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Contraceptive use among female sex workers in three Russian cities

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Abstract

Objective—To determine the prevalence of, and factors associated with, use of non-barrier contraception (intrauterine device, hormonal contraceptives, and female sterilization) among female sex workers (FSWs) in three Russian cities.

Methods—A secondary analysis of data from a cross-sectional survey of FSWs aged 18 years and older from Kazan, Krasnoyarsk, and Tomsk was undertaken. Participants had completed a one-time computer-based survey in 2011. Among the 708 with a current contraceptive need, logistic regression was used to evaluate factors associated with use of non-barrier contraceptives.

Results—Use of non-barrier contraceptives was reported by 237 (33.5%) FSWs. Use of non-barrier contraceptives was associated with being in sex work longer (4 years vs <1 year: adjusted odds ratio [AOR] 4.70; 95% confidence interval [CI] 1.51–14.66) and having a non-paying partner (AOR 2.02; 95% CI 1.32–3.11). Odds of non-barrier contraception were reduced among FSWs who had ever worked with a pimp/momka (AOR 0.46; 95% CI 0.24–0.87), who had experienced recent client-perpetrated violence (AOR 0.19; 95% CI 0.07–0.52), or reporting consistent condom use (AOR 0.30; 95% CI 0.16–0.54). Only 13 (5.5%) of the 237 FSWs using non-barrier contraception reported consistent condom use.

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Conflict of interest

The authors have no conflicts of interest.

Conclusion—Only one-third reported use of non-barrier contraception, suggesting substantial unmet contraceptive needs. FSWs are an important target population for family planning, reproductive health counseling, and care.

Keywords

Contraception; Female sex workers; Russia

1. Introduction

Globally, female sex workers (FSWs) are at increased risk of HIV [1], and research on this population focuses heavily on infectious disease [1–4]. However, FSWs across various geocultural settings also experience unintended pregnancy and abortion [5–11]; there is a need to understand reproductive health in this population. The limited data available suggest low levels of reliable contraception use among FSWs [5–8,11,12]. FSWs' abilities to obtain and use contraception are probably compromised by barriers to health care, including stigma and discrimination [10,13]. Individuals further marginalized through drug use, early initiation of sex work, and low levels of control over condom use could experience greater unmet contraceptive need than others do [5,9]. Control over working conditions probably relates to contraception and reproductive health; past evidence shows increased risk of abortion among FSWs working with a pimp or brothel, facing high client volumes, or who have experienced forced unprotected sex [8,14].

Understanding contraception patterns among FSWs is particularly crucial in Russia given its high national unmet need (17%) and unintended pregnancy rate (33%) [15]. Moreover, Russia has the highest rate of induced abortion in Eastern Europe/Central Asia, at 950.94 per 1000 live births [16]. Recent evidence from Moscow illustrates that over half of FSWs have experienced an induced abortion, and only 12% report using a non-barrier contraceptive method [11]. Concern persists for FSWs' use of ineffective and potentially hazardous pregnancy prevention methods, such as douching [11,13]. HIV prevention efforts for FSWs and other high-risk groups focus heavily on condom promotion [17]. When used properly, condoms offer the dual benefit of sexually transmitted infection (STI)/HIV prevention and pregnancy prevention. These benefits are reliant on adherence, with a first-year unintended pregnancy rate of 2% for women using male condoms perfectly as compared with 15% for more typical, intermittent condom use in real-world conditions [18]. More efficacious contraceptive methods exist, such as oral contraceptives (8% unintended pregnancy rate) and the copper intrauterine device (IUD) at (0.8% unintended pregnancy rate) [18]. These effective and female-controlled methods are efficacious in part because they are not coital-dependent (i.e. they do not require action at each sexual act) [18,19]. Female-controlled, non-barrier methods are particularly relevant for FSWs who experience high levels of violence and control [2,4], which can undermine condom use [20]. Thus, clarifying and promoting FSWs' use of non-barrier contraceptive methods—specifically hormonal methods, IUDs, and sterilization where voluntary and appropriate—is critical given their comparative advantage in preventing unintended pregnancy.

Thus, the aim of the present study was to explore the prevalence of, and factors associated with, use of non-barrier contraception (oral contraceptive pills, IUD, hormonal injectables or implant, or female sterilization) among FSWs in three Russian cities. It is hoped that the findings can inform more tailored outreach, services, and management of family planning for this unique population.

2. Materials and methods

The present study was a secondary analysis of a cross-sectional survey focusing on HIV prevention conducted in 2011 with FSWs in Kazan, Krasnoyarsk, and Tomsk, Russia. Eligible participants were women aged 18 years and older who reported trading sex for money, drugs, or shelter in the previous 3 months. The present secondary analyses of anonymous data were deemed exempt from ethics approval by the Johns Hopkins Bloomberg School of Public Health Human Subjects Committee.

Full details of the parent study have been reported previously [4]. Briefly, participants were recruited via respondent driven sampling, which has been shown to be successful in hard-to-reach populations [21]. Consistent with respondent driven sampling methods, initial “seeds” were selected from the target population with the assistance of local nongovernmental organizations (NGOs) and were to serve as the first round of study participants and initiate recruitment. All study activities were conducted by an in-country research team with logistical assistance from outreach staff. Study activities predominantly took place within the office or clinic of the local NGO—namely, the Simona Clinic in Kazan, Krasnyi Yar in Krasnoyarsk, and Belaya Siren Project in Tomsk, all of which are affiliated with the GLOBUS HIV prevention effort. Additionally, outreach workers were accompanied to enable data collection in the context of street-based outreach (but in a separate and private location proximal to outreach).

After eligibility was determined and verbal informed consent obtained, FSWs completed a 20–30-minute confidential survey and underwent HIV screening. Participants self-administered the computer-based survey with a paper-based option upon request. All questions were written in English, professionally translated into Russian, reviewed by native speakers, piloted, and then edited as necessary. Participants were then given up to five recruitment cards with which to recruit other FSWs. All participants were given a small material gift as an incentive for participation.

These procedures generated a sample of 754 participants. The present analytic sample was restricted to include only those with a current contraceptive need, as assessed via the question “How important is it to you to avoid getting pregnant now?” Respondents indicating that it was “not at all important” (n=32) were excluded from the current analysis, as were 14 individuals who provided incomplete data on this item. Therefore, the final sample reflects 708 FSWs with a current contraceptive need.

The primary outcome for the present analysis, use of non-barrier contraceptive method, was assessed by one item: “I am going to read you a list of different methods that women may use to prevent pregnancy. For each method I mention, please tell me if you are currently

using it. Some women use more than one method, so you can say more than one.” Participants endorsing female sterilization, oral contraceptive pills, IUDs, hormone injectables, or the implant were classified as users of non-barrier contraceptive methods. Additional options included male and female condoms, the diaphragm, withdrawal, emergency contraception, douche, the rhythm method, and foam/jelly. Consistent male condom use was defined as “always” using condoms during vaginal sex with both non-paying partners and clients. Although there were no missing data for consistent use with partners, 25 (3.5%) refused or did not report on consistency with clients; these women were classified as inconsistent users.

Demographic characteristics assessed included age, nationality, possession of registration papers, education, number of children, and socioeconomic status (SES). Low SES was indicated by having “below the minimum necessary to live” or being “just able to meet basic living needs.” Women were deemed to have a high SES when they had “finances to meet most/all needs.” Risk behaviors assessed included the number of non-paying partners, alcohol or drug use (i.e. “alcohol,” “legal drugs or those purchased in a pharmacy,” or “illegal drugs such as heroin, mak (injected opium), cocaine, marijuana”), and inconsistent condom use in the past 6 months. Sex work conditions assessed included sex work venue (i.e. street-based vs non-street venues [e.g. internet or escort services]), duration of sex work, and history of having worked with a pimp or momka. Women were deemed to have been exposed to sex worker-targeted HIV prevention programming prevention program if they either talked to a GLOBUS-affiliated outreach worker or went to a clinic in the past year (i.e. an outreach worker or clinic visit to one of the three participating NGOs). Physical violence perpetrated by clients and non-paying partners was assessed by single items drawn from the Conflict Tactics Scale [22], specifically by asking participants whether they had been “hit, pushed, slapped, or otherwise physically hurt.” Small amounts of missing data (<5%) were recoded to the most conservative value.

Prevalence of contraceptive use, including any method and specific types (e.g. barrier and non-barrier methods), were calculated as simple proportions of the study sample. X^2 analyses assessed differences in use of non-barrier contraceptive methods on the basis of demographics, sex work conditions, and violence exposures. Univariate and multivariate logistic regression models were constructed to evaluate factors associated with non-barrier method use; factors identified as significant at a $P<0.05$ in unadjusted analyses and/or thought to be potential confounders were included in the model. Analyses were conducted using Stata version 12 (StataCorp, College Station, TX, USA), and complex survey design adjustments were used to accommodate the respondent driven sampling strategy [23].

3. Results

Contraceptive use was common among the 708 participants (Table 1). Approximately one-third were using a non-barrier contraceptive method, most commonly oral contraceptive pills and IUDs. Almost all reported use of a barrier method, predominantly male condoms. However, consistent condom use with both clients and non-paying partners was reported by only approximately one-tenth of participants. Other reported methods included withdrawal

and douche. Among the 237 respondents who reported using a non-barrier contraceptive method, 13 (5.5%) reported consistent condom use.

Exposure to GLOBUS FSW-targeted HIV prevention in the past year was reported by 529 (74.7%) respondents. Among the 529 women, 240 (45.4%) had discussed pregnancy prevention with an outreach worker. Satisfaction with the services was reported by all 240 (100.0%). Prior unwanted pregnancy was common, reported by 444 (84.7%) of the 524 respondents who answered this item.

In the adjusted analysis, factors associated with non-barrier contraceptive use included having a non-paying partner and having been involved in sex work for at least 4 years (Table 2). Conversely, those having ever worked with a pimp or momka, reporting consistent condom use, or having experienced client-perpetrated violence in the last 6 months were less likely to use a non-barrier contraceptive method.

4. Discussion

In the present sample of FSWs with a current contraceptive need, only one-third were using a non-barrier contraceptive method. Use of a non-barrier method was associated with having at least one regular non-paying partner and involvement in sex work for at least 4 years. By contrast, non-barrier methods were significantly less common among FSWs who had worked with a pimp or momka, and among those experiencing client violence. These findings, coupled with the low levels of consistent condom use in the present sample, indicate a substantial risk of unintended pregnancy in the sample of FSWs with a self-reported need to avoid pregnancy. Together, these findings demonstrate significant unmet contraceptive needs among FSWs in Russia, against the backdrop of prevalent unintended pregnancy and abortion in the general population in this setting [15,16].

Although almost all FSWs indicated using contraception, both effective and ineffective methods were used. Current estimates of contraceptive use are similar to those found among other Eastern European FSWs in Uzbekistan [14], but differ from those in high-income countries such as Canada [6]. Estimates of contraception use among FSWs in low-income settings vary, with up to a half of FSWs using contraception in Kenya and India (53%–54%), and far lower estimates emerging from Cambodia and Madagascar (ranging from 5% to 30%) [6,7,12,24]. Family-planning-related policies and other determinants of access at the national level are probably relevant to FSWs' contraceptive use patterns, in addition to the individual and relational factors described herein. The present findings advance a growing body of evidence demonstrating prevalent unintended pregnancy and abortion among FSWs [5–11,14] by describing factors associated with non-barrier contraceptive use.

Consistent with past research [11], consistent condom users were less likely to use a non-barrier contraceptive method in the present study. Although having a non-paying partner was associated with use of non-barrier contraceptive methods, consistent condom use with non-paying partners is often low among FSWs [7,12,24]. Simultaneous promotion of both barrier (e.g. condoms) and effective non-barrier methods (e.g. hormonal contraceptives) is important to address the dual needs for pregnancy prevention and STI/HIV prevention in

this population. Interventions targeting FSWs with this focus should address the complexity of FSWs' contraception decision making, including their pregnancy intentions and the role of their intimate partners [25]. Previous work has shown high acceptability of FSW-targeted HIV prevention programs in Russia [4]. Almost half of respondents in the present study who had recently accessed GLOBUS HIV services had talked to an outreach worker or clinician about pregnancy prevention, with all reporting satisfaction with these services. Thus, incorporating contraception education and access into existing HIV prevention programs could be a strategy to respond to these unmet contraceptive needs. Specifically, training existing HIV outreach workers targeting FSWs in family planning and expanding their linked programs to include these services could be effective and cost-efficient methods to reach these goals.

Women who had been involved in sex work for longer were found to be more likely to use a non-barrier method than were those who had been involved for a shorter time in the present age-adjusted model. Past research [6,9,12] has found older age to be a predictor of non-barrier contraception use. Working in the sex work environment for a long period could allow women to become more knowledgeable about their own health needs as well as how and where to access pregnancy prevention services.

FSWs who had ever worked with a pimp/momka or who had experienced recent client-perpetrated violence were significantly less likely to use a non-barrier method. Similarly, both these factors have been found to increase risk of STI/HIV, unintended pregnancy, and abortion [2,8,14,20]. FSWs working with pimps or momkas could have reduced access to family planning services via isolation and limited agency to enact protective behaviors. The health impact of not using non-barrier methods could be further exacerbated by sexual violence and forced or coerced condom non-use [20]. Effective and long-term female-controlled forms of contraception are important harm reduction strategies for FSWs, particularly those exposed to violence [25]. For example, the IUD and hormonal methods can be used clandestinely and without the need for frequent follow-up care at health facilities. Reaching FSWs for contraceptive counseling and raising awareness about highly effective methods remains a priority. Integration of family planning within HIV outreach and education is one strategy to accomplish this goal. However, the future of HIV prevention and intervention in Russia for FSWs is uncertain with the end of the Global Fund that supported HIV prevention for key populations including FSWs in Russia. The present findings demonstrate that ensuring safe, non-discriminatory access to family planning should be among the priorities for promoting the health and well-being of FSWs.

The present findings should be considered in light of several limitations. The cross-sectional design limits the ability to make temporal inferences. Despite inclusion of three diverse cities in Russia, generalizability to FSWs in other areas of Russia and beyond Russia is unclear. For example, more "elite" FSWs working in higher class venues could not have been well represented in the present sample. Finally, the eligibility criteria excluded women younger than 18 years, limiting the generalizability of findings to minors.

In conclusion, the present findings confirm that FSWs are a high-risk group for unmet contraceptive needs and subsequent poor reproductive health outcomes, given that only a

small proportion is using a non-barrier form of contraception. Resolving this unmet need requires the promotion of effective, female-controlled contraception via safe, easily accessible, and non-discriminatory reproductive health services for FSWs. Although international guidance affirms the need for access to reproductive health services for FSWs [17], previous work with this population in Russia and elsewhere typically focuses on HIV risk and drug use. The present findings have highlighted the need to expand the scope of health services for FSWs to include family planning.

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References

1. Baral S, Beyrer C, Muessig K, Poteat T, Wirtz AL, Decker MR, et al. Burden of HIV among female sex workers in low-income and middle-income countries: a systematic review and meta-analysis. *Lancet Infect Dis*. 2012; 12(7):538–49. [PubMed: 22424777]
2. Decker MR, Wirtz AL, Baral SD, Peryshkina A, Mogilnyi V, Weber RA, et al. Injection drug use, sexual risk, violence and STI/HIV among Moscow female sex workers. *Sex Transm Infect*. 2012; 88(4):278–83. [PubMed: 22287530]
3. Aral SO, St Lawrence JS, Tikhonova L, Safarova E, Parker KA, Shakarishvili A, et al. The social organization of commercial sex work in Moscow, Russia. *Sex Transm Dis*. 2003; 30(1):39–45. [PubMed: 12514441]
4. Decker MR, Wirtz AL, Moguilnyi V, Peryshkina A, Ostrovskaya M, Nikita M, et al. Female sex workers in three cities in Russia: HIV prevalence, risk factors and experience with targeted HIV prevention. *AIDS Behav*. 2014; 18(3):562–72. [PubMed: 23929034]
5. Khan MR, Turner AN, Pettifor A, Van Damme K, Rabenja NL, Ravelomanana N, et al. Unmet need for contraception among sex workers in Madagascar. *Contraception*. 2009; 79(3):221–7. [PubMed: 19185677]
6. Duff P, Shoveller J, Zhang R, Alexson D, Montaner JS, Shannon K. High lifetime pregnancy and low contraceptive usage among sex workers who use drugs—an unmet reproductive health need. *BMC Pregnancy Childbirth*. 2011; 11:61. [PubMed: 21851622]
7. Wayal S, Cowan F, Warner P, Copas A, Mabey D, Shahmanesh M. Contraceptive practices, sexual and reproductive health needs of HIV-positive and negative female sex workers in Goa, India. *Sex Transm Infect*. 2011; 87(1):58–64. [PubMed: 20980465]
8. Morineau G, Neilsen G, Heng S, Phimpachan C, Mustikawati DE. Falling through the cracks: contraceptive needs of female sex workers in Cambodia and Laos. *Contraception*. 2011; 84(2):194–8. [PubMed: 21757062]
9. Bautista CT, Mejía A, Leal L, Ayala C, Sanchez JL, Montano SM. Prevalence of lifetime abortion and methods of contraception among female sex workers in Bogota, Colombia. *Contraception*. 2008; 77(3):209–13. [PubMed: 18279693]
10. Lau JT, Mui LW, Tsui HY, Wong E, Ho SP. Prevalence of induced abortion and associated factors among Chinese female sex workers in Hong Kong. *J Sex Marital Ther*. 2007; 33(1):19–29. [PubMed: 17162485]
11. Decker MR, Yam EA, Wirtz AL, Baral SD, Peryshkina A, Mogilnyi V, et al. Induced abortion, contraceptive use, and dual protection among female sex workers in Moscow, Russia. *Int J Gynecol Obstet*. 2013; 120(1):27–31.
12. Feldblum PJ, Nasution MD, Hoke TH, Van Damme K, Turner AN, Gmach R, et al. Pregnancy among sex workers participating in a condom intervention trial highlights the need for dual protection. *Contraception*. 2007; 76(2):105–10. [PubMed: 17656179]
13. Aral SO, St Lawrence JS. The ecology of sex work and drug use in Saratov Oblast, Russia. *Sex Transm Dis*. 2002; 29(12):798–805. [PubMed: 12466723]

14. Todd CS, Alibayeva G, Sanchez JL, Bautista CT, Carr JK, Earhart KC. Utilization of contraception and abortion and its relationship to HIV infection among female sex workers in Tashkent, Uzbekistan. *Contraception*. 2006; 74(4):318–23. [PubMed: 16982233]
15. Federal State Statistic Service, Ministry of Health of the Russian Federation, Information and Publishing Center “Statistics of Russia”, United Nations Population Fund, Centers for Disease Control and Prevention. [April 15, 2015] Reproductive Health Survey Russia 2011: Executive Summary. <http://stacks.cdc.gov/view/cdc/29068>. Published September 2012.
16. United Nations Population Fund. [May 27, 2015] A Review of Progress in Maternal Health in Eastern Europe and Central Asia. http://www.unfpa.org/sites/default/files/pubpdf/maternal_health.pdf. Published 2009.
17. Joint United Nations Programme on HIV/AIDS. [May 27, 2015] UNAIDS guidance note on HIV and sex work. http://www.unaids.org/en/media/unaids/contentassets/documents/unaidspublication/2009/JC2306_UNAIDS-guidance-note-HIV-sex-work_en.pdf. Updated 2012.
18. Trussell J, Wynn LL. Reducing unintended pregnancy in the United States. *Contraception*. 2008; 77(1):1–5. [PubMed: 18082659]
19. World Health Organization. [August 19, 2015] Johns Hopkins Bloomberg School of Public Health, United States Agency for International Development.. Family Planning: A Global Handbook for Providers. http://apps.who.int/iris/bitstream/10665/44028/1/9780978856373_eng.pdf. Published 2011.
20. Decker MR, McCauley HL, Phuengsamran D, Janyam S, Seage GR 3rd, Silverman JG. Violence victimisation, sexual risk and sexually transmitted infection symptoms among female sex workers in Thailand. *Sex Transm Infect*. 2010; 86(3):236–40. [PubMed: 20444745]
21. Johnston LG, Sabin K, Mai TH, Pham TH. Assessment of respondent driven sampling for recruiting female sex workers in two Vietnamese cities: reaching the unseen sex worker. *J Urban Health*. 2006; 83(6 Suppl):i16–28. [PubMed: 17031567]
22. Straus MA, Hamby SH, Boney-McCoy S, Sugarman DB. The revised conflict tactics scales (CTS2): development and preliminary psychometric data. *J Fam Issues*. 1996; 17(3):283–316.
23. Szwarcwald CL, de Souza Júnior PR, Damacena GN, Junior AB, Kendall C. Analysis of data collected by RDS among sex workers in 10 Brazilian cities, 2009: estimation of the prevalence of HIV, variance, and design effect. *J Acquir Immune Defic Syndr*. 2011; 57(Suppl 3):S129–35. [PubMed: 21857308]
24. Delvaux T, Crabbé F, Seng S, Laga M. The need for family planning and safe abortion services among women sex workers seeking STI care in Cambodia. *Reprod Health Matters*. 2003; 11(21): 88–95. [PubMed: 12800706]
25. Miller E, Jordan B, Levenson R, Silverman JG. Reproductive coercion: connecting the dots between partner violence and unintended pregnancy. *Contraception*. 2010; 81(6):457–9. [PubMed: 20472110]

Synopsis

Female sex workers in Russia have substantial unmet reproductive health needs, with only one-third using non-barrier contraception and few using condoms consistently.

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Table 1Contraception use (n=708).^a

Method	No. (%)
No contraception	7 (1.0)
Non-barrier method	237 (33.5)
Oral contraceptive pills	173 (24.4)
Intrauterine device (IUD)	64 (9.0)
Sterilization	11 (1.6)
Hormone injection	5 (0.7)
Hormonal implant	1 (0.1)
Barrier method	690 (97.5)
Male condoms ^b	675 (95.3)
Consistent male condom use ^c	75 (10.6)
Female condoms	49 (6.9)
Diaphragm	1 (0.1)
Emergency contraception	71 (10.0)
Other methods	163 (23.0)
Withdrawal	134 (18.9)
Douché	64 (9.0)
Rhythm method	8 (1.1)
Foam/jelly	2 (0.3)
Other	0

^a Methods used are not mutually exclusive.^b All reporting using male condom for pregnancy prevention, not adjusted by consistency of use.^c Includes respondents using male condoms “always” in vaginal sex with clients and partners.

Table 2Factors associated with non-barrier contraceptive use (n=708).^a

Factor	Overall	Non-barrier contraceptive use ^{b,c}	Unadjusted OR (95% CI)	Adjusted OR (95% CI) ^d
Demographics				
Age, y				
18–24	317 (44.8)	81 (25.6)	Ref.	Ref.
25–29	223 (31.5)	80 (35.9)	1.63 (0.87–3.05)	0.83 (0.46–1.49)
30–34	118 (16.7)	51 (43.2)	2.22 (1.30–3.78)	0.87 (0.49–1.53)
35–49	50 (7.1)	25 (50.0)	2.91 (1.66–5.10)	0.98 (0.51–1.86)
Nationality				
Native Russian	652 (92.1)	212 (32.5)	Ref.	–
Immigrant	56 (7.9)	25 (44.6)	1.67 (0.92–3.03)	–
Has registration papers				
Yes	465 (65.7)	187 (40.2)	Ref.	Ref.
No	243 (34.3)	50 (20.6)	0.39 (0.28–0.53)	0.75 (0.53–1.05)
Education				
Less than secondary	14 (2.0)	4 (28.6)	Ref.	Ref.
Secondary	303 (42.8)	57 (18.8)	0.58 (0.16–2.06)	0.55 (0.12–2.45)
Specialized	257 (36.3)	112 (43.6)	1.93 (0.49–7.53)	1.26 (0.24–6.49)
College or above	134 (18.9)	64 (47.8)	2.29 (0.57–9.12)	1.94 (0.38–9.90)
Socioeconomic status				
Able to meet most or all needs	304 (42.9)	104 (34.2)	Ref.	Ref.
Below minimum or just able to meet basic needs	404 (57.1)	133 (32.9)	0.94 (0.58–1.55)	0.92 (0.60–1.40)
Number of children				
0	394 (55.6)	111 (28.2)	Ref.	Ref.
1	231 (32.6)	92 (39.8)	1.69 (0.24–2.28)	1.04 (0.64–1.69)
2	83 (11.7)	34 (41.0)	1.77 (1.15–2.72)	1.23 (0.60–2.55)
Risk behaviors				
Number of non-paying partners				
0	319 (45.1)	87 (27.3)	Ref.	Ref.
1	389 (54.9)	150 (38.6)	1.67 (0.19–2.35)	2.02 (1.32–3.11)
Alcohol or drug use				
No	178 (25.1)	66 (37.1)	Ref.	Ref.
Yes	530 (74.9)	171 (32.3)	0.81 (0.55–1.19)	0.73 (0.49–1.08)
Consistent condom use				
No	633 (89.4)	224 (35.4)	Ref.	Ref.
Yes	75 (10.6)	13 (17.3)	0.38 (0.19–0.76)	0.30 (0.16–0.54)
Sex work conditions				
Work venue				
Street tochka	467 (66.0)	157 (33.6)	Ref.	Ref.

Factor	Overall	Non-barrier contraceptive use ^{b,c}	Unadjusted OR (95% CI)	Adjusted OR (95% CI) ^d
Non-street venue	241 (34.0)	80 (33.2)	0.98 (0.41–2.35)	0.78 (0.36–1.69)
Duration of involvement in sex work, y				
<1	84 (11.9)	9 (10.7)	Ref.	Ref.
1 to <2	106 (15.0)	29 (27.4)	3.14 (0.28–7.67)	2.54 (0.93–6.97)
2 to <3	165 (23.3)	54 (32.7)	4.05 (1.51–10.92)	2.90 (0.92–9.12)
3 to <4	90 (12.7)	33 (36.7)	4.82 (1.47–15.88)	3.55 (0.94–13.43)
4	263 (37.1)	112 (42.6)	6.18 (1.97–19.35)	4.70 (1.51–14.66)
Ever worked with a pimp or momka				
No	316 (44.6)	148 (46.8)	Ref.	Ref.
Yes	392 (55.4)	89 (22.7)	0.33 (0.19–0.59)	0.46 (0.24–0.87)
Exposed to GLOBUS HIV prevention programming in the past year				
No	179 (25.3)	41 (22.9)	Ref.	Ref.
Yes	529 (74.7)	196 (37.1)	1.98 (0.98–3.99)	0.98 (0.50–1.93)
Violence				
Physical violence by client in past 6 months				
No	639 (90.3)	231 (36.2)	Ref.	Ref.
Yes	69 (9.7)	6 (8.7)	0.17 (0.06–0.44)	0.19 (0.07–0.52)
Physical violence by non-paying partner in past 6 months				
No	664 (93.8)	227 (34.2)	Ref.	–
Yes	44 (6.2)	10 (22.7)	0.57 (0.23–1.37)	–

Abbreviations: OR, odds ratio; CI, confidence interval.

^a Values are given as number (percentage) unless indicated otherwise.

^b Includes respondents using sterilization, an intrauterine device, or a hormonal method.

^c Percentages calculated using the denominator of the overall number of women in that group.

^d Adjusted for age, registration papers, education, socioeconomic status, children, non-paying partner, alcohol/drug use, consistent condom use, sex work venue, duration in sex work, ever worked with pimp/momka, exposed to prevention program, and client physical violence.