The European Journal of Contraception and Reproductive Health Care, 2014; Early Online: 1–11

High rates of abortion and low levels of contraceptive use among adolescent female sex workers in Kunming, China: A cross-sectional analysis

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ABSTRACT

Objectives In China, considerable stigma surrounds sexual activity, contraception use and abortion among young unmarried women, and sex work remains illegal. This study examines characteristics of adolescent female sex workers (FSWs) associated with contraceptive use and abortion in Kunming, China.

Methods This cross-sectional study was conducted between July 2010 and February 2011. Adolescent FSWs were recruited using snowball and convenience sampling. We present descriptive statistics, comparative analyses of socio-demographic and reproductive characteristics of respondents who had or had not used modern contraceptives, and assessed factors associated with prior abortion using simple odds ratios (ORs) and multivariate logistic regression adjustments.

Results Twenty-seven percent of adolescent FSWs had never used any modern contraceptive. Condoms (69%) and oral contraceptives (38%) were most commonly reported, and less than 3% had ever relied on an intrauterine device. We found low rates of dual protection (34%). About half of the respondents reported one or more lifetime abortions. Inconsistent condom use, frequent alcohol use and longer-term cohabitation were associated with prior abortion.

Conclusions Low consistent utilisation of modern contraceptives and of dual protection, and high rates of abortion, highlight the urgent need for early contact and continuous provision of comprehensive reproductive health services for adolescent FSWs.

KEYWORDS Adolescent; Female sex workers; Family planning; Unintended pregnancy; Abortion; Reproductive health; Sexual behaviour; China

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DOI: 10.3109/13625187.2014.927421

INTRODUCTION

China's young people are growing up in a rapidly changing society. Increasing access to media, urbanisation and globalisation are contributing to changing sexual attitudes and behaviours, with more young people engaging in premarital sex[1–4]. However, policy responses are lagging behind: access to comprehensive sex education remains limited and governmental subsidised family planning (FP) services are generally only accessible to married couples[2,3,5,6]. Additionally, traditional socio-cultural taboos regarding premarital sex and pregnancy, judgemental attitudes of health service providers, and a lack of privacy at health facilities contribute to low uptake of sexual and reproductive health (SRH) services and high levels of unmet needs among young unmarried people[2,6].

A 2010 nationally representative survey of 10,966 unmarried Chinese women aged 15 to 24 years reported that 19% were sexually active, but only 4% had adequate knowledge about SRH, with the lowest levels of knowledge recorded among girls aged 15 to 19 years. Overall, 17% of sexually-active young women aged 15 to 19 years had experienced a premarital pregnancy, 91% of which ended in an abortion. Of young women who had ever had an abortion, 19% reported multiple abortions[4].

Abortion has been legal in China since the early 1950s. An estimated ten million induced abortions occur in registered health facilities annually. About two-thirds result from contraceptive failure and one-third from non-use of contraception[3,5,7]. The 10-million figure excludes self-induced abortion by means of oral mifepristone and/or misoprostol. Women under the age of 18 constitute about 25% of all women having abortions at regulated facilities.

Safe abortion services are available through government-funded public hospitals and FP clinics. In addition to regulated public services, a large commercial sector provides abortion services in China. These are generally operated by self-employed, private medical practitioners resulting in considerable variation in the safety and quality of services. Previous studies indicate that adolescents are more likely to seek abortion services from these unregulated commercial providers due to concerns about judgemental attitudes of public sector health workers, fear of disclosure, inconvenience, and lack of health insurance associated with public hospitals[6,9]. The 2010 national survey[4] indicated that unmarried females aged 15 to 19 years were significantly more likely than those aged 20 to 24 years to seek abortion services in commercial health facilities rather than government-recommended public health facilities (49% vs. 34%, $p = 0.021$). Consequently, adolescents are more likely to encounter unskilled providers, to submit to unsafe methods, and to delay seeking care for abortion-related complications[10–12]. As a result, poor health outcomes associated with early pregnancy and unsafe abortion are being increasingly reported among unmarried young women[13,14].

Reproductive health problems confronting adolescent female sex workers

In China, sex work is illegal and highly stigmatised, which further augments adolescent female sex workers' (FSWs) vulnerability and reduces access to government-provided contraceptive and reproductive health services[4,15,16].

Research and programmatic attention to FSWs in China have primarily focused on vulnerability to sexually transmitted infections (STIs), including HIV. Available data clearly show FSWs' low use of contraception, high unmet need, and high rates of unintended pregnancy and abortion[17,18]. To date, few studies have specifically addressed the SRH needs and outcomes among adolescent FSWs, with limited data describing contraceptive use and access to services that could inform policy and programmes[15,16].

In response to these research gaps, the main objectives of this paper are to describe contraceptive use and to assess the factors associated with ever use of modern contraception and prior abortion among adolescent FSWs in Kunming, China.

METHODS

Study setting

Yunnan Province, in the southwest of China, is a multi-ethnic area home to 26 different ethnic groups and with a total population of 45.7 million (2009). Kunming, which is the largest economic centre and the capital city of Yunnan province, has an estimated population of 7.2 million (2012). Around 3.3 million live in the four urban areas, with rural-urban migrants accounting for 58% of the total urban population.

Despite sex work being illegal, the sex industry has flourished in the past two decades, fostered by rapid urban development and a thriving tourism industry[19]. Underlying driving forces include changes in sexual attitudes and behaviours, migration of youths from rural areas, and a large population of men of reproductive age relative to females[19,20]. Numerous entertainment establishments (e.g., karaoke, night club, dancing hall, disco, bar) or personal service sectors (e.g., hair washing room, hair salon, massage parlour, sauna, restaurant, hotel) are involved in providing sex services[19]. It is estimated that about 10,200 FSWs are active in Kunming (approximately 0.33% of Kunming's female population), with about 7900 (77%) concentrated in urban areas[21]. While few adolescent workers or FSWs are reported by owners or managers of entertainment venues for fear of arrest or harassment by authorities, an emerging population of adolescent FSWs has been noted. Based on data from local services, including HIV and STI prevention, estimates of the proportion of FSWs who are under age 20 range from 15 to 25%.

Study design, participants and sampling procedures

This cross-sectional study was conducted between July 2010 and February 2011. The study design and methods are detailed elsewhere[22]. In brief, a two-stage sample with mapping of sex work venues (116 locations identified in four urban areas) and size estimation made by a preliminary count at each predicting 493 adolescents (aged 15 to 19 years) currently working as sex workers (selling sex for money or goods). Stratified random sampling was planned; however, a nationwide police crackdown on the sex industry during the study period meant that this was no longer possible. Therefore, second stage snowball- and convenience sampling were used to recruit adolescent FSWs from their living quarters and/or guesthouses or workplaces in all four urban areas within Kunming city. Women consenting to participate were administered a semi-structured questionnaire by trained peer educators and outreach workers of local peer-support organisations who had located the respondents. The required sample size of 226 was determined by using the statistical power analysis programme G*Power 3[23] for logistic regression analysis (odds ratio [OR] = 2.0, $\alpha = 0.05$, power = 0.95).

Following the interview, a gynaecological examination and biological sampling to identify HIV/STIs were done among consenting participants at the Kunming Centre for Disease Prevention and Control (CDC).

The study protocol was reviewed and approved by the ethical committee of the Kunming Public Health Bureau. A total reimbursement fee of RMB 50 (about US$ 8) was given to the participants to compensate for their time, expenses and inconvenience.

Measures

The questionnaire collected information on socio-demographic characteristics, sexual and drug use practices, HIV prevention knowledge, self-reported history of symptoms of STIs, contraceptive practices, lifetime abortion, and health service utilisation.

The term 'workplace' describes places where sex workers solicit. Participants were classified as 'higher-class' or 'lower-class' depending on how much they charged for sex, working conditions, and type of clients. Lower-class workplaces included street walking, bars, small road-side guesthouses/hotels with manager or pimp, foot massage parlours, small sauna/bath rooms, barbershops, karaoke clubs, dancing halls, self-employed (women who solicit through the internet, mobile phone) or through a pimp, while higher-class workplaces included VIP clubs, big night clubs and karaoke clubs, and fancy hotels[24–28]

Sexual partners were categorised as 'non-paying', including boyfriends, fiancés and husbands, or as 'paying', referring to regular or casual partners who had exchanged money or goods for sex. Adolescent FSWs were considered to be 'sexually active' if they reported sexual intercourse in the past week, regardless of whether this was with a paying or non-paying partner. Evidence of a STI was defined as at least one episode of gonorrhoea (caused by *Neisseria gonorrhoeae*, NG), *Chlamydia trachomatis* (CT) infection, syphilis, condylomata acuminata (genital warts), genital herpes (caused by HSV-2) based on clinical diagnosis or laboratory screening, depending on the STI.

Two outcome variables were constructed to assess adolescent FSWs' exposure to risk of unintended pregnancy: (i) 'ever use of modern contraceptives' was defined as self-reported current or previous use of any modern method of contraception including female sterilisation (tubal occlusion), male condom, intrauterine

device (IUD), injectables, implants, oral contraceptives (OCs) and the levonorgestrel-only emergency contraceptive pill (LNG-ECP), regardless of whether it was used alone or in combination with other methods; (ii) 'prior abortion' was defined as self-reported lifetime medically- or surgically-induced abortion, but excluded spontaneous abortion (miscarriage). To evaluate the medical safety of pathways that participating adolescent FSWs followed in case of unintended pregnancy, we asked them whether the service accessed for the participants' first abortion was public or commercial.

Statistical analysis

For statistical tests we resorted to the Stata version 10.0 (StataCorp, College Station, Texas, USA). Descriptive analysis was employed to characterise the participants. By means of the Wilcoxon rank sum test and t test we assessed associations between socio-demographic variables and the use of modern contraceptives. Logistic regression analysis was applied to determine the socio-demographic and behavioural characteristics most strongly associated with induced abortion.

Correlation of the dependent variable (prior abortion) with hypothesised factors was expressed as odds ratios (ORs) and assessed by binary logistic regression. Factors significant at the $p < 0.1$ level in the bivariate analysis were selected for inclusion in the initial multivariate logistic regression model. Stepwise forward logistic regression then removed variables that did not markedly alter the regression model's fit. Variables were considered significant with $p < 0.05$. To adjust for clustering due to the sampling procedures, the Stata survey option (svy) was used with 39 chains as primary sampling units. Survey-adjusted odds ratios are presented for the initial bivariate model and the final multivariate model, respectively.

RESULTS

A total of 295 eligible adolescent FSWs were approached throughout all four urban areas of Kunming, of whom 231 (78%) from 39 different networks consented to participate. Of these consenting subjects, 201 (87%) completed the interview and submitted to the STI and HIV testing procedures; the overall non-response rate was 32%. The median age was 18 years (interquartile range [IQR]: 18–19) (Table 1). Nearly all respondents were unmarried (99%) as the legal age of marriage for women is 20 years in China. Approximately one-third of these adolescents were illiterate or had completed only primary level schooling (Table 1). Sex work was the main source of income for 91% of the respondents.

Contraceptive practices

Of the 201 respondents, 160 (80%) reported that they had ever used a FP method, alone or in combination with one or more other methods. Thirteen (6%) of these had relied on traditional methods (i.e., douching, herbal mixtures, withdrawal or rhythm). Condoms (139/201; 69%) and OCs (76/201; 38%) were the most commonly reported modern methods of contraception, whereas IUDs (5/201; 2%) and LNG-ECPs (10/201; 5%) had been infrequently employed (Table 2). No adolescent FSW had undergone sterilisation or used an injectable, an implant, a diaphragm or a spermicide. Of women who had ever used condoms, 44% (61/139) relied solely on this barrier method with 16 (26%) of these 61 women reporting consistent utilisation of condoms with sexual partners in the past month. When asked about reasons for no condom use at last paid sex, 79% (38/48) of women responded that they were already resorting to another method of contraception. Two-thirds (66%) of the girls reported they never used dual protection (condom plus another modern method).

Approximately a quarter (54/201) of adolescent FSWs had never used any modern method of contraception (Table 1). Those who had ever employed modern contraceptives were more likely to be older (median age 19 vs 18 years, $p = 0.006$), to have been involved in sex work for a longer time, ($p = 0.044$), to be married or cohabiting ($p = 0.004$), or to have had more than five non-paying partners in the past three months ($p = 0.009$) (Table1).

No statistically significant differences in the type of contraception used were identified by monthly income, number of clients, duration of cohabitation with the current/latest non-paying partner, evidence of any STI, repeat abortion or age at first abortion (Table 1).

Abortion

Half of the adolescent FSWs (51%) stated they had had an induced abortion, with 42 (41%) reporting repeat abortions. Women who had had an abortion

Table 1 Socio-demographic and reproductive characteristics of adolescent female sex workers, stratified by ever use of any modern contraceptives.

Characteristics	*All women (N = 201)*	*Ever used modern contraceptives (n = 147)*	*Never used modern contraceptives (n = 54)*	*p-value*[a]
Socio-demographic variables				
Age, median yrs (IQR)	18 (18–19)	19 (18–19)	18 (17–19)	0.006[b]
Current marital status				
Never married or single, *n* (%)	144 (72)	98 (67)	46 (85)	
Married or cohabiting, *n* (%)	57 (28)	49 (33)	8 (15)	0.004
Duration of involvement in sex work				
≤6 months, *n* (%)	107 (53)	73 (50)	34 (63)	
7–12 months, *n* (%)	67 (33)	51 (34)	16 (30)	
>12 months, *n* (%)	27 (13)	23 (16)	4 (7)	0.044
Monthly income in past 6 months (in USD)				
<US$ 150, *n* (%)	18 (9)	14 (10)	4 (8)	
US$ 150–500, *n* (%)	114 (57)	75 (51)	39 (72)	
>US$ 500, *n* (%)	69 (34)	58 (39)	11 (20)	0.06
Reproductive variables				
No. of clients (past week), median (IQR)	2 (1–3)	2 (1–3)	2 (1–3.5)	0.76[b]
No. of non-paying partners (past 3 months)				
<2, *n* (%)	33 (17)	21 (14)	12 (22)	
2–4, *n* (%)	75 (37)	49 (33)	26 (48)	
≥5, *n* (%)	93 (46)	77 (53)	16 (30)	0.009
Cohabiting duration with current or latest non-paying partners[#]				
≤6 months, *n* (%)	111 (55)	82 (56)	29 (55)	
7–12 months, *n* (%)	43 (22)	28 (19)	15 (28)	
>12 months, n (%)	46 (23)	37 (25)	9 (17)	0.57
Evidence of any STI (based on clinical or laboratory screening)*, *n* (%)	61 (30)	45 (31)	16 (30)	0.89
Prior abortion, *n* (%)	102 (51)	89 (61)	13 (24)	<0.001
Repeat abortion, *n* (%)	42 (41)	36 (40)	6 (46)	0.71
Age at first abortion, median yrs (IQR)	17 (16–18)	17 (16–18)	17 (16–18)	0.82[b]

STI, sexually transmitted infection; IQR, interquartile range.
[a]*p*-value compares ever use of modern contraception versus no modern contraception with Student's t test, unless otherwise indicated; [b]Wilcoxon rank sum test.
[#]One response is missing in the group that never used modern contraceptives.
*Participant had at least one episode of gonorrhoea, Chlamydia infection, syphilis, condylomata acuminata or genital herpes based on clinical diagnosis or laboratory screening, depending on the STI.

were more likely to mention ever use of modern contraception (61% vs. 24%, $p < 0.001$; Table 1). In binary logistic regression model (Table 3), those who had one or more STIs during study screening (OR = 0.47; $p = 0.027$) were less likely to have declared a prior abortion. Respondents who reported frequent alcohol use, having been involved for a longer duration in sex work, or having a stable non-paying partner (cohabiting for more than 12 months) had significantly increased odds of prior abortion (Table 3).

After adjusting for confounding in the final multivariate logistic regression model, inconsistent use of condoms, frequent consumption of alcohol or a stable relationship with a non-paying partner were associated with a prior abortion (Table 3).

Access to reproductive health services

Ninety-nine of the 101 adolescent FSWs who had ever had an abortion provided details concerning their

Table 2 Contraceptive methods used by adolescent female sex workers ($N = 201$).

*Contraceptive methods**	*Women n (%)*
Intrauterine device	5 (2)
Oral contraceptive	76 (38)
Condom (any use)	139 (69)
Emergency contraceptive pill	10 (5)
Traditional methods (douching/withdrawal/ rhythm)	13 (6)
Dual protection (condom plus one other modern method)	68 (34)
No method	41 (20)

*Multiple-response question.

care. Only 39% had sought care for their first abortion at a public hospital or government-funded clinic. Six of the 99 women who provided details, self-administered a medical abortion, for which the mifepristone and misoprostol they utilised were obtained through commercial channels without a prescription or backup surgical services (Table 4).

In addition to low utilisation of government-provided abortion services, 51% of adolescent FSWs reported a need for affordable and accessible FP services, and 87% stated that more reproductive/or obstetric health services were required. In contrast, three-quarters of the respondents (77%) mentioned having received free condoms from health workers through HIV/STIs prevention programmes in the past year (Table 4).

DISCUSSION

Findings and interpretation

No adolescent FSWs in our study reported having ever used injectables or implants, and only 2% reported the use of an IUD. This is consistent with previous studies which demonstrated low uptake of IUD and implants (0–3%) among unmarried women in China due to low-awareness of long-acting reversible contraceptive methods (LARCs), poor access to skilled providers, costs, and concerns about side effects[29–33]; this phenomenon may also reflect the strong sociocultural pressures in China to preserve fertility among young women who have yet to have a child.

Programmes to increase awareness which address misconceptions and improve access to LARCs need to be incorporated into future interventions aiming to reduce the high abortion rate of young FSWs and to expand their access to comprehensive SRH and FP services.

Our study shows, as was expected, that the risks of pregnancy and of abortion are time-dependent in this population: the longer the involvement in sex work or the cohabitation with non-paying partners, the greater the risks of pregnancy and abortion. Early contact and continuous provision of FP information and services to FSWs are needed.

Despite criminalisation of sex work, the increasing prevalence of HIV and STIs among female sex workers has become a focus of China's public health strategy[34]. Free HIV counselling and testing services, and condom promotion have been provided to FSWs through local CDC and peer-led organisations nationwide. The Ministry of Health's *2012 China Country Progress Report* showed that 81% of FSWs had been covered by some form of intervention service, up from 74% in 2009. Similarly, as reported previously, our study shows a high level of coverage of services for HIV/STIs among this FSW sample.[22] However, consistent use of condoms was low, and few practised dual protection despite being at risk of both HIV/STIs and unwanted pregnancy. This finding has two implications: the first is the need to address the barriers to consistent condom use among adolescent FSWs; secondly, the high coverage of HIV/STI programmes may represent an important entry point to reach this vulnerable population with broader SRH interventions (including prevention of unwanted pregnancy) through integrated projects.

Strengths and weaknesses of the study

To our knowledge, this is the first study to examine contraceptive practices, and lifetime abortion among adolescent FSWs in China. The sensitive nature of the topic and the hidden and mobile nature of this population in China presented the study with considerable challenges. There were significant limitations due to ongoing police crackdowns, which prevented random sampling. The snowball and convenience sampling strategy used does not allow generalisation of our findings to the entire Kunming population of adolescent FSWs. Moreover, the study relied on self-reported sexual behaviours, practices related to sex work, con-

Table 3 Demographic and reproductive characteristics associated with prior abortion among adolescent female sex workers ($N = 201$).

		Prior abortion			
Variables	*n/N (%)*	*Crude OR (95% CI)*	*p-value*	*Adjusted OR* (95% CI)*	*p-value*
Age					
19 years	52/97 (54)	1.0			
18 years	34/67 (51)	0.89 (0.48–1.67)	0.71		
≤17 years	16/37 (43)	0.66 (0.25–1.73)	0.38		
Workplace characteristics[†,‡]					
Higher-class[§]	60/105 (57)	1.0		1.0	
Lower-class[#]	42/96 (44)	0.58 (0.33–1.03)	0.061	1.04 (0.44–2.43)	0.93
Duration of involvement in sex work*					
≤6 months	45/107 (42)	1.0			
7–12 months	38/67 (57)	1.81 (1.03–3.17)	0.040		
>12 months	19/27 (70)	3.27 (1.29–8.31)	0.014		
Current marital status					
Never married or single	70/144 (49)	1.0			
Married or cohabiting	32/57 (56)	1.35 (0.58–3.19)	0.48		
Number of non-paying partners (past 3 months)					
<2	15/33 (46)	1.0			
2–4	31/75 (41)	0.85 (0.34–2.08)	0.70		
≥5	56/93 (60)	1.82 (0.66–5.03)	0.24		
Cohabiting duration with current or latest non-paying partners[^,†,‡]					
≤6 month	44/111 (40)	1.0		1.0	
7–12 months	26/43 (61)	2.33 (0.88–6.20)	0.088	4.72 (1.46–15.28)	0.011
>12 months	32/46 (70)	3.48 (1.64–7.40)	0.002	5.56 (1.84–16.82)	0.003
Alcohol use (past 6 months)[†,‡]					
Abstainer or casual drinker	43/98 (44)	1.0		1.0	
Drinks daily or frequently	59/103 (57)	1.72 (1.07–2.75)	0.026	2.27 (1.07–4.83)	0.034
Evidence of any STI (based on clinical or laboratory screening)[@,†,‡]					
No	79/140 (56)	1.0		1.0	
Yes	23/61 (38)	0.47 (0.24–0.92)	0.027	0.47 (0.20–1.07)	0.071
Inconsistent condom use with any sexual partners[†,‡]					
No	19/45 (42)	1.0		1.0	
Yes	57/94 (61)	2.11 (0.99–4.50)	0.054	2.39 (1.11–5.14)	0.027

OR, odds ratio; CI, confidence interval; STI, sexually transmitted infection.

*Adjusted odds ratio in the final model.

[†]Variables included in the base multivariate model.

[‡]Variables included in the final multivariate model.

[§]VIP clubs, night clubs, big night clubs and karaoke clubs, and fancy hotels.

[#]Street walking, small road-side guesthouses with manager or pimp, foot massage parlours, sauna/bath rooms, barbershops, inns/hotels, karaoke clubs, dancing halls.

[^]One response is missing.

[@]Participant had at least one episode of gonorrhoea, Chlamydia infection, syphilis, condylomata acuminata or genital herpes, based on clinical diagnosis or laboratory screening, depending on the STI.

traceptive use and history of abortion, which may have introduced a social desirability bias, particularly given the highly sensitive and stigmatising nature of these behaviours. While we have identified some important factors associated with contraceptive use and abortion, the cross-sectional study design does not allow the determination of causality. Our study found a positive correlation between ever use of modern contraception and the prevalence of prior abortion, a correlation confounded by duration of sex work and of cohabitation with a partner. We did not collect data regarding the timing and duration of modern contraceptive use, nor on the timing of abortion, which makes interpretation of this finding difficult.

Differences from results of other studies

In comparison with national data, our findings suggest that the prevalence of lifetime abortion among adolescent FSWs is much higher than for all sexually active adolescent Chinese women (51% vs. 16%), as is repeat abortion (20% vs. 5%)[4]. Other studies in Asia have also found a high prevalence of lifetime abortion among adult FSWs in the context of low contraceptive use (other than condoms). Cross-sectional surveys in Cambodia showed that only 3% of FSWs currently used hormonal contraception, and 28% had had an abortion in the past year. A cross-sectional study of FSWs in Goa, India brought to light that 39% did not use contraception, and 26% had experienced abortion[17].

Previous studies have revealed a high rate of contraceptive failure among nulliparous Chinese women, contributing to high rates of induced abortion[3,5,8]. A significant proportion of our study participants reported inconsistent use of condoms, so that inconsistent or incorrect use of modern methods, or use of less effective traditional methods, may have contributed to the high prevalence of lifetime abortion.

In low- and middle-income countries, complications of pregnancy and childbirth are the leading cause of death in young women aged 15 to 19 years[35]. An estimated 9% of unsafe abortions occur among adolescents in Asia[36]. More than half of adolescent FSWs who had an abortion (61%) in our study had their first abortion at a commercial health setting; this was higher than rates reported by sexually active Chinese women of the same age (49%)[4]. Some (6%) abortions occurred through self-administration of oral mifepristone-misoprostol, putting these adolescents at risk of adverse health outcomes. Stigma associated with premarital pregnancy, lack of adequate information, high service costs, negative attitudes of service providers, fear of disclosure of sexual activity and the illegal status of sex work are all likely to deter adolescent FSWs from seeking abortion care from qualified providers in the public sector[29,37].

Relevance of the findings: Implications for clinicians and policymakers

Previous studies have demonstrated an increase in contraceptive use and a reduction in the incidence of unintended pregnancies and repeat abortions where FP services have been integrated within public health interventions (including prenatal and gynaecological services) in China[38]. The World Health Organisation's

Table 4 Access to reproductive health services among adolescent female sex workers ($N = 201$).

	n/N	*%*
*Free condoms accessed**		
Received free condoms from health workers of HIV/STI programmes (past year)	155/201	77
Healthcare services accessed for first abortion ($N = 99$)#		
At public general hospital	15/99	15
At public hospital for maternal and child health	23/99	23
At public family planning clinic	1/99	1
At private hospital	13/99	13
At private or unofficial small clinic	41/99	41
None, self-administered use oral mifepristone-misoprostol	6/99	6

*Multiple-response question.

#A total of 102 adolescent FSWs had had an induced abortion, but only 99 of them reported the circumstances.

Global reproductive health strategy emphasises the importance of political, legal and regulatory environments that support and facilitate universal and equitable access to SRH services for adolescents. Removing the restriction on unmarried young people's access to government subsidised FP services in China is a key priority to improve the sexual and reproductive health (SRH) of adolescents, including those engaged in sex work. In addition, greater attention is required to the provision of adolescent-friendly SRH services, particularly for those most marginalised, which includes addressing the skills and attitudes of health providers. The criminalisation of sex work remains a significant barrier to improving the SRH of adolescent FSWs. However, outreach programmes targeting HIV and STIs have achieved high coverage despite this difficult context. Such programmes present an important opportunity to access this hard-to-reach population with more comprehensive SRH information and services, including contraception, through more integrated approaches. In particular, the increasing risk of pregnancy and abortion in relation to duration of sex work and cohabiting with a non-paying partner reinforces the need for the earlier provision of comprehensive SRH services which will target this population.

The very low use of LARCs (3% for IUDs and 0% for implants) among our participants must be addressed in health programmes. As the most effective and reliable reversible methods, LARCs should be promoted for adolescents at high risk of unintended pregnancy, such as those engaged in sex work. Integrating contraceptive counselling and services into HIV/STI prevention, maternal health and gynaecological settings is an important strategy to make these methods more accessible to sexually active adolescents. Improving the counselling skills of health providers is also key to increasing acceptance and uptake of LARCs among this group.

Unanswered questions and future research

Future research is warranted to better understand the contraceptive practices and experiences of unintended pregnancy among adolescent FSWs, also taking into account the temporality of events. In particular, information about FP knowledge, attitudes, reasons for non-use and discontinuation, and barriers that limit access to FP information and services would guide efforts to improve awareness and uptake of modern methods of contraception among this vulnerable population. A better understanding is also needed on how to increase uptake of dual protection methods, and how adolescent sex workers can be more empowered to negotiate consistent condom use in this setting.

CONCLUSIONS

The high prevalence of abortion and repeat abortion among adolescent FSWs in Kunming highlights the need to greatly improve their access to comprehensive contraceptive services and supplies.

Adolescent FSWs have poor access to, and utilisation of, low-cost public health facilities, and a high need for affordable and accessible reproductive services. The current practice of making subsidised FP and SRH services accessible only to married couples in China is a particular barrier. Given their stigmatised legal status, adolescent FSWs face considerable hurdles, even where services are available, and so require targeted interventions to meet their needs and rights to SRH.

ACKNOWLEDGEMENTS

We are indebted to Marlise L. Richter for her linguistic revision of an early draft of this article. The authors are deeply grateful for the valuable comments provided by the editors and peer reviewers of the *European Journal of Contraception and Reproductive Health Care*.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and the writing of the paper, which does not necessarily represent the official views of its financial sponsors.

This study received partial financial support from the *Accelerating AIDS Action in China Project* funded by the Bill and Melinda Gates Foundation (funding number: 2010YNworkplan-8) and the *HIV Research Trust Scholarships* (funding number: HIVRT11-06) award to Xu-Dong Zhang. The authors wish to thank the STI laboratory in Kunming CDC for partially funding the cost of the STI testing. The authors gratefully acknowledge the contribution to this work of the Victorian Operational Infrastructure Support Program received by the Burnet Institute.

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