

# KNOWLEDGE, USE AND ASSOCIATED FACTORS RELATING TO MODERN CONTRACEPTIVE METHODS AMONG FEMALE SEX WORKERS IN DHAKA, BANGLADESH

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## ABSTRACT:

**Background:** Female sex workers (FSWs) are an isolated population of the world who have unmet needs of contraceptive services. This study assessed knowledge on and use of modern contraceptive methods among FSWs.

**Methods:** A survey (n=731) and 14 qualitative in-depth interviews with 15-49 year old FSWs were implemented in 2015 in Dhaka, Bangladesh. Descriptive statistics and multivariate logistic regression analyses were applied to assess knowledge on use of contraceptives including associated factors. Qualitative data was managed using content analysis where in-depth perceptions regarding contraceptive methods were illustrated.

**Results:** About 73% of FSWs had good knowledge of names and physical sources of contraceptives. The qualitative data added various concerns about contraceptives which included having problems of irregular menstruation, vertigo, becoming weak or fat, displacement of the intra-uterine contraceptive device in the vagina. According to survey results, the majority of FSWs used condoms (71%) but use of oral contraceptive pills (20.9%), Injectable (16.2%), Intra Uterine Device (IUD) (1.5%), implant (4.7%) and female sterilization (4.5%) was very poor. Dual protection (condom plus any other method) was only reported in 22% of the women studied. Being divorced/separated/widowed/husband lived out of country [OR with 95% CI: 2.34 (1.2-4.5)] and performing sex acts in multiple settings [OR with 95% CI: 3.95 (1.7-9.4)] were significantly associated with use of any modern methods of contraception.

**Conclusions:** The use rate of contraception except condom is evidence of poor accessibility of services. We recommend integrating or making linkage to contraceptive services with existing HIV prevention services targeting FSWs in Bangladesh.

**Keywords:** Knowledge and use; modern contraceptives; female sex workers; Dhaka

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## INTRODUCTION

Contraceptive services played important roles on improving different millennium development goals (MDGs) [1, 2]. According to World Health

Organization (WHO), around 222 million women of

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developing world do not use contraception in spite of their intention to postpone or not being pregnant [3]. Millions of women face problems in accessing contraceptive services [4]. The global family planning (FP) 2020 initiative'2012 set a goal "*120 by 20, or reaching 120 million additional users of modern contraceptive methods by 2020 in the world's poorest countries*" [5]. The female sex workers (FSWs), an underserved and isolated population of the world have unmet needs of contraceptive services [6, 7]. Studies conducted in different parts of the world showed high prevalence of unwanted or unplanned pregnancies (37%-52%) [7-9] and abortions in past one year (17.1% to 60%) [10-12] among FSWs which can be prevented through implementing low cost contraceptive services. Bangladesh, a country with around 160 million populations is the home for an estimated 74300 FSWs [13]. Except condom use status, little is known about the other contraceptive related knowledge and practices of these FSWs in the country.

Health programmes for FSWs in Bangladesh are largely focused on STI/HIV prevention interventions. With the stewardship of the National AIDS/STD Programme (NASP), many Non-Governmental Organizations (NGOs) are implementing community based fixed Drop-in-centers (DICs) which distribute condoms and lubricants, one to one or group counselling and other behavior change activities, HIV testing, and management of sexually transmitted infections (STIs) [14, 15]. However, the need for contraceptive methods to prevent unwanted pregnancies among FSWs gets very limited attention and therefore remains a major public health issue.

According to David Hubacher and James Trussell [16] a modern contraceptive method is "*a product or medical procedure that interferes with reproduction from acts of sexual intercourse*". Different types of modern short term (e.g. pills, injectable, and condoms), long-acting (e.g. intrauterine contraceptive device (IUCD), implants,) and permanent contraceptive methods (e.g. female and male sterilization) are available in Bangladesh. Studies from other countries suggest that contraceptive use among FSWs is poor, 17% to 98% FSWs used no method of contraception [7, 10, 11, 17]. Several studies in Bangladesh reported condom use among FSWs [18-21] but there is only study that reported utilization of other modern contraceptive methods (e.g. pill, injectable) among hotel and street-based FSWs [22]. Moreover, FSWs' high

number of sex acts with multiple partners may require dual protection: (i) condom use for preventing sexually transmitted infection and (ii) any other method use to prevent unwanted pregnancies. Having a non-paying partner, regular alcohol use, poor knowledge on sexual and reproductive health, sex trade at outside of their city of residence, prohibited drug use were identified as associated factors of FSW's unmet need of contraceptives in several countries [7, 9, 23] but there is scarcity of information on association between using different types of contraceptive methods and socio-demographic or other factors. This study was carried out among Bangladeshi FSWs for loading the information gaps on knowledge and use of modern contraceptive methods, dual contraception practice and factors associated with use of different types of contraception.

## METHODS

### Study design, study population and sites

This cross-sectional study was implemented among FSWs in 2015. The street, hotel and/or residence based FSWs having reproductive age (e.g. 15-49 years old), residing in Dhaka city were considered as inclusion criteria. FSWs who were suffering from HIV/AIDs at the time of interview were excluded. A total of 25 DICs were being operated in Dhaka city by two consortiums (Bangladesh Women's Health Coalition and Durjoy Nari Songha) with the support of the Global Fund. Three of the 25 DIC sites were used for quantitative survey. One additional DIC was used for qualitative data collection.

### Data collection

Data were collected using two techniques, i) survey, and ii) qualitative in-depth interviews.

### Sample size and sampling for survey

As the proportion of FSWs using sexual and reproductive health services (SRH) was unknown, we considered 50% service utilization rate on SRH, with 5% margin of errors and 95% confidence interval. The minimum required sample size was calculated as 384. Considering a design effect of 1.5 and 20% non-availability and non-response rate, the proposed sample size was 720.

A stratified sampling methodology was used to collect data. The following three sizes (strata) of DICs were made: 1) small size serves less than 200 FSWs; 2) medium size serve 200-299 FSWs; and 3) large

size serve  $\geq 300$  FSWs. One DIC from each strata were randomly selected. All FSWs who met the inclusion criteria was invited to participate in a face to face interview on a first come first serve basis.

#### **Survey questionnaire and data collection**

A structured questionnaire addressing knowledge, availability and utilization related issues were administered. The study questionnaire was pretested with FSWs in the DIC which was not selected as our study site.

Face-to-face interviews with FSWs were conducted at their respective DICs. The outreach workers of DIC helped to identify the locations of the FSWs who were not available at DIC and thus, they were interviewed in parks, streets, residential settings. Privacy was maintained during interview by selecting an isolated space, maintaining low voice and making request to the approaching visitors to wait in keeping a distance. The study principal investigator made frequent field visits and gave feedback to data collectors to maintain the quality of data.

#### **Qualitative in-depth interviews**

A total of 14 in-depth interviews FSWs were conducted at DICs to supplement quantitative results on knowledge level of respondents including gathering in-depth perceptions on different types and sources of contraceptives methods. The participants were purposively chosen based on their sexual and reproductive related experiences (e.g. currently using or not using any methods, having an abortion or childbirth in last one year, suffered any sexually transmitted infections in last one year). A study investigator with sufficient knowledge and skills on qualitative methods facilitated the interviews in an office room of DIC using a guideline. The length of interviews was 30 minutes to one hour which were recorded using digital audio recorders.

#### **Survey data analysis**

Data were entered using SQL server 2008 and ASP.net and statistical software SPSS version 20 (SPSS Inc., Chicago, IL, USA) was used for data editing and analysis. Association between socio-demographic variables, contraceptive method use status and size of DIC were measured using Pearson's Chi-square and Fisher's Exact test.

#### **Knowledge score**

In the questionnaire, we used 7 correct

responses for the question of 'name of modern contraceptive methods' and 6 responses for the question on 'places of availability' which gave a maximum possible score of 13 by assigning '1' score for each correct response, Table 1 [24]. The using descriptive statistics. mean score with standard deviation was calculated

#### **Logistic regression analysis**

Univariate and multivariate logistic regression analysis was performed to estimate unadjusted and adjusted odds ratios [24, 25] of using any modern contraceptive methods, any short term methods (oral pill or condom, or injection), any long-acting or permanent methods (IUCD or implant or female sterilization) or dual contraceptive methods (condom plus any other modern method). Initially, a number of independent variables were considered in the regression model. The number of clients entertained per day was highly correlated with per day income of FSWs, therefore, we included 'number of client entertained per day' in the adjusted model. Type of sex workers (street-based/ hotel-based/ residence based) were excluded from the model as many FSWs engaged in sex work in more than one settings (e.g., street plus hotel-based or street plus residence based). We created dichotomous variables of using or not using any modern contraceptive method, any short term method, any long acting or long term method and dual methods which were considered as outcome variables.

#### **Qualitative data analysis**

The recorded interviews were transcribed in Bangali which were assigned at ATLAS.ti 5.2 data management software for coding. The coded data were interpreted into English based on two major themes, i) knowledge and perceptions about contraceptives and ii) sources of contraceptives. The quotations from the transcription were adopted to convey the respondents' exact thoughts regarding the issue.

#### **Ethical consideration**

The Ethics Review Committee for Research involving Human Research Subjects, Health Science Group, Chulalongkorn University, Thailand approved this study (Protocol No: 178.1/58). A verbal consent was collected from the FSWs before starting of an interview. Informed assent were obtained for the FSWs below 18 year ages.

**Table 1** Knowledge on name and places of availability of modern contraceptive methods (n=731)

Characteristics	Assigned score	%
<b>Knowledge on name of contraceptive methods* (sorting)</b>		
Oral pill	1	98.0
Condom	1	100.0
Injection	1	90.4
IUD	1	38.2
Implant	1	62.1
Female sterilization	1	34.7
Male sterilization	1	32.4
<b>Places of availability of contraceptive methods*</b>		
Community health workers	1	38.7
Drug shops	1	86.0
Public health facilities	1	38.4
Private for profit health facilities	1	20.5
Private NGO health facilities	1	57.2
DICs	1	56.5
Total given score	13	
Mean (SD)	7.53 ± 1.738	

\* Multiple response

**Table 2** Socio-demographic characteristics of participants by different size of DIC

Characteristics	Low size (n=195) %	Medium size (n=214) %	Large size (n=322) %	Total (n=731) %	p-value
<b>Age group (years)</b>					
15-24	19.5	35.0	32.0	29.5	p<0.001
25-34	44.1	37.4	50.3	44.9	
35+	36.4	27.6	17.7	25.6	
<b>Education</b>					
No education	63.6	56.1	26.7	45.1	p<0.001
Primary	29.7	36.0	43.2	37.5	
Secondary and above	6.7	7.9	30.1	17.4	
<b>Marital status</b>					
Married	53.3	71.5	65.5	64.0	p<0.001
Unmarried	5.1	3.3	9.6	6.6	
Divorced/separated/widowed/husband is out of country	41.5	25.2	24.8	29.4	
<b>Daily income (in BDT<sup>£</sup>)</b>					
≤600	66.2	57.9	36.6	50.8	p<0.001
>600	33.8	42.1	63.4	49.2	
<b>Single vs multiple settings based sex workers</b>					
Single	72.3	71.0	84.8	77.4	p<0.001
Multiple	27.7	29.0	15.2	22.6	
<b>Type of sex workers*</b>					
Street based	91.3	65.0	3.4	44.9	p<0.001
Hotel based	27.7	37.4	22.0	28.0	p=0.001
Residence based	21.5	31.3	91.0	55.0	p<0.001
<b>Number of clients entertained per day</b>					
1-3	28.7	38.3	41.3	37.1	p=.008
4-5	39.5	41.1	32.0	36.7	
>=6	31.8	20.6	26.7	26.3	
<b>Number of pregnancy in lifetime</b>					
0	8.2	6.5	12.1	9.4	p=.036
1-2	37.9	41.6	45.3	42.3	
3 or more	53.8	51.9	42.5	48.3	

\*Multiple response, <sup>£</sup>1 US\$ =79 BDT

## RESULTS

### i) Socio-demographic characteristics of survey respondents

A total of 731 FSWs of 3 different sized DICs interviewed; 195 were from low size, 214 from medium size and 322 from large size DICs. Table 2 presents the variations in distribution of different socio-demographic characteristics of FSWs by different size of DICs. Of the respondents 45% were 25 to 34 years old, 45% had no education and 64% were married. Around half of the respondents had a daily income of 600 BDT (7.6 US\$) or less per day. FSWs at most of the low (91%) and medium (65%) sized DICs were street-based while 91% of large sized DICFSWs were residence-based. Ninety-one percent of women were pregnant once in their life time.

### ii) Knowledge and perceptions about contraceptive methods

Both quantitative and qualitative measures were taken to understand knowledge and perceptions about different types and sources of contraceptive methods.

#### *Survey findings*

All FSWs knew the name of condom as a contraceptive method. Oral pill (98%) and injectable (90%) were known to almost all women. Nearly 61% women also knew about implant while about one-third mentioned IUD (38%), female (35%) and male sterilization (32%), respectively. The majority of women had knowledge that contraceptives are available at local shops (86%). Almost similar proportion of women knew that NGO health facilities and community based DICs are the places where contraceptives can be obtained. On an average, respondents got 7.53 scores on knowledge with a standard deviation of  $\pm 1.738$  (Table 1).

#### *Qualitative findings*

While quantitative findings measured the knowledge level of respondents simply using the spontaneous correct responses on different types and sources of contraceptive methods, qualitative data supplement this result with exploring more details perceptions around the topics.

- **Perceptions on different types of contraceptives**

Almost all in-depth interview participants (11 of 14) knew some name of contraceptives which included oral pills, injectables, condom, implant, IUCD, ligation. The women cited some name of pills as- 'Femicon', 'Maya bori', 'Shukhi Bori', 'Ovastate'. Most of them refer injectables as 'Sui',

condom as 'packet', IUD as 'kathi in vagina', implant as 'kathi in arm/hand'.

Participants have common knowledge that these contraceptives can prevent pregnancy. They also perceived that different types of contraceptives can keep them safe from having pregnancy for different duration, such as- injectables will prevent pregnancy for three months, implant for five years.

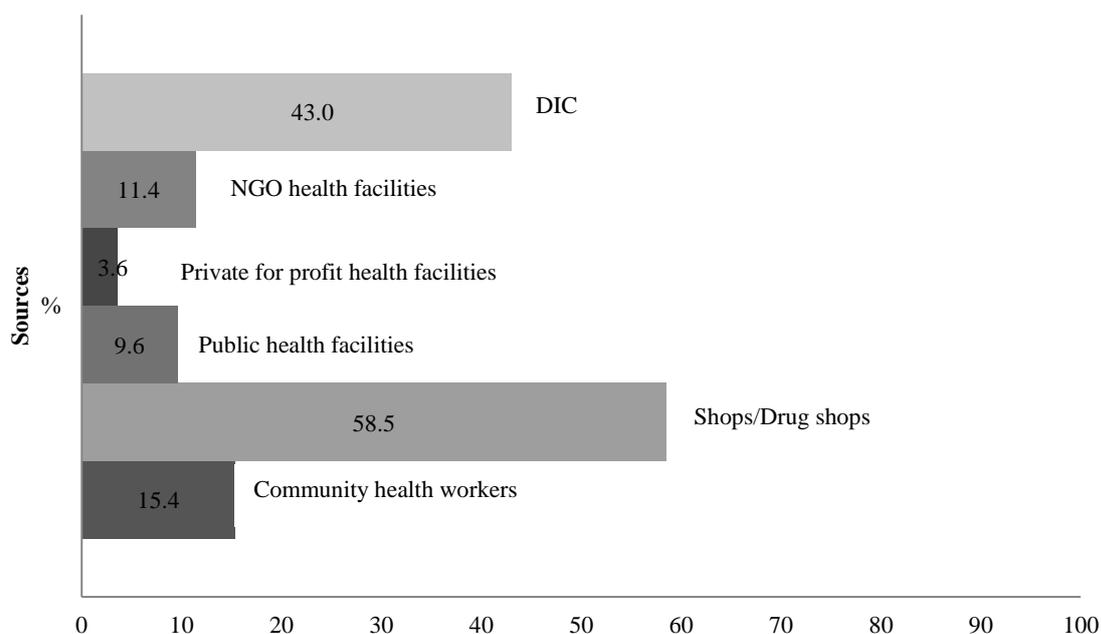
Respondents liked the condom most as it has a number of benefits to use, such as-it is not an oral medicine and no side-effect. A few also mentioned liking the injectables most as it is adjusted by their health. A few respondents (n=5) perceived that oral pill has only one benefit (e.g. prevent pregnancy) while condom has several benefits, such as- prevention of pregnancy, itching, ulcer in vagina, transmission of sexually transmitted infection from one to another. Some women mentioned that they take oral pill if they have husbands. One FSW whose husband was unaware of their wives' sex trade disclosed that their husbands do not like to use condom and they cannot tell them about possibility of having diseases which can transfer from her to him. FSWs also mentioned that they are not able to make understand all their clients to use condoms;

*"We tell them, I may have diseases or you may have diseases, if we use a condom, it will prevent disease transmission, then the clients agree to use condoms, but not all, some clients do not like to hear anything, as they are spending money, they do not like to use condom. If we forbade, they complain to pimps and pimp will not give me work again if I don't hear. In such cases, we don't use condom".*

Respondents (9 of 14) also disclosed different types of side effects they have to experience if they take contraceptives. Irregular or continuous menstruation is a common problem of almost all types of contraceptives which included oral pills, injectables, implant, IUCD. One respondent explained as,

*"I took injectables once for three months. My menstrual bleeding was not being stopped, it was continuously going. Then doctor advices me to take oral pill".*

They have common understanding that if these contraceptives are not adjusted by the body they have to suffer from different problems, such as- their



**Figure 1** The sources of contraceptives among respondents who were currently using any modern contraceptive methods (n=586)

health become ill, weak. On the other hand, those women are adjusted with contraceptives; they sometimes become overweighted/fat. Respondents perceived that if women cannot adjust with oral pills, they have vertigo, anorexia, become weak. They also added that women cannot work if there are health problems like vertigo. One respondent mentioned that she has to suffer from fever if she takes injectable. The disadvantage of implant was also identified. It got displace if high numbers of sexual contacts made. They also mentioned that it hurts when they do sexual intercourse.

One woman identified 'having oral pills every day' as a problem. According to her, some procedures should be maintained to have oral pill. For example, one should take one whole strip of pill throughout the month. If anyone make mistakes, they have to suffer from abdominal pain, irregular menstruations. Respondents also feel some restriction on using contraceptives from the provider side.

*"If women do not have at least one child, injectable or implant or IUD are not given by providers".*

- **Perceptions about sources of contraceptives**

Most FSWs (n=10) have general idea that pharmacy/drug stores, non-governmental organizations (NGOs), public health facilities are the places where

contraceptives are available. Most women illustrated that oral pill can be found at pharmacy while a few mentioned about NGO (eg. Marrie Stopes). Only one respondent mentioned about community health workers who distribute contraceptives at home level.

NGOs are main sources of injectables (eg. Marrie Stopes International, Bangladesh Association for Prevention of Septic Abortion (BAPSA)). Some women also mentioned about pharmacy. Moreover, pharmacy takes 50 BDT per injectable while NGO gives it free. Some mentioned about paying 10 BDT to make a card for getting injectables services from selected NGOs. A few respondents mentioned about Public hospitals where free injectables can be received.

Pharmacy, pimps, out-reach workers of DIC are main sources of condom. A few respondents identified NGO for getting implant services while some other named Marrie Stopes, public family planning health facilities, BAPSA are sources of IUCD. One FSW mentioned that women go to the public family planning health facilities for ligation.

### iii) Status and sources of current modern contraceptives use

#### *Current status of contraceptives use*

Approximately 88% of 665 FSWs were currently using any modern methods of contraceptives. Greater proportions (91%) of FSWs

were using short acting methods, condom (71%), oral pill (21%) and injection (16%). The reported use of long acting and permanent methods (LAPM) - Intra-uterine device (IUD) (1.5%), implant (4.7%) or female sterilization (4.5%) was very low (11%). Interestingly, the smaller the size of the DIC, the higher the reported condom use - low size (84.7%), medium size (71.7%), and large size (62.6%). The use of dual protection was only 22% (Data not shown).

#### **Sources of contraceptive services**

Local shops (58.5%) and community based DICs (43%) were the main places where FSWs received contraceptives services. A smaller proportion of women received these services from community health workers (15.4%), NGO health facilities (11.4%), public health facilities (9.6%) and private for profit health facilities (3.6%) (Figure 1).

#### **iv) Regression analysis**

Table 3 shows the unadjusted and adjusted odds ratios of using any short term, long acting or permanent methods and dual methods of contraception.

#### **Use of any modern methods**

Respondent's marital status, engaging in sex work in multiple settings (hotel, residence, street) remained significant in association with reporting use of a method after adjusting all variables. The FSWs having 'divorced/separated/widowed/husband was out of country' status were two times [OR with 95% CI: 2.34 (1.2-4.5)] more likely to use a modern contraceptive than married women. The FSWs using multiple settings for sex act were 3.9 times more likely to use a method compared to use of single setting (Model B).

#### **Use of any short term methods**

No significant association was observed between use of short term methods and different variables (Model C and Model D).

#### **Use of any long-acting or permanent methods**

The FSWs using multiple setting sex work showed a significant association on using long-acting or permanent methods with an adjusted odds 1.80 and 95% CI: 1.0-3.1 (Model F).

#### **Dual protection**

Individually, respondents' other marital status, use of multi-settings for sex act, having a pregnancy history in life time (Gravida) were significantly associated with dual protection of contraception (Model G). After adjusting all variables, 25 to 34 years age range, multiple setting based FSWs,

having pregnancy experience three or more times in lifetime were finally associated with dual protection. Compared to younger FSWs, 25 to 34 years age group [OR with 95% CI: 0.56 (0.3-0.9)] were 44% less likely to use dual protection. FSWs who had their sex work in multiple setting were 3.9 times more likely to use dual protection than single setting practice. The FSWs who had become pregnant at least 3 times in life showed significant odds [OR with 95% CI: 3.85 (1.3-11.2)] to report dual protection compared with those who reported no pregnancy in their life (Model H).

## **DISCUSSION**

This study shows that FSWs had good knowledge on names of short-term method (90%-100%) but fewer women could name long-acting (39%-61%) or permanent methods (31%). Except condom, the reported use of other contraceptives and dual protection of contraception was very low.

Overall, 73% respondents had good knowledge on contraceptive methods which differed from a study conducted in Spain that showed FSWs had lower knowledge on contraception (26). Some of our study findings corroborate with the findings from another study conducted in China among adolescent FSWs. The similarity part showed 100% participants could name of condom and lower knowledge on male or female sterilizations, IUD, implant. The dissimilarity part showed 98% vs 55% and 90% vs 12% between Bangladesh and China participants knew about oral pills and injectables respectively (23). The reasons for this difference are not known.

Although a good proportion of respondents (88%) reported using any modern methods, use of oral contraceptive pills, Injectables, IUD, implant and female sterilization was very poor (15% to 21%); similar to studies in Moscow, Russia and Colombia [17, 27] which indicated either insufficient availability of services or barriers in accessing services. About 16.9% FSWs participated in an Afgan study reported not liking the side-effects of contraception as a reason of not using a method (9). The qualitative participants of our study also explained different types of side-effects on using contraceptives which could be contributed behind low use of other methods.

The majority (71%) of FSWs in our study were using condom which is in the middle of the range of other study findings for Bangladesh (59%-93%) and many other countries other studies' result of

**Table 3** The unadjusted and adjusted odds ratios of using any, short term, long acting or permanent methods and dual protection contraceptives among female sex workers in Dhaka, Bangladesh (n=665)

Characteristics	N	Any modern methods		Any short term methods		Any long-acting or permanent methods		Dual protection	
		Model A	Model B	Model C	Model D	Model E	Model F	Model G	Model H
		Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
<b>Age (years)</b>									
15-24	191	1	1	1	1	1	1	1	1
25-34	292	0.84 (0.4-1.4)	1.01 (0.5-1.9)	0.55 (0.3-1.1)	0.67 (0.3-1.5)	1.93 (0.9-3.7)	1.65 (0.8-3.2)	0.91 (0.6-1.4)	0.56 (0.3-0.9) §
35+	182	1.18 (0.6-2.3)	1.50 (0.7-3.3)	0.59 (0.3-1.3)	0.93 (0.4-2.4)	1.89 (0.9-3.9)	1.57 (0.7-3.4)	1.00 (0.6-1.6)	0.69 (0.4-1.3)
<b>Education</b>									
No education	300	1	1	1	1	1	1	1	1
Primary	247	0.62 (0.3-1.0)	0.74 (0.4-1.3)	1.28 (0.7-2.4)	1.32 (0.6-2.5)	0.71 (0.4-1.2)	0.78 (0.4-1.4)	1.02 (0.7-1.5)	1.15 (0.7-1.7)
Secondary and above	118	0.65 (0.3-1.2)	0.69 (0.3-1.4)	0.71 (0.4-1.4)	0.61 (0.3-1.3)	0.64 (0.3-1.3)	0.85 (0.4-1.9)	0.69 (0.4-1.2)	0.87 (0.5-1.6)
<b>Marital status</b>									
Married	413	1	1	1	1	1	1	1	1
Unmarried	47	4.20 (0.9-17.7)	3.72(0.8-18.4)	1.57 (0.5-5.2)	1.07 (0.2-4.8)	0.19 (0.3-1.5)	0.27 (.03-2.1)	0.37 (0.1-1.1)	0.67 (0.2-2.3)
Other**	205	3.00 (1.5-5.7)§	2.34 (1.2-4.5)§	1.46 (0.7-2.7)	1.28 (0.7-2.5)	1.49 (0.9-2.5)	1.32 (0.8-2.2)	1.63 (1.1-2.4) §	1.27 (0.8-1.9)
<b>Single vs multiple settings based sex workers</b>									
Single	504	1	1	1	1	1	1	1	1
Multiple	161	4.37 (1.8-10.2)§	3.95 (1.7-9.4)§	2.06 (0.9-4.4)	2.16 (0.9-4.7)	1.96 (1.2-3.3) §	1.80 (1.0-3.1) §	4.06 (2.7-6.0) §	3.93 (2.6-5.9) §
<b>Number of clients entertained per day</b>									
1-3	238	1	1	1	1	1	1	1	1
4-5	246	1.16 (0.6-1.9)	1.17 (0.7-2.0)	1.42 (0.8-2.7)	1.46 (0.8-2.8)	1.00 (0.6-1.8)	0.95 (0.5-1.7)	0.73 (0.5-1.1)	0.66 (0.4-1.1)
>=6	181	1.40 (0.7-2.5)	1.3 (0.7-2.4)	1.24 (0.6-2.4)	1.33 (0.7-2.7)	0.76 (0.4-1.4)	0.64 (0.3-1.2)	0.96 (0.6-1.5)	0.85 (0.5-1.3)
<b>Number of pregnancy in lifetime (Gravida)</b>									
0	67	1	1	1	1	***		1	1
1-2	278	0.43 (0.1-1.2)	0.63 (0.2-2.1)	0.98 (0.3-2.9)	0.95 (0.3-3.6)			2.68 (1.1-6.5) §	2.70 (0.9-7.6)
3 or more	320	0.46 (0.2-1.3)	0.52 (0.1-1.8)	0.50 (0.2-1.5)	0.44 (0.1-1.7)			3.44 (1.4-8.2) §	3.85 (1.3-11.2) §
<b>Daily income (in BDT)</b>									
≤600	333	1		1		1		1	
>600	332	1.03 (0.6-1.6)	-	1.03 (0.6-1.8)	-	0.75 (0.5-1.2)	-	0.92 (0.6-1.3)	-

\*\* Divorced/separated/widowed/husband is out of country, £1 US\$ =79 BDT, §p<0.05

\*\*\* Of 67 women who never become pregnant in lifetime (reference category), only one person was using a long acting or permanent method. For this reason, we excluded this from regression analysis

Bangladesh (59%-93%) and many of the countries of the world (51%-84.5%) excluding Colombia where condom use was relatively low (17%) [9, 17, 18, 28, 29]. As Bangladesh currently has a condom distribution programme for FSWs, it is not surprising that condom use is quite common among our respondents. The in-depth interview participants also disclosed several advantages (e.g. prevention of pregnancy, diseases) of condom use which made this method popular to them. Although qualitative data support the inconsistent use of condom, the survey did not assess whether the use of condom or other contraception was consistent as recommended or irregular which is a limitation of this study. Todd et al showed in their study that consistent use of condom and contraception was much lower than reported use of condom and contraception [11]. According to Colombian study, the younger FSWs having 18 to 28 years old commonly used oral pill, condom and IUD while our study did not find any association between age group and current use of any methods [17]. However, our study findings indicate a little association between age group and dual protection of contraception.

The use of contraceptive was lower among residence-based FSWs compared to street or hotel-based FSWs. Due to frequent raids by police at hotels, FSWs are increasingly moving to residence-based locations. This may require that reproductive health programme implementers need to design programs that specifically provide contraceptive services to these residence based FSWs. The FSWs who had their practice in multiple settings, may have increased exposure to multiple interventions which may explain why they are using more contraceptives compared to FSWs who work in a single setting. Although dual protection is a recommended practice, it was only reported in 22% of women, much lower than Katz et al's study in Dhaka city which found dual protection rates of 44% among hotel based and 30% among street based FSWs [22]. One explanation for the difference may be that Katz et al did not include residence based sex workers in their study. However, this dual protection status among Bangladeshi sex workers is better compared to other countries (8-12%) [27, 30]. Local drug shops sell oral pills, condoms and injectables and these shops were the first source of contraceptive services reported by FSWs. As condom distribution is one of the services provided by DICs, a majority of FSWs reported receiving condoms from DICs.

This study has several limitations. This study

was conducted only in the capital Dhaka city of Bangladesh where only street, hotel or residential-based FSWs are available. The contraceptive use status of brothel based sex workers could not be shown in this study as they are available only outside of Dhaka city. Respondents for this study were identified and reached through DIC staff, therefore, we could not include FSWs who do not access DICs and who were not identified by the DIC. Finally, as data was collected through interviews with FSWs, there is the possibility of response and/or recall bias.

The study results suggest some recommendations for policy makers and reproductive health programme implementers to consider regarding provision of contraceptive services to this population in the future. Increasing use of modern contraceptives and dual protection of contraception through making services available at community based DICs should be immediately initiated. For this purpose, the contraceptives supply of oral pills and injectables should be made available to the existing paramedic in the DIC. In Dhaka community based family planning (FP) services are available through static as well as satellite clinics. Initiative should be taken to integrate family planning (FP) services with existing HIV prevention intervention through establishing existing FP satellite clinic services weekly a day in the DIC. In addition, a referral system should be developed by the DIC with FP clinic where implant, IUD and Tubectomy services are available. An accessible and friendly environment also should be established in those existing FP clinics so that FSWs can receive services from them without help from DIC. Advocacy meeting with service providers of FP clinics should be conducted for easy access to services by the FSWs. Actions on improving negotiation skills on safer sex with FSWs and their clients should be considered as a priority. Regular group discussion and counseling on long-acting or permanent methods including the importance of dual protection should be added to existing DIC services. Married and residence-based sex workers, FSWs who had their sex work in only one setting, women with none or few lifetime pregnancy experiences should be specifically targeted for this type of counseling and group discussions given their poor use of contraceptives. A routine medical check-up at workplace of FSWs could be considered for implementation by the health program implementers. Further study should be undertaken to explore feasibility, acceptability and possible scope of

collaboration with existing family planning and sexual transmitted infection prevention programme for delivery of contraceptive services to FSWs.

## CONCLUSIONS

This study highlights the need for modern contraceptive methods and services among FSWs working in street-based, hotel-based and residence-based settings in Dhaka, Bangladesh. The study found very low use of long-acting or permanent methods and dual protection. Given that FSWs are at increased risk for both STI and HIV acquisition as well as unintended pregnancy, improving rates of dual protection is crucial. The availability of contraceptive services in the DICs is essential which can be done through establishing collaboration with existing static and outreach contraceptive services. Thus, we recommend developing the linkage between existing contraceptive services and DICs where services are available only for FSWs to increase use of modern contraceptives.

## COMPETING INTERESTS

The authors declare that there is no competing interest.

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