0%	83.3%****
	Making more money by drinking	32.4%	14.8%	40.2%	54.1%	57.3%****
	Clients will give the FSWs tips for drinking with them	55.4%	67.8%	82.9%	77.8%	53.5%****
Peer norms	At least half of the FSWs they know...					
	Drink alcohol	60.4%	33.0%	78.5%	85.4%	91.1%****
	Become intoxicated	32.5%	13.2%	41.9%	51.6%	65.9%****
	Drink with other clients	51.3%	21.6%	69.7%	80.5%	87.6%****

FSWs = female sex workers.

* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

alcohol-serving practices of the venues and the various risk levels of alcohol use among FSWs. The finding that alcohol use was significantly associated with the alcohol-serving practices of commercial sex venues is consistent with global literature (Agha and Nchima 2004; Li et al. 2010a; Yadav et al. 2005). Compared to women in other occupations as well as the general population of China (Tomasson et al. 2004; Xiang et al. 2009), FSWs in the current study had much higher rates of alcohol use. Our findings also confirm the importance of a number of social environmental correlates that were related to FSWs' drinking behaviours. These findings indicate alcohol use is a major health concern for FSWs, and a call for effective interventions should go beyond individual FSWs to address structural-level determinants of alcohol use among FSWs.

The data in the current study suggested that clients play an important role in FSWs' drinking behaviours. For instance, direct pressure from clients is one of the most frequently reported reasons (65.2%) for alcohol use among FSWs in the current study. Similar results were also found in studies conducted in both developed and developing countries (Gossop et al. 1995; Nishigaya 2002). A study conducted in Cambodia showed clients played an important role in both physically and monetarily forcing FSWs to use alcohol during their sexual practice (Nishigaya 2002). Such findings

Table 4. Multivariate regression on association between the pro-alcohol-use social environment and alcohol use

	Problematic Alcohol Use ^a (aOR, 95% CIs)	P-values
Alcohol-serving venues ^b	5.96 (3.49, 10.17)	.00
Pro-alcohol-use social environment		
Institutional norms	1.28 (1.00, 1.65)	.06
Institutional practices	1.40 (1.06, 1.85)	.02
Risk perceptions	1.35 (1.05, 1.74)	.02
Peer norms	1.26 (1.02, 1.56)	.04
Demographic information		
Age	1.00 (0.97, 1.05)	.77
Marital status	0.99 (0.59, 1.65)	.95
Income	1.03 (0.96, 1.11)	.46
Education	1.19 (0.83, 1.70)	.35

^aOR = adjusted odds ratio; CI = confidence interval; KTVs = karaoke.

^bProblematic alcohol use in the current study employed a cut-off point of 8 of AUDIT scores: AUDIT score <8 points was non-problematic alcohol use; AUDIT score ≥8 points was problematic alcohol use.

^cAlcohol-serving venues in the current study included restaurants, bars, nightclubs and KTVs; nonalcohol-serving venues included mini-hotels, streets, massage parlours, hair salons and saunas.

suggested that the interventions involving clients of FSWs could be an effective strategy in reducing alcohol-use-associated commercial sex.

Furthermore, our data revealed gatekeepers (e.g., mammy, manager, and owner) who supervise FSWs at commercial sex venues played a critical role in FSWs' drinking behaviours. This finding is consistent with existing studies indicating influential impacts of gatekeepers on venue-based FSWs' sexual behaviours and alcohol use (Li et al. 2010b; Hong et al. 2008; Morisky et al. 2006; Yang et al. 2005). In the current study, nearly half of the FSWs reported drinking alcohol at the request of their mummies or other gatekeepers. As the key persons who provide employment opportunities, business connections and possibly safety and protection for FSWs, the mammy or other gatekeepers may have a direct impact on alcohol use among FSWs, especially at venues where alcohol sales are a significant source of income for the venues or key stakeholders (e.g., mammy, FSWs). In addition, given the high mobility of FSWs, training for gatekeepers may be a feasible and sustainable strategy for reducing alcohol-use problems among this high-risk population. Therefore, interventions targeting gatekeepers could be critical for changing drinking norms as well as establishing an alcohol risk reduction working environment for FSWs.

Our data revealed that both institutional norms and institutional practices are intricately related to alcohol-use problems in venues where FSWs work. More than half of the FSWs reported that part of their work was to drink with clients, or that they could drink at work. Alcohol use has become part of the routine of daily work and an occupational risk factor for some FSWs. Such institutional norms and practices have shaped current alcohol consumption patterns among FSWs in China. Consistent with global literature regarding the positive effect of peer norms on alcohol use among general populations (Brennan et al. 1986), our data also showed that peer norms play a considerable role in alcohol use among FSWs.

In the current study, some FSWs in the nonalcohol-serving venues reported on-job alcohol use. For instance, 9.4% (25/267) of FSWs who work in saunas reported their venues were served alcohol. There are two possible explanations for this finding. First, some nonalcohol-serving venues in fact did serve alcohol without permits or allowed clients to bring alcoholic beverages to the venues. Second, some FSWs recruited from nonalcohol-serving venues actually worked in multiple venues that included alcohol-serving venues. Therefore, their reporting of on-the-job alcohol use might not necessarily reflect only the alcohol use practices of the venues where they were recruited. In addition, our findings showed that women who worked in nonalcohol-serving venues earned significantly higher incomes than those who worked in alcohol-serving venues. It is possible that the job description of FSWs who worked in alcohol-serving venues tended to involve more activities related to drinking other than having sex with clients, whereas women who worked in nonalcohol-serving venues tended to have commercial sex as their primary business focus. As a result, income disparities between two types of venues have been detected.

There are several limitations in the current study. First, our study was conducted in Guangxi, a multi-ethnic region of China. The findings may not be generalizable to other areas of China. Second, the nature of cross-sectional design prevents us from making a causal conclusion regarding the association between the pro-alcohol-use social environment and alcohol use among the FSWs. Future studies with a longitudinal design are needed to examine the temporal relationships. Third, the current study may be subject to self-selection bias because FSWs who drank may choose to work at alcohol-serving venues, and the presence of a pro-alcohol-use social environment may not shape their drinking behaviours. However, for most FSWs, they may not have much “choosing power” in terms of selecting work places, given their stigmatized social status and the illegality of commercial sex in China. Fourth, due to the illegal status and highly stigmatized and marginalized nature of sex work in China, our data were subject to volunteer bias and socially desirable reporting. Fifth, the sample in the current study was recruited through venue-based sampling, which might have resulted in under-sampling FSWs who work on the streets or “freelance” (less than 5%). Finally, some measures of the pro-alcohol social environment had relatively low consistency estimates.

Despite these limitations, the findings of the current study have several important implications for future alcohol-use risk reduction interventions among FSWs in China and other developing countries. First, the high rates of alcohol use among FSWs call for effective alcohol risk reduction efforts among this at-risk population, especially among FSWs who work in alcohol-serving venues. Work-related alcohol use can be considered as one of the occupational hazards for FSWs. Alcohol-use screening protocols should be incorporated with existing healthcare practices in order to address such a prevalent and severe problem among FSWs. Accessible and affordable alcohol-risk reduction health services are necessary for this at-risk and marginalized population. Second, future health promotion efforts should focus on changing social norms as well as reducing peer influence. Interventions that change social norms to reduce alcohol consumption among vulnerable populations have proved to be effective in the United States and other Western countries (Borsari and Carey 2001), and these interventions can be culturally adapted for FSWs in China and other developing countries. In addition, considering alcohol-use problems among FSWs varied with different demographic characteristics (e.g., age, types of working environments, residency), these interventions need to be tailored to meet the unique needs of different subgroups of FSWs (Hong et al. 2008). Third, alcohol risk reduction intervention programs also need to take FSWs’ socially marginalized status into consideration. If women cannot afford to lose their clients by refusing to drink alcohol, or they are under threat of violence, they may have no choice in deciding whether to drink with their clients or not. Without taking the power inequality associated with commercial sex into consideration, alcohol risk reduction programs among FSWs may not be effective. Empowerment for these socially marginalized women would be a promising strategy. Fourth, considering social contexts of commercial sex in China, a venue-based multi-level alcohol risk reduction intervention approach may work effectively. Our data revealed multiple factors of social environment that may shape FSWs’ drinking behaviours, such as availability of alcohol, pressure from gatekeepers, clients’

demands, peer influence and social norms of drinking. Furthermore, these factors interacted in venues where FSWs work. Such findings suggest that effective interventions should incorporate physical, social and policy elements. Interventions addressing individual levels (personal knowledge, risk perceptions, refusal and negotiation skills) as well as environmental and structural levels (discouraging alcohol use in these establishments, training gatekeepers to communicate with their employees regarding their risks, and delivering prevention messages to both FSWs and their clients in the venues) targeting all stakeholders including FSWs, gatekeepers and clients in these venues can create a supportive social and working environment for the vulnerable group and reduce their alcohol use as well as related health problems.

In summary, our findings underscore the role of the pro-alcohol-use social environment in alcohol-use problems among FSWs in China. Culturally appropriate venue-based multi-level alcohol risk reduction interventions are urgently needed to target both individual alcohol use and the pro-alcohol-use social environment associated with commercial sex. Future efforts to establish an alcohol risk reduction environment will help FSWs to reduce their alcohol use as well as related health problems.

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