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Alcohol Consumption in Relation to Work Environment and Key Sociodemographic Characteristics Among Female Sex Workers in China

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Abstract

The study explores the variation in pattern of alcohol use and related risk behaviors by types of sex work environments and sociodemographic characteristics among female sex workers (FSWs) in China. Data were collected from 1,022 FSWs in Guangxi, China, through a self-administered questionnaire. Chi-square and analysis of variance (ANOVA) were used to assess the variations. Results showed that younger FSWs were more susceptible than older FSWs to nearly all the risk drinking behaviors. FSWs of non-Han ethnicity as compared with those of Han ethnicity were more at risk of drinking large amounts of alcohol and having sex under the influence of alcohol. FSWs in entertainment establishments were most likely to have all kinds of risk drinking behaviors. Street-based FSWs were least likely to drink alcohol but more or equally likely to engage in alcohol-related sexual risk behaviors. The study highlights a need to develop tailored alcohol risk reduction intervention that takes into consideration these differences.

RÉSUMÉ

L'étude explore la variation dans le modèle de consommation d'alcool et les comportements à risque liés par les types de milieux de travail du sexe et sociaux caractéristiques démographiques chez les travailleurs du sexe en Chine. Les données ont été recueillies auprès de 1.022 travailleuses du sexe dans le Guangxi, en Chine par le biais d'un questionnaire auto-administré. Chi-carré et analyse de la variance ont été utilisés pour évaluer les variations Les résultats ont montré que les jeunes travailleurs du sexe étaient plus susceptibles que les travailleurs âgés du sexe à presque tous les comportements de consommation à risque. Les travailleuses du sexe de non-Han ethnique par rapport à ceux de Han ethnique étaient plus à risque de boire de grandes quantités d'alcool et avoir

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Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

des relations sexuelles sous l'influence de l'alcool. Les travailleuses du sexe dans les établissements de divertissement étaient les plus susceptibles d'avoir toutes sortes de comportements de consommation à risque. Basés sur les travailleuses du sexe étaient les moins susceptibles de boire de l'alcool, mais aussi plus ou susceptibles de s'engager dans liés à l'alcool comportements sexuels à risque. L'étude met en évidence un besoin de développer sur mesure d'intervention la réduction d'alcool risque qui prend en considération ces différences.

RESUMEN

El estudio analiza la variación en el patrón de consumo de alcohol y comportamientos de riesgo por tipos de ambiente de trabajo profesionales del sexo y las características sociodemográficas entre trabajadoras sexuales (TS) en China. Se recogieron datos de 1.022 trabajadoras sexuales en Guangxi, China, utilizando un cuestionario auto-administrado. Chi-cuadrado y ANOVA se utilizaron para evaluar las variaciones. Los resultados mostraron que las trabajadoras sexuales más jóvenes son más susceptibles que los mayores TS para casi todos los comportamientos de riesgo de consumo. En comparación con los de la etnia Han, TS de la etnia Han no estaban en mayor riesgo de beber grandes cantidades de alcohol y tener relaciones sexuales bajo la influencia del alcohol. TS en establecimientos de ocio eran los más propensos a tener todo tipo de conductas de riesgo de consumo de alcohol. Callejera trabajadoras sexuales fueron menos propensos a beber alcohol, pero más o igualmente propensos a involucrarse en comportamientos sexuales de riesgo relacionados con el alcohol. Este estudio demuestra la necesidad de desarrollar intervenciones para disminuir el riesgo de alcohol que toma estas diferencias en consideración.

Keywords

alcohol use; work environment; female sex workers; sociodemographic characteristics

INTRODUCTION

Global literature suggests that alcohol consumption can be related to several sexual risks (Arasteh, Jarlais, & Perlis, 2008; Li, Li, & Stanton, 2010a; Markos, 2005) and is the most commonly used legal substance associated with HIV/STIs (sexually transmitted infections) (Kalichman et al., 2007). Alcohol consumption-related sexual risks may be increased under certain drinking contexts and environment (World Health Organization [WHO], 2008). A review of studies in developed countries suggests that alcohol use in sexually stimulating situations is associated with an increased chance of sexual intercourse and unprotected sex (Fisher, Bang, & Kapiga, 2007). Drinking-related exposures to sexual risk behaviors and biological susceptibility could also lead to an increased risk of STIs (Cook & Clark, 2005). Therefore, in response to the crucial role of context in alcohol consumption–sex relationship, more research is needed to better assess the context of alcohol use (Li, Li, & Stanton, 2010a).

Commercial sex industry creates a particular context that offers access to both sexual contact and alcohol use. Several factors have made alcohol use an inseparable component of commercial sex. First, some commercial sex establishments usually rely on sales of alcohol to attain profitability (Degraaf, Vanwesenbeeck, Vanzessen, Straver, & Visser, 1995).

Second, due to its entertaining attribute, alcohol is often used by female sex workers (FSWs) to facilitate sexual engagement (Gossop, Powis, Griffiths, & Strang, 1995; Markosyan et al., 2007). Third, FSWs may also use alcohol as a tool to cope with the stressors associated with their stigmatized and often illegal occupation (Hong, Li, Fang, & Zhao, 2007).

Many studies have documented an association between alcohol use and sexual risk behaviors among FSWs (Chersich et al., 2007; Chiao, Morisky, Rosenberg, Ksobiech, & Malow, 2006; Degraaf et al., 1995; Wang, Li, Stanton, Zhang, & Fang, 2010). It has been found that FSWs who used alcohol were less likely to use a condom consistently and were more likely to be infected with STIs. Based on the intertwined relationship between alcohol consumption and sexual risks in the context of commercial sex, alcohol-related harm reduction interventions were recommended to be implemented among FSWs (Chersich et al., 2007). Furthermore, the profound life course impacts on health and intergenerational health by women's involvement in alcohol consumption and commercial sex further justify the necessity of alcohol consumption reduction intervention among this high-risk population (Mardh, Shoubnikova, Genc, Chaplinkas, & Unzeitig, 1999).

The co-occurrence of alcohol use and sexual activities in the same physical location (e.g., entertainment establishments) or during a particular context (e.g., sexual transaction) lays an etiological foundation for effective setting-based interventions (Bryant, 2006).

Understanding of the drinking pattern and the distribution of alcohol consumption-related risks will be a stepping stone to inform the development of effective setting-based alcohol consumption intervention to break the linkage between high-risk drinking patterns and high-risk sexual behaviors (Chersich et al., 2007; Li, Li, & Stanton, 2010b). A review of studies worldwide among FSWs has highlighted distinct contrast of drinking patterns across different work settings. In the Netherlands, FSWs in clubs reported drinking more alcohol than those working in the street, home, and brothels (Degraaf et al., 1995). In Uruguay, FSWs in discos/bars tend to have a higher level of alcohol consumption than those in the street and brothels (Bautista et al., 2008). In Kenya, daily or binge drinking was more common among FSWs working in bars or nightclubs relative to those in other sites (Chersich et al., 2007). The alcohol consumption-related risks however are not congregated exclusively among FSWs in alcohol-serving venues. Studies in the Philippines actually found that street FSWs were more likely to accept intoxicated clients and/or drink alcohol before commercial sex (Chiao et al., 2006).

China has been witnessing a large-scale rural-to-urban migration during the past years and women comprised nearly half of the migrating population (Miao & Chen, 2011). Although commercial sex is illegal in China and may be punishable with fine and imprisonment, the economic imperative of this population has pushed many female migrants into the sex industry for job opportunities and quick money (Miao & Chen, 2011). The actual number of FSWs in China remains unknown, but various studies put the figure of FSWs in China to be between 4 and 10 million (Huang, Henderson, Pan, & Cohen, 2004; Pan, 2004; Yang, Li, Stanton, Liu et al., 2005).

As in other countries, FSWs in China are often categorized schematically based on the types of venues they work in (Pan, 1999). Briefly speaking, FSWs at low-end venues (e.g.,

massage parlors and street brothels) are more likely to be older, less educated, and even have higher STD infection rates than those among high-end venues (Merli et al., 2008), while FSWs working at high-end venues (e.g., karaoke halls and nightclubs) are more likely to be required to drink with clients as part of their job requirement and have access to drugs (Xia & Yang, 2009).

To most of the FSWs in China, health problems such as excessive drinking and alcohol consumption-related sexual risks are far less concerning as compared with making ends meet and dodging legal penalties (Miao & Chen, 2011), but it is inarguable that work requirements and/or the need to cope with work-related stressors, such as violence and stigma, have forced many FSWs into routine drinking and/or to become the victims of engaging in alcohol consumption-related sexual risk behaviors (Li et al., 2010). Five available studies among FSWs in China have documented a high prevalence of alcohol use among FSWs. Two studies documented a drinking rate of 42% and 30%, respectively (Rogers, Ying, Xin, Fung, & Kaufman, 2002; Wang et al., 2010), and another two studies found a monthly inebriation among a majority of the study population (Hong et al., 2007; Yang, Li, Stanton, Chen et al., 2005). Alcohol use has also been discovered as a prelude behavior before engaging in commercial sex among one-third of the FSWs in our previous studies in Guangxi (Wang et al., 2010). FSWs, in a study from southern China, attributed their failure to use condoms with inebriated clients to the negative effect of alcohol consumption on a client's reasoning and ejaculation (Choi & Holroyd, 2007).

However, despite a growing awareness of the alcohol–sex relationship and a clear rationale to conduct setting-based alcohol reduction intervention among FSWs, little attention has been given to elucidate the different drinking patterns across work settings in China. Although global literature may provide some insights for designing alcohol consumption-related intervention among FSWs, there is still a need for a more elaborated profile that contains other unattended but equally important alcohol use patterns and behaviors in order to cast light on the design of tailored alcohol consumption reduction programs among different FSWs populations (Li, Li, & Stanton, 2010a).

The current study therefore is designed to provide a general profile of alcohol use and related risk behaviors among FSWs by typology of work environment and sociodemographic characteristics. Relevant elements of interest to this profile were captured through reviewing available literature on alcohol use in different populations in China and elsewhere. The association of alcohol and/or other drug use with first sexual intercourse is well established (Santelli, Robin, Brener, & Lowry, 2001). Existing studies on alcohol use among adolescents suggest that early alcohol consumption initiation predicts early sexual behavior, which in turn implies increased HIV vulnerability (Parish, Laumann, & Mojola, 2007; Rosenbaum & Kandel, 1990). Studies specifically conducted among FSWs have also documented an association between early alcohol exposure and engaging in commercial sex (DeRiviere, 2005; Pedersen & Hegna, 2003). Different alcohol drinking patterns and preferences have been identified across different age groups among general population in China and some minority ethnic groups tend to drink more alcohol than other (Cochrane, Chen, Conigrave, & Hao, 2003). In terms of alcohol use measurement, an increasing attention has been given to the Alcohol Use Disorders Identification Test (AUDIT) in its

utility to quantify alcohol use in different populations (Kalichman et al., 2007). Based on elements identified by previous studies, this study will (1) examine the pattern of alcohol use, including alcohol initiation, general pattern of alcohol consumption, and alcohol use in the context of sex among FSWs in China; and (2) compare the pattern of alcohol use across different types of sex work environments and sociodemographic characteristics. The findings of this study will generate ideas and insights into alcohol use situations among FSWs and facilitate the design of a setting-based sexual risk reduction intervention among FSWs, which may incorporate alcohol consumption risk-related reduction as a component.

METHOD

Research Site

The research was conducted in Guangxi Zhuang Autonomous Region (“Guangxi”) in 2009. A growing tourism and prosperous economy in Guangxi has created a huge and lucrative market for commercial sex. Two of the most famous tourist cities in the region (City A and City B) were selected as the study sites. The two cities attract 4–10 million tourists annually, with an estimated 2,000 FSWs in each city.

Participants and Sampling Procedure

Following a similar procedure in previous studies with FSWs in China (Li et al., 2006), the research team and local health workers first identified venues that provided commercial sex services through ethnographic mapping, a method that transformed local people’s knowledge toward the distribution of entertainment venues directly into visual presentation (Tripathi, Sharma, Pelto, & Tripathi, 2010). Venues identified through ethnographic mapping included saunas, karaoke (KTV), bars, hair salons, massage parlors, mini-hotels, restaurants, and the streets. All the venues were randomly selected from the map and priority in sample selection was given to small- and medium-sized venues to prevent overrepresentation by large ones (mainly KTV and nightclubs). Upon obtaining oral permission from the gatekeepers (persons who manage sex workers and have a reciprocal financial relationship with FSWs) of each venue (Yang, Li, Stanton, Fang et al., 2005), trained outreach health workers from the local CDC (Center for Diseases Control and Prevention) approached women in these establishments individually and invited them to participate in the study. A total of 60 venues (29 from City A and 31 from City B) agreed to participate and 1,022 women (515 in City A and 507 in City B) were recruited. A written informed consent was completed by all participants and each participant was given a gift (about \$4.5 each) as a token of appreciation for their participation. The study protocol was approved by the Institutional Review Boards at Wayne State University in the US and Beijing Normal University in China.

Survey Procedure

The survey was conducted in a separate room or private space in or near the places where participants were recruited. Participants completed a confidential, self-administered questionnaire. For a small proportion (<5%) of FSWs with low literacy and/or reading difficulty, trained interviewers read the questionnaire to them and the participants marked

the answers on her own questionnaire. The questionnaire contained questions regarding sociodemographic characteristics and alcohol drinking behaviors.

Measures

Sociodemographic characteristics—Participants were asked to provide information on their age, education, ethnicity, monthly income, and living arrangement. To facilitate group comparison by age in the current study, we categorized age into three groups: 20 years old, 21–29 years old, and 30 years old. Income was also categorized into three groups: 1000 RMB, 1001–2000, and >2000. Education attainment was dichotomized into no more than middle school versus at least high school, marriage into ever married and never married, and ethnicity into Han and non-Han. Living arrangement consisted of four categories: living alone, living with husband/boyfriend, living with coworkers, and living with family members.

Sex work environments—Nine different types of sex work venues were included in the study. For the purpose of data analysis, these venues were categorized into three main types: entertainment (e.g., KTV and nightclubs), personal service (e.g., hair salons, sauna, and massage parlors) and street-based (e.g., streets and mini-hotels), following a similar classification system in previous studies (Yi et al., 2010).

Alcohol use onset—Alcohol use onset measures included the age of onset and setting of the onset (drinking alone, with family, with coworkers, with friends, or others), type of alcohol used at onset, intoxication at onset (yes/no), and having sex or using drug at onset (yes/no). Given that only a small proportion of participants (4%) reported solitary drinking at onset, they were grouped into “others” in the final analysis.

General pattern of alcohol use—Five indexes were employed to describe the general pattern of alcohol use. They included the general setting of alcohol use, the type of alcohol usually consumed, maximum amount drunk for each type of alcohol, the frequency of intoxication, and scores from the AUDIT (Saunders, Aasland, Babor, de la Fuente, & Grant, 1993). A unit of alcohol was defined, using common measure of quantity of alcohol use in China, as “a glass of beer,” “a glass of wine,” or “a shot of liquor” (Anhui Public Security Department, 2010; Changchun Bureau of Vehicle Traffic, 2009; Nanjing Public Security Bureau, 2009). For the measurement of the frequency of intoxication, participants were asked “how often they had been intoxicated with alcohol?,” using a five-point scale ranging from everyday, once every 2–3 days, once a week, about once a month to never being intoxicated. Because the frequency distribution of responses was skewed toward the last two answers, the first three were grouped into “intoxication at least weekly”, generating a three-item measurement for the frequency of intoxication. The prevalence of hazardous drinking was measured via the AUDIT, a test developed by the WHO to screen for excessive drinking and to help identify people who would benefit from reducing or ceasing drinking (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). The AUDIT (Cronbach’s alpha = 0.79 in the current study) consists of 10 questions concerning recent alcohol use, alcohol dependence symptoms, and alcohol consumption-related problems. Each question is scored from 0 to 4, with a maximum total score of 40 indicating extreme alcohol use. Following the

recommendation in the AUDIT guidelines, four levels of alcohol use risk were defined: low risk (AUDIT score < 7), risk drinking (AUDIT score 8–15), heavy drinking (AUDIT score 16–19), and hazardous drinking (AUDIT score 20–40) (Babor et al., 2001).

Alcohol use in the context of sex—Lifetime and recent alcohol use in the context of sex was assessed using five items. The first three items included (“drinking alcohol prior to sex,” “having sex with clients after drinking,” and “having sex with intoxicated clients”) were measured with a five-point scale (never to always). For the purpose of data analysis in this study, responses to the first three items were dichotomized, with people who had these experiences at least once being combined into one group (“ever”), and people who never had such experiences, into the other group (“never”). The last two items measured commercial sex act during recent three drinking episodes. Participants were asked whether they had sex with a client during the most recent three drinking episodes (yes/no) and how many times (0–3) they had sex with clients during the most recent three drinking episodes.

Data Analysis

We first used Chi-squared tests and analysis of variance (ANOVA) to compare the difference in sociodemographic characteristics among three types of commercial sex settings: entertainment, personal service, and street-based. We then compared the four aspects of alcohol use (alcohol onset, general pattern of drinking, alcohol use risk, and alcohol use in the context of sex) by age, education, and ethnicity, as well as by types of work environment, using the Chi-squared tests or ANOVA. Because participants were allowed to skip any questions that they felt uncomfortable answering, missing values exist for different variables and so analyses were performed only on available data for each variable of interest. All data analyses were conducted using SPSS for Windows 16 (SPSS Inc., 2007).

RESULTS

Sample Characteristics

As shown in Table 1, the average age of the entire sample was 24.89 (SD = 6.67), but street-based FSWs were older than FSWs working in entertainment establishments and personal service venues (39.76 for street-based FSWs vs. 22.70 for entertainment FSWs and 24.60 for personal service FSWs). The urban–rural population distribution was different for the three groups. Most street-based FSWs came from rural area, with a rural–urban ratio of 4.3, whereas the urban–rural distributions were similar between entertainment FSWs and personal service FSWs ($p < .0001$). Educational level was significantly different across the three work settings. About half of entertainment FSWs (42%) reported receiving at least high school level education, but the proportion decreased to 34% for personal service FSWs and only 10% for street-based FSWs ($p < .0001$). Nearly all of the street-based FSWs (97%) had married at least once, with at least one child, while a majority of entertainment and personal service FSWs (81% and 74%, respectively) had never married, and a small proportion of them (18% of entertainment FSWs and 22% of personal service FSWs) had a child. Although most street-based FSWs were married and had children, more than half of them (53%) lived alone, and only 8% lived with parent/child and they were also less likely than entertainment and personal service FSWs to live with coworkers (11% vs. 35% and

37%, $p < .0001$). There was also an income difference among the three settings. A majority of entertainment and personal service FSWs earned more than 1000 RMB/month, and nearly half of them had a monthly income higher than 2000 RMB, whereas 81% of street-based FSWs earned less than 1000 RMB/month, and very few of them (1%) earned more than 2000 RMB per month, in contrast to the average monthly income (2358.5 RMB) for people employed at Guangxi in 2009 (Human Resources and Social Security Bureau in Beihai, 2010). Ethnicity was not associated with typology of work environment and most of the participants (84%) were of Han ethnicity.

Alcohol Use by Age Groups

Table 2 depicts FSWs' drinking behaviors and their differences by three age groups. As displayed, the average age of alcohol use onset for FSWs was 15.78, 18.89, and 22.39 for the three age categories, respectively. The age of onset was positively associated with the age of participants, with older people having alcohol onset at an older age ($p < .0001$). The rate of drug use at onset was negatively associated with age, with younger FSWs being more likely to use drugs at alcohol onset and no FSWs over 30 reported drug use at onset ($p < .0001$). A majority of FSWs reported drinking with friends (34%) or family (40%) at onset, and an overwhelmingly higher proportion of people (76%) drank beer instead of wine (8%) or liquor (15%) at onset. About 20% of people got drunk and 4% had sex at the onset of alcohol use.

In terms of general pattern of alcohol use, the most common place/occasion of alcohol use was at work (48%), followed by with friends (36%) and with family (10%). The most popular alcohol beverage usually drank by FSWs was beer (92%), followed by wine (27%) and liquor (8%). The use rates of beer decreased with advancing age, while the rates of wine increased. From 20 years of age to 30 years of age, beer drinking decreased by 12% ($p < .001$), while wine increased by 10% ($p < .05$). The proportion of FSWs who drank liquor also increased with age but did not reach statistical significance. There was a declining trend of maximum amount of beer ($p < .0001$) and wine ($p < .05$) consumed in each occasion with the increase in age. There was a 65% of reduction in the average amount of beer consumed ($p < .01$) and a 53% reduction in the amount of wine consumed ($p < 0.05$), from the lowest age group to the highest. There was no age difference in use rate and maximum amount of liquor consumption. Overall, 35% of FSWs reported being intoxicated at least weekly, and among them, 10% were intoxicated everyday; 12%, once every 2–3 days; and 13%, once a week. The weekly intoxication was significantly associated with age and younger FSWs were more likely to be intoxicated on a weekly basis ($p < .0001$). Over half of the participants (55%) were involved in risk drinking, with an AUDIT score ≥ 8 . Among these problem drinkers, 61% were risk drinkers, 23% were heavy drinkers, and 16% were hazardous drinkers. While more younger FSWs than older FSWs scored ≥ 8 , the overall distribution of AUDIT risk levels did not differ by age.

Overall, more than one-third of FSWs (36%) reported drinking alcohol prior to sex and similar proportion of FSWs reported ever having sex with clients after drinking alcohol. Nearly a quarter of the participants (23%) reported ever having sex with intoxicated clients. As for recent drinking and sex behaviors, about 14% of the participants reported to have at

least one sex trade during the most recent three drinking episodes. ANOVA revealed a significant age difference ($p < .05$) for the average number of sex trade among FSWs who had sex with clients during the most recent three drinking episodes. Although less likely to be intoxicated and having consumed less alcohol compared with the younger groups, FSWs in the oldest age group were more likely to engage in sex trade during the most recent three drinking episodes ($p < .05$).

Alcohol Use by Education and Ethnicity

As shown in Table 3, the rate of wine drinking among FSWs was significantly different by the level of educational attainment ($p < .05$). More FSWs with at least high school education reported wine use than those with no more than middle school education (31% vs. 24%). FSWs of non-Han ethnicity were more likely to start drinking alcohol at a younger age (18.63 vs. 17.88, $p < .05$). FSWs of Han ethnicity were found to have a lower threshold (maximum tolerance) for liquor consumption ($p < .001$), with non-Han FSWs being able to consume 31% more liquor during single drinking occasion than Han FSWs. No difference was found for the settings of general alcohol use and the rate of hazardous drinking by either education or ethnicity. More non-Han FSWs than Han FSWs ever had sex trade during the most recent three drinking episodes (21% vs. 13%, $p < .05$). Non-Han FSWs, on average, also had more sex trade than Han FSWs during the most recent three drinking episodes (1.31 vs. 1.18, $p < .05$).

Alcohol Use by Work Environment

Table 4 presents a profile of alcohol use across the three work environments. The age of alcohol onset was significantly lower for entertainment and personal service FSWs than for street-based FSWs ($p < .0001$). Entertainment and personal service FSWs were more likely to drink their first ever alcohol with friends, while more street-based FSWs experienced the first alcohol with others. Compared with street-based FSWs, entertainment and personal service FSWs were more likely to drink beer at onset and were less likely to use liquor. With respect to general setting of alcohol use, entertainment FSWs almost unanimously reported the work environment as their usual drinking setting compared with a small proportion of personal service and street-based FSWs who chose this option (77% vs. 9% and 6%, $p < .0001$). A majority of personal service FSWs (63%) usually drank with friends, while family (38%) and friends (32%) were both common drinking mates for street-based FSWs, who also had a higher likelihood to drink alone or with others. With regard to the types of alcohol usually consumed, entertainment FSWs had an exclusive preference for beer (98%), followed by personal service FSWs (85%) and street-based FSWs (79%). No difference was observed in the use rate of wine and liquor across the three work environments.

Entertainment FSWs having a much higher threshold for both beer and wine compared with the other two groups, especially the street-based FSWs. Entertainment FSWs could consume nine times more beer and 15 times more wine than street-based FSWs, and their maximum consumption of both alcohol doubled that of personal service FSWs. Entertainment FSWs were five times more likely than personal service FSWs and four times more likely than street-based FSWs to have alcohol intoxication on a weekly basis ($p < .0001$). The distribution of AUDIT score also revealed entertainment FSWs to be more congregated at

risk levels compared with the other two groups and were thus more likely to be hazardous drinkers ($p < .0001$).

Nearly all variables related to alcohol use in the context of sex were significantly associated with types of work environments. Despite larger drinking amount and higher frequency of intoxication, entertainment FSWs were least likely to report having sex with intoxicated clients and to ever have sex with clients after drinking. This lower rate of having sex transactions after alcohol use was also observed in recent drinking behaviors, with a smaller proportion of entertainment FSWs reporting having sex with clients during recent three drinking episodes (12%, 19%, and 44% for entertainment, personal service, and street-based FSWs, respectively, $p < .0001$). On the contrary, street-based FSWs, with the lowest consumption of alcohol and the second-lowest probability of intoxication, were much more likely than entertainment and personal service FSWs to have sex with clients after drinking (56% vs. 32% and 46%, $p < .0001$) and to have greater average number of sex trade (1.63 vs. 1.16 and 1.29, $p < .0001$) during recent three alcohol consumption episodes. However, entertainment FSWs, compared with personal service and street-based FSWs, still reported the highest percentage of alcohol drinking prior to sex in general (43% vs. 29% and 24%).

DISCUSSION

This paper provides a detailed analysis of alcohol consumption and its association with typology of sex work environments as well as sociodemographic characteristics (age, education, and ethnicity) among FSWs in China. Findings from the study may help to inform alcohol-related interventions in terms of providing clues on potential environmental and sociodemographic factors that are correlated with the pattern of alcohol use and the frequency of engaging in alcohol consumption-related sexual risk behaviors. In general, intoxication was prevalent among the study population and one-third of FSWs reported drinking alcohol in the context of sex. These findings were consistent with other studies among FSWs from different countries (Chersich et al., 2007; Hong et al., 2007; Yang, Li, Stanton, Chen et al., 2005), underlying the magnitude of the drinking problem among this particular population.

The current study indicates that the sociodemographic characteristics, especially educational attainment and income level, were different across the three sex work settings. These differences were consistent with the findings from another study conducted among FSWs in Beijing (Yi et al., 2010). On the one hand, the difference in sociodemographic profile across the three types of work environments highlights the need for behavioral interventions to be tailored based on typology of work environments; also, the similarity of FSWs within same type of venues provides a possibility to contextualize risk factors in similar environments and to establish a framework that can help to standardize intervention procedures and inform policy changes among similar settings.

FSWs of non-Han ethnicity reported larger drinking amount and a younger age of alcohol onset. This finding may be a reflection of different customs and cultural aspects of alcohol drinking among different ethnic groups. In many countries, ethnic minorities are usually under-represented in alcohol consumption research and the ignorance of variability within

each ethnic group often results in inaccurate generalizations (Caetano, Clark, & Tam 1998). Findings from this study merit further investigation on ethnic minority women's alcohol use and alcohol consumption-related risk behaviors. Evaluating whether the FSWs of ethnic minority would be at higher risk of alcohol use and having sex under the influence of alcohol may benefit the design of proper prevention strategies, especially in areas where ethnic minorities congregate.

The age trend of alcohol use among participants suggests that FSWs may progress from low-ethanol-content alcohol, such as beer, to high-ethanol-content alcohol such as wines and liquors. This finding echoes those from earlier studies about alcohol use among young adults in different countries (Bautista et al., 2008; Li, Fang, Stanton, Feigelman, & Dong, 1996), indicating the role of beer as a gateway beverage progressing to the use of other alcohol among various kinds of population, including FSWs. Although the use of wine increased with advancing age, the results of the current study suggests that beer remained as the most commonly used alcohol beverage among FSWs of all ages. The finding that beer and wine were the most consumed alcohol among FSWs was consistent with results from studies in the general population, where women reported consuming more wine and beer than other alcoholic beverages (Cochrane et al., 2003).

Although only a small proportion of FSWs used drugs at onset of alcohol drinking, it is notable that nearly all of them were in the youngest age group. The upsurge of drug use at alcohol onset among FSWs younger than 20 years old coincides with the popularity of club drugs (i.e., MDMA [ecstasy] and methamphetamine [ice]) among young people in China during recent years (Yang & Xia, 2010). The special features of club drugs (odorless, colorless, tasteless, and dissolvable in liquid) makes alcohol its most suitable companion substance (Fendrich, Wislar, Johnson, & Hubbell, 2003; Koesters, Rogers, & Rajasingham, 2002). Although data in the current study did not distinguish between club drugs and traditional drugs (i.e., heroin), a greater health and sexual risk created by the combined use of alcohol and club drugs calls for further study on this coincidence (Pichini et al., 2010; Temple & Freeman, 2011).

Street-based FSWs in the current study have the lowest level of alcohol use and frequency of intoxication, which echoes findings from several other studies that documented a low prevalence of alcohol use among street-based FSWs (Bautista et al., 2008; Degraaf et al., 1995). Yet in contrast to the lowest drinking amount and the lowest frequency of intoxication, street-based FSWs were most at risk of having sex with clients under the influence of alcohol. This contradiction, observed also by other studies (Chiao et al., 2006), probably reflects the nature of work environment among street-based FSWs. Unlike FSWs working at venues where alcohol is served, street-based FSWs usually do not have as much access to alcohol and are not required to promote sales of alcohol during their work (Bautista et al., 2008; Chersich et al., 2007). Yet at the same time, they also have not as much choices of clients as their counterparts working at high-end venues, which pushes them to be more likely to accept intoxicated clients or succumb to clients' requests to have sex under the influence of alcohol (Wojcicki & Malala, 2001). Therefore, limited access to alcohol, coupled with limited choices for clients among street-based FSWs, may produce the coexistence of low-level alcohol consumption and the high-frequency sex under the

influence of alcohol. Alcohol risk reduction interventions, which are usually recommended among FSWs working in alcohol-served venues (Li, Li, & Stanton, 2010a), may also be applied to street-based FSWs.

Contrary to what we expected, although entertainment FSWs were most likely to be intoxicated and/or to be involved in risk drinking, they were less likely to report having sex with clients under the influence of alcohol. This may be a result of the subtle distinction in the definition of “clients” among FSWs in different work environment. Since entertainment FSWs usually have more stable clients than personal service and street-based FSWs, they tend to categorize stable partners into “boyfriends” instead of clients as a self-denial of their involvement in commercial sex, a stigmatized and illegal activity. This speculation is not groundless because when asking about drinking alcohol prior to sex in general (both stable and casual partners included), the proportion of entertainment FSWs was significantly much higher than personal service and street-based FSWs, implying entertainment FSWs’ unwillingness to admit the existence of casual or commercial partners. With over 40% reporting alcohol drinking prior to sex in general, entertainment FSWs were still the most at-risk group that was likely to engage in sex under the influence of alcohol. Findings from other studies have shown that for those clients who transformed into stable partners or boyfriends over time, FSWs were less likely to use condoms with them (Project Parivartan, 2007), highlighting an urgent need to intervene sex-related alcohol use among this population. In addition, future studies may be highly sensitive to local culture among the study populations that are in a disadvantaged position in order to avoid potential response biases.

Limitations

This study has some potential methodological limitations. First, the study sample was a convenience sample. In addition, based on our previous experience with FSWs in the same region (Fang et al., 2007), the participation rates were 67% and 78% for eligible venues and FSWs, respectively. However, the proportion of venues/women who agreed to participate out of all venues/women approached and information from women who refused to participate were not available in the current study, which renders us unable to assess the representativeness of our samples and generalizability of our findings. Yet a high similarity of sociodemographic profile by sex work background between this study and other studies among FSWs in China may lend some support for the representativeness of the sample (Yi et al., 2010). Second, all the data used in this study were self-reported and could be affected by recall bias, social desirability, and other self-reported bias. Third, illegality of behaviors, such as selling sex and using drugs, may discourage participants from acknowledging their involvement and thus underestimate the magnitude of the problem. Fourth, for the sake of convenience to the participants, the study used a rough yet more culturally accepted measurement of alcohol consumption instead of standard unit of alcohol, generating a potential for inaccuracy in estimation of alcohol use among the study sample.

Implications

Despite these limitations, this study has important implications for designing future alcohol prevention interventions among FSWs. The sharp difference in alcohol consumption across

three sex work environments calls for tailored interventions for each type of setting. Most of the existing study on alcohol use among FSWs paid particular attention to entertainment FSWs, who had higher risk of alcohol use and having sex under the influence of alcohol. Given the high mobility and complexity of behavior change among FSWs, venue-based structural intervention was considered as a favorable choice for entertainment FSWs and personal service FSWs. This study however revealed that street-based FSWs were equally and even more at risk of having sex with clients after drinking alcohol, highlighting the importance of designing proper intervention among this population. Unlike entertainment and personal service FSWs, street-based FSWs are more scattered and less reachable. Therefore, intervention on these populations may rely more on community health workers or their peers to locate and gather them on a regular basis. Different educational levels of FSWs working in different settings may require different types of intervention materials. Other studies have revealed that street-based FSWs were less likely to receive health-related information through the mass media (e.g., newspapers and the Internet) (Yi et al., 2010). This could be due to their lower educational level and lower income that impeded them from acquiring information voluntarily. Therefore, intervention on this population is more of finding proper forms and route of distributing information. The diversity of FSWs in relation to a range of sociodemographic factors may provide further implication for using community mobilization, led by highly educated and more experienced FSWs to come up with culturally acceptable and practically feasible approaches to reduce alcohol use and related sexual risk among this most at-risk population (Devine, Bowen, Dzuvichu, Rungtung, & Kermode, 2010). Finally, this study sets the stage for more qualitative investigation research to come explore the mechanisms behind differential alcohol use and alcohol-related risk behaviors among FSWs across different types of work environment, which may provide a more detailed implication for intervention design.

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GLOSSARY

FSWs

female sex workers are women who receive money or goods in exchange for sexual services.

Entertainment FSWs

female sex workers working in entertainment establishments or high-end venues such as night clubs and karaoke halls.

Personal-service FSWs

refers to female sex workers working in venues that offer personal hygiene and cosmetic services such as massage parlors and beauty salons.

Street-based FSWs

refers to female sex workers who solicit in streets or construction sites.

Gatekeepers

persons who manage sex workers, including madams, pimps, establishment owners, managers, and other employees, who have a reciprocal financial relationship with FSWs often by providing room and board, with or without a formal salary, in exchange for the services and income generated by the FSWs.

ANOVA

a statistical method for the analysis of variance which is useful in comparing means for two or more groups.

HIV

human immunodeficiency virus, which causes acquired immunodeficiency syndrome (AIDS).

STIs

sexually transmitted infections are illnesses that is transmitted between humans by means of human sexual behavior, including vaginal intercourse, oral sex, and anal sex.

AUDIT

alcohol use disorders identification test is developed by the World Health Organization as a simple method of screening for excessive drinking.

KTV

karaoke television, a form of interactive musical entertainment, but has been used to refer to places that provide such entertainment facilities and services in China.

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TABLE 1.

Sociodemographic characteristics by work environment

	Entire sample	Work environment			p-value
		Entertainment	Personal service	Street	
N	1,022 (100%)	553 (54%)	380 (37%)	89 (9%)	
Age in years (SD)	24.89	22.70 (4.45)	24.60 (5.08)	39.76 (5.19)	<.0001
Hometown					<.0001
Rural	445 (44%)	265 (49%)	163 (44%)	17 (19%)	
Urban	558 (56%)	279 (51%)	208 (56%)	71 (81%)	
Education					<.0001
Middle school	64 (63%)	317 (58%)	245 (66%)	78 (90%)	
High school	369 (37%)	232 (42%)	128 (34%)	9 (10%)	
Marital status					<.0001
Never married	723 (72%)	440 (81%)	280 (74%)	3 (3%)	
Married at least once	288 (29%)	106 (19%)	97 (26%)	85 (97%)	
Had a child	266 (26%)	96 (18%)	84 (22%)	86 (97%)	<.0001
Living arrangement					
Alone	369 (36%)	189 (34%)	133 (35%)	47 (53%)	
With husband/boyfriend	280 (27%)	142 (26%)	105 (28%)	33 (37%)	
With coworker	342 (34%)	191 (35%)	141 (37%)	10 (11%)	<.0001
With family member	85 (8%)	59 (11%)	19 (5%)	7 (8%)	
Monthly income					<.0001
1000	305 (30%)	133 (25%)	100 (27%)	72 (81%)	
1001–2000	296 (29%)	174 (32%)	106 (28%)	16 (18%)	
>2000	409 (41%)	236 (44%)	172 (46%)	1 (1%)	
Ethnicity					
Han	853 (84%)	457 (84%)	316 (83%)	80 (92%)	
Non-Han	158 (16%)	88 (16%)	63 (17%)	7 (8%)	

Note. The number of participants for some of the variables did not add up to the total sample size because of missing data.

TABLE 2.

Alcohol use by age group

	Entire sample	Age group			p-value
		20	21–29	30	
N	1,022 (100%)	299 (29%)	521 (51%)	202 (20%)	<.0001
Age of onset (SD)	18.51 (4.17)	15.78 (2.87)	18.89 (3.24)	22.39 (5.21)	<.0001
Setting of onset					
With family	326 (34%)	92 (31%)	170 (34%)	64 (39%)	
With coworkers	132 (14%)	31 (11%)	74 (15%)	27 (17%)	
With friends	387 (40%)	134 (45%)	209 (41%)	44 (27%)	
With others	122 (13%)	39 (13%)	55 (11%)	28 (17%)	
Type of alcohol consumed at onset					
Beer	731 (76%)	243 (82%)	385 (76%)	103 (63%)	
Wine	81 (8%)	14 (5%)	48 (9%)	19 (12%)	
Liquor	141 (15%)	34 (12%)	69 (14%)	38 (23%)	
Other	15 (2%)	5 (2%)	6 (1%)	4 (2%)	
Drunk at onset	209 (22%)	67 (23%)	111 (22%)	31 (19%)	
Sex at onset	35 (4%)	11 (4%)	15 (3%)	9 (5%)	
Drug use at onset	15 (2%)	13 (4%)	2 (< 1%)	0 (0%)	<.0001
General setting of alcohol use					
Alone	401 (44%)	14 (5%)	15 (3%)	11 (7%)	
At work	458 (48%)	180 (61%)	241 (48%)	37 (23%)	
With friends	345 (36%)	84 (29%)	191 (38%)	70 (43%)	
With family	91 (10%)	12 (4%)	45 (9%)	34 (21%)	
Other	27 (3%)	4 (1%)	13 (3%)	10 (6%)	
Alcohol usually consumed					
Beer	885 (92%)	283 (96%)	467 (93%)	135 (84%)	<.01
Wine	255 (27%)	60 (20%)	147 (29%)	48 (30%)	<.05
Liquor	75 (8%)	17 (6%)	40 (8%)	18 (11%)	
Maximum amount consumed					
Beer	14.54 (19.93)	21.20 (25.13)	12.79 (17.26)	7.32 (11.14)	<.0001

	Entire sample	Age group			p-value
		20	21–29	30	
Wine	5.71 (10.75)	7.16 (14.91)	5.43 (8.68)	3.35 (2.91)	<.05
Liquor	2.37 (2.55)	2.42 (2.93)	2.30 (2.22)	2.45 (2.60)	
Frequency of intoxication					
Everyday	97 (10%)	47 (16%)	45 (9%)	5 (3%)	
Once/2–3 days	110 (12%)	43 (15%)	50 (10%)	17 (11%)	
Once/week	128 (13%)	51 (17%)	64 (13%)	13 (8%)	
Once/month	308 (32%)	91 (31%)	170 (34%)	47 (30%)	
Never	313 (33%)	63 (21%)	173 (35%)	77 (48%)	
Intoxication at least weekly	335 (35%)	141 (48%)	159 (32%)	35 (22%)	<.0001
AUDIT score					
0–7	438 (45%)	95 (32%)	228 (45%)	115 (66%)	
8–15	332 (34%)	115 (39%)	182 (36%)	35 (20%)	
16–19	123 (13%)	45 (15%)	66 (13%)	12 (7%)	
20–0	90 (9%)	42 (14%)	36 (7%)	12 (7%)	
Ever had sex with intoxicated clients	217 (23%)	67 (23%)	103 (22%)	47 (25%)	
Drink alcohol prior to sex	366 (36%)	122 (41%)	184 (36%)	60 (31%)	
Ever had sex with clients after drinking	258 (36%)	89 (34%)	136 (36%)	33 (39%)	
Had sex with clients during recent three times	102 (14%)	31 (12%)	53 (14%)	18 (22%)	
Number of sex trade during recent three times (SD)	1.20 (0.55)	1.17 (0.51)	1.18 (0.52)	1.36 (0.75)	<.05

Note: The number of participants for some of the variables did not add up to the total sample size because of missing data.

TABLE 3.

Alcohol consumption by education and ethnicity

	Education			Ethnicity	
	Middle school	High school	Han	Han	Non-Han
<i>N</i>	640 (63%)	369 (37%)	853 (84%)	158 (16%)	
Age of onset (SD)	18.64 (4.47)	18.27 (3.69)	18.63 (4.21)	17.88 (3.97)*	
Setting of onset					
With family	197 (33%)	127 (35%)	275 (34%)	49 (31%)	
With coworkers	92 (16%)	38 (11%)	111 (14%)	19 (12%)	
With friends	230 (39%)	15 (42%)	308 (38%)	74 (47%)	
With others	75 (13%)	44 (12%)	108 (14%)	14 (9%)	
Type of alcohol consumed at onset					
Beer	457 (77%)	268 (74%)	615 (77%)	109 (70%)	
Wine	45 (8%)	35 (10%)	67 (8%)	13 (8%)	
Liquor	83 (14%)	52 (14%)	108 (13%)	32 (21%)	
Other	10 (2%)	5 (1%)	13 (2%)	2 (1%)	
Drunk at onset	127 (22%)	74 (21%)	168 (21%)	39 (25%)	
Sex at onset	24 (4%)	9 (3%)	30 (4%)	5 (3%)	
Drug use at onset	9 (2%)	5 (1%)	12 (2%)	3 (2%)	
General setting of alcohol use					
Alone	26 (4%)	14 (4%)	31 (4%)	9 (6%)	
At work	256 (44%)	197 (55%)	383 (48%)	70 (45%)	
With friends	225 (38%)	116 (32%)	278 (35%)	64 (41%)	
With family	64 (11%)	25 (7%)	81 (10%)	9 (6%)	
Other	18 (3%)	8 (2%)	24 (3%)	3 (2%)	
Alcohol usually consumed					
Beer	546 (93%)	329 (91%)	735 (92%)	142 (91%)	
Wine	143 (24%)	110 (31%)*	211 (27%)	43 (28%)	
Liquor	46 (8%)	27 (8%)	62 (8%)	13 (8%)	
Maximum amount consumed					
Beer	13.80 (20.06)	15.50 (19.29)	14.16 (18.85)	16.77 (25.04)	

	Education			Ethnicity	
	Middle school	High school	Han	Non-Han	
Wine	5.64 (11.96)	5.84 (8.72)	5.65 (7.97)	6.27 (19.73)	
Liquor	2.31 (2.63)	2.38 (2.32)	2.18 (2.06)	3.15 (3.99)**	
Frequency of intoxication					
Everyday	60 (10%)	47 (13%)	78 (10%)	16 (10%)	
Once/2–3 days	54 (9%)	41 (11%)	83 (11%)	26 (17%)	
Once/week	84 (14%)	42 (12%)	113 (14%)	13 (8%)	
Once/month	181 (31%)	125 (35%)	253 (32%)	54 (35%)	
Never	207 (35%)	104 (29%)	265 (34%)	46 (30%)	
Intoxication at least weekly	198 (34%)	130 (36%)	274 (35%)	55 (36%)	
AUDIT score					
0–7	290 (48%)	142 (39%)	375 (46%)	59 (38%)	
8–15	192 (32%)	136 (37%)	268 (33%)	61 (39%)	
16–19	76 (13%)	45 (12%)	97 (12%)	24 (15%)	
20–0	45 (8%)	44 (12%)	76 (9%)	13 (8%)	
Ever had sex with intoxicated clients	127 (21%)	89 (26%)	181 (23%)	35 (24%)	
Drink alcohol prior to sex	223 (36%)	138 (38%)	296 (35%)	67 (43%)	
Ever had sex with clients after drinking	152 (35%)	103 (36%)	211 (35%)	46 (40%)	
Had sex with clients during recent three times	66 (16%)	34 (12%)	78 (13%)	24 (21%)*	
Number of sex trade during recent three times (SD)	1.21 (0.56)	1.17 (0.53)	1.18 (0.52)	1.31 (0.68)*	

Note. The number of participants for some of the variables did not add up to the total sample size because of missing data.

* $p < .05$,

** $p < .01$.

TABLE 4.

Alcohol use by work environment

	Work environment			p-value
	Entertainment	Personal service	Street	
N (%)	553 (54%)	380 (37%)	89 (9%)	
Age of onset (SD)	18.10 (3.75)	18.30 (3.71)	24.38 (6.65)	<.0001
Setting of onset				<.0001
With family	170 (31%)	134 (37%)	22 (41%)	
With coworkers	75 (14%)	48 (14%)	8 (15%)	
With friends	242 (44%)	139 (39%)	6 (11%)	
With others	65 (12%)	39 (11%)	18 (33%)	
Type of alcohol consumed at onset				<.001
Beer	443 (80%)	256 (71%)	32 (59%)	
Wine	36 (7%)	40 (11%)	5 (9%)	
Liquor	69 (13%)	57 (16%)	15 (28%)	
Other	5 (1%)	8 (2%)	2 (4%)	
Drunk at onset	129 (23%)	74 (21%)	6 (11%)	
Sex at onset	17 (3%)	13 (4%)	5 (9%)	
Drug use at onset	13 (2%)	2 (1%)	0	
General setting of alcohol use				<.0001
Alone	13 (2%)	21 (6%)	6 (11%)	
At work	424 (77%)	31 (9%)	3 (6%)	
With friends	105 (19%)	223 (63%)	17 (32%)	
With family	7 (1%)	64 (18%)	20 (38%)	
Other	3 (< 1%)	17 (5%)	7 (13%)	
Alcohol usually consumed				<.0001
Beer	540 (98%)	304 (85%)	41 (79%)	
Wine	153 (28%)	95 (27%)	7 (14%)	
Liquor	78 (7%)	31 (9%)	6 (12%)	
Maximum amount				<.0001
Beer	19.45 (22.89)	8.40 (12.42)	2.24 (2.16)	

	Work environment			p-value
	Entertainment	Personal service	Street	
Wine	7.41 (13.01)	2.86 (3.08)	1.37 (0.86)	<.0001
Liquor	2.45 (2.79)	2.26 (2.10)	1.71 (1.25)	<.0001
Frequency of intoxication				
Everyday	89 (16%)	8 (2%)	0	
Once/2–3 days	95 (17%)	11 (3%)	4 (8%)	
Once/week	106 (19%)	19 (5%)	3 (6%)	
Once/month	181 (33%)	117 (33%)	10 (20%)	
Never	78 (14%)	201 (57%)	34 (67%)	
Intoxication at least weekly	290 (53%)	38 (11%)	7 (14%)	<.0001
AUDIT score				
0–7	104 (19%)	280 (76%)	54 (86%)	<.0001
8–15	265 (48%)	61 (17%)	6 (10%)	
16–19	102 (18%)	19 (5%)	2 (3%)	
20–40	82 (15%)	7 (2%)	1 (2%)	
Ever had sex with intoxicated clients	89 (18%)	108 (29%)	20 (24%)	<.0001
Drink alcohol prior to sex	236 (43%)	108 (29%)	20 (24%)	<.0001
Ever had sex with clients after drinking	173 (32%)	75 (46%)	10 (56%)	<.0001
Had sex with clients during recent three times	65 (12%)	30 (19%)	7 (44%)	<.0001
Number of sex trade during recent three times (SD)	1.16 (0.48)	1.29 (0.68)	1.63 (0.81)	<.0001

Note. The number of participants for some of the variables did not add up to the total sample size because of missing data.