Alcohol intoxication and sexual risk behaviors among rural-to-urban migrants in China

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Abstract

Background— The migrant population in China is at high risk for sexual risk behavior and alcohol intoxication. Information about the prevalence of alcohol intoxication and its association with sexual risk behavior among migrants is needed for designing effective intervention prevention programs for reduction in alcohol abuse and HIV infection.

Methods— Cross-sectional data were collected from 2153 sexually experienced young rural-to-urban migrants in Beijing and Nanjing, China, in 2002.

Results— Approximately one-third of the participants had been intoxicated with alcohol at least once during the previous month, with more males than females reporting intoxication (40.2% versus 23.7%, $p < 0.001$). Compared to non-intoxicated participants, respondents with alcohol intoxication in previous 30 days reported more psychological problems, including higher depression scores, lower levels of satisfaction with life and work, and higher perception of peer involvement in risk behavior. Intoxicated respondents were more likely to engage in premarital sex than non-intoxicated respondents (76% versus 60.2%, $p < 0.001$), have multiple sexual partners (13.4% versus 5.2%, $p < 0.001$), purchase sex (12.6% versus 4.9%, $p < 0.001$), and sell sex (10.1% versus 3.7%, $p < 0.001$). However, there was no association between alcohol intoxication and inconsistent/non-use of condoms. Multivariate analysis controlling for depression, peer risk involvement, age, gender, and other socio-demographic variables indicated that alcohol intoxication was independently correlated with premarital sex, multiple sexual partners, and buying and selling sex.

Conclusions— Compared to the general Chinese population, levels of intoxication were elevated among Chinese rural-to-urban migrants. Alcohol intoxication was associated with sexual risk behaviors. HIV/AIDS prevention and intervention efforts should include components of alcohol use/abuse prevention for an effective reduction of sexual risk among young rural-to-urban migrants in China.

Keywords

Alcohol intoxication; China; rural-to-urban migrants; Sexual risk behavior

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1. Introduction

The association of alcohol use with increased sexual risk behaviors has been well documented in the literature from industrialized countries, such as the United States and Western Europe (Brook et al., 2002;Hingson et al., 2003). In the United States, adolescents who consumed alcohol were seven times more likely to have sex than those, who did not (The National Center on Addiction and Substance Abuse at Columbia University (CASA), 1999). In the Kaiser Family Foundation's National Survey of Youth Knowledge and Attitudes on Sexual Health Issues, which is compiled by a national random-sample survey and interviews of 1200 teens and young adults, 23% (5.6 million) of sexually active teens and young adults 15–24 years of age in the United States report having had unprotected sex, because they were drinking or using drugs at the time. Twenty-four percent of teens 15–17 years of age say that their alcohol and drug use led them to do more sexually than they had planned (CASA, 1999). Heavy use of alcohol was correlated with increased casual sex without condoms and with increased number of sexual partners among youth (Staton et al., 1999). Limited research conducted in developing countries in Asia and Africa also suggested a positive relationship between alcohol use and sexual risk behaviors. For example, in Nepal, young men who reported alcohol consumption were observed to be fourfold more likely to have casual sex than those who abstained from alcohol (Brown and Shireen, 2001). Among rural Vietnamese adolescents, alcohol use was significantly associated with sexual behavior and intention to engage in sexual behavior (Kaljee et al., 2005). In Zimbabwe, men who had sex while intoxicated reported 20-fold more episodes of unprotected sex with casual partners and 27-fold more episodes of paying for sex than men, who did not have sex while intoxicated (Fritz et al., 2002). Although a positive relationship between alcohol use and sexual risk behaviors has been found in the majority of studies, results have not been uniformly consistent (Guo et al., 2002). For example, a study among adolescent detainees in the United States failed to find significant associations of alcohol use either in the past 30 days or during sex with unprotected sexual episodes (Kingree et al., 2000). Therefore, more research in this regard is needed.

1.1. HIV/AIDS in China

With the largest population in the world, China is facing a growing epidemic of HIV/AIDS. Although intravenous drug users and former plasma donors account for the majority of the infected, heterosexual intercourse is playing an increasingly important role in the epidemic (Yang et al., in press). The proportion of heterosexual transmission increased from 5.5% in 1997 to 10.9% at the end of 2002 (The Joint United Nations Program on HIV/AIDS (UNAIDS), 2003). Many of the infections identified in southeastern coastal China were "underground" female sex workers (Lau et al., 2002a). In Yunnan province, where HIV has been transmitted predominately through injecting drug use, about 11% of female sex workers were infected with HIV in 2000. In the first half of 2002, HIV cases in Shanghai increased 45.2%, with unprotected sex viewed as a main cause (Settle, 2003). Although specific high risk groups (e.g., female sex workers) have accounted for the majority of sexually transmitted HIV infections, the growing category of rural-to-urban migrants has caused concern for potential increases in the sexual transmission of HIV (Zhang and Ma, 2002;Li et al., 2004).

1.2. Rural-to-urban migration

The rapid modernization and economic development in China has spawned a new category of more than 100 million rural-to-urban migrants who have been identified as particularly vulnerable to HIV infection or other STDs (Xu, 2001). Limited data in China have demonstrated a relatively high HIV/STD prevalence among rural-to-urban migrants. Among the seropositive cases in Shanghai, Shangxi Province, and Zhejiang Province from 1995–2000, two-thirds were migrants (Xu, 2001;Qiao et al., 2000;Zhu et al., 2001). Migrants accounted for 83% (263/316) of the HIV infection cases reported in 2003 in Beijing and 72% (140/195)

in Shanghai (China CDC National Center for AIDS/STD Control and Prevention (China CDC, 2004)). Factors associated with high risk of HIV infection among migrants include geographic mobility (Li et al., 2004), low level of education (Settle, 2003), limited HIV/AIDS knowledge (Xu, 2001), and being displaced or separated from their spouses or families (Zheng and Zhu, 2000).

Rural-to-urban migrants appear to have increased participation in sexual risk behavior compared to their indigenous counterparts in rural or urban areas. Compared to urban residents, rural-to-urban migrants appear to be more likely to engage in sex trade and/or have multiple sexual partners (Luo et al., 2002). For example, 95% of commercial sex workers arrested in Guangzhou during 1991–1995 were migrants (Zheng and Zhu, 2000). More than 80% of female migrants working in bars and barber shops in Yunnan province admitted to having sold sex for money (Xu, 2001). Premarital sex is common among this floating population. It was reported that unmarried female migrants initiated sex at 17–18 years of age, and that among unmarried migrant women, 50% of those working in factories and 80% of those working in service sectors had engaged in premarital sex (Zheng et al., 2001).

1.3. Alcohol consumption in China

Alcohol consumption has a history of thousands of years in China (Hao et al., 1999). In recent nationwide surveys, the proportions of the current drinkers (i.e., those individuals, who reported having at least one drink in the past 3 months), was 63.8 and 18.3% for Chinese men and women, respectively (Hao et al., 2004). Although social drinking (e.g., in the event of celebrations) is widely practiced, solitary drinking has been commonly used for stress reduction and coping among Chinese (Hussong, 2003;Martin et al., 2003). A multisite study found that 18–35% of female and 40–55% of male heavy drinkers, who drank once a week or more, reported that they drank to reduce negative feelings (Hao et al., 1995). About 5% of males and 0.02% of females experienced acute alcohol intoxication in the past 6 months (Hao et al., 1999).

In the process of migrating from rural to urban areas, migrants experience geographic mobility, instability of living and employment conditions in cities (Ying, 2003), social alienation and discrimination, as well as profound changes in social and cultural context of living. All of these experiences are associated with increased psychological distress and anxiety, which in turn may result in elevated levels of alcohol intoxication among migrants (Huriwai, 2002;Elder et al., 2000;Griffin and Soskolne, 2003).

1.4. Goals of the study

Given that the migrant population may be at particular risk for sexual risk behavior and alcohol intoxication, information about the association of alcohol intoxication with sexual risk behavior among Chinese migrants is needed for effective planning and development of HIV prevention intervention programs. However, data regarding this issue among Chinese migrants are scant. While the existing literature regarding the relationship between alcohol use and sexual risk behavior is informative in formulating research questions, there are some limitations. First, most of these studies were conducted in other countries, where the cultural context regarding drinking and sexual attitudes may substantially differ from that in China. Second, most of the existing studies have focused on college students, adolescents, or minority youth; little information is available regarding rural-to-urban migrants. Therefore, the present study was designed to examine the relationship between alcohol intoxication and sexual risk behavior among Chinese rural-to-urban migrants. Specifically, the study aimed to explore two primary research questions: (1) what is the prevalence of alcohol intoxication and sexual risk behaviors (including premarital sex, multiple sexual partners, commercial sex, and unprotected sex)

among this population? (2) What is the association between alcohol intoxication and sexual risk behavior among rural-to-urban migrants in China?

2. Methods

2.1. Sampling and data collection

A cross-sectional survey was conducted among 4208 young rural-to-urban migrants (18–30 years old) in two large Chinese cities: Beijing, the national capital, and Nanjing, the capital of Jiangsu province in eastern China. Beijing and Jiangsu were among the Chinese administrative regions that reported the highest incidence of sexually transmitted diseases (China CDC, 2004). Beijing and Nanjing were also among the Chinese cities with large numbers of rural-to-urban migrants (Shen and Huang, 2003). Details on sampling and data collection have been described elsewhere (Li et al., 2004). Briefly, a "quota-sampling" procedure was used to recruit migrants from 10 main occupational clusters (restaurants, barbershops/beauty salons, bathhouses, dance halls/bars, construction sites, street stalls, small retail shops, hotels, domestic services, and factories) and job markets, so that the number of participants in each occupational cluster was approximately proportionate to the overall estimated distribution of migrants in the occupational cluster. Trained outreach workers recruited eligible participants from workplaces and job markets. After providing written informed consent, participants were asked to complete a self-administered anonymous questionnaire in a separate room or private space at the workplace or a nearby community location convenient to participants. The questionnaire, which was administered in Mandarin Chinese, took 40–60 min to complete. Reading assistance was provided to a few participants with limited literacy. The study protocol was approved by the Institutional Review Boards at West Virginia University and Wayne State University in the United States as well as Beijing Normal University and Nanjing University in China.

2.2. Measures

2.2.1. Demographic characteristics—Information on age, gender, ethnicity, educational attainment, and monthly income in the city was collected. For the purpose of data analysis in the current study, monthly income, measured in Chinese currency Yuan, was categorized using the 25th and 75th percentile into three groups (<480 Yuan or US$ 60; 480 to <1000 Yuan; ≥1000 Yuan or US$ 120). Participants were also asked about the frequency of residence change in the city (never, less than once per year, once every year, more than once a year), number of jobs they ever had during the course of migration (none, 1, 2, and at least 3) and whether they visited entertainment establishments (i.e., dancing hall, karaoke hall, bar, and night club) in their spare time (no/yes).

2.2.2. Alcohol intoxication—Participants were asked how many times they had been intoxicated with alcohol during the past 30 days using a five-point scale ranging from "none" to "at least four times". Because the frequency distribution of the variable was highly skewed (65.4, 15.4, 18.8, 0.2, and 0.2% for "none", "once", "twice, "three time", "at least four times", respectively), we dichotomized the variable so that participants who were intoxicated at least once in the past 30 days were classified as "intoxicated".

2.2.3. Sexual risk behaviors—Participants were asked whether they had engaged in several sexual risk behaviors, including premarital sex (no/yes), multiple sexual partners (having at least two sexual partners) in the previous month and having ever sold sex or bought sex (no/yes), and having had unprotected sex (inconsistent/non-use of condoms). Condom use during their sexual life was measured on a five-point scale, ranged from "never" to "always". Participants who reported never using a condom or not always using a condom during sexual intercourse were grouped into one category of "inconsistent/non-use" (of condoms).

2.2.4. Illicit drug use—Participants were asked whether they had ever used illicit drugs, including heroin, marijuana, opium, etc. Those who ever used any of these drugs were combined into one group of "illicit drug users."

2.2.5. Depression—Depressive symptoms were measured using the Center of Epidemiological Studies Depression Scale (CES-D) (Radloff, 1977). The existing Chinese version of CES-D was modified by the investigators based on the English version to ensure the accuracy of the translation. The Cronbach's alpha was 0.84 for the current study sample. Following the scoring scheme provided by the original developers, the scale scores ranged from 0 to 60, with higher scores reflecting higher frequency of depressive symptoms.

2.2.6. Satisfaction—Two questions were employed to assess participants' satisfaction with their current life and work along a five-point scale. The responses ranged from 1 (very dissatisfied) to 5 (very satisfied). For the purpose of data analysis in the current study, we dichotomized the variables so that participants who reported "very dissatisfied" or "dissatisfied" were grouped into one group of "dissatisfied".

2.2.7. Peer risk involvement—Participants were asked how many of their peers (1, none; 2, few; 3, some; 4, most) had engaged in six risk behaviors, which included having multiple sexual partners, unprotected sex (sex without a condom) and commercial sex (bought sex or sold sex), having had an STD and selling blood/plasma. The internal consistency of the scale for the current study sample was 0.79. A composite score of 1–4 was created by averaging the responses to the six items, with a higher score indicating a higher level of perceived peer risk involvement.

2.3. Statistical analysis

First, descriptive statistical analyses were employed to examine the distribution of demographic characteristics by gender among the study sample. Second, associations of alcohol intoxication with demographic characteristics, psychological factors and sexual risk behavior were examined using Chi-square test for categorical variables and ANOVA for continuous variables. The analysis was conducted among the entire sample, as well as by gender. Third, the Chi-square test was employed to explore the association of sexual risk behavior with alcohol intoxication. Finally, five multiple logistic regression analyses were performed to explore the association of alcohol intoxication with each sexual risk behavior by controlling for demographic characteristics and psychological factors. Age and gender were forced into the regression models first, followed by a stepwise selection of alcohol intoxication, demographic characteristics, and psychological factors into the model. Two dichotomous variables with much skewed frequency distributions (i.e., ethnicity, illegal drug use) were excluded from the multiple logistic regressions to ensure a robust estimate of regression equations. All statistical analyses were performed with SPSS for Windows, Version 11.5.

3. Results

3.1. Demographic characteristics

A total of 4301 migrants in Beijing and Nanjing were approached, of whom 4277 (99.4%) agreed to participate. Sixty-nine participants (1.6%) were removed from the dataset because of either substantial missing data (e.g., more than half of the variables were missing) or missing values on key demographic variables (e.g., gender). A final sample of 4208 (98%) was retained in the database (40% females and 60% males). Data from 2153 participants who reported having ever had sex were employed in the current study. As shown in Table 1, 66.2% of the participants were men and 33.8% were women, with an average age of 25.60 years (S.D. = 3.62). The majority of the sample (96.9%) was of Han ethnicity. Two-fifth had completed at

least 9 years of school education. Significant gender differences were found in monthly income and frequency of residence change. More women than men reported making less than 480 Yuan (US$ 60)/month (21.4% versus 12.1%, $p < 0.001$) and never changing residence (46.6% versus 34.8%, $p < 0.001$); 10% of the participants visited entertainment places in their free time. About one-third of the participants had been intoxicated with alcohol at least once during the past month, with more males than females being intoxicated (40.2% versus 23.7%, $p < 0.001$). About 3% of the participants reported having ever used illicit drugs. There was no gender difference in illicit drug use.

3.2. Sexual risk behavior, demographic characteristics, and psychological factors

As shown in Table 2, demographic and psychological variables were significantly associated with sexual risk behavior. Younger participants and men were more likely than older participants and women to engage in premarital sex ($p < 0.001$ for both groups), and to have sex with multiple sexual partners ($p < 0.001$ for both groups). Han ethnicity was associated with lower rates of selling sex ($p < 0.01$). Premarital sex was positively associated with educational attainment ($p < 0.001$), monthly income ($p < 0.001$), frequency of residence change ($p < 0.001$), and the number of jobs ever had during migration ($p < 0.001$). In addition, all five sexual risk behaviors were associated with visiting entertainment establishments ($p < 0.001$ for having premarital sex, $p < 0.01$ for having multiple sexual partners, $p < 0.05$ for buying sex, $p < 0.001$ for selling sex, and $p < 0.05$ for inconsistent/non-use of condoms), depression ($p < 0.001$ for all of the sexual risk behaviors except inconsistent/non-use of condoms) and perceived peer risk involvement ($p < 0.001$ for all five sexual risk behaviors). Participants involved in premarital sex and selling sex were more likely to be dissatisfied with their life ($p < 0.001$ for premarital sex, $p < 0.01$ for selling sex) and dissatisfied with their work ($p < 0.001$ for premarital sex, $p < 0.05$ for selling sex).

3.3. Alcohol intoxication, demographic characteristics, psychological factors, and sexual risk behaviors

Table 3 displays the association of alcohol intoxication with demographic, psychological, and sexual behaviors. Compared to non-intoxicated respondents, those who had been intoxicated in the past 30 days were younger ($p < 0.001$), obtained more years of formal schooling ($p < 0.05$), had a higher monthly income ($p < 0.01$), had a higher frequency of residence change ($p < 0.05$), were more likely to have an unstable employment history ($p < 0.05$), and were more likely to visit entertainment establishments in their spare time ($p < 0.001$). Intoxicated respondents also tended to report more psychological problems, including higher depression scores ($p < 0.001$), lower levels of satisfaction with life ($p < 0.001$) or with work ($p < 0.05$), and perceived more peer risk behavior involvement ($p < 0.001$). Intoxicated respondents were more likely than those who had not been intoxicated to engage in premarital sex (76% versus 60.2%, $p < 0.001$), to have multiple sexual partners (13.4% versus 5.2%, $p < 0.001$), to buy sex (12.6% versus 4.9%, $p < 0.001$) and to sell sex (10.1% versus 3.7%, $p < 0.001$). There were no significant relationships between intoxication and condom use. The associations between alcohol intoxication and these measures were similar for women and men, although males reported higher levels of sexual risk.

3.4. Multivariate analysis

Results of the multiple logistic regression models revealed that alcohol intoxication was significantly associated with all of the sexual risk behaviors except inconsistent/non-condom use after controlling for gender, age, demographic characteristics and psychological variables (Table 4). Specifically, intoxication was positively associated with the risk of engaging in premarital sex (OR = 1.30), having multiple sexual partners (OR = 1.57), buying sex (OR = 1.88) and selling sex (OR = 1.99). In addition, a number of demographic characteristics and

psychological factors were associated with sexual risk behaviors. Educational attainment was positively correlated with premarital sex (OR = 1.55), but negatively associated with buying sex (OR = 0.55), selling sex (OR = 0.62), and inconsistent/non-use of condoms (OR = 0.57). Depression and peer risk involvement were significantly related to premarital sex (OR = 1.02 and 2.06, respectively), having multiple sexual partners (OR = 1.04 and 3.39, respectively), buying sex (OR = 1.03 and 3.24, respectively) and selling sex (OR = 1.03 and 3.84, respectively). Dissatisfaction with work was positively associated with premarital sex (OR = 1.35) and inconsistent/non-use of condoms (OR = 1.93), while dissatisfaction with life was positively associated with having multiple sexual partners (OR = 1.64). Visiting entertainment places, having at least three jobs during migration and changing residence in cities at least twice per year were also significantly associated with premarital sex (OR = 1.96, 1.50, and 1.44, respectively).

4. Discussion

In the current study, about one-third of sexually experienced migrants (nearly one-half of the men and approximately one-quarter of the women) reported being alcohol intoxicated at least once during the past 30 days. These proportions were much higher than those reported in a study from six areas of China, in which 23,513 community household residents, aged 15–65 years, were assessed, and an acute intoxication rate during last 6 months was reported to be 5% for men and 0.02% for women (Hao et al., 1999). The findings in the current study that alcohol intoxication is associated with migratory factors and psychological problems support the notion that the process of acculturation and adaptation in urban areas may be so stressful that young migrants are likely to employ substance use as a coping strategy (Johnson et al., 2002). Health promotion efforts targeting migrants should include alcohol use prevention and adaptive stress coping training.

The current data support previous research, which found higher levels of sexual risk behaviors among young migrants than either the urban population or their rural counterparts. About two-thirds of our sample reported engaging in premarital sexual intercourse, which was substantially higher than rates reported in other studies conducted among the general population. For example, several studies have found that only 10–15% of Chinese college students are sexually experienced (Li et al., 2000;Stewart et al., 2000), and 23% of rural residents in Anhui province reported having premarital sex (Liu et al., 1998). Eight percent of migrants in the current study reported having multiple sexual partners in the past 30 days. By contrast, one study in mainland China reported that 7.8% of rural residents had more than one sexual partner in their lifetime (Liu et al., 1998) and another study from Hong Kong reported that 1.3% of the general female population had multiple sexual partners in the past 6 months (Lau et al., 2002b). About 6% of female migrants in this study reported engaging in selling sex, while less than 1% of general Chinese women reported receiving money for sex (Parish et al., 2003). These findings suggest that rural-to-urban migrants are at increased risk of involvement in sexual risk behaviors.

The positive relationship between alcohol intoxication and most sexual risk behaviors is consistent with those from the majority of previous studies conducted among adolescents, college students, and rural residents (Staton et al., 1999;Duncan et al., 1999). Likewise, the findings are consistent with some previous studies (Kingree and Betz, 2003) in western countries as well as a survey conducted among commercial sex workers in China, which reported 42% of sexual workers and 32% of their clients used alcohol during sex (Rogers et al., 2002). Alcohol use prevention intervention should be included as an important component in HIV prevention intervention programs. Given the striking difference between men and women, gender-specific approaches should be employed to improve the efficacy of prevention and intervention programs.

It is worthwhile to note the associations of some demographic and psychological factors with sexual risk behaviors. Consistent with findings from previous studies, higher levels of depressive symptoms were associated with sexual risk behaviors (Bachanas et al., 2002). Lower levels of education attainment and income were associated with increased risk of buying sex, whereas higher levels of education attainment and income were associated with increased premarital sex. Studies in other Asian countries have suggested that patronizing commercial sex workers might be also prevalent among migrants with lower socio-economic status (Elmer, 2001). Although some studies suggested that the majority of clients of sex workers in China were middle-class men under 35 years of age (Settle, 2003), lower socio-economic status populations (e.g., drivers, laborers, migrant construction workers) might also patronize commercial sex workers on streets or in small barber shops. Low levels of education and income, socially marginalized status, and limited opportunities to meet their emotional and physical needs may cause socially isolated rural-to-urban migrants to participate in commercial sex (Settle, 2003;Elmer, 2001). On the other hand, the association may suggest that people involved in commercial sex may be more apt than others to migrate.

Although alcohol intoxication was associated with sexual risk behaviors in general, the data in the current study did not suggest a significant relationship between alcohol intoxication and inconsistent/non-use of condoms. This finding corresponds to those from studies in the United States among adolescents (Morrison et al., 2003), non-monogamous heterosexually active single women (Testa and Collins, 1997), and non-injection drug users (Labrie et al., 2002). There are a number of possible reasons for such a non-significant relationship in the current study. First, alcohol intoxication and condom use were assessed within different timeframes (i.e., alcohol intoxication during past 30 days, condom use during sexual life). Second, factors other than alcohol intoxication were more likely to be associated with consistent use of condoms among this population. Previous research has suggested that the relationship between alcohol use and unprotected sex depends on context and sexual experience of the partners (Leigh, 2002). Future research with more closely matched assessment timeframes, using appropriate level of assessment (e.g., event level), and including other contextual or situational factors is needed to examine the link between alcohol intoxication and consistent condom use.

4.1. Potential limitations

Several limitations of the study should be noted. First, the cross-sectional study design limits our ability to examine causal relationship between alcohol intoxication and sexual risk behaviors. Further research, ideally with a longitudinal design, is needed to explore whether the social and cultural context associated with the rural-to-urban migration causes the increase in alcohol consumption, or alternatively, the heavy alcohol use prompts people to migrate. Second, the questions about alcohol assessed general use, not use during sex, thus, it is not known if the individuals who were engaging in high-risk behaviors were intoxicated at the time. Third, measures of alcohol intoxication and some of the sexual risk behaviors employed different timeframes, with alcohol intoxication happening in the past 30 days while some sexual risk behaviors (e.g., premarital sex, commercial sex, and unprotected sex) over their lifetime. Fourth, only alcohol intoxication was examined in the current study. It would be interesting to look at both general alcohol consumption and alcohol intoxication. However, as the original study was not designed to study the relationship of alcohol consumption and risk behaviors, information regarding general alcohol use was not collected. Fifth, since participants were recruited through convenience sampling rather than random sampling, results may not be generalizable to other migrant populations. Finally, information collected was based on self-report, and subject to social desirable reporting as most of the sexual behaviors assessed in the current study are socially stigmatized in China.

4.2. Implications of the findings

Our findings suggest a need for health-related prevention interventions (i.e., HIV prevention and alcohol abuse prevention) among young Chinese rural-to-urban migrants, especially among female migrants to reduce high levels of both alcohol use and sexual risk in the population. HIV prevention programs targeting this population should focus on not only skills for safer sex practices but also activities for alcohol use reduction. To be effective, prevention efforts need to address the specific risk factors contributing to alcohol intoxication among rural-to-urban migrants. Proper guidance and information about employment, housing and occupational training which aim to improve young migrants' living and employment condition in urban settings might be helpful in reducing migration-related stress, and in turn, lead to a reduction in alcohol intoxication. Appropriate training of life skills and adaptive coping strategies should be provided to young migrants.

Special attention should be paid to young Chinese women migrants because the prevalence of alcohol intoxication among them is 1200 times higher than in the general female population (Hao et al., 1999). Gender-specific intervention programs appear to be needed for effective intervention due to gender differences in both alcohol use and sexual risk behaviors.

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Table 1

Social-demographic characteristics of the 2153 Chinese rural-to-urban migrants, overall, and by gender

	Total		Male		Female	
	N	%	N	%	N	%
N	2153		1425		728	
Age	25.60 ± 3.62		25.86 ± 3.61		25.10 ± 3.59***	
Han ethnicity	2069	96.9	1375	97.2	694	96.1
Education						
≤9 years of education	1300	60.8	863	61.0	437	60.4
>9 years of education	837	39.2	551	39.0	286	39.6
Monthly income (Yuan)						
≤480 (or US$ 60)	324	15.3	170	12.1	154	21.4***
481–999	909	42.8	577	41.1	332	46.2
≥1000 (or US$ 120)	890	41.9	658	46.8	232	32.3
Frequency of changing residence						
Never	819	38.8	486	34.8	333	46.6***
<1 move every year	343	16.3	223	16.0	120	16.8
Once every year	439	20.8	300	21.5	139	19.5
>1 move every year	508	24.1	386	27.7	122	17.1
Number of job ever had						
No job	31	1.5	20	1.4	11	1.5
1	576	27.0	377	26.7	199	27.5
2	634	29.7	405	28.6	229	31.7
≥3	896	41.9	612	43.3	284	39.3
Visited entertainment places	206	9.6	137	9.6	69	9.5
Intoxicated in the last month	744	34.6	572	40.2	172	23.7***
Used illicit drugs	58	2.7	34	2.4	24	3.3

*
  $p < 0.05$;

**
  $p < 0.01$;

***
  $p < 0.001$.

Table 2

Sexual risk behaviors and socio-demographic, psychological factors among 2153 Chinese rural-to-urban migrants

	Premarital sex		Multiple sexual partners		Bought sex		Sold sex		Inconsistent/non use	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
N (%)	665 (34.3)	1276 (65.7)	1739 (91.8)	155 (8.2)	1767 (92.3)	147 (7.7)	1793 (94.0)	114 (6.0)	155 (8.0)	1780 (92.0)
Demographic factors										
Age	27.63 ± 2.90	24.73 ± 3.44***	25.80 ± 3.50	24.56 ± 3.46***	25.69 ± 3.43	25.47 ± 4.48	25.72 ± 3.51	25.12 ± 3.68	24.74 ± 3.25	25.80 ± 3.53***
Male	404 (60.8)	895 (70.1)***	1136 (65.3)	126 (81.3)***	1148 (65.0)	133 (90.5)***	1200 (66.9)	74 (64.9)	96 (61.9)	1203 (67.6)
Han ethnicity	642 (97.4)	1227 (96.5)	1677 (97.0)	144 (95.4)	1704 (97.2)	138 (94.5)	1733 (97.3)	103 (92.8)**	150 (97.4)	1711 (96.8)
>9 years of education	197 (29.8)	566 (44.7)***	529 (42.0)	56 (36.6)	714 (40.7)	44 (30.3)*	719 (40.4)	37 (33.0)	82 (53.2)	682 (38.6)***
Monthly income ≥1000 Yuan (or US$ 120)	234 (35.7)	601 (47.7)***	747 (43.5)	73 (47.4)	766 (43.8)	59 (40.7)*	770 (43.4)	49 (43.4)	71 (46.7)	765 (43.4)
Changing residence ≥2 times per year	121 (18.5)	349 (27.9)***	412 (24.2)	49 (31.8)	416 (24.0)	48 (32.9)	428 (24.4)	35 (31.0)	39 (26.0)	436 (24.9)
Had ≥3 jobs	232 (35.1)	599 (47.2)***	729 (42.2)	83 (53.5)*	743 (42.3)	78 (53.4)	759 (42.6)	60 (52.6)	55 (35.7)	777 (43.9)*
Visited entertainment Places in spare time	26 (3.9)	170 (13.3)***	162 (9.3)	27 (17.4)**	171 (9.7)	23 (15.6)*	169 (9.4)	23 (20.2)***	24 (15.5)	171 (9.6)*
Psychological factors										
Depression	9.68 ± 8.58	12.10 ± 9.56***	10.59 ± 8.75	16.25 ± 11.96***	11.02 ± 9.24	15.44 ± 8.59***	11.03 ± 9.11	16.31 ± 10.64***	10.92 ± 9.32	11.34 ± 9.29
Dissatisfied with life	145 (21.9)	372 (29.3)***	440 (25.4)	64 (41.3)***	465 (26.4)	49 (33.3)	472 (26.4)	45 (39.8)**	35 (22.6)	481 (27.2)
Dissatisfied with work	159 (24.0)	408 (32.2)***	499 (28.8)	54 (34.8)	509 (29.0)	51 (34.7)	518 (29.0)	44 (38.9)*	31 (20.0)	533 (30.1)**
Peer risk involvement	1.35 ± 0.45	1.60 ± 0.56***	1.47 ± 0.50	1.97 ± 0.67***	1.48 ± 0.51	1.94 ± 0.63***	1.49 ± 0.51	2.02 ± 0.71***	1.66 ± 0.59	1.50 ± 0.53***

Note: Numbers presented in the cells are either N (%) or mean $\pm$ standard deviation (S.D.).

*
$p < 0.05$.

**
$p < 0.01$.

***
$p < 0.001$.

Table 3

Alcohol intoxication and socio-demographic, psychological factors and sexual risk behaviors among 2153 Chinese rural-to-urban migrants

	Overall		Male		Female	
	Non-intoxicated	Intoxicated	Non-intoxicated	Intoxicated	Non-intoxicated	Intoxicated
Demographic factors						
Age	25.94 ± 3.51	24.96 ± 3.74***	26.22 ± 3.41	25.31 ± 3.83***	25.50 ± 3.62	23.77 ± 3.20***
Han ethnicity	1356 (97.1)	711 (96.3)	827 (97.6)	547 (96.6)	529 (96.4)	164 (95.3)
>9 years of education	524 (37.5)	313 (42.4)*	315 (37.2)	236 (41.7)	209 (37.9)	77 (44.8)
Monthly income ≥1000 Yuan (or US$ 120)	548 (39.5)	341 (46.5)**	395 (47.0)	262 (46.5)	153 (28.0)	79 (46.5)***
Changing residence ≥2 times per year	310 (22.6)	198 (27.0)*	229 (27.6)	157 (27.8)	81 (14.9)	41 (24.3)**
Had ≥3 jobs	556 (39.7)	339 (46.1)*	354 (41.7)	257 (45.5)	202 (36.7)	82 (48.0)*
Visited entertainment places in spare time	105 (7.5)	101 (13.6)***	69 (8.1)	68 (11.9)*	36 (6.5)	33 (19.2)***
Psychological factors						
Depression	10.43 ± 8.85	13.23 ± 10.14***	10.35 ± 8.68	12.73 ± 9.72***	10.55 ± 9.12	14.88 ± 11.31***
Dissatisfied with life	315 (22.5)	246 (33.2)***	196 (23.2)	184 (32.3)***	119 (21.5)	62 (36.3)***
Dissatisfied with work	372 (26.6)	238 (32.1)*	243 (28.8)	175 (30.7)***	129 (23.4)	63 (36.8)**
Peer risk involvement	1.42 ± 0.49	1.64 ± 0.60***	1.45 ± 0.50	1.64 ± 0.57***	1.39 ± 0.48	1.66 ± 0.68***
Risky sexual behavior						
Premarital sex behavior	755 (60.2)	520 (76.0)***	497 (64.6)	397 (75.0)***	258 (53.1)	123 (79.4)***
Had multiple sex partners	63 (5.2)	91 (13.4)***	51 (6.9)	74 (14.2)***	12 (2.5)	17 (10.9)***
Bought sex	60 (4.9)	87 (12.6)***	53 (7.1)	80 (15.1)***	7 (1.5)	7 (4.4)*
Sold sex	45 (3.7)	69 (10.1)***	31 (4.1)	43 (8.2)**	14 (2.9)	26 (16.6)***
Inconsistent/non-use of condoms	1145 (92.0)	633 (91.9)	711 (92.7)	491 (92.5)	434 (91.0)	142 (89.9)

Note: Numbers presented in the cells are either *N* (%) or mean ± standard deviation (S.D.).

*
$p < 0.05$.

**
$p < 0.01$.

***
$p < 0.001$.

Table 4

The association of alcohol intoxication, demographic characteristics, psychological factors and sexual risk behaviors among 2153 Chinese rural-to-urban migrants

	OR 95% CI				
	Premarital sex behavior	Multiple sexual partners	Bought sex	Sold sex	Inconsistent/non-condom use
Age	0.75 (0.72–0.78)	0.89 (0.84 to 0.94)	–	–	1.09 (1.04 to 1.15)
Male	1.66 (1.30–2.11)	3.07 (1.91 to 4.95)	5.46 (2.97 to 10.04)	–	–
Intoxicated	1.30 (1.02–1.67)	1.57 (1.07–2.31)	1.88 (1.29–2.74)	1.99 (1.29–3.06)	–
>9 years of education	1.55 (1.22–1.97)	–	0.55 (0.37–0.82)	0.62 (0.40–0.96)	0.57 (0.40–0.80)
Monthly income ≥1000 Yuan (or US$ 120)	1.53 (1.21–1.94)	–	–	–	–
Changed residence at least twice per year	1.44 (1.10–1.89)	–	–	–	–
Had ≥3 jobs	1.50 (1.20–1.89)	–	–	–	1.52 (1.06–2.17)
Visited entertainment places in spare time	1.96 (1.22–3.13)	–	–	–	–
Depression score	1.02 (1.00–1.03)	1.04 (1.02–1.05)	1.03 (1.01–1.05)	1.03 (1.01–1.05)	–
Dissatisfied with life	–	1.64 (1.11–2.44)	–	–	–
Dissatisfied with work	1.35 (1.04–1.74)	–	–	–	1.93 (1.26–2.96)
Peer risk involvement	2.06 (1.62–2.63)	3.39 (2.48–4.65)	3.24 (2.39–4.40)	3.84 (2.79–5.30)	0.62 (0.46–0.83)

Note: (1) Only independent variables contained in the final model of each regression analysis are reported in the table; (2) goodness-of-fit test results for the five models were $\chi(8)^2 = 9.17$, $p = 0.33$; $\chi(8)^2 = 6.89$, $p = 0.55$; $\chi(8)^2 = 5.32$, $p = 0.72$; $\chi(8)^2 = 7.93$, $p = 0.44$; and $\chi(8)^2 = 11.14$, $p = 0.19$, respectively.