BMJ Open

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Journal:	*BMJ Open*
Manuscript ID:	bmjopen-2015-007947
Article Type:	Research
Date Submitted by the Author:	12-Feb-2015
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Primary Subject Heading:	Public health
Secondary Subject Heading:	Epidemiology, Obstetrics and gynaecology, Reproductive medicine, Sexual health
Keywords:	PUBLIC HEALTH, REPRODUCTIVE MEDICINE, PREVENTIVE MEDICINE, EPIDEMIOLOGY

Factors associated with induced abortion among female entertainment workers: A cross-sectional study in Cambodia

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ABSTRACT

Objective: To explore risk factors associated with induced abortion among sexually active female entertainment workers (FEWs) in Cambodia.

Design: Cross-sectional study.

Setting: Phnom Penh and Siem Reap, Cambodia.

Participants: This study included 556 FEWs aged 18 to 47 years randomly selected from entertainment establishments in the two cities in 2014 using a two-stage cluster sampling method. Data were collected through interviews using a structured questionnaire.

Primary outcome measure: Induced abortion experienced during the time working as FEWs.

Results: Of the total samples, 45.6% reported currently using a contraceptive method with condom (42.4%) being the most common method, followed by pills (25.6%). One-fourth (25.0%) of the respondents reported having been pregnant at least once, and 21.4% reported having at least one induced abortion during the time working as FEWs. After controlling for other covariates in multivariate logistic regression model, FEWs with induced abortion experience remained significantly more likely to report working in a karaoke bar (AOR= 1.69, 95% CI= 1.05-2.73), having worked for the current career for ≥2.5 years (AOR= 4.97, 95% CI= 2.93-8.43), currently using a contraceptive method (AOR= 3.15, 95% CI= 1.17-4.62), having ≥3 sexual partners in the past three months (AOR= 2.24, 95% CI= 1.29-3.90), inconsistent condom use with non-commercial partners in the past three months (AOR= 1.86, 95% CI= 1.05-3.42), and being able to find condom when they needed it (AOR= 2.04, 95% CI= 1.09-3.84).

Conclusions: This study highlights the high rates of unwanted pregnancies and induced abortions among FEWs in Cambodia. Access of FEWs to quality sexual reproductive health care

services is deemed a high priority. Integrated interventions to improve sexual reproductive health among these vulnerable women should be tailored to reach the most-at-risk groups.

Strengths and limitations of the study

- This is the first study to examine potential factors associated with induced abortion among FEWs–one of the most vulnerable populations in Cambodia.
- This study included sexually active young women working in different establishments such as karaoke bars, massage parlors, beer gardens, nightclubs, restaurants, etc. These women are considered at alarmingly high risk for sexual reproductive health problems because of their involvement in direct and/or indirect sex work.
- Several factors that had not been examined in previous studies were included in this study, including condom use with non-commercial partners and substance use.
- Limitations of the study included the representativeness of the study samples, the validity of self-reported measures, and cross-sectional nature of the data.

INTRODUCTION

In Cambodia, a common pathway for young women from poor, rural families is to migrate to urban areas to earn and remit income to their home villages.[1,2] While economic migration can be an empowering experience, navigating new social and sexual norms can put young women in disempowering situations that can negatively affect their health and other life outcomes.[3] Many young Cambodian women migrate to urban areas to work in entertainment venues as 'female entertainment workers' (FEWs) which refers to women working as beer promoters, karaoke singers, massage workers, hostesses or singers in restaurants, or women working in other entertainment establishments such as bars, night clubs, discotheques, or beer gardens.[2]

These women are considered at high risk for experiencing poor sexual reproductive health outcomes because of their involvement in direct or indirect sex work,[2] with only limited access to sexual reproductive health care services.[4] Recent studies indicate alarmingly high HIV prevalence among street-based sex workers (37.3%), brothel-based sex workers (17.4%), and women working in other entertainment establishments (9.8%).[5] While there have been remarkable increases in condom use in commercial relationships over the past decade, no improvement has been observed in consistent condom use between FEWs and their non-commercial partners.[4 6 7] As a result, sexually transmitted infections (STIs)[5 8] as well as unwanted pregnancies and induced abortions[4] are very common among these women. In our most recent survey, 46% of FEWs reported having experienced at least one induced abortion, and 40% reported having experienced two or more induced abortions in their lifetime.[4]

Several factors have been linked to induced abortion among sex workers in many countries, although the findings are sometimes contradictory. In a previous study in Cambodia among female sex workers, the risk of induced abortion increased with the number of clients,

inconsistent condom use, recent condom breakage, and recent forced unprotected sex.[9] A study in Spain found that induced abortion was more common among female sex workers who were older and married, had higher number of pregnancies, had lower contraceptive knowledge, and had worked as sex workers for a longer period.[10] Among female sex workers in Hong Kong, those who did not use condom in the last episode of serving a client and those who would agree not to use condom if they were paid more were more likely than other to have had induced abortion.[11] Data from four population-based surveys in Russia, Estonia, and Finland showed that women who reported multiple sexual partners were more likely to have induced abortion;[12] however, in contrast, another study reported that women who had multiple sexual partners were less likely to experience induced abortion.[13] Other reported risk factors that may place women at greater risk for induced abortion include early sexual debut,[12] lower education,[12] and economic constraints.[14]

The low condom use rates within non-commercial relationships may be undermining the current efforts to reduce sexual reproductive health risk behaviors among FEWs in Cambodia. Moreover, women who use induced abortion as a means to prevent births are particularly vulnerable to HIV and STI infections as the epidemic spreads mainly through heterosexual intercourse.[15] For these reasons, investigations of risk factors for induced abortion among this high-risk population will provide useful information to inform health policies for the reduction of unwanted pregnancy and induced abortion as well as for prevention of new HIV and STI infections among these vulnerable women.

Despite the need for information, only a few studies have been conducted on induced abortion among FEWs in Cambodia as well in other developing countries. Furthermore, the relationship between induced abortion and common sexual reproductive health risk behaviors in

this key population such as inconsistent condom use with non-commercial partners and substance use has not been addressed. Alcohol and illicit drugs have been found to be associated with sexual behaviors such as unplanned and/or unprotected sexual intercourse[16 17] and intimate partner violence[18] among young people that may also place them at greater risk for unwanted pregnancy and induced abortion. This study was therefore conducted to fill in the literature gaps and explore risk factors associated with induced abortion among FEWs in Cambodia.

METHODS

Study sites, population, and sampling

This study was conducted in April and May 2014 in Phnom Penh and Siem Reap as part of an impact evaluation study of the Sustainable Action against HIV and AIDS in Communities (SAHACOM) Project. Number of FEWs in Phnom Penh and Siem Reap represents approximately 70% of the total FEWs population in Cambodia.[19] Data were collected through self-reported interviews with 667 FEWs randomly selected from entertainments establishments under coverage of the project using two-stage cluster sampling method. The sample size was proportionally allocated to the size of FEWs in each city and province. The probability proportional-to-size sampling was used to select the required number of FEWs from each province, and a proportionate number of participants were randomly selected from the lists of entertainment establishments with number of FEWs in each venue under the coverage of KHANA's implementing partners. To be included in the study, a FEW must be: (1) at least 18 years of age, (2) biologically female, (3) able to provide consent to participate in the study, and (4) able to present themselves on the day of the interview. FEWs were excluded if they were mentally and/or physically too sick to participate in the study. In this study, we included only

women who reported having had sexual intercourse experience in their lifetime (*n*= 556), excluding 111 women who were not sexually active.

Data collection training and procedure

Before data collection, a three-day training was conducted for all interviewers and field supervisors with a focus on data collection methods including tool pretesting and reflection. The training was provided to ensure that all research team members understood the procedures and followed the standardized guidelines in the same manner to guarantee quality of the data. The necessary skills covered in the training included how to obtain informed consent, interview techniques, confidentiality, and practices of the questionnaire administration. During the training sessions, the study protocol was also reviewed in order for the team members to be thoroughly familiar with it. We also included quality control skills such as rechecking and reviewing the questionnaires after administration as well as resolving issues that might arise during the fieldwork. Research team leaders were encouraged to perform review sessions with interviewers regularly to review progress and communicate any issues occurring during the data collection.

Questionnaire development

We initially developed a structured questionnaire in English and then translated it into Khmer, the national language of Cambodia. Another translator back-translated it into English to ensure that the "content and spirit" of every original item were maintained. Clear instructions and explanations were addressed to avoid any confusion during the interviews. A pilot study was conducted among a random sample of 20 FEWs before constructing the final questionnaire, to ensure that wording and contents were culturally suitable, acceptable, and clearly understandable

for the study participants. The 20 FEWs were then excluded from the lists of FEWs to be selected for the main study. We modified the questionnaire based on the feedbacks from the pilot study and comments from researchers and public health practitioners working in the areas of HIV and sexual reproductive health in Cambodia.

Variables and measurements

The variables were measured using standardized tools adapted from previous studies in the same populations,[20 21] the most recent Cambodia Demographic and Health Survey,[22] as well as from other studies in Cambodia.[23-27] Socioeconomic characteristics included age, marital status, completed years of formal education, average monthly income, living situations, types of establishment they were working for, and duration they had worked in the current career as well as in the current place of employment.

The survey included questions assessing pregnancy and induced abortion history. Induced abortion experience was assessed via a question, "During your work as an entertainment worker, have you experienced any induced abortion?" with three response options: (1) never had sexual intercourse, (2) no, or (3) yes. We also collected information on age at their first pregnancy, number of pregnancy in lifetime and during the time working as FEWs, number of induced abortion they had experienced in lifetime and during the time working as FEWs, and facility where they received their most recent induced abortion services. In addition, yes/no questions were used to ask whether the participants were currently using any contraceptive method and whether they have received any forms of sexual reproductive health education in the past six months. They were also questioned about the type of the contraceptive method being used and sources of sexual reproductive health education they had received in the past six months.

Several variables on sexual behaviors and condom use were also measured including age at the first instant of sexual intercourse, number of sexual partners in the past 12 months, number of partners with whom they had sexual intercourse in exchange for money or gift (commercial partners) in the past three months, number of partners with whom they had sexual intercourse not in exchange for money or gift (non-commercial partners) in the past three months, and condom use with both types of sexual partners in the past three months. Condom use was measured on a Likert scale with six-point response options ranging from (1) "always" to (6) "never." Those answering "always" to the questions were considered consistent condom users. The respondents were also questioned whether they had clients who requested them not to use condom in the past three months and if they were able to find condom when they needed it in the past three months (0= no, 1= yes).

Regarding substance use, participants were questioned about the use of alcohol (at least a full glass of beer, wine, or liquor) and illicit drugs (methamphetamine, heroin, ecstasy, inhalants, cocaine, or marijuana) in the past three months. In addition, participants were also asked whether they usually used these substances regularly at work and whether they have been forced to drink alcohol or use illicit drugs in the past three months. All response options were dichotomous (0= no, 1= yes).

Data analyses

EpiData version 3 (Odense, Denmark) was used to code and enter the data into a computerized database. To minimize entry errors, double data entry was performed. Categorical variables with too many categories were recoded combining small categories as appropriate. Descriptive analyses were conducted to describe socioeconomic characteristics and the history of pregnancy and induced abortion of the study sample using number (%) for categorical variables and mean

with standard deviation (± SD) for continuous variables. Chi-square test or Fisher's exact test was used as appropriate for categorical variables and Student's *t*-test was used for continuous variables to compare socio-demographic characteristics, sexual behaviors, substance use, contraceptive use, and exposure to sexual reproductive health education among respondents with and without induced abortion experience.

A multivariate logistic regression model was then constructed to examine the associated factors of induced abortion controlling for the effects of potential confounders. All variables found to have significant association with induced abortion in bivariate analyses at a level of $p<0.05$ were simultaneously included in the model. To be included in the model, continuous variables were dichotomized using the mean value of each variable. Adjusted odds ratio (AOR) were calculated and presented with 95% confidence intervals (CI) and *p*-values. SPSS version 22 (IBM Corporation, New York, USA) was used for all data analyses.

Ethical considerations

The participants were made clear that their participation in this study was voluntary both before and during the consenting process. Written informed consent was then obtained from each participant after a detailed description of the study objectives and procedures was provided. We strictly protected privacy of the respondents by conducting the interviews in a private place, and their confidentiality was ensured by removing all personal identifiers from the survey questionnaires and field notes. The questionnaires and data collected from the participants were kept under the responsibility of KHANA's Research Center. The study protocol and tools were approved by the National Ethics Committee for Health Research, Ministry of Health, Cambodia (No. 082NECHR).

RESULTS

Socio-demographic characteristics

As shown in **Table 1,** 556 FEWs were included in this study with a mean age of 26.4 years (SD= 5.5 years, ranging from 18 to 47 years). Approximately one-third (32.9%) of the respondents were never married with a mean years of formal education completed of 6.1 years (SD= 3.1 years). The average monthly income was approximately US$230 (SD= US$220). Only 29.3% reported living with family either their parents (13.3%) or another relative (16.0%), while 28.8% reported living with their spouse or sexual partner, and 18.5% lived by their self. The most common establishment they were working for were karaoke bars (46.9%) and restaurants (29.3%). The rest of the samples reported working at massage parlors (10.1%), beer gardens (3.2%), and other (10.4%). The average working duration in the current career was 2.5 years (SD= 2.8 years), and the average working duration at the current place of employment was 1.5 years (SD= 2.1 years).

Contraceptive use, pregnancy, and induced abortion

Table 2 shows the history of contraceptive use, pregnancy, and induced abortion. Of total sample, 45.6% reported being currently using a contraceptive method with condom (42.4%) being the most common method, followed by pills (25.6%). The majority (72.3%) of respondents reported having been pregnant at least once during their lifetime with a mean age at the first pregnancy of 21.3 years (SD= 3.3 years). During the time working as FEWs, 25.0% reported having at least one pregnancy; out of these women, 85.6% reported that their pregnancy ended up with induced abortion (119 out of 139). The mean number of pregnancy in lifetime was 1.5

(SD= 2.4) and during the time working as FEWs was 0.7 (SD= 1.6). Of total respondents, 21.4% reported having at least one induced abortion during the time working as FEWs, and 13.7% reported having more than one induced abortion during the same period. The mean number of induced abortion during the entertainment work was 2.1 (SD= 3.1) with a wide range from 1 to 20. Private hospitals or clinics (45.2%) was the most common facility where they received the most recent induced abortion services, followed by self-abortion using abortion medication from a pharmacy (39.5%).

Bivariate analysis results

As shown in **Table 3**, experience of induced abortion during the time working as FEWs was significantly associated with several socio-demographic characteristics of the respondents measured in the study. FEWs with induced abortion experience were significantly more likely to be older, to have higher income, to work in a karaoke bar, to work for a longer duration in the current career as well as for the current place of employment compared to FEWs without induced abortion experience.

Comparisons of sexual behaviors and substance use among FEWs with and without induced abortion experience are shown in **Table 4**. FEWs with induced abortion experience were significantly more likely to have more sexual partners in the past 12 months and less likely to report consistent condom use with non-commercial partners in the past three months compared to FEWs without induced abortion experience. They were also significantly more likely to report having sexual intercourse with clients in exchange for money or gifts and having at least one client who requested them not to use condom in the past three months. Regarding condom accessibility, FEWs with induced abortion experience were significantly more likely to report

that they were able to find condom whenever they needed it in the past three months. No alcohol and illicit drug use variables were significantly associated with induced abortion experience among FEWs in this study.

Table 5 shows comparisons of contraceptive use and exposure to sexual reproductive health education among FEWs with and without induced abortion experience. Interestingly, FEWs with induced abortion experience were significantly more likely to be currently using a contraceptive method. However, types of contraceptive method being used, exposure to sexual reproductive health education, and sources of sexual reproductive health education received in the past six months were not significantly associated with induced abortion experience.

Multivariate analysis results

Table 6 presents factors associated with induced abortion experience after controlling for other covariates in multivariate logistic regression model. After adjustment, FEWs with induced abortion experience remained significantly more likely to be currently working in a karaoke bar (AOR= 1.69, 95% CI= 1.05-2.73), to work in the current career for at least 30 months (AOR= 4.97, 95% CI= 2.93-8.43), and to be currently using a contraceptive method (AOR= 3.15, 95% CI= 1.17-4.62). Regarding sexual behaviors, FEWs with induced abortion experience remained significantly more likely to have at least three sexual partners in the past three months (AOR= 2.24, 95% CI= 1.29-3.90) and to report inconsistent condom use with non-commercial partners in the past three months (AOR= 1.86, 95% CI= 1.05-3.42). Moreover, FEWs with induced abortion experience remained significantly more like to report that they were able to find condom whenever they needed it in the past three months (AOR= 2.04, 95% CI= 1.09-3.84).

DISCUSSION

This study is among a few attempts to explore factors associated with induced abortion among FEWs who are at high risk for HIV and sexual reproductive health problems. We found that the prevalence of contraceptive use and consistent condom use with non-commercial partners among FEWs in this study was low, while unwanted pregnancy and induced abortion were common. Worse still, the majority of the induced abortions were not carried out in public health or NGO's facilities considered to be the safest place equipped with formally trained abortion care providers. Self-abortion seems to be increasingly popular among these women. We have identified several socio-economic and sexual reproductive health factors that increased the risk of induced abortion among these vulnerable women. Surprisingly, induced abortion was not significantly associated with either the number of commercial partners or inconsistent condom use in the commercial relationships. It is also not related to the history of substance use such as alcohol or illicit drugs which have been reported to have close relationships with risky sexual behaviors among young people.[16 17 26]

After controlling for potential confounders, induced abortion experience remained significantly associated with inconsistent condom use with non-commercial partners. This finding expands our understanding of the relationships between induced abortion and condom use with different types of partners. Previous studies have also reported the association between condom use and induced abortion but did not distinguish the difference effects of condom use in commercial and non-commercial relationships.[9 11 28 29] This finding also highlights the consequences of low rates of consistent condom use in non-commercial relationships among FEWs in Cambodia[4 30] that may place women at greater risk for unwanted pregnancies that in turn leads to induced abortion. FEWs tend to use condom more consistently when having sexual intercourse in exchange for money or gifts.[4 30] However, a previous study found that incidence

and prevalence of induced abortions were associated with inconsistent condom use with both commercial and non-commercial partners.[9]

It is interesting to note that FEWs with experience of induced abortion during the time working as FEWs were significantly more likely to report being currently on contraception than those who did not experience induced abortion. They were also more likely to respond that they were able to find condom whenever they needed it. These findings may be interpreted that women who did not have induced abortion experience were less sexually active or less involved in sex work compared to those with induced abortion experience. As a result, they did not see contraception or condom necessary for them. Moreover, contraceptive use may be motivated by prior unintended pregnancies or induced abortions. In a previous study among female sex workers in Cambodia, the frequency of the uptake of hormonal contraception was more than doubled if women had induced abortion in the past year.[9] Among female sex workers in Spain, the risk for induced abortion also increased with the number of pregnancies.[10]

In this study, experience of induced abortion was not significantly associated with substance use including alcohol and illicit drugs in both bivariate and multivariate analyses. These findings do not support current evidence on the relationship between substance use and risky sexual behaviors in young people,[31 32] including Cambodian adolescents.[26] Alcohol drinking may result in the great engagement in risky sexual behaviors such as having multiple sex partners,[33 34] while induced abortion is common among women with unplanned sexual intercourse or multiple partners.[12] Drinking women are more likely to engage in unplanned sexual intercourse and/or unprotected sex[16 17] and to report unwanted pregnancies.[35] Furthermore, the relationships between substance use and induced abortion have been reported in different populations such as adolescent female sex workers in China,[36] female university

students in Ethiopia[37] and high-risk women in Russia.[28] The difference in the nature of the study populations may explain the discrepancies in findings in this study and previous studies. These relationships merit further investigations.

Induced abortion also retained its significant association with some socio-demographic characteristics including being a woman working in a karaoke bar and longer working duration in the current entertainment industry. A study among female sex workers in Cambodia found that induced abortion was more common among non-street-based sex workers such as women working in clubs or hotels.[9] It was noted that greater ability to pay for induced abortion procedures of establishment-based sex workers may explain the relationship, given their relatively high status and earnings compared to those working on the streets.[9] Girls working in karaoke bars in Cambodia are also more likely to get involved in commercial sexual relationships and multiple sexual partners compared to girls working in other establishments.[38] The relationship between duration of sex work and induced abortion has also been previously reported among female sex workers.[9 10 39]

Some limitations of this study should be acknowledged. First, causal inferences were not possible due to the cross-sectional nature to the data. Second, as with any self-reported measures, there may be inherent biases that may lead to both underreporting and over-reporting in the variables. Given the cultural norms governing sexual reproductive health behaviors among Cambodian women, it is likely that the sexual risk and outcomes found in this study were under-reported. However, measures were taken to create conditions that encouraged valid responses from the women; their responses were confidential, and interviews were conducted in a private place.

The final limitation concerns the representativeness of the study samples. Although a wide range of sub-populations of FEWs were included, data were collected only from FEWs in the capital city and a large province where the SAHACOM, a comprehensive community-based project aiming to improve sexual reproductive health of FEWs, has been implemented. The levels of sexual reproductive health risks and outcomes reported in this study may therefore represent a more optimistic view than in other areas of Cambodia. However, the main purpose of this study was not to explore the prevalence of induced abortion among FEWs when they are engaged in sex work. We instead intended to show that these high-risk women are vulnerable to unwanted pregnancies and induced abortions and further inferred that they are at risk of contracting HIV and STIs and vulnerable to other subsequent sociocultural problems.

Despite these limitations, findings from this study have important implications for interventions and programming for the improvement of sexual reproductive health among FEWs in Cambodia. Overall, this study highlights the high rates of unwanted pregnancies and induced abortions as a result of the low rates of consistent condom and contraceptive use among these vulnerable women. In addition, use of unregulated private facilities and self-induced abortion was high among this group. Access of FEWs to sexual reproductive health care services is deemed a high priority. Recently, great efforts have been made in the implementation of integrated HIV and sexual reproductive health interventions in order to improve the quality of and access to service packages among key populations in Cambodia. Such interventions should be tailored to reach these most vulnerable women and ensure that they could receive quality services.

Acknowledgments

The authors thank KHANA's senior management team, the programs division, and research assistants for their endless support. Special thanks are deserved by KHANA's implementing partners and their staff members, local authorities, community support volunteers, outreach workers as well as all participants for their excellent contribution to the data collection. Without such extensive supports, this study would have been impossible.

Contributors

SY managed the literature review, designed the study, developed the research protocol, analyzed the data, and prepared the manuscript. PC, CB, and ST were responsible for data collection and supported study design, protocol development, and analyses of the study findings. All authors read and approved the final manuscript.

Funding This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None.

Data sharing statement No additional data are available.

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Table 1 Socio-demographic characteristics of FEWs in the study (*n*= 556)

Variables	*n* (%)
Age (in years, ± SD)	26.4 ± 5.5
Marital Status	
Never married	183 (32.9)
Married and living together	190 (34.2)
Divorced, separated, or widowed	183 (32.9)
Mean years of formal education completed (± SD)	6.1 ± 3.1
Mean monthly income (in US$, ± SD)	230 ± 220
Currently living with:	
Parents	74 (13.3)
Relatives/siblings	89 (16.0)
Spouse/sexual partner	160 (28.8)
Friends/colleagues	78 (14.0)
Alone	103 (18.5)
Others	52 (9.4)
Place of employment in the past 12 months	
Karaoke center	261 (46.9)
Restaurant	163 (29.3)
Massage parlor	56 (10.1)
Beer garden	18 (3.2)
Other	58 (10.4)
Mean working duration for this career (in months, ± SD)	29.6 ± 33.9

Mean working duration for this establishment (in months, ± SD)	18.1 ± 25.2

Abbreviations: FEW, female entertainment workers; SD, standard deviation.

Table 2 Contraceptive use, pregnancy, and induced abortion experience among FEWs (*n*= 556)

Pregnancy and abortion experience	*n* (%)	Mean ± SD
Currently using a contraceptive method	252 (45.6)	
Type of contraceptive method being used		
Pills	64 (25.6)	
Condom	106 (42.4)	
Injection	22 (8.8)	
Withdrawal	43 (17.0)	
Other (IUD, implant, calendar, natural ways)	16 (6.2)	
Having been pregnant in lifetime	401 (72.3)	
Mean age at first pregnancy		21.3 ± 3.3
Having been pregnant during the time working as FEWs	139 (25.0)	
Had at least one abortion during working as FEWs	119 (21.4)	
Mean times of induced abortion during working as FEWs		2.1 ± 3.1
Had more than one abortion during working as FEWs	55 (13.7)	
Facility where the most recent abortion was performed		
Public health center/clinic/hospital	3 (2.5)	
Private clinic /hospital	56 (45.2)	
Pharmacy (self-abortion)	49 (39.5)	
NGO clinic/hospital	12 (9.7)	
Other (including traditional birth attendant)	4 (3.2)	

Abbreviations: FEW, female entertainment workers; IUD, intra-uterine devices; NGO, non-governmental organization; SD, standard deviation.

Table 3 Comparisons of socio-economic characteristics of FEWs with and without induced abortion experience

Socio-economic characteristics	Induced abortion experience		
	No (*n*= 437)	Yes (*n*= 119)	*p*-value*
Mean age (in year)	26.1 ± 5.4	27.5 ± 5.5	0.02
Marital Status			0.42
Never married	149 (34.0)	34 (28.6)	
Married	144 (33.0)	46 (38.7)	
Divorced, separated, or widowed	144 (33.0)	39 (32.7)	
Years of formal education completed (in years)	6.2 ± 3.1	5.6 ± 3.2	0.06
Mean monthly income (in US$)	219.8 ± 150.3	271.8 ± 211.6	0.03
Currently living with:			0.38
Parents	62 (14.2)	12 (10.1)	
Relatives/siblings	71 (16.2)	18 (15.1)	
Spouse/sexual partner	117 (26.8)	43 (36.1)	
Friends/colleagues	65 (14.9)	13 (10.9)	
Alone	80 (18.3)	23 (19.3)	
Other	42 (9.6)	10 (8.4)	
Place of employment in the past 12 months			0.01
Karaoke bar	197 (45.1)	64 (53.8)	
Restaurant	138 (31.6)	25 (21.0)	
Massage parlor	45 (10.3)	11 (9.2)	
Beer garden	15 (3.4)	3 (2.5)	

Other (hairdresser's, barber's, street base, etc.)	42 (9.6)	16 (13.4)	
Mean working duration in this career (in months)	23.1 ± 26.9	53.3 ± 44.9	<0.001
Mean working duration in this establishment (in months)	14.8 ± 20.5	30.3 ± 35.3	<0.001

Abbreviation: FEW, female entertainment worker.
Values are number (%) for categorical variables and mean ± SD for continuous variables
**Chi-square test or Fisher's exact test was used for categorical variables and Student's t-test was used for continuous variables.*

Table 4 Comparisons of sexual behaviors and substance use among FEWs with and without induced abortion experience

Sexual behaviors and substance use	Induced abortion experience		
	No	Yes	*p*-value*
Mean age at first sexual intercourse (in years)	19.6 ± 2.8	19.5 ± 3.6	0.59
Mean number of sexual partners in the past 12 months	2.1 ± 4.4	5.4 ± 11.1	<0.001
Had sexual intercourse with regular partners (past 3 months)	152 (35.0)	53 (44.5)	0.06
Always used condom with regular partners (past 3 months)	52 (34.4)	12 (22.6)	0.04
Had sexual intercourse with commercial partners (past 3 months)	89 (20.6)	35 (29.7)	0.04
Mean number of commercial partners in the past 3 months	0.9 ± 1.5	1.5 ± 2.1	0.08
Always used condom with commercial partners (past 3 months)	73 (78.5)	27 (79.4)	0.91
Having clients who requested not to use condom (past 3 months)	11 (12.2)	10 (27.8)	0.03
Able to find condom when needed it (past 3 months)	321 (73.6)	104 (88.1)	0.002
Drunk at least a full glass of alcohol in the past three months	407 (93.1)	114 (95.8)	0.29
Usually drank alcohol at work in the past 3 months	351 (86.9)	96 (85.7)	0.70
Forced to drink at work in the past three months	110 (27.1)	35 (30.7)	0.50
Self-regarded as heavy alcohol drinkers	37 (9.1)	12 (10.5)	0.27
Used any kind of illicit drugs in the past three months	7 (1.6)	4 (3.4)	0.26

Abbreviations: FEW, female entertainment worker.
Values are number (%) for categorical variables and mean ± SD for continuous variables.
**Chi-square test or Fisher's exact test was used for categorical variables and Student's t-test was used for continuous variables.*

Table 5 Comparisons of contraceptive use and exposure to SRH education among FEWs with and without induced abortion experience

Contraceptive use and SRH education	Induced abortion experience		
	No	Yes	
	n (%)	*n* (%)	*p*-value*
Currently using a contraceptive method	186 (42.9)	66 (55.5)	0.04
Type of contraceptive method being used			0.41
Pills	46 (24.5)	18 (27.7)	
Condom	82 (44.3)	24 (36.9)	
Injection	17 (9.2)	5 (7.7)	
Other (IUD, implant, calendar, natural ways)	40 (21.6)	18 (27.7)	
Received SRH education in the past 6 months	282 (64.8)	75 (63.6)	0.80
Sources of SRH education information received in the past 6 months			0.74
Mass media (TV/radio/newspapers)	87 (31.0)	22 (28.9)	
Outreach workers/peer educators	184 (65.5)	61 (64.9)	
Public health providers	13 (4.6)	4 (5.3)	
NGOs	134 (47.7)	36 (47.4)	
Other	11 (3.9)	3 (4.0)	

Abbreviations: FEW, female entertainment worker; IUD, intra-uterine devices; NGO, non-governmental organization; SRH, sexual reproductive health; TV, television.

**Chi-square test or Fisher's exact test was used as appropriate.*

Table 6 Factors associated with induced abortion experience during working as FEWs in multiple logistic regression model

Variables in the model*	Induced abortion experience	
	AOR (95% CI)	*p*-value
Age group		
< 26 years	Reference	
≥ 26 years	1.1 (0.67-1.71)	0.81
Average monthly income		
< US$ 231	Reference	
≥ US$ 231	1.11 (0.70-1.76)	0.67
Type of entertainment establishment currently working for		
Other establishments	Reference	
Karaoke bar	1.69 (1.05-2.73)	0.03
Working duration in present career		
< 2.5 years	Reference	
≥ 2.5 years	4.97 (2.93-8.43)	<0.001
Working duration in present establishment		
< 1.5 years	Reference	
≥ 1.5 years	1.26 (0.74-2.13)	0.40
Currently using a contraceptive method		
Yes	Reference	
No	3.15 (1.17-4.62)	0.005
Number of sexual partners in the past 12 months		

< 3	Reference	
≥ 3	2.24 (1.29-3.90)	0.004
Condom use with non-commercial partners in the past 3 months		
Always	Reference	
Not always	1.86 (1.05-3.42)	0.04
Had sexual intercourse with commercial partners (past 3 months)		
No	Reference	
Yes	1.58 (0.72-1.31)	0.20
Able to find condom when needed		
No	Reference	
Yes	2.04 (1.09-3.84)	0.03

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; FEW, female entertainment worker.
[*]All variables in the table were included simultaneously in a multiple logistic model.

BMJ Open

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Journal:	*BMJ Open*
Manuscript ID:	bmjopen-2015-007947.R1
Article Type:	Research
Date Submitted by the Author:	12-May-2015
Complete List of Authors:	Yi, Siyan; KHANA, Research Center Tuot, Sovannary; KHANA, Research Center Chhoun, Pheak; KHANA, Research Center Pal, Dyla; KHANA, Research Center Tith, Khimuy; KHANA, Research Center Brody, Carinne; Touro University California, Public Health Program
Primary Subject Heading:	Public health
Secondary Subject Heading:	Epidemiology, Obstetrics and gynaecology, Reproductive medicine, Sexual health
Keywords:	PUBLIC HEALTH, REPRODUCTIVE MEDICINE, PREVENTIVE MEDICINE, EPIDEMIOLOGY

Factors associated with induced abortion among female entertainment workers: A cross-sectional study in Cambodia

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ABSTRACT

Objective: To explore risk factors associated with induced abortion among sexually active female entertainment workers (EWs) in Cambodia.

Design: Cross-sectional study.

Setting: Phnom Penh and Siem Reap, Cambodia.

Participants: This study included 556 EWs aged 18 to 47 years randomly selected from entertainment establishments in the two cities in 2014 using a two-stage cluster sampling method. Data were collected through face-to-face interviews using a structured questionnaire.

Primary outcome measure: History of induced abortion during the time working as an EW.

Results: Of the total sample, 45.6% reported currently using a contraceptive method with condom (42.4%) being the most common method, followed by pills (25.6%). One-fourth (25.0%) of the respondents reported having been pregnant at least once, and 21.4% reported having at least one induced abortion during the time working as an EW. After controlling for other covariates in multivariate logistic regression model, EWs with a history of induced abortion remained significantly more likely to be currently working in a karaoke bar (AOR=1.75, 95%CI=1.10-2.78), to have worked longer as an EW (AOR=1.42, 95%CI=1.06-1.43), to have had

more number sexual partners in the past 12 months (AOR=1.86, 95%CI=1.02-1.54), to be currently using a contraceptive method (AOR= 1.52, 95%CI=1.01-2.29), to be able to find condom when they needed it (AOR= 2.03, 95% CI= 1.09-3.82), and to report inconsistent condom use with non-commercial partners in the past three months (AOR= 1.62, 95% CI= 1.06-3.44).

Conclusions: This study highlights the high rates of pregnancies that ended in induced abortions among EWs in Cambodia. Access of EWs to quality sexual and reproductive health care services is deemed a high priority. Integrated interventions to improve sexual and reproductive health among these vulnerable women should be tailored to reach the most-at-risk groups.

Strengths and limitations of the study

- This is the first study to examine potential factors associated with induced abortion among EWs – one of the most vulnerable populations in Cambodia.
- This study included sexually active young women working in different establishments such as karaoke bars, massage parlors, beer gardens, nightclubs, restaurants, etc. These women are considered at alarmingly high risks for sexual and reproductive health problems because of their involvement in direct and/or indirect sex work.
- Several factors that had not been examined in previous studies were included in this analysis, including condom use with non-commercial partners.
- Limitations of the study included the representativeness of the study sample, the validity of self-reported measures, and the cross-sectional nature of the data.

INTRODUCTION

In Cambodia, many young women from poor, rural families migrate to urban areas to earn and remit income to their families in their home villages.[1,2] A common migratory pull are the garment factories that employ over 600,000 young women. Garment workers are typically not given fair wages, safe work environments, or health insurance – a combination of factors that have resulted in worker unrest and mass fainting incidents at various factories. Claiming worker rights becomes a complicated challenge that involves risking their jobs, their livelihood, and their ability to provide for family. As a result, more and more young migrant women become involved in alternative work opportunities in the entertainment industry where many participate in direct and indirect sex work. 'Female entertainment workers' (EWs) refers to women working in entertainment venues such as karaoke bars, massage parlors, restaurants (as hostesses or singers), or at beer gardens.[2]

By 2013, there were approximately 40,000 EWs in Cambodia, 24,000 of which resided in the capital city of Phnom Penh.[3] This group has been increasing since the 2008 passage and implementation of the 'Law on Suppression of Human Trafficking and Sexual Exploitation,' which banned brothel-based sex work, and more women have moved into indirect sex work based out of entertainment venues. EWs in Cambodia are considered at high risks for poor sexual and reproductive health outcomes because of their involvement in direct or indirect sex work,[2] with only limited access to sexual and reproductive health care services.[4] Recent studies indicate alarmingly high HIV prevalence among street-based sex workers (37.3%), brothel-based sex workers (17.4%), and women working in other entertainment establishments (9.8%).[5] While there have been remarkable increases in reported condom use in commercial sex work over the past decade, there may be misreporting of condom use as well as condom failure. In addition, no improvement has been observed in consistent condom use between EWs and their non-commercial partners.[4 6 7] Moreover, unwanted pregnancies and induced abortions[4] as well as sexually transmitted infections (STIs)[5 8] are very common among these women. In our most recent survey, 46% of EWs reported having experienced at least one induced abortion, and 40% reported having experienced two or more induced abortions in their lifetime.[4]

KHANA, the largest national HIV organization in Cambodia, is currently offering specialized services for EWs including free distribution of condoms, on-spot STI screening, a "safe space" drop-in center, community-based finger-prick HIV testing, accompanied referrals to enrollment of HIV-positive most-at-risk people to pre-antiretroviral therapy (ART) and ART services, the integration of sexual and reproductive health services with HIV services, partner tracing, self-help groups for PLHIV, and prevention of mother to child transmission (PMTCT) programming. Understanding the factors associated with induced abortion will inform program improvements.

Several factors have been linked to induced abortion among sex workers in many countries. In a previous study in Cambodia, lifetime history of induced abortion increased with the number of clients, inconsistent condom use, recent condom breakage, and recent forced unprotected sex.[9] A study in Spain found that lifetime history of induced abortion was more common among female sex workers who were older and married, had higher number of pregnancies, had lower contraceptive knowledge, and had worked as sex workers for a longer period.[10] Among female sex workers in Hong Kong, those who did not use condom in the last episode of serving a client and those who would agree not to use condom if they were paid more were more likely than other to have ever had induced abortion.[11] Other reported risk factors that may place women from the general population, and not sex workers specifically, at greater risk for induced abortion include early sexual debut,[12] lower education,[12] and economic constraints.[13]

The low condom use rates within non-commercial relationships may be undermining the current efforts to reduce sexual and reproductive health risk behaviors among EWs in Cambodia. Moreover, women who use induced abortion as a means to prevent births are particularly vulnerable to HIV and STIs as the epidemic spreads mainly through heterosexual intercourse.[3] For these reasons, investigations of risk factors for induced abortion among this high-risk population will provide useful information to inform health policies for the reduction of unwanted pregnancy and induced abortion as well as for the prevention of new HIV infections and STIs among these vulnerable women.

Despite the need for information, only a few studies have been conducted on induced abortion among EWs in Cambodia or in other developing countries. Furthermore, the relationship between induced abortion and risk behaviors such as inconsistent condom use with non-commercial partners has not been addressed. This study was therefore conducted to fill in the literature gaps and explore risk factors associated with induced abortion among EWs in Cambodia.

METHODS

Study sites, population, and sampling

This study was conducted in April and May 2014 in Phnom Penh and Siem Reap as part of an impact evaluation study of the Sustainable Action against HIV and AIDS in Communities (SAHACOM) Project. Number of EWs in Phnom Penh and Siem Reap represents approximately 70% of the total EWs population in Cambodia.[14] Data were collected through face-to-face interviews conducted in a private space at the workplace of EWs randomly selected from a list of entertainment establishments enrolled in the SAHACOM using two-stage cluster sampling method. The sample size was proportionally allocated to the number of EWs in Phnom Penh and Siam Reap. At the first stage, probability proportional-to-size sampling was used to select entertainment establishments from a list of the venues. At the second stage, a proportionate number of participants were randomly selected from the lists of EWs at each selected establishment. To be included in the study, an EW must be: (1) at least 18 years of age, (2) biologically female, (3) able to provide consent to participate in the study, and (4) able to present themselves on the day of the interview. EWs were excluded if they were mentally and/or physically too sick to participate in the study.

Data collection training and procedure

Before data collection, a three-day training was conducted for all interviewers and field supervisors with a focus on data collection methods including tool pretesting and reflection. During the training sessions, the study protocol was also reviewed in order for the team members to be thoroughly familiar with it. Research team leaders were encouraged to perform

review sessions with interviewers regularly to review progress and communicate any issues occurring during the data collection. We developed a structured questionnaire which was modified based on feedback from a pilot study and comments from researchers and public health practitioners working in the areas of sexual and reproductive health in Cambodia.

Variables and measurements

The variables were measured using standardized tools adapted from previous studies in the same population,[15 16] the most recent Cambodia Demographic and Health Survey,[17] as well as from other studies in Cambodia.[18-22] Socioeconomic characteristics included age, marital status, completed years of formal education, average monthly income, living situations, types of establishment they were working for, and duration they had worked in the current career as well as in the current place of employment.

The survey included questions assessing history of pregnancy and induced abortion. History of induced abortion was assessed via a question, "During your work as an EW, have you experienced any induced abortion?" with three response options: (1) never had sexual intercourse, (2) no, or (3) yes. We also collected information on age at their first pregnancy, number of pregnancy in lifetime and during the time working as an EW, number of induced abortion they had in lifetime and during the time working as an EW, and facility where they received their most recent induced abortion services. In addition, yes/no questions were used to ask whether the participants were currently using any contraceptive method and whether they had received any forms of sexual and reproductive health education in the past six months. They were also questioned about the type of the contraceptive method being used and sources of sexual and reproductive health education they had received in the past six months.

Several variables on sexual behaviors and condom use were measured including age at the first sexual intercourse, number of sexual partners in the past 12 months, number of partners with whom they had sexual intercourse in exchange for money or gifts (commercial partners) in the past three months, number of partners with whom they had sexual intercourse not in exchange for money or gift (non-commercial partners) in the past three months, and

condom use with both types of sexual partners in the past three months. The respondents were also questioned whether they had clients who requested them not to use condoms in the past three months and if they were able to find condoms when they needed it in the past three months (0= no, 1= yes).

Data analyses

EpiData version 3 (Odense, Denmark) was used to enter the data into a computerized database. To minimize entry errors, double data entry was performed. Categorical variables with too many categories were recoded combining small categories as appropriate. Descriptive analyses were conducted to describe socioeconomic characteristics and the history of pregnancy and induced abortion of the study sample using number (%) for categorical variables and mean with standard deviation (± SD) for continuous variables. Chi-square test, or Fisher's exact test when sample sizes were less than 5 in one cell, was used as appropriate for categorical variables, and Student's *t*-test was used for continuous variables to compare socio-demographic characteristics, sexual behaviors, substance use, contraceptive use, and exposure to sexual and reproductive health education among respondents with and without history of induced abortion.

A multivariate logistic regression model was constructed to examine the independent association between demographic characteristics and risky sexual behaviors and history of induced abortion. All variables found to have significant association with history of induced abortion in bivariate analyses at a level of $p<0.05$ were simultaneously included in a preliminary model. A final model was developed by removing variables with the highest *p*-value >0.05, refitting the model and repeating the steps until all *p*-values of included variables were <0.05. Odds ratio (OR) for bivariate analyses and adjusted odds ratio (AOR) for multivariate analyses were calculated and presented with 95% confidence intervals (CI) and *p*-values. STATA version 13 (StataCorps LP, Texas, USA) was used for all data analyses.

Ethical considerations

The participants were informed that participation in this study was voluntary, and they could refuse or discontinue their participation at any time for any reason without any consequences. Written informed consent was then obtained from each participant after a detailed description of the study objectives and procedures was provided. We strictly protected privacy of the respondents by conducting the interviews in a private place, and their confidentiality was ensured by using an identification number for each individual, and no personal identifiers such as name or address were collected. Each respondent received approximately US$2.5 for their time compensation. The questionnaires and data collected from the participants were kept under the responsibility of KHANA's Research Center. The study protocol and tools were approved by the National Ethics Committee for Health Research, Ministry of Health, Cambodia (No. 082NECHR).

RESULTS

We interviewed 667 EWs in total. For this study, we included only women who reported having had sexual intercourse experience in their lifetime (*n*=556), excluding 111 women who had not had sexual intercourse in the past three months.

Socio-demographic characteristics

As shown in **Table 1**, 437 respondents had no history of induced abortion, and 119 had a history of at least one induced abortion in their lifetime. The mean times of induced abortion during the time working as an EW was 2.1 (SD= 3.1). The most common facility where the most recent abortion was performed was private clinics or hospitals (45.4%), followed by home abortion using abortion medication bought from pharmacies (41.2%) and NGO clinics or hospitals (10.1%). Compared to respondents without a history of induced abortion, respondents with a history of induced abortion were significantly older (mean age: 26.1 years vs. 27.5 years), more likely to have no formal education (6.4% vs. 12.6%), had significantly higher monthly income (median: US$189.5 vs. 199.5), more likely to work in a karaoke bar (45.1% vs. 53.8%), had worked significantly longer in entertainment industry (mean duration: 23.1 months vs. 53.3

months), and had worked in a significantly longer duration at the current establishment (mean duration: 14.8 months vs. 30.3 months).

Sexual behaviors, contraceptive use, and pregnancy

Table 2 shows the comparisons of sexual behaviors, contraceptive use, and history of pregnancy of EWs with and without a history of induced abortion. Respondents with a history of induced abortion had significantly higher mean number of sexual partners in the past 12 months (2.1 vs. 5.4). They were also significantly more likely to report having sexual intercourse with a non-commercial partner in the past 3 months (35.0% vs. 44.5%), always using condom with their non-commercial partners in the past 3 months (34.4% vs. 22.6%), having sexual intercourse with commercial partners in the past 3 months (20.6% vs. 29.7%), having clients who requested them not to use condom in the past 3 months (12.2% vs. 27.8%), and to report that they were able to find condom when they needed it (73.6% vs. 88.1%). Regarding contraceptive use, respondents with a history of induced abortion were significantly more likely to report currently using a contraceptive method (42.9% vs. 55.5%) and having been pregnant during their time working as an EW (6.7% vs. 98.3%).

Factors associated with induced abortion

Table 3 presents factors associated with history of induced abortion in multivariate logistic regression model. After adjustment for the effects of other covariates, EWs with a history of induced abortion remained significantly more likely to be currently working in a karaoke bar (AOR=1.75, 95%CI=1.10-2.78), to have work longer as an EW (AOR=1.42, 95%CI=1.06-1.43), to have had more number sexual partners in the past 12 months (AOR=1.86, 95%CI=1.02-1.54), to be currently using a contraceptive method (AOR= 1.52, 95%CI=1.01-2.29), to be able to find condom when they needed it (AOR= 2.03, 95% CI= 1.09-3.82), and to report inconsistent condom use with non-commercial partners in the past three months (AOR= 1.62, 95% CI= 1.06-3.44).

DISCUSSION

This study is among a few attempts to explore factors associated with induced abortion among EWs who are at high risks for HIV and sexual reproductive health problems. We found that the prevalence of consistent condom and contraceptive use, particularly with non-commercial partners, among EWs in this study was low, while pregnancies ending in induced abortion were common. The majority of the induced abortions were not carried out in public health or NGO's facilities considered to be the safest place equipped with formally trained abortion care providers. We have identified several socio-economic and sexual reproductive health factors that increased the risks of induced abortion among these vulnerable women. However, induced abortion for those who engaged in sex work was not significantly associated with either the number of commercial partners or inconsistent condom use in the commercial relationships.

It is interesting to note that EWs with experience of induced abortion during the time working as an EW were significantly more likely to report being currently on contraception than those who did not experience induced abortion. They were also more likely to respond that they were able to find condom whenever they needed it. These findings may be interpreted that women who did not have a history of induced abortion were less sexually active or less involved in sex work compared to those with a history of induced abortion. As a result, they did not see contraception or condoms necessary for them. Moreover, contraceptive use may be motivated by prior unintended pregnancies or induced abortions. In a previous study among female sex workers in Cambodia, the frequency of the uptake of hormonal contraception was more than doubled if women had induced abortion in the past year.[9] Among female sex workers in Spain, the risk for induced abortion also increased with the number of pregnancies.[10]

History of induced abortion remained significantly associated with inconsistent condom use with non-commercial partners. This finding expands our understanding of the relationships between induced abortion and condom use with different types of partners. Previous studies have also reported the association between condom use and induced abortion but did not distinguish the difference effects of condom use in commercial and non-commercial relationships.[9 11 23 24] This finding also highlights the consequences of low rates of consistent condom use in non-commercial relationships among EWs in Cambodia[4 25] that may place women at greater risks for unwanted pregnancies that in turn leads to induced abortion. EWs

tend to use condom more consistently when having sexual intercourse in exchange for money or gifts.[4 25] However, a previous study found that incidence and prevalence of induced abortions were associated with inconsistent condom use with both commercial and non-commercial partners.[9]

One of the most important findings in this study was the relationship between induced abortion and the increased number of sexual partners. A possible explanation for this tendency is the increased chance of condom failure, corresponding to the increased number of sexual intercourse. Even with the slightest chance of condom breakage (two broken condoms per 100 condoms used), the chances of condom failure accumulated as the number of sexual intercourse increased.[26] Similarly, a study among female sex workers in Cambodia and Lao PDR found that the increase in number of clients correlates with an increase in number of induced abortions independent of the use of condoms with non-commercial partners.[9] On a different note, the low condom use with non-commercial partners among EWs,[4] which can be a major risk factor associated with unintended pregnancy, should be taken into consideration when interpreting this result. A study in Ethiopia found that one third of female sex workers had a regular partner, while condoms were not consistently used in such relationship, and this practice increased the number of unintended pregnancy.[27]

Induced abortion retained its significant association with working in a karaoke bar, longer working duration in the current entertainment industry. Similar findings were reported in a study among female sex workers in Cambodia and Lao PDR which found that induced abortion was more common among non-street-based sex workers such as women working in clubs or hotels.[9] It was noted that greater ability to pay for induced abortion procedures or medication for home abortions of establishment-based sex workers may explain the relationship, given their relatively high status and earnings compared to those working on the streets.[9] Women working in karaoke bars in Cambodia are also more likely to get involved in commercial sexual relationships and multiple sexual partners compared to women working in other establishments.[28] The relationship between duration of sex work and induced abortion has also been previously reported among female sex workers.[9 10 29]

Some limitations of this study should be acknowledged. First, causal inferences were not possible due to the cross-sectional nature to the data. Second, as with any self-reported measures, there may be inherent biases that may lead to both underreporting and over-reporting in the variables. Given the cultural norms governing sexual and reproductive health behaviors among Cambodian women, it is likely that the sexual risk and outcomes found in this study were under-reported. However, measures were taken to create conditions that encouraged valid responses from the women; their responses were confidential, and interviews were conducted in a private place.

The final limitation concerns the representativeness of the study samples. Although a wide range of sub-populations of EWs were included, data were collected only from EWs in the capital city and a large province where the KHANA's SAHACOM, a comprehensive community-based project aiming to improve sexual and reproductive health of EWs, has been implemented. Therefore, participants had an existing link to KHANA. The levels of sexual and reproductive health risks and outcomes reported in this study may therefore represent a more optimistic view than in other areas of Cambodia. However, the main purpose of this study was not to explore the prevalence of induced abortion among EWs when they are engaged in sex work. We instead intended to show that these at-risk women are vulnerable to induced abortions and are not all availing themselves of safe abortion services.

Despite these limitations, findings from this study have important implications for interventions and programming for the improvement of sexual and reproductive health among EWs in Cambodia. Overall, this study highlights the high rates of pregnancies that end in induced abortions as a result of the low rates of consistent condom and contraceptive use among these vulnerable women. In addition, use of unregulated private facilities and home medication abortion was high among this group. Access of EWs to sexual and reproductive health care services is deemed a high priority. Recently, great efforts have been made in the implementation of integrated HIV and reproductive health interventions in order to improve the quality of and access to service packages among key populations in Cambodia. Such interventions should be tailored to reach these most vulnerable women and ensure that they could receive quality services.

Acknowledgments

Data used for this study were collected as part of the impact evaluation of the SAHACOM funded by the United States Agency for International Development (USAID). The authors thank KHANA's Senior Management Team, Programs Division, and research assistants for their endless support. Special thanks are deserved by our implementing partners and their staff members, local authorities, community support volunteers, outreach workers as well as all participants for their excellent contribution to the data collection. Without such extensive supports, this study would have been impossible.

Contributors

SY managed the literature review, designed the study, developed the research protocol, analyzed the data, and prepared the manuscript. ST, PC, KDP, KT, and CB supported study design, protocol development, data collection, and analyses of the study findings. All authors read and approved the final manuscript.

Funding This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None.

Data sharing statement No additional data are available.

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Table 1 Demographic characteristics of EWs with and without a history of induced abortion

	Total	No history of induced abortion (*n*=437)	History of induced abortion (*n*=119)	*p*-value
Age (in years)	26.4 ± 5.5	26.1 ± 5.4	27.5 ± 5.5	0.02
Marital Status				0.42
Never married	183 (32.9)	149 (34.0)	34 (28.6)	
Married and living together	190 (34.2)	144 (33.0)	46 (38.7)	
Divorced, separated, or widowed	183 (32.9)	144 (33.0)	39 (32.7)	
Mean years of formal education	6.1 ± 3.1	6.2 ± 3.1	5.6 ± 3.2	0.06
No formal schooling	50 (7.5)	35 (6.4)	15 (12.6)	0.02
Median monthly income (in US$)	199.4	189.5	199.4	0.04
Currently living with:				0.38
Parents	74 (13.3)	62 (14.2)	12 (10.1)	
Relatives/siblings	89 (16.0)	71 (16.2)	18 (15.1)	
Spouse/sexual partner	160 (28.8)	117 (26.8)	43 (36.1)	
Friends/colleagues	78 (14.0)	65 (14.9)	13 (10.9)	
Alone	103 (18.5)	80 (18.3)	23 (19.3)	
Others	52 (9.4)	42 (9.6)	10 (8.4)	
Current place of employment				0.01
Karaoke bar	261 (46.9)	197 (45.1)	64 (53.8)	
Restaurant	163 (29.3)	138 (31.6)	25 (21.0)	
Massage parlor	56 (10.1)	45 (10.3)	11 (9.2)	
Beer garden	18 (3.2)	15 (3.4)	3 (2.5)	
Other	58 (10.4)	42 (9.6)	16 (13.4)	
Mean working duration in entertainment industry (in months)	29.6 ± 33.9	23.1 ± 26.9	53.3 ± 44.9	<0.001
Mean working duration for the	18.1 ± 25.2	14.8 ± 20.5	30.3 ± 35.3	<0.001

current establishment (in months)

Abbreviations: EWs, entertainment workers; SD, standard deviation.

Values are number (%) for categorical variables and mean ± SD for continuous variables.

[*] *Chi-square test or Fisher's exact test was used as appropriate for categorical variables, and T-test was used for continuous variables.*

Table 2 Sexual and reproductive health of EWs with and without a history of induced abortion

	Total	No history of Induced Abortion (*n*=437)	History of Induced Abortion (*n*=119)	*p*-value
Mean age at first sexual intercourse	19.6 (3.0)	19.6 ± 2.8	19.5 ± 3.6	0.59
Mean number of sexual partners (past 12 months)	2.8 (6.5)	2.1 ± 4.4	5.4 ± 11.1	<0.001
Had sexual intercourse with non-commercial partners (past 3 months)	205 (37.0)	152 (35.0)	53 (44.5)	0.04
Always used condom with non-commercial partners (past 3 months)	64 (31.4)	52 (34.4)	12 (22.6)	0.04
Had sexual intercourse with commercial partners (past 3 months)	124 (22.5)	89 (20.6)	35 (29.7)	0.04
Mean number of commercial partners (past 3 months)	1.1 (1.7)	0.9 ± 1.5	1.5 ± 2.1	0.08
Always used condom with commercial partners (past 3 months)	100 (78.7)	73 (78.5)	27 (79.4)	0.91
Having clients who requested not to use condom (past 3 months)	21 (16.7)	11 (12.2)	10 (27.8)	0.03
Able to find condom when needed it (past 3 months)	426 (76.8)	321 (73.6)	104 (88.1)	0.002
Currently using a contraceptive method	252 (45.6)	186 (42.9)	66 (55.5)	0.04
Type of contraceptive method being used				0.41
Pills	64 (25.6)	46 (24.5)	18 (27.7)	
Condom	106 (42.4)	82 (44.3)	24 (36.9)	
Injection	22 (8.8)	17 (9.2)	5 (7.7)	
Other (IUD, implant, natural ways)	59 (23.2)	40 (21.6)	18 (27.7)	
Having been pregnant in lifetime	402 (72.3)	283 (64.8)	119 (100.0)	

Mean age at first pregnancy (*n*=402)	21.3 ± 3.3	21.2±3.2	21.3±3.5	0.64
Having been pregnant during the time working as an EW (*n*=402)	136 (33.8)	19 (6.7)	117 (98.3	<0.001

Abbreviations: EWs, entertainment workers; IUD, intra-uterine devices.
Values are number (%) for categorical variables and mean ± SD for continuous variables.
**Chi-square test or Fisher's exact test was used as appropriate for categorical variables, and T-test was used for continuous variables.*

Table 3 Factors associated with history of induced abortion in multivariate logistic regression model (*n*=556)

Variables in the model	AOR (95% CI)	*p*-value
Working at karaoke bar		0.02
No	Reference	
Yes	1.75 (1.10-2.78)	
Duration working as an EW	1.42 (1.06 – 1.43)	<0.001
More number of sexual partners in past 12 months	1.86 (1.02-1.54)	0.002
Currently using contraceptive method		0.04
No	Reference	
Yes	1.52 (1.01-2.29)	
Able to find condom when needed		0.03
No	Reference	
Yes	2.03 (1.08-3.82)	
Condom use with non-commercial partners in the past 3 months		
Always	Reference	
Not always	1.62 (1.06-3.44)	0.04

Abbreviations: EW, entertainment worker; AOR, adjusted odds ratio; CI, confidence interval.

BMJ Open

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Journal:	*BMJ Open*
Manuscript ID:	bmjopen-2015-007947.R2
Article Type:	Research
Date Submitted by the Author:	22-Jun-2015
Complete List of Authors:	Yi, Siyan; KHANA, Research Center Tuot, Sovannary; KHANA, Research Center Chhoun, Pheak; KHANA, Research Center Pal, Dyla; KHANA, Research Center Tith, Khimuy; KHANA, Research Center Brody, Carinne; Touro University California, Public Health Program
Primary Subject Heading:	Public health
Secondary Subject Heading:	Epidemiology, Obstetrics and gynaecology, Reproductive medicine, Sexual health
Keywords:	PUBLIC HEALTH, REPRODUCTIVE MEDICINE, PREVENTIVE MEDICINE, EPIDEMIOLOGY

Factors associated with induced abortion among female entertainment workers: A cross-sectional study in Cambodia

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ABSTRACT

Objective: To explore risk factors associated with induced abortion among sexually active female entertainment workers (FEWs) in Cambodia.

Design: Cross-sectional study.

Setting: Phnom Penh and Siem Reap, Cambodia.

Participants: This study included 556 FEWs aged 18 to 47 years randomly selected from entertainment establishments in the two cities in 2014 using a two-stage cluster sampling method. Data were collected through face-to-face interviews using a structured questionnaire.

Primary outcome measure: History of induced abortion during the time working as a FEW.

Results: Of the total sample, 45.6% reported currently using a contraceptive method with condom (42.4%) being the most common method, followed by pills (25.6%). One-fourth (25.0%) of the respondents reported having been pregnant at least once, and 21.4% reported having at least one induced abortion during the time working as a FEW. After controlling for other covariates in multivariate logistic regression model, FEWs with a history of induced abortion remained significantly more likely to be currently working in a karaoke bar (AOR=1.75, 95%CI=1.10-2.78), to have worked longer as a FEW (AOR=1.42, 95%CI=1.06-1.43), to have had more number sexual partners in the past 12 months (AOR=1.86, 95%CI=1.02-1.54), to be

currently using a contraceptive method (AOR= 1.52, 95%CI=1.01-2.29), to be able to find condoms when they needed it (AOR= 2.03, 95% CI= 1.09-3.82), and to report inconsistent condom use with non-commercial partners in the past three months (AOR= 1.62, 95% CI= 1.06-3.44).

Conclusions: This study highlights the high rates of unwanted pregnancies that ended in induced abortions among FEWs in Cambodia. Access of FEWs to quality sexual and reproductive health care services is deemed a high priority. Integrated interventions to improve sexual and reproductive health among these vulnerable women should be tailored to reach the most-at-risk groups.

Strengths and limitations of the study

- This is the first study to examine potential factors associated with induced abortion among FEWs – one of the most vulnerable populations in Cambodia.
- This study included sexually active young women working in different establishments such as karaoke bars, massage parlors, beer gardens, nightclubs, restaurants, etc. These women are considered at alarmingly high risks for sexual and reproductive health problems because of their involvement in direct and/or indirect sex work.
- Several factors that had not been examined in previous studies were included in this analysis, including condom use with non-commercial partners.
- Limitations of the study included the representativeness of the study sample, the validity of self-reported measures, and the cross-sectional nature of the data.

INTRODUCTION

In Cambodia, many young women from poor, rural families migrate to urban areas to earn and remit income to their families in their home villages.[1,2] A common migratory pull are the garment factories that employ over 600,000 young women. Garment workers are typically not given fair wages, safe work environments, or health insurance – a combination of factors that have resulted in worker unrest and mass fainting incidents at various factories. Claiming worker rights becomes a complicated challenge that involves risking their jobs, their livelihood, and their ability to provide for family. As a result, more and more young migrant women become involved in alternative work opportunities in the entertainment industry, where many participate in direct and indirect sex work. 'Female entertainment workers' (FEWs) refers to women working in entertainment venues such as karaoke bars, massage parlors, restaurants (as hostesses or singers), or at beer gardens.[2]

By 2013, there were approximately 40,000 FEWs in Cambodia, 24,000 of which resided in the capital city of Phnom Penh.[3] This group has been increasing since the 2008 passage and implementation of the 'Law on Suppression of Human Trafficking and Sexual Exploitation,' which banned brothel-based sex work, and more women have moved into indirect sex work based out of entertainment venues. FEWs in Cambodia are considered at high risks for poor sexual and reproductive health outcomes because of their involvement in direct or indirect sex work,[2] with only limited access to sexual and reproductive health care services.[4] Recent studies indicate alarmingly high HIV prevalence among street-based sex workers (37.3%), brothel-based sex workers (17.4%), and women working in other entertainment establishments (9.8%).[5] While there have been remarkable increases in reported condom use in commercial sex work over the past decade, there may be misreporting of condom use as well as condom failure. In addition, no improvement has been observed in consistent condom use between FEWs and their non-commercial partners, such as boyfriends or other romantic relationships.[4 6 7] Moreover, unwanted pregnancies and induced abortions[4] as well as sexually transmitted infections (STIs)[5 8] are very common among these women. In our most recent survey, 46% of Cambodian FEWs reported having experienced at least one induced abortion, and 40% reported having experienced two or more induced abortions in their lifetime.[4]

In Cambodia, free and friendly sexual and reproductive health services are currently available through government and NGO providers to FEWs. However, some FEWs experience barriers to service use such as discrimination by providers and report a preference for private providers.[9] KHANA, the largest national HIV organization in Cambodia, is currently offering specialized services for FEWs including free distribution of condoms, on-spot STI screening, a "safe space" drop-in center, community-based finger-prick HIV and syphilis testing, accompanied referrals to enrollment of HIV-positive FEWs to pre-antiretroviral therapy (ART) and ART services, the integration of sexual and reproductive health services with HIV services, partner tracing, and prevention of mother to child transmission (PMTCT) programming.

Several factors have been linked to induced abortion among female sex workers (FSWs) in many countries. In a previous study in Cambodia, lifetime history of induced abortion increased with the number of clients, inconsistent condom use, recent condom breakage, and recent forced unprotected sex.[10] A study in Spain found that lifetime history of induced abortion was more common among FSWs who were older and married, had higher number of pregnancies, had lower contraceptive knowledge, and had worked as FSWs for a longer period.[11] Among FSWs in Hong Kong, those who did not use condom in the last episode of serving a client and those who would agree not to use condom if they were paid more were more likely than other to have ever had induced abortion.[12] Other reported risk factors that may place women from the general population, and not sex workers specifically, at greater risk for induced abortion include early sexual debut,[13] lower education,[13] and economic constraints.[14]

The low condom use rates within non-commercial relationships may be undermining the current efforts to reduce sexual and reproductive health risk behaviors among FEWs in Cambodia. Moreover, women who use induced abortion as a means to prevent births are particularly vulnerable to HIV and STIs as the epidemic spreads mainly through heterosexual intercourse.[3] For these reasons, investigations of risk factors for induced abortion among this high-risk population will provide useful information to inform health policies for the reduction of unwanted pregnancy and induced abortion as well as for the prevention of new HIV infections and STIs among these vulnerable women.

Despite the need for information, only a few studies have been conducted on induced abortion among FEWs in Cambodia or in other developing countries. Recent studies of FEWs in Cambodia found that 34-54% of FEWs reported always using condoms with their regular, non-commercial partners, and 83-85% reported always using condoms with commercial partners.[7,15] Furthermore, the relationship between induced abortion and risk behaviors, such as inconsistent condom use with non-commercial partners, has not been addressed. This study was therefore conducted to fill in the literature gaps and explore risk factors associated with induced abortion among FEWs in Cambodia.

METHODS

Study sites, population, and sampling

This study was conducted in April and May 2014 in Phnom Penh and Siem Reap as part of an impact evaluation study of the Sustainable Action against HIV and AIDS in Communities (SAHACOM) Project. Number of FEWs in Phnom Penh and Siem Reap represents approximately 70% of the total FEWs population in Cambodia.[16]

Data were collected through face-to-face interviews conducted in a private space at the workplace of FEWs randomly selected from a list of entertainment establishments enrolled in the SAHACOM using a two-stage cluster sampling method. The sample size was proportionally allocated to the number of FEWs in Phnom Penh and Siam Reap. At the first stage, probability proportional-to-size sampling was used to select entertainment establishments from a list of the venues. At the second stage, a proportionate number of participants were randomly selected from the lists of FEWs at each selected establishment. To be included in the study, a FEW must be: (1) at least 18 years of age, (2) biologically female, (3) able to provide consent to participate in the study, and (4) able to present themselves on the day of the interview. FEWs were excluded if they were mentally and/or physically too sick to participate in the study.

A structured questionnaire was developed based on the results from a pilot study and comments from public health experts in the areas of sexual and reproductive health in Cambodia. A three-day training on data collection methods was conducted for all interviewers and field supervisors.

Variables and measurements

The variables were measured using standardized tools adapted from previous studies in the same population,[17 18] the most recent Cambodia Demographic and Health Survey,[19] as well as from other studies in Cambodia.[20-24] Socio-demographic characteristics included age, marital status, completed years of formal education, average monthly income, living situations, types of establishment they were working for, and duration they had worked in the current career as well as in the current place of employment.

The survey included questions assessing history of pregnancy and induced abortion. History of induced abortion was assessed via a question, "During your work as a FEW, have you experienced any induced abortion?" with three response options: (1) never had sexual intercourse, (2) no, or (3) yes. We also collected information on age at their first pregnancy, number of pregnancy in lifetime and during the time working as a FEW, number of induced abortion they had in lifetime and during the time working as a FEW, and facility where they received their most recent induced abortion services. In addition, yes/no questions were used to ask whether the participants were currently using any contraceptive method and whether they had received any forms of sexual and reproductive health education in the past six months. They were also questioned about the type of the contraceptive method being used and sources of sexual and reproductive health education they had received in the past six months.

Several variables on sexual behaviors and condom use were measured including age at the first sexual intercourse, number of sexual partners in the past 12 months, number of partners with whom they had sexual intercourse in exchange for money or gifts (commercial partners) in the past three months, number of partners with whom they had sexual intercourse not in exchange for money or gift (non-commercial partners) in the past three months, and condom use with both types of sexual partners in the past three months. For condom use, we asked, "During the past 3 months, how often have you used condoms when you had sex with your sweetheart?" The same question was used to assess condom use when having sex in exchange for money or gifts. The participants answered these questions on a Likert scale with

six-point response options ranging from (1) “always” to (6) “never.” Those answering “always” to the questions were considered consistent condom users. The respondents were also questioned whether they had clients who requested them not to use condoms in the past three months, and if they were able to find condoms when they needed in the past three months (0= no, 1= yes).

Data analyses

EpiData version 3 (Odense, Denmark) was used for double data entry. Descriptive analyses were conducted to describe socio-demographic characteristics and the history of pregnancy and induced abortion of the study sample using number (%) for categorical variables and mean with standard deviation (± SD) for continuous variables. Chi-square test, or Fisher’s exact test when sample sizes were smaller than 5 in one cell, was used as appropriate for categorical variables, and Student’s *t*-test was used for continuous variables to compare socio-demographic characteristics, sexual behaviors, substance use, contraceptive use, and exposure to sexual and reproductive health education among respondents with and without a history of induced abortion.

A multivariate logistic regression model was constructed to examine the independent association between socio-demographic characteristics and risky sexual behaviors and history of induced abortion. All variables found to have significant association with history of induced abortion in bivariate analyses at a level of $p<0.10$ were simultaneously included in a preliminary model. A final model was developed by removing variables with p-value >0.05, refitting the model, and repeating the steps until all p-values of included variables were <0.05. Odds ratio (OR) for bivariate analyses and adjusted odds ratio (AOR) for multivariate analyses were calculated and presented with 95% confidence intervals (CI) and p-values. STATA version 13 (StataCorps LP, Texas, USA) was used for all data analyses.

Ethical considerations

The participants were informed that participation in this study was voluntary, and they could refuse or discontinue their participation at any time for any reason without any consequences.

A written informed consent was obtained from each participant after a detailed description of the study objectives and procedures was provided. We strictly protected privacy of the respondents by conducting the interviews in a private place, and their confidentiality was ensured by using an identification number for each individual, and no personal identifiers such as name or address were collected. Each respondent received approximately US$2.5 for their time compensation. The questionnaires and data collected from the participants were kept under the responsibility of KHANA's Research Center. The study protocol and tools were approved by the National Ethics Committee for Health Research, Ministry of Health, Cambodia (No. 082NECHR).

RESULTS

We interviewed 667 FEWs in total. For this study, we included only women who reported having sexual intercourse (*n*=556) and excluded 111 women who reported not having sexual intercourse in the past three months.

Socio-demographic characteristics

As shown in **Table 1**, 437 (79%) respondents had no history of induced abortion during the time working as a FEW, and 119 (21%) had a history of at least one induced abortion during the time working as a FEW. The mean times of induced abortion during the time working as a FEW was 2.1 (SD= 3.1). The most common facility where the most recent abortion was performed was private clinics or hospitals (45.4%), followed by home abortion using abortion medication bought from pharmacies (41.2%) and NGO clinics or hospitals (10.1%). Compared to respondents without a history of induced abortion, respondents with a history of induced abortion were significantly older (mean age: 26.1 years vs. 27.5 years), more likely to have no formal education (6.4% vs. 12.6%), had significantly higher monthly income (median: US$189.5 vs. 199.5), more likely to work in a karaoke bar (45.1% vs. 53.8%), had worked significantly longer in the entertainment industry (mean duration: 23.1 months vs. 53.3 months), and had worked in a significantly longer duration at the current establishment (mean duration: 14.8 months vs. 30.3 months).

Sexual behaviors, contraceptive use, and pregnancy

Table 2 shows the comparisons of sexual behaviors, contraceptive use, and history of pregnancy of FEWs with and without a history of induced abortion. Respondents with a history of induced abortion had significantly higher mean number of sexual partners in the past 12 months (2.1 vs. 5.4). They were also significantly more likely to report having sexual intercourse with a non-commercial partner in the past 3 months (35.0% vs. 44.5%), always using condom with their non-commercial partners in the past 3 months (34.4% vs. 22.6%), having sexual intercourse with commercial partners in the past 3 months (20.6% vs. 29.7%), having clients who requested them not to use condoms in the past 3 months (12.2% vs. 27.8%), and to report that they were able to find condoms when they needed (73.6% vs. 88.1%). Regarding contraceptive use, respondents with a history of induced abortion were significantly more likely to report currently using a contraceptive method (42.9% vs. 55.5%) and having been pregnant during their time working as a FEW (6.7% vs. 98.3%).

Factors associated with induced abortion

Table 3 presents factors associated with history of induced abortion in multivariate logistic regression model. After adjustment for the effects of other covariates, FEWs with a history of induced abortion remained significantly more likely to be currently working in a karaoke bar (AOR=1.75, 95%CI=1.10-2.78), to have worked longer as a FEW (AOR=1.42, 95%CI=1.06-1.43), to have had more number sexual partners in the past 12 months (AOR=1.86, 95%CI=1.02-1.54), to be currently using a contraceptive method (AOR= 1.52, 95%CI=1.01-2.29), to be able to find condoms when they needed (AOR= 2.03, 95% CI= 1.09-3.82), and to report inconsistent condom use with non-commercial partners in the past three months (AOR= 1.62, 95% CI= 1.06-3.44).

DISCUSSION

This study is among a few attempts to explore factors associated with induced abortion among FEWs who are at high risks for HIV and sexual reproductive health problems. We found that the

prevalence of consistent condom and contraceptive use, particularly with non-commercial partners, among FEWs in this study was low, while pregnancies ending in induced abortions were common. The majority of the induced abortions were not carried out in public health or NGO's facilities considered to be the safest place equipped with formally trained abortion care providers. We have identified several socio-demographic and sexual reproductive health factors that increased the risks of induced abortions among these vulnerable women.

Surprisingly, induced abortion for those who engaged in sex work was not significantly associated with either the number of commercial partners or inconsistent condom use in the commercial relationships. Evidence from another study based on in-depth interviews with Cambodian FEWs found that, while condom use was generally high with commercial partners, non-commercial or romantic relationships were not characterized as risky and typically did not involve condom use.[7] Therefore, unprotected sex was more likely to be occurring between FEWs and their non-commercial romantic partners.

It is interesting to note that FEWs with experience of induced abortion during the time working as a FEW were significantly more likely to report being currently on contraception than those who did not experience induced abortion. They were also more likely to respond that they were able to find condoms whenever they needed it. These findings may be interpreted that women who did not have a history of induced abortions were less sexually active or less involved in sex work compared to those with a history of induced abortions. As a result, they did not see contraception or condoms necessary for them. Moreover, contraceptive use may be motivated by prior unintended pregnancies or induced abortions. In a previous study among FSWs in Cambodia, the frequency of the uptake of hormonal contraception was more than doubled if women had an induced abortion in the past year.[10] Among FSWs in Spain, the risk for induced abortions also increased with the number of pregnancies.[11]

History of induced abortions remained significantly associated with inconsistent condom use with non-commercial partners. This finding expands our understanding of the relationships between induced abortion and condom use with different types of partners. Previous studies have also reported the association between condom use and induced abortion but did not distinguish the different effects of condom use in commercial and non-commercial

relationships.[10 12 25 26] This finding also highlights the consequences of low rates of consistent condom use in non-commercial relationships among FEWs in Cambodia[4 15] that may place women at greater risks for unwanted pregnancies that in turn leads to induced abortions. FEWs tend to use condom more consistently when having sexual intercourse in exchange for money or gifts.[4 15] However, a previous study found that incidence and prevalence of induced abortions were associated with inconsistent condom use with both commercial and non-commercial partners.[10]

One of the most important findings in this study was the relationship between induced abortion and the increased number of sexual partners. A possible explanation for this tendency is the increased chance of condom failure, corresponding to the increased number of sexual intercourse. Even with the slightest chance of condom breakage (two broken condoms per 100 condoms used), the chances of condom failure accumulated as the number of sexual intercourse increased.[27] Similarly, a study among FSWs in Cambodia and Lao PDR found that the increase in number of clients correlates with an increase in number of induced abortions independent of the use of condoms with non-commercial partners.[10] On a different note, the low condom use with non-commercial partners among FEWs,[4] which can be a major risk factor associated with unintended pregnancy, should be taken into consideration when interpreting this result. A study in Ethiopia found that one third of FSWs had a regular partner, while condoms were not consistently used in such relationship, and this practice increased the number of unintended pregnancies.[28]

Induced abortion retained its significant association with working in a karaoke bar and longer working duration in the current entertainment establishment. Similar findings were reported in a study among FSWs in Cambodia and Lao PDR, which found that induced abortion was more common among non-street-based sex workers such as women working in clubs or hotels.[10] It was noted that greater ability to pay for induced abortion procedures or medication for home abortions of establishment-based FSWs may explain the relationship, given their relatively high status and earnings compared to those working on the streets.[10] Women working in karaoke bars in Cambodia are also more likely to get involved in commercial sexual relationships and multiple sexual partners compared to women working in other

establishments.[28] The relationship between duration of sex work and induced abortion has also been previously reported among FSWs.[10 11 30]

Some limitations of this study should be acknowledged. First, there was no timeframe for induced abortion in the survey question that forms the outcome variable, and therefore, we cannot tell if these were recent or past abortions; however, we did ask respondents to specify if their abortions occurred during their career as FEWs, and 90% of the respondents had been working in this career for six years or less. Second, as with any self-reported measures, there may be inherent biases that may lead to both underreporting and over-reporting in the variables. Given, the cultural norms governing sexual and reproductive health behaviors among Cambodian women, it is likely that the sexual risk and outcomes found in this study were under-reported. However, measures were taken to create conditions that encouraged valid responses from the women; their responses were confidential, and interviews were conducted in a private place. Third, causal inferences were not possible due to the cross-sectional nature to the data.

The final limitation concerns the representativeness of the study sample. Although a wide range of sub-populations of FEWs were included, data were collected only from FEWs in the capital city and a large province where the KHANA's SAHACOM, a comprehensive community-based project aiming to improve sexual and reproductive health of FEWs, has been implemented. The levels of sexual and reproductive health risks and outcomes reported in this study may therefore represent a more optimistic view than in other areas of Cambodia. However, the main purpose of this study was not to explore the prevalence of induced abortion among FEWs when they are engaged in sex work. We instead intended to show that these at-risk women are vulnerable to induced abortions and are not all availing themselves of safe abortion services.

Despite these limitations, findings from this study have important implications for interventions and programming for the improvement of sexual and reproductive health among FEWs in Cambodia. Overall, this study highlights the high rates of pregnancies that end in induced abortions as a result of the low rates of consistent condom and contraceptive use among these vulnerable women. In addition, the use of unregulated private facilities and home

medication abortions was high among this group. Access of FEWs to sexual and reproductive health care services is deemed a high priority. Recently, great efforts have been made in the implementation of integrated HIV and reproductive health interventions in order to improve the quality of and access to service packages among key populations in Cambodia. Such interventions should be tailored to reach these most vulnerable women and ensure that they could receive quality services.

Acknowledgments

The authors thank KHANA's Senior Management Team, Programs Division, and research assistants for their endless support. Special thanks are deserved by our implementing partners and their staff members, local authorities, community support volunteers, outreach workers as well as all participants for their excellent contribution to the data collection. Without such extensive supports, this study would have been impossible.

Contributors

SY managed the literature review, designed the study, developed the research protocol, analyzed the data, and prepared the manuscript. ST, PC, KP, KT, and CB supported study design, protocol development, data collection, and analyses of the study findings. All authors read and approved the final manuscript.

Funding Data used for this study were collected as part of the impact evaluation of the SAHACOM project funded by the United States Agency for International Development (USAID).

Competing interests None.

Data sharing statement No additional data are available.

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Table 1 Demographic characteristics of FEWs with and without a history of induced abortion

	Total	No history of induced abortion (*n*=437)	History of induced abortion (*n*=119)	*p*-value
Age (in years)	26.4 ± 5.5	26.1 ± 5.4	27.5 ± 5.5	0.02
Marital Status				0.42
Never married	183 (32.9)	149 (34.0)	34 (28.6)	
Married and living together	190 (34.2)	144 (33.0)	46 (38.7)	
Divorced, separated, or widowed	183 (32.9)	144 (33.0)	39 (32.7)	
Mean years of formal education	6.1 ± 3.1	6.2 ± 3.1	5.6 ± 3.2	0.06
No formal schooling	50 (7.5)	35 (6.4)	15 (12.6)	0.02
Median monthly income (in US$)	199.4	189.5	199.4	0.04
Currently living with:				0.38
Parents	74 (13.3)	62 (14.2)	12 (10.1)	
Relatives/siblings	89 (16.0)	71 (16.2)	18 (15.1)	
Spouse/sexual partner	160 (28.8)	117 (26.8)	43 (36.1)	
Friends/colleagues	78 (14.0)	65 (14.9)	13 (10.9)	
Alone	103 (18.5)	80 (18.3)	23 (19.3)	
Others	52 (9.4)	42 (9.6)	10 (8.4)	
Current place of employment				0.01
Karaoke bar	261 (46.9)	197 (45.1)	64 (53.8)	
Restaurant	163 (29.3)	138 (31.6)	25 (21.0)	
Massage parlor	56 (10.1)	45 (10.3)	11 (9.2)	
Beer garden	18 (3.2)	15 (3.4)	3 (2.5)	
Other	58 (10.4)	42 (9.6)	16 (13.4)	
Mean working duration in entertainment industry (in months)	29.6 ± 33.9	23.1 ± 26.9	53.3 ± 44.9	<0.001
Mean working duration for the	18.1 ± 25.2	14.8 ± 20.5	30.3 ± 35.3	<0.001

current establishment (in months)

Abbreviations: FEWs, entertainment workers; SD, standard deviation.

Values are number (%) for categorical variables and mean ± SD for continuous variables.

**Chi-square test or Fisher's exact test was used as appropriate for categorical variables, and T-test was used for continuous variables.*

Table 2 Sexual and reproductive health of FEWs with and without a history of induced abortion

	Total	No history of Induced Abortion (*n*=437)	History of Induced Abortion (*n*=119)	*p*-value
Mean age at first sexual intercourse	19.6 (3.0)	19.6 ± 2.8	19.5 ± 3.6	0.59
Mean number of sexual partners (past 12 months)	2.8 (6.5)	2.1 ± 4.4	5.4 ± 11.1	<0.001
Had sexual intercourse with non-commercial partners (past 3 months)	205 (37.0)	152 (35.0)	53 (44.5)	0.04
Always used condom with non-commercial partners (past 3 months)	64 (31.4)	52 (34.4)	12 (22.6)	0.04
Had sexual intercourse with commercial partners (past 3 months)	124 (22.5)	89 (20.6)	35 (29.7)	0.04
Mean number of commercial partners (past 3 months)	1.1 (1.7)	0.9 ± 1.5	1.5 ± 2.1	0.08
Always used condom with commercial partners (past 3 months)	100 (78.7)	73 (78.5)	27 (79.4)	0.91
Having clients who requested not to use condom (past 3 months)	21 (16.7)	11 (12.2)	10 (27.8)	0.03
Able to find condom when needed it (past 3 months)	426 (76.8)	321 (73.6)	104 (88.1)	0.002
Currently using a contraceptive method	252 (45.6)	186 (42.9)	66 (55.5)	0.04
Type of contraceptive method being used				0.41
Pills	64 (25.6)	46 (24.5)	18 (27.7)	
Condom	106 (42.4)	82 (44.3)	24 (36.9)	
Injection	22 (8.8)	17 (9.2)	5 (7.7)	
Other (IUD, implant, natural ways)	59 (23.2)	40 (21.6)	18 (27.7)	
Having been pregnant in lifetime	402 (72.3)	283 (64.8)	119 (100.0)	

Mean age at first pregnancy (*n*=402)	21.3 ± 3.3	21.2±3.2	21.3±3.5	0.64
Having been pregnant during the time working as a FEW (*n*=402)	136 (33.8)	19 (6.7)	117 (98.3	<0.001

Abbreviations: FEWs, entertainment workers; IUD, intra-uterine devices.
Values are number (%) for categorical variables and mean ± SD for continuous variables.
**Chi-square test or Fisher's exact test was used as appropriate for categorical variables, and T-test was used for continuous variables.*

Table 3 Factors associated with history of induced abortion in multivariate logistic regression model (*n*=556)

Variables in the model	AOR (95% CI)	*p*-value
Working at karaoke bar		0.02
No	Reference	
Yes	1.75 (1.10-2.78)	
Duration working as a FEW	1.42 (1.06 – 1.43)	<0.001
More number of sexual partners in past 12 months	1.86 (1.02-1.54)	0.002
Currently using contraceptive method		0.04
No	Reference	
Yes	1.52 (1.01-2.29)	
Able to find condom when needed		0.03
No	Reference	
Yes	2.03 (1.08-3.82)	
Condom use with non-commercial partners in the past 3 months		
Always	Reference	
Not always	1.62 (1.06-3.44)	0.04

Abbreviations: FEW, entertainment worker; AOR, adjusted odds ratio; CI, confidence interval.