Published in final edited form as:

Women Health. 2015 ; 55(5): 580–594. doi:10.1080/03630242.2015.1022811.

Multiple abortions and sexually transmitted infections among young migrant women working in entertainment venues in China

Yanyan Dong^a, Hongbo Zhang^a, Yongyang Wang^b, Haidong Tao^b, Song Xu^c, Junrui Xia^c, Wen Huang^a, Huan He^a, Nickolas Zaller^d, and Don Operario^e

^aDepartment of Adolescent Health and Maternal and Child Health, School of Public Health, Anhui Medical University, Hefei, Anhui Province, China

^bLuyang District Center for Disease Control and Prevention, Hefei, Anhui Province, China

^cBaohe District Center for Disease Control and Prevention, Hefei, Anhui Province, China

^dFay W. Boozman College of Public Health, University of Arkansas, USA

^eSchool of Public Health, Brown University, Providence, RI, USA

Abstract

We conducted a survey of 358 young migrant women working in entertainment venues in China to explore the prevalence of and factors associated with two indicators of sexual and reproductive health: (i) multiple abortions and (ii) the dual risk of sexually transmitted infections (STI) and abortion history. One quarter (25.4%) of the women in this sample had multiple abortions during their lifetime and, of those with any abortion history, 18.3% had had an abortion outside of a regulated health clinic. One-third (33.0%) of the sample had had a STI during the past year, and approximately one-fourth (23.7%) of those women did not receive STI treatment in a public hospital. Approximately one-fourth (23.5%) of the sample reported both a history of abortion and an STI during the past year. Women with a history of multiple abortions had significantly lower income levels, were more likely to have sex with clients and with husbands, and tended more to use alcohol before sex. Women who experienced both abortion and STI risks were more likely to report having had unprotected sex, genitourinary tract infections symptoms, anxiety, illicit drug use, and suicidal ideation. Enhanced efforts are needed to improve reproductive and sexual health for female migrants in urban China, particularly those working in entertainment venues.

Keywords

China; migrants; women; sexual health; reproductive health

INTRODUCTION

The World Health Organization (WHO) has advocated for increased access to contraception and reproductive health services to improve women's health in low and middle income

Correspondence: Hongbo Zhang, MD, MS, School of Public Health, Anhui Medical University, 69 Meishan Road, Hefei 230032, Anhui Province, People's Republic of China; zhongbo62@163.com. Alternative correspondence to Don Operario, School of Public Health, Brown University, 121 South Main Street, Providence, RI, USA; Don_Operario@brown.edu.

countries (WHO, 2005). Unprotected sex is among the leading factors contributing to illness and mortality for women in developing countries (Glasier et al., 2006). Induced abortion is frequently used as remediation after contraception failure, and risks associated with unsafe abortions have contributed to as many as 100,000 deaths annually (Wang & Sun, 2008; WHO, 2005). Untreated sexually transmitted infections (STIs) pose significant risks to women's health and can lead to pelvic inflammatory disease, ectopic pregnancy, infertility, and cervical cancer. Untreated STIs can also increase the risk for transmission of the human immunodeficiency virus (HIV) (WHO, 2008; Xia et al., 2004). Dual protection methods are key strategies to prevent against both unintended pregnancy and STIs, including HIV (Berer, 2006; Bull & Shlay, 2005).

Due to ongoing demographic, social, and economic changes, China is a compelling context in which to examine women's reproductive and sexual health. Many women in China have sought induced abortion as a strategy for compliance with the state's "one-child policy" (Wang, 2012). The estimated number of induced abortions among women ages 15 to 40 years in China peaked at 14.4 million in 1983 and has since stabilized at about 9 million annually (Zheng et al., 2012). Although access to contraception in China expanded during the past two decades, often unmarried women rely on ineffective methods for preventing pregnancy, such as withdrawal (Li et al., 2013). Moreover, abortion remains a frequent method of contraception in China (Zhu, Lu, & Hesketh, 2009). According to one study, nearly half of young women seeking abortions in China did not use any form of contraception (Ip, 2011).

During the past three decades, China has experienced a dramatic increase in rural-to-urban migration due to economic expansion and growth of large cities (Qiu, Li, & Liu, 2011). Approximately 36% of 221 million migrants in 2010 were females (National Population and Family Planning Commission of P.R. China, 2011). Relocation from rural to urban settings in China exposes female migrants to shifting norms about sexual behavior (Yang, Derlega, & Luo, 2007). Previous studies have found that, compared with non-migrants, young female migrants in urban settings had lower knowledge about sexual health, inadequate safe sex practices, and limited awareness of reproductive health services (He, Yu, & Song, 2012; Liu et al., 2011). Female migrants were also more likely than non-migrants to engage in casual or commercial sex due to economic necessity (Yang, Derlega, & Luo, 2007; Hong et al., 2006).

Many female migrants experience challenges finding skilled or formal employment (Kuang & Liu, 2012), and, thus, frequently seek jobs in entertainment venues, such as bars, nightclubs, and karaoke parlors, which are common in urban settings throughout China. Patrons (mostly male) who visit these venues generally pay fees in exchange for companionship with a female employee, with whom they engage in various social activities, such as singing karaoke, gambling, and drinking (Huang et al., 2013). Some male patrons offer entertainment workers money in exchange for sex. Studies in large cities in China have estimated that 50% to 80% of migrant women working in entertainment venues engaged in commercial sex activity (Wei et al., 2004; Yang & Xia, 2006).

Owing to the challenges associated with rural-to-urban migration and the specific occupational risks associated with entertainment venues, understanding the sexual and reproductive health issues – such as sexual behavior, abortion history and STIs – among female migrants working in entertainment venues is critical. This paper reports on findings from a survey of young rural-to-urban female migrants working in entertainment venues in a large city in China. The aims of this project were to: (i) describe the prevalence of abortion history and STIs in this sample and (ii) explore the sociodemographic and behavioral characteristics associated with having multiple abortions and having the dual risk of STI and abortion history. Findings from this exploratory study can provide an important step in improving sexual and reproductive health services for young migrant women in China.

METHODS

Participants and Recruitment

We carried out a cross-sectional survey of young female migrants between March and July 2012 to examine sexual risk behaviors among women working in entertainment venues in Hefei, the capital city of Anhui province. Due to improving economic conditions during the past twenty years, Hefei has witnessed an increasing numbers of entertainment venues (e.g., bars, karaoke parlors, dance halls) which provide a large job market for young female migrants.

Eligibility criteria for inclusion in the survey were being female, 18 to 29 years old, a migrant originating from a rural setting, currently living in Hefei, and employed in an entertainment venue. The sample included only rural-to-urban migrants because of our focus on the health of women who experienced this form of migration. The sample included only women ages 18 to 29 years based on input from key staff at the Anhui Provincial Centers for Disease Control (CDC), who indicated that the majority of women working in these establishments were below the 30 years of age. Participants were recruited using targeted venue-based sampling. To identify venues for recruitment, we first obtained a list of all registered Hefei entertainment venues from the Anhui Provincial CDC.

We employed two strategies to maximize the socioeconomic diversity within our sample. First, we purposefully selected two districts (of four) in Hefei, including a lower socioeconomic district (Baohe) and a higher socioeconomic district (Luyang). Second, we recruited more-affluent and less-affluent venues within each district, using the CDC classification of entertainment venues as either “affluent” or “average/marginal” status; classification was determined by the size of the staff/number of employees (affluent venues had substantially larger staff sizes), quality of physical premises, and client profiles of each venue. Of 157 registered entertainment venues across both districts, we randomly selected 54 establishments to contact (18 affluent venues and 36 average/marginal venues), described to venue managers the nature of the research study, and asked their permission to recruit female staff members from within the establishment. We contacted twice as many average/marginal venues than affluent venues due to the relatively lower number of employees at average/marginal venues. Six venues declined our request to recruit. Overall, we obtained permission to recruit from 18 affluent venues and 30 average/marginal venues. We calculated that a sample size of 350 was necessary to detect an effect size of at least 0.2 in

sexual risk across the two categories of entertainment venues, with 80% power and a two-tailed alpha level of 0.05. We approached and screened 374 entertainment venue workers. Overall, 16 individuals declined to participate in our study, all of whom were employed in average/marginal venues, yielding participation rates of 100% and 89% for affluent venues and average/marginal venues, respectively.

Procedure

We conducted in-person recruitment in targeted venues prior to standard evening work schedules to minimize any disruption of business activities. After screening for eligibility, participants received appointments to complete a confidential interview in a private space outside of the entertainment venue. We obtained verbal informed consent from all participants using institutional review board-approved documents and then verbally conducted structured questionnaire interviews. Each interview lasted about 30 minutes. Participants received a gift packet containing safer sex materials valued at 50 RMB (approximately \$7.8 USA) after completing the questionnaire.

Measures

Surveys included measures of demographic characteristics including age, education level, marital status, and monthly income. The survey asked participants to self-report various health-related behaviors, including sexual behaviors (age of initial sex, unprotected sexual behaviors during the past 6 months; Huang et al., 2013); alcohol use (measured using the Alcohol Use Disorders Identification Test (AUDIT; Babor et al., 2001); other drug use (adapted from the Addiction Severity Index (ASI; McLellan et al., 1992). Participants also reported lifetime history of and total number of abortions; HIV testing and counseling history; genitourinary tract infections (GTIs) during the past 12 months, and STIs during the past 12 months (Huang et al., 2013). In addition, the survey included psychosocial measures including history of suicidal ideation, recent depression symptomatology (CES-D; Liu et al., 1995), and recent anxiety symptomatology (ASA; Liu et al., 1997). Finally, the survey included measures of knowledge about STI and HIV transmission (e.g., “Can HIV/AIDS be cured?”), knowledge about condom use (e.g., “It is OK to put on a condom right before ejaculation”), and self-efficacy to use condoms (e.g., “Are you confident that you are able to use condoms each time you have sexual intercourse?”); these measures had been previously validated with similar populations in China (Chen et al., 2009; Wang et al., 2007).

Data Analysis

Data were entered using EpiData 3.0 software and analyses were conducted using SPSS 10.01. We conducted descriptive analyses for all measures and conducted bivariate and multivariable analyses to examine correlates of two dependent variables: (i) multiple abortions was defined as self-reported history of two or more lifetime abortions; and (ii) combined abortion-STI was defined as self-reported history of one or more abortion and any self-reported STI during the past 12 months. To identify covariates for inclusion in the multivariable regression models, we included any variable that had a bivariate association with each dependent variable at $p < 0.10$, following procedures described by Hosmer and Lemeshow (2000). To achieve parsimonious models, backward elimination

logistic regression was used to eliminate covariates that did not contribute to the explaining the model variance. We examined odds ratios (ORs) and 95% confidence intervals (CIs) as well as model fit statistics including the R-square and the omnibus model chi-square.

RESULTS

Participant Characteristics

The average age of participants was 23 years (standard deviation (sd) 3.0 years), with 18.4% of participants aged between 18 and 20 years old and 81.6% between 21 and 29 years old (Table 1). More than half (55.6%) had a junior high school education or less, and 44.4% were married or living with a boyfriend. Over half (51.7%) had earned more than 4000 Yuan (roughly \$640 US) monthly. Nearly two-thirds (64.2%) of participants were recruited from affluent entertainment venues, and 35.8% were recruited from average or marginal entertainment venues. Overall, 24.3% were married, and 75.7% were unmarried. Compared with married participants, those who were unmarried were more likely to be between the ages of 18 to 20 years, have completed high school education, and work in an affluent entertainment venue (Table 1).

Three-fifths of the sample (213 of 358 participants) had a lifetime history of abortion. One-fourth (25.4%) of the entire sample had two or more lifetime abortions. Of those with any abortion history, 18.3% had an abortion outside of the public hospital system. One third (33.0%) of participants had had a STI during the past 12 months, and 20.4% had had GTI symptoms during the past 12 months. Of those with a past-year STI, 23.7% did not receive STI treatment in a public hospital. Nearly one-fourth (23.5%) of the sample reported having had both any abortion history and any STI in the past year. No differences were observed between married and unmarried participants on abortion and STI-related variables (Table 1).

Associations with Multiple Abortion and Combined Abortion-STI Risk

Frequency of multiple (two or more) lifetime abortions was significantly higher among participants who had initial sex below the age of 18 years, experienced sexual coercion during their first sexual experience, did not use contraception during first sex, did not use a condom during first sex, had any STI during the past year, had sex with a husband during the past six months, had sex with paying male client during the past six months, had sex with a non-paying casual male partner during the past six months, consumed alcohol before sex during the past six months, and ever used illicit drugs (Table 2). The frequency of the combination dependent variable – any abortion history and any STI in the past year – was significantly higher among participants who had initial sex below the age of 18 years, did not use contraception during first sex, did not use a condom during first sex, ever used illicit drugs, had symptoms of anxiety during the past week, and reported suicidal ideation during the past year.

In multivariable regression analysis, correlates of multiple abortion history included having a monthly income less than 4000 RMB (OR = 1.73, 95% CI = 1.00, 2.97), sex with a husband during the past six months (OR = 2.20, 95% CI = 1.23, 3.94), alcohol consumption before sex during the past six months (OR = 1.79, 95% CI = 1.05, 3.06), and non-use of

contraception during first sex (OR = 2.31, 95% CI = 1.21, 4.40) (Table 3). Multiple abortion history was moderately associated with sex with a male client during the past six months (OR = 1.66, 95% CI = 0.99, 2.79). The omnibus model was significant ($p < 0.001$), explaining 12.8% of the variance.

In multivariable regression analysis, significant correlates of the combination variable (abortion history and any STIs during the past year) were any unprotected sex during the past six months (OR = 13.19, 95% CI = 6.51, 26.72), any GTI symptoms during the past year (OR = 3.85, 95% CI = 1.94, 7.64), history of illicit drug use (OR = 3.47, 95% CI = 1.14, 10.41), suicidal ideation during the past year (OR = 3.12, 95% CI = 1.06, 9.18), and non-use of contraception during first sex (OR = 2.29, 95% CI = 1.04, 5.02) (Table 4). This dependent variable was moderately associated with anxiety symptoms during the past week (OR = 3.85, 95% CI = 0.96, 12.04). The omnibus model was significant ($p < 0.001$), explaining 47% of the variance.

DISCUSSION

Findings in this paper bring attention to the prevalence and potential risks associated with multiple abortions and STIs among young migrant women working in urban entertainment venues in China. These results are consistent with other studies that have reported on sexual health risks among migrant women working in China's entertainment venues (Mantell et al., 2011; Weir et al., 2013). Promotion of dual protection methods, which prevent against both unintended pregnancy and STIs, are necessary strategies to improving the health of these women (Berer, 2006; Bull & Shlay, 2005). Of particular concern is the proportion of women in this sample who did not seek clinic-based abortion or STI treatment services. These findings may possibly reflect barriers to safe and appropriate sexual and reproductive health services for this group of women.

Our findings identified specific correlates of multiple abortion history and with the combined risk of abortion and past-year STI. Women in the sample with a history of multiple abortions had significantly lower incomes, were more likely to have sex with clients and with husbands, and used alcohol more often before sex, compared with those who did not have multiple abortions. Women who experienced conjoined abortion-STI risks were more likely to have reported unprotected sex, GTI symptoms, anxiety, illicit drug use, and suicidal ideation. Notably, lack of contraception use during first sex episode was significantly associated with both multiple lifetime abortions and abortion-STI risk. This finding is consistent with research showing that early sexual experiences may be predictive of long-term patterns of sexual and reproductive health risks (Kalmuss et al., 2009; Ma et al., 2009). In bivariate analyses, early age of sexual debut, lack of contraception use during first sex, and lack of condoms during first sex were associated with both dependent variables; coercion during first sex was also associated with multiple abortions. Although exploratory, these findings suggest that early sexual experiences might have implications for future reproductive and sexual health behaviors in this group.

As noted, young female migrants from rural areas in China may have few opportunities for education about reproductive and sexual health prior to their urban migration. Prior research

has shown that many young and unmarried migrants in urban China reach their destination cities without adequate education and awareness about reproductive and sexual health behaviors, risk factors, and services (He, Yu, & Song, 2012; Zheng et al., 2001). Thus, efforts are needed to educate young people better, especially unmarried females, about family planning and sexual and reproductive health, in accordance with the 2001 Population and Family Planning Law of the People's Republic of China (Li et al., 2009; Watts, 2004).

Findings from this study indicated that entertainment venues might be at least one type of feasible site for conducting outreach and education to high-risk women regarding reproductive and sexual health services. It is worth noting that managers/owners of only six of 54 contacted venues declined our request to conduct on-site recruitment, suggesting that these venues might potentially serve as sites for the delivery of HIV/STI testing and reproductive health education. Recent research provides worksite-based health promotion programs to promote contraception among unmarried female migrants in factory settings in China (Qian et al., 2007). Further research is needed to clarify some of the factors that may promote or obstruct the willingness of entertainment venue managers/owners and employees to participate in on-site sexual and reproductive health promotion programs.

Limitations

Several limitations of the study need to be considered. First, as mentioned, the cross-sectional design did not permit inferences about temporal relations or causal pathways between variables. Second, due to the reliance on self-report data, findings might have been affected by social desirability bias and recall bias. Third, because we used convenience sampling of women working in entertainment venues, findings might not be generalizable to other female migrants in urban China. Fourth, due to time and space limitations, we did not collect comprehensive information about current and history of contraception use, sexual behaviors with paying and non-paying partners, and experiences with reproductive and sexual health services. Fifth, gestational age for abortion was not ascertained, and results could have differed for earlier versus later gestations. Finally, risk factors might differ for married versus unmarried women, but our sample size provided inadequate statistical power to examine this potential effect modification, and for women older than 30 years who were not included in this study.

CONCLUSION

In summary, this study provides an enhanced understanding of the reproductive and sexual health risk factors among young female migrants working in entertainment venues. These findings suggest a need to improve the reach of reproductive and sexual health education and services to young female migrants, particularly those who work at entertainment venues, to address the high proportion of abortions and STIs. Efforts are also needed to address the correlates of these sexual and reproductive health risks, such as psychological distress, illicit drug use, alcohol use before sex, unprotected sex with both husbands and with paying partners. Future research should explore the feasibility and acceptability of providing on-site sexual and reproductive health promotion programs at entertainment venues.

Acknowledgments

The authors would like to thank all of the participants who supported this research. The authors also would like to thank the staff of the Baohe and Luyang District Centers for Disease Control and Prevention of Hefei for their help in facilitating this study. The content is solely the responsibility of the authors and does not necessarily represent the official views of any study sponsors.

FUNDING

This work was supported by China AIDS Program Round 3, Global Fund to Fight AIDS, Tuberculosis and Malaria (no. ZY38); by a pilot grant from Brown University Office of International Affairs; and by infrastructure and resources provided by the Brown University Alcohol Research Center on HIV/AIDS (NIH/NIAAA P 01 AA019072) and the Lifespan/Tufts/Brown Center for AIDS Research (NIH/NIAID P30AI042853).

References

- Babor, TF.; Higgins-Biddle, JC.; Saunders, JB.; Monteiro, MG. The Alcohol Use Disorders Identification Test. Geneva: World Health Organization; 2001.
- Berer M. Dual protection: more needed than practised or understood. *Reprod Health Matters*. 2006; 14:162–70. [PubMed: 17101435]
- Bull SS, Shlay JC. Promoting “dual protection” from pregnancy and sexually transmitted disease: A social ecological approach. *Health Promot Pract*. 2005; 6:72–80. [PubMed: 15574531]
- Chen L, Zhang HB, Wang J, Hu HL, Wu HH, Zhu JL. Relationship between depressive symptoms and social capital, social networks among female migrant adolescents in Hefei. *Chin J Dis Control Prev*. 2009; 13:302–05.
- Glasier A, Gulmezoglu AM, Schmid GP, Moreno CG, Van Look PFA. Sexual and reproductive health: A matter of life and death. *Lancet*. 2006; 368:4–10. [PubMed: 16815358]
- He CY, Yu JY, Song LP. Factors analysis of multiple induced abortion among unmarried migrant women. *Chinese J Rural Medicine and Pharmacy*. 2012; 16:30.
- Hong Y, Stanton B, Li XM, Yang HM, Lin DH, Fang XY, et al. Rural-to-urban migrants and the HIV epidemic in China. *AIDS and Behavior*. 2006; 10:421–30. [PubMed: 16421651]
- Hosmer, DW.; Lemeshow, S. *Applied Logistic Regression*. New York: Wiley; 2000.
- Huang W, Operario D, Dong Y, Zaller N, Song D, He H, Tao H, Xia J, Zhang H. HIV-related risk among female migrants working in entertainment venues in China. *Prev Sci*. 2013; 15:329–39. [PubMed: 23921562]
- Ip WY, Chan MY, Chan DS, Chan CW. Knowledge of and attitude to contraception among migrant woman workers in mainland China. *J Clin Nurs*. 2011; 20:1685–95. [PubMed: 21255168]
- Kalmuss D, Davidson A, Cohall A, Laraque D, Cassell C. Preventing sexual risk behaviors and pregnancy among teenagers: Linking research and programs. *Perspect Sex Reprod Health*. 2003; 35:87–93. [PubMed: 12729138]
- Kuang L, Liu L. Discrimination against rural-to-urban migrants: The role of the hukou system in China. *PLoS One*. 2012; 7:e46932. [PubMed: 23144794]
- Li H, Li DQ, Li HQ, Diao YT. Contraception and induced abortions for women of reproductive age married in recent years in rural areas of Shandong, China. *Gynecol Obstet Invest*. 2009; 68:174–80. [PubMed: 19672085]
- Li J, Temmerman M, Chen QJ, Xu JL, Hu LN, Zhang WH. A review of contraceptive practices among married and unmarried women in China from 1982 to 2010. *Eur J Contracept Reprod Health Care*. 2013; 18:148–58. [PubMed: 23544865]
- Liu XC, Sun LM, Tang MQ, Liu QL, Yang J, Ma DD, et al. The analysis of anxiety self-assessment among 2462 adolescents. *Chinese Ment Health J*. 1997; 11:75–7.
- Liu XC, Tang MQ, Chen K, Hu L, Wang AZ. The comparison of SDS with CES-D for undergraduates. *Chinese Ment Health J*. 1995; 9:19–20.
- Liu ZY, Zhu MM, Dib HH, Li Z, Shi SH, Wang ZZ. Reproductive health knowledge and service utilization among unmarried rural-to-urban migrants in three major cities, China. *BMC Public Health*. 2011; 11:74. [PubMed: 21284893]

- Ma Q, Ono-Kihara M, Cong L, Xu G, Pan X, Zamani S, et al. Early initiation of sexual activity: A risk factor for sexually transmitted diseases, HIV infection, and unwanted pregnancy among university students in China. *BMC Public Health*. 2009; 9:111. [PubMed: 19383171]
- Mantell ME, Kelvin EA, Sun X, Zhou J, Exner TM, Hoffman S, Zhou F, Sandfort TG, Leu CS. HIV/STI risk by migrant status among workers in an urban high-end entertainment centre in Eastern China. *Health Educ Res*. 2011; 26:283–295. [PubMed: 21389063]
- McLellan AT, Kushner H, Metzger D, Peters R, Smith I, Grissom G, et al. The fifth edition of the Addiction Severity Index. *J Subst Abuse Treat*. 1992; 9:199–213. [PubMed: 1334156]
- National Population and Family Planning Commission of P.R. China. China's floating population development report. Beijing: China Population Publishing House; 2011.
- Qian X, Smith H, Huang W, Zhang J, Huang Y, Garner P. Promoting contraceptive use among unmarried female migrants in one factory in Shanghai: A pilot workplace intervention. *BMC Health Serv Res*. 2007; 7:77. [PubMed: 17540025]
- Qiu H, Li JH, Liu HJ. Study on floating population reproductive health and counter measures. *Med Society*. 2011; 24:29–31.
- Wang C. History of the Chinese Family Planning program: 1970–2010. *Contraception*. 2012; 85:563–69. [PubMed: 22176797]
- Wang Q, Fu XL, Wei YL, Jia Y, Liao J, He Y, et al. The study on anxiety and its influence on factors in the floating population in Chengdu. *J Prev Med Information*. 2007; 23:544–46.
- Wang XL, Sun AJ. Survey on induced abortion among migrant population. *Maternal Child Health Care China*. 2008; 23:1836–37.
- Watts J. China sex education lags behind sexual activity. *Lancet*. 2004; 363:1208. [PubMed: 15083825]
- Wei SB, Chen ZD, Zhou W, Wu FB, Li SP, Shan JG. A study of commercial sex and HIV/STI-related risk factors among hospitality girls in entertainment establishments in Wuhan, China. *Sexual Health*. 2004; 1:141–44. [PubMed: 16335301]
- Weir SS, Li J, Edwards JK, Gandhi AD, Yingying H, Suchindran CM, Chen XS. Exploring venue-associated risk: A comparison of multiple partnerships and syphilis infection among women working at entertainment and service venues. *AIDS Behav*. 2013 Epub ahead of print.
- World Health Organization. Strategy to accelerate progress towards the attainment of international development goals and targets related to reproductive health. *Reprod Health Matters*. 2005; 13:11–8.
- World Health Organization. Sexually Transmitted Infections. *Reprod Health Matters*. 2008. <http://www.who.int/mediacentre/factsheets/fs110/en/index.html>
- Xia DY, Liao SS, He QY, Choi KH, Mandel JS. Self-reported symptoms of reproductive tract infections among rural women in Hainan, China: prevalence rates and risk factors. *Sex Transm Dis*. 2004; 31:643–49. [PubMed: 15502670]
- Yang X V, Derlega J, Luo H. Migration, behaviour change and HIV/STD risks in China. *AIDS Care*. 2007; 19:282–88. [PubMed: 17364411]
- Yang XS, Xia GM. Gender, work, and HIV risk: determinants of risky sexual behavior among female entertainment workers in China. *AIDS Educ Prev*. 2006; 18:333–47. [PubMed: 16961450]
- Zheng X, Pang L, Tellier S, Tan L, Zhang L, Hu Y, Wei J. The changing patterns of abortion among married women in China, 1984–2005. *Eur J Obstet Gynecol Reprod Biol*. 2012; 166:70–5. [PubMed: 23219292]
- Zheng Z, Zhou Y, Zheng L, Yang Y, Zhao D, Lou C, Zhao S. Sexual behavior and contraceptive use among unmarried, young women migrant workers in five cities in China. *Reprod Health Matters*. 2001; 9:118–127. [PubMed: 11468827]
- Zhu WX, Lu L, Hesketh T. China's excess males, sex selection, abortion, and one child policy: Analysis of data from 2005 national intercensus survey. *BMJ*. 2009; 338:b1211. [PubMed: 19359290]

Table 1

Sociodemographic characteristics, lifetime abortion history, and STIs in the past year, by marital status

Variables	N=358 (%)	Married	Unmarried	χ^2
		n=87 (%)	n=271 (%)	
Age group (Mean=23, SD=3.0), years				
18–20	66 (18.4)	1 (1.1)	65 (24.0)	22.84**
21–29	292 (81.6)	86 (98.9)	206 (76.0)	
Education Level				
Junior high school or less	199 (55.6)	66 (75.9)	133 (49.1)	19.14**
High school or higher	159 (44.4)	21 (24.1)	138 (50.9)	
Monthly income (RMB)				
4000	173 (48.3)	48 (55.2)	125 (46.1)	2.16
> 4000	185 (51.7)	39 (44.8)	146 (53.9)	
Type of entertainment venues				
Affluent	230 (64.2)	48 (55.2)	182 (67.2)	4.12*
Average/Marginal	128 (35.8)	39 (44.8)	89 (32.8)	
Ever had an abortion				
Yes	213 (59.5)	56 (64.4)	157 (57.9)	1.13
No	145 (40.5)	31 (35.6)	114 (42.1)	
Multiple abortions				
Yes	91(25.4)	31 (35.6)	60 (22.1)	6.32*
No	267(74.6)	56 (64.4)	211 (81.5)	
Had abortion in a public hospital, of those with abortion history (n=213) ^a				
Yes	174 (81.7)	44 (78.6)	130 (82.8)	0.49
No	39 (18.3)	12 (21.4)	27 (17.2)	
Had any STIs in the past year				
Yes	118 (33.0)	30 (34.5)	88 (32.5)	0.12
No	240 (67.0)	57 (65.5)	183 (67.5)	
Received treatment in a public hospital for last STI, of those with past year STI (n=118) ^b				
Yes	90 (76.3)	23 (76.7)	67 (76.1)	0.00
No	28 (23.7)	7 (23.3)	21 (23.9)	
Any GTI symptoms past year				
Yes	73 (20.4)	18 (20.7)	55 (20.3)	0.01
No	285 (79.6)	69 (79.3)	216 (80.8)	
Lifetime history of abortion and any STI in the past year				
Yes	84 (23.5)	22 (25.3)	62 (22.9)	0.21
No	274 (76.5)	65 (74.7)	209 (77.1)	

Note: Columns might not add to 100% due to missing values.

^aIncludes only participants with abortion history^bIncludes only participants with past year STI

**
 $P < 0.01$,

*
 $P < 0.05$

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 2
Correlates of multiple (2) lifetime abortions and combination abortion-STI risk (any lifetime abortion and 12-month STI)

Variables	N=358 (%)	Multiple Abortions		Abortion and STI	
		n=91 (%)	χ^2	n=84 (%)	χ^2
Age of initial sex, years ^a					
< 18	55 (15.8)	21 (23.1)	4.97*	19 (22.6)	3.92*
18	294 (84.2)	70 (76.9)		65 (77.4)	
Voluntary first sex ^a					
Yes	318 (91.1)	78 (85.7)	4.44*	73 (86.9)	2.43
No	31 (8.9)	13 (14.3)		11 (13.1)	
Used contraception during first sex ^a					
Yes	95 (27.2)	14 (15.4)	8.71**	12 (14.3)	9.34**
No	254 (72.8)	77 (84.6)		72 (85.7)	
Condom use during the first sex ^a					
Yes	66 (18.9)	8 (8.8)	8.22**	9 (10.7)	4.85*
No	283 (81.1)	83 (91.2)		75 (89.3)	
Any STI, past year					
Yes	118 (33.0)	40 (44.0)	6.68*	-	-
No	240 (67.0)	51 (56.0)		-	
Received treatment in a public hospital for last STI ^b					
Yes	90 (76.3)	31 (72.1)	0.05	-	-
No	28 (23.7)	12 (27.9)		-	
Any GTI symptoms, past year					
Yes	73 (20.4)	27 (29.7)	6.47*	40 (54.8)	50.12**
No	285 (79.6)	64 (70.3)		44 (15.4)	
Had sex with husband, past 6 months ^a					
Yes	77 (22.1)	28 (30.8)	5.43**	21 (25.0)	0.56
No or unmarried	272 (77.9)	63 (69.2)		63 (75.0)	
Had sex with male client, past 6 months ^a					

Variables	N=358 (%)	Multiple Abortions		Abortion and STI	
		n=91 (%)	χ^2	n=84 (%)	χ^2
Yes	154 (44.1)	52 (57.1)	8.46**	44 (52.4)	3.06
No	195 (55.9)	39 (42.9)		40 (47.6)	
Have sex with boyfriend or lover, past 6 months ^a					
Yes	220 (63.0)	53 (58.2)	1.22	53 (63.1)	0.00
No	129 (37.0)	38 (41.8)		31 (36.9)	
Have sex with casual non-paying partners, past 6 months ^a					
Yes	38 (10.9)	15 (16.5)	3.97*	13 (15.5)	2.40
No	311 (89.1)	76 (83.5)		71 (84.5)	
Any unprotected sex, past 6 months					
Yes	219 (61.2)	48 (52.7)	3.65	59 (70.2)	3.80
No	139 (38.8)	43 (47.3)		25 (29.8)	
Ever drink alcohol before sex, past 6 months					
Yes	191 (53.4)	60 (65.9)	7.76**	51 (60.7)	2.39
No	167 (46.6)	31 (34.1)		33 (39.3)	
Harmful drinking behaviors					
Yes	203 (56.7)	58 (63.7)	2.46	51 (60.7)	0.72
No	155 (43.3)	33 (36.3)		33 (69.3)	
Ever used illicit drugs					
Yes	27 (7.5)	12 (13.2)	5.58*	15 (17.9)	16.75**
No	331 (92.5)	79 (86.8)		69 (82.1)	
Depression, past week (CES-D 20)					
Yes	69 (19.3)	20 (22.0)	0.57	24 (28.6)	6.10*
No	289 (80.7)	71 (78.0)		60 (71.4)	
Anxiety, past week (SAS 60)					
Yes	18 (5.0)	8 (8.8)	3.62	11 (13.1)	12.83**
No	340 (95.0)	83 (91.2)		73 (86.9)	
Suicidal ideation, past year					
Yes	33 (9.2)	10 (11.0)	0.46	13 (15.5)	5.14*
No	325 (90.8)	81 (89.0)		71 (84.5)	

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Note: Frequencies for some variables do not add to 100% (n=358) due to missing values.

I_p Includes only participants with a history of any sexual activity

b Includes only participants with past year STI

$P < 0.01$,
**

$P < 0.05$
*

Table 3

Multivariable logistic regression to identify factors associated with multiple (≥ 2) lifetime abortions

Variables	Multiple Abortions OR (95% CI)
Monthly income (RMB)	
> 4000	1.0
4000	1.73 (1.003 – 2.97)*
Had sex with male client, past 6 months	
No	1.0
Yes	1.66 (0.99 – 2.79)#
Had sex with husband, past 6 months	
No	1.0
Yes	2.20 (1.23 – 3.94)**
Drink alcohol before sex, past 6 months	
No	1.0
Yes	1.79 (1.05 – 3.06)*
Used contraception during first sex	
Yes	1.0
No	2.31 (1.21 – 4.40)*

Note: Variables entered into the regression = age of initial sex, voluntary first sex, used contraception during first sex, any STI during the past year, any GTI symptoms during the past year, had sex with husband during the past 6 months, had sex with male client during the past 6 months, had sex with casual non-paying partners during the past 6 months, drink alcohol before sex during the past 6 months, ever used illicit drugs, monthly income (RMB).

**
 $p < 0.01$,

*
 $p < 0.05$,

 $p < 0.10$

Table 4

Multivariable logistic regression to identify factors associated with combination risk: any history of abortion and any STI during past 12 months

Variables	Multiple Abortions OR (95% CI)
Any unprotected sex, past 6 months	
No	1.0
Yes	13.19 (6.51 – 26.72) **
Any GTI symptoms, past year	
No	1.0
Yes	3.85 (1.94 – 7.64) **
Anxiety symptoms, past week (SAS = 60)	
No	1.0
Yes	3.39 (0.96 – 12.04) #
Ever used illicit drugs	
No	1.0
Yes	3.47 (1.15 – 10.41) *
Suicidal ideation, past year	
No	1.0
Yes	3.12 (1.06, 9.18) *
Used contraception during first sex	
Yes	1.0
No	2.29 (1.04 – 5.02) *

Note: Variables entered into the regression = age of initial sex, used contraception during first sex, any STI during the past year, had sex with a male client during the past 6 months, monthly income (RMB), any unprotected sex during the past 6 months, ever used illicit drugs, depression symptoms during the past week (CES-D = 20), anxiety symptoms during the past week (SAS = 60), suicidal ideation during the past year.

**
 $p < 0.01$,

*
 $p < 0.05$,

 $p < 0.10$