

Sexual Behaviors, Knowledge and Attitudes of Female Sex Workers' towards HIV/AIDS in Shiraz

Parvin Afsar Kazerooni¹, MD; Nasrin Motazedian¹, MD; Mehrab Sayadi², MSc; Nadia Motazedian¹, MD; Mojghan Sabet³, MD

¹Shiraz HIV/AIDS Research Center, Shiraz University of Medical Sciences, Shiraz, Iran;

²Cardiovascular Research Center, Shiraz University of Medical Sciences, Shiraz, Iran;

³Vice Chancellor for Health Affairs, Shiraz University of Medical Sciences, Shiraz, Iran

Correspondence:

Nasrin Motazedian; MD;
Shiraz HIV/AIDS Research Center,
2nd floor,
Voluntary Counseling and Testing
Center,
Lavan Ave, Delavaran-e Basij Blvd,
Khatoun Sq, Post Code: 71659-83885,
Shiraz, Iran

E-mail: motazedian@yahoo.com

Received: 16 May 2014

Revised: 29 May 2014

Accepted: 20 June 2014

Abstract

Background: Human Immunodeficiency Virus (HIV) epidemics are largely linked to high-risk populations such as female commercial sex workers (FSWs). This study assessed sexual behaviors, attitudes and knowledge of this marginalized group.

Methods: We conducted a cross-sectional study on 278 self-identified FSWs by using Respondent Driven Sampling (RDS) method in Shiraz, south of Iran, from June 2010 to March 2011. Volunteer women were interviewed in order to explore issues such as sexual behavior, sexual violence, work conditions, contraceptive methods, HIV/AIDS knowledge, HIV test, and source of HIV information.

Results: The majority of participants (95.1%) knew about condoms; however, only 40.6% used condoms consistently. Despite the subject's wide knowledge regarding modes of transmission, 61% and 40% did not use any protection with anal and oral intercourse, respectively. 21% of FSWs experienced sexual violence. Nearly half (45.2%) of them had an HIV test and more than three-quarters knew their test results. The women in our study preferred to receive their information from health workers (63%) and peer group (45.2%).

Conclusion: This study sheds light on the existing knowledge and practices of this high-risk group. Although the majority of FSWs were familiar with HIV/AIDS, risky behaviors such as anal and oral sex are still in practice; this calls for education and HIV prevention campaigns focusing on risk education awareness. Efforts in addressing the problem of inconsistent condom use needs to be directed towards client specific approaches and must be regarded a top priority.

Please cite this article as: Afsar Kazerooni P, Motazedian N, Sayadi M, Motazedian N, Sabet M. Sexual Behaviors, Knowledge and Attitudes of Female Sex Workers' towards HIV/AIDS in Shiraz. *J Health Sci Surveillance Sys.* 2014;2(3):99-106.

Keywords: Sexual Behaviors, Knowledge, Attitudes, Sex Workers, HIV

Introduction

Human Immunodeficiency Virus (HIV) epidemics are largely linked to high-risk populations such as female commercial sex workers (FSWs), illegal drug users (IDUs), men who have sex with men (MSMs), and mobile populations and their sexual partners. The impression

that this high-risk group requires special attention only when they give rise to an epidemic among general population will certainly prevent us from focusing on preventive interventions and methods for controlling epidemic and behavioral risk patterns.¹

Prevalence of HIV is low in general population of Iran. A report by Ministry of Health and Medical

Education revealed a prevalence of 15.07% among IDUs. Evidence indicates the growing role of sexual contact in expanding HIV epidemic recently and prevalence of HIV has reached a concentrated level among FSWs(4.5%).²

Asia has a great diversity in HIV epidemics and unfortunately it has to be noted that they are far from reaching an end. Among factors affecting the rate and degree of an escalating epidemic, population size of FSWs and the frequency of commercial sex have to be highlighted. Although access to antiretroviral therapy is increasing, several countries in Asia have expanding epidemics, including China, Indonesia, and Vietnam. HIV epidemics in Asia are mostly attributed to transmission of the virus via sexual contact and sharing needles.³

A study by Madani and colleagues evaluated the HIV related knowledge of FSWs in Tehran with a mean year of 5.8 in commercial sex work. The majority of participants, 97.5% and 98.5%, reported that they have heard about HIV/AIDS, and condoms, respectively. 70% of them believed there was no facility for HIV test in Tehran.⁴

According to a cross-sectional survey by Zhang *et al.*, the prevalence of STI is 30.4% among FSWs in China, one of the world most populous countries. Young age, early onset of sexual activity, living alone, short time sex work, and illegal drug use were important predictors of unprotected sex and sexually transmitted infections (STIs). Conversely, having access to condom, free HIV counseling and testing, and peer education were associated with less unprotected sex. The majority of women reported a need for improvement in health knowledge, free condoms and low-cost STI diagnosis and treatment.⁵

In Vietnam, 85.2% of the participants of a study correctly answered the questions regarding HIV modes of transmission and 90% reported condom use, whereas only 2.2% reported persistent condom use with their boy friend or husbands.⁶

A study from Somalia on 237 participants showed that only 2.6% of FSWs knew a secure place for HIV test but a strikingly low number (4%) ever took the test. None of them received their test results. Only 6.9% answered the HIV basic knowledge questions correctly, and more than one-third (38.4%) had at least heard about STIs. Most (95.7%) of FSWs reported their only source of income was prostitution.⁷

Studies of psychosocial and behavioral influences and its correlation in African – American women's high risk sexual behavior reveal that 42.7% had inconsistent condom use, and 13.3% had multiple clients. Women who smoked crack were more likely to have multiple sexual partners by 5.3 times and those who drank alcohol had 2.8 times higher rate of

inconsistent condom use.⁸

Recent sexual violence, being sexual partner of an IDU, and lack of exposure programs were reported by FSWs as independent risk factors for inconsistent condom use in Pakistan. On the other hand, HIV prevalence of educational program was regarded as a protective factor.⁹

A cross-sectional study of FSWs from Tehran regarding knowledge of respondents on HIV mode of transmission states that most common routes of infection is broadly known by the majority with regard to some exceptions. Oral sex and anal sex were correctly answered by only 23.4% and 44.9% of the subjects respectively as HIV transmission routes. There were also some misconceptions; 46.5% of the subjects believed HIV is transmissible through sharing food. Eyebrow tattooing was not known as a mode of transmission by 41% of respondents. Most (97.5%) had heard of AIDS. Kolahi *et al.* found that condom use was recognized as a preventive measure against AIDS by 65.3%; on the other hand, 35.4% thought single sexual partner could be protective against HIV infection. A similar study also reports areas which require major improvements; more than three-quarters (76.6%) of the subjects considered sex education as fundamental, the majority (91.4%) agreed on its corporation in school curriculum, and even more believed (93.0%) more information was needed about AIDS/STIs.¹⁰

A study designed in four cities of Iran (Saravan, Astara, Islamshahr and Kermanshah) with higher HIV prevalence, showed a general poor knowledge of high-risk behavior group (cross-border truck drivers, FSWs and youths) about HIV. Truck drivers and FSWs had better knowledge about STIs compared with youth. Interestingly, they achieved their knowledge from the personal experiences compared to public awareness program. The incorrect information about HIV prevention and transmission modes was higher among FSWs.¹¹

High-risk behavior groups act as a HIV/STI bridge in a community by transferring these infections to general population. A study from northwest of Iran put this claim into test. 100 males with gonorrhea infection, diagnosed by the university affiliated center in Kermanshah, were enrolled in the study. Sources of infection as reported by the patients were girl friends (4%), temporary marriage (sigheh), wives (24%), and street prostitutes (64%). Zargooshi reported, among 38 married cases, 31 of them reported unprotected sex with their wives during infection period. The majority (89%) of commercial sex was unprotected.¹²

The presence of prostitution and sexually transmitted infections in Iran and many other Islamic countries cannot be denied. Government and

community have considered these two facts as taboos. No official record has revealed the prevalence of prostitution in Iran. Lack of access to medical services and awareness about HIV/AIDS are significant challenges for FSWs. As these groups are usually socially isolated and stigmatized, seeking appropriate medical care and treatment poses a considerable challenge.^{13, 14}

We designed this study to evaluate the knowledge and attitudes of FSWs in Shiraz, south of Iran towards HIV and predicting factors in taking an HIV test and condom use.

Materials and Methods

To describe the characteristic of FSWs, we conducted a cross-sectional study using Respondent Driven Sampling (RDS) method in Shiraz, south of Iran, from June 2010 to March 2011. Our study started with 14 seeds with maximum eight waves. Three seeds did not recruit additional participants. Number of waves for the other 11 seeds ranged from one to eight waves. We considered FSWs as finite population, so a sample size of 395 was calculated. Finally, 11 remained seeds recruited 278 FSWs. The women were recruited from three areas, which were found to have the most sex workers in the city and also from all districts and areas of Shiraz to ensure a representative sample. In this method, we asked the first subject to introduce further subjects and the "wave" propagates. Approvals for the survey were obtained from the National Ethics Committee.

We recruited 278 women who identified themselves as FSWs (selling sex for money or good at least six months during their lifetime or at least once within the last 12 months) and were 17 years or older. Participants were assured that their information will remain confidential. They could exit from our study whenever they wanted. After obtaining informed consent, trained interviewers administered a face-to-face questionnaire. The validity questionnaire was performed by consulting experts in this field. Cronbach alpha was calculated (85%) to assess the internal consistency. The questionnaire contained 28 questions about knowledge and attitude toward HIV infection and routes of HIV transmission. The scale for measurement of HIV-related knowledge was yes, no, and don't know. A dichotomous response scale of agree or disagree was considered for measuring attitude. The questionnaire consisted of a broad range of issues such as socio-demographic background, history of sexual contact, drug and alcohol use, knowledge and attitude about HIV and STIs, number of partners, condom use, duration of sex work, and client numbers and type. After completing the interview, the seeds received a monetary incentive. These women also received another incentive for each referred participant who was qualified and

completed the study. At the end of the interview, a free gynecological examination was done by a midwife. We checked the study samples for independency by using a unique code in their coupons, and they were rejected by the health staff if they participated more than once in the study.

Data were prepared in excel software and then imported into SPSS version 16 (SPSS Inc, Chicago, IL, USA); also, RDSAT version 6.01 was used for descriptive analysis. Chi-square test or Fisher's exact test were used to analyze qualitative variables. We used logistic regression to identify the factors associated with condom use and having HIV test. P value less than 0.05 was considered significant.

Only results relevant to the study aims are reported here. The method has been detailed in another paper.¹⁵

Results

Socio-Demographic and Behavioral Characteristics

In all, 278 FSWs participated in the study, with a mean age of 32.91 ± 8.67 years and mean marriage age of 16.78 ± 3.99 years. The majority (38.1%) had junior middle school education (8 years of education). The mean age for initiating commercial sex was 27.6 ± 8.15 . 40.7% of the woman had first intercourse experience before age 15.¹⁵

At time of our study: the participants included 41.2% married, 30.4% divorced, 0.9% single, 15% concubine, 9.8% widowed, and 2.7% ready for divorce. 42.3% of women were supervisor and earned money. Persons under their guardianship were their children (98.4%), addicted husband (27.3%), sibling (7.9%), and parents (7.9%). 29.8% of the participants were involved in prostitution for less than one year, 44.2% for a period of one to five years, and about one quarter (25.2%) for more than 5 years.

The majority of participants (95.1%) knew about condoms and nearly half of them (54%) used a condom at their last sexual contact before the study and 40.6% used condoms consistently in the previous month before the study with a paying partner. 36.3% used condom at their last sexual contact before the study, and 25.2% used condoms consistently in last month before the study with a non-paying partner.¹⁵ Sexual practices among FSWs were: vaginal sex (90%), anal sex (25%), and oral sex (17.5%) with a non-paying partner in the last month before the study. The rate of unprotected sex in this group according to the type of sexual activity was as follows: 20%, 61%, and 40% vaginal sex, anal sex, and oral sex, respectively.

Client's objection was the major reason for not using a condom at their last monetary and nonmonetary sexual contact in 38.6% and 38.1% of the subjects,

respectively. Other reasons are mentioned in Table1.

Regarding the method for preparation of a condom, the majority (63.8%) prepared condoms from pharmacies, more the one-third from drop in centers (DIC) (35.4%) and family planning clinics (15.4%). About 78.9% spent less than one hour and 7.9% spent more than one hour to procure condoms.

In addition, 39.8% of the women said that they had sex during menstruation. 26% of FSWs had at least one sexual encounter over their last seven days of menstrual bleeding. One of them had sex during menstruation with 11 clients, and another had sexual contact with 20 clients.

Sexual Violence

21% of the subjects experienced violence by clients during the past month of our study. One-third (31%) of them were forced to have sex by a partner. 3.5% had experience of group sex.

Work Conditions

30.7% of FSWs in Shiraz had worked in illegal sex houses. 69.2%, 11.1%, and 5.7% of FSWs had one, two, and three clients in the last day of work. FSWs reported earning between 150,000-200, 000 Rs (20 dollars) for the last commercial sex before our study was conducted.

Contraceptive Methods

The contraceptive methods used most commonly among subjects of our study were natural family planning method (withdrawal) (8.2%), contraceptive pills (21.1%), intrauterine device (IUD) (3.9%), tubal ligation (TL) (12.2%) and condom (34.8%). Among the participants, 37.7% had experience of unwanted pregnancies and 37.6% had a history of miscarriage.

HIV/AIDS Knowledge

The majority of the participants were aware of the most common route of HIV transmission in Iran:

injecting drugs (80.2%), sharing needles (79.8%), and sexual transmission (77.6%). Knowledge and attitude of FSWs to HIV/AIDS are listed in Tables 2 and 3. Table 3 also shows more than half of women in our study had positive attitude towards HIV/AIDS infected individuals; on the other hand, we observed HIV misinformation regarding modes of transmission; 178 FSWs (64.1%) would not share a meal with a HIV infected person.

HIV Test

Prior to this study, 45.2% of the women had an HIV test. 79.3% of them knew their test results. To perform the test, 43.8% were referred to Voluntary Counseling and Testing (VCT) center; the others were referred to DIC (36.1%), private sector (6.6%), Blood Transfusion Organization to donate blood (3.3%) and prison (1.6%).

Source of HIV Information

More than three-quarters (76%) of the participants had received HIV education messages; among them, source of HIV information were TV(33.2%), peer group(28.8%), health workers (26.4%), poster (13.7%), and radio (10.3%). The women in our study preferred to receive their educational information from health workers (63%), peer group (45.2%), TV (28.1%), and street advertising (14%).

Discussion

The current study is one of the first studies to examine HIV-related sexual behaviors among FSWs in Iran. Our study showed the majority of FSWs were familiar with most common route of HIV transmission in Iran, i.e. injecting drugs.

Over three-fourths acknowledged the sexual transmission of HIV, similar to the results of Kolahi.¹⁰ The number of subjects who knew the methods of transmission and protective effect of condom were higher than those of the study by Ramezani and Malek-Afzali.¹¹ Misconceptions about route of HIV transmission in Somalia were higher than our study.⁷

Table1: Reasons for not using condom in the last sexual act among FSWs in Shiraz (2010 – 2011)

Reasons for not using condom in last sexual intercourse	With Paying client (n=121)		With non paying partner (n=81)		P value ^b
	Number	Percent	Number	Percent	
Lack of awareness	31	26	28	34.2	0.207
Lack of access	19	15.9	9	10.5	0.411
Unwillingness	16	13.6	12	14.4	0.836
High prices	1	0.8	0	0	1
Client/ Partner 's objects	47	38.6	31	38.1	1
Condom was not Available in hand	4	3.36	6	7.8	0.075
Others reason ^a	2	2	3	3.6	0.392

a such as: trustable client/itching; b Fisher exact test was used

Table 2: Knowledge about HIV/AIDS among 278 FSWs in Shiraz (2010–2011)

HIV/AIDS knowledge	Yes	N	No	N	Don't know percent	N
	Percent (95%CI)		Percent (95%CI)		(95%CI)	
HIV can be transmitted through injecting illegal drugs	80.2 (75.5-84.9)	223	0.7 (0-1)	2	19.1 (16.74-21.46)	53
HIV can be transmitted through sharing needle	79.8 (75.1-84.6)	222	1 (0-2)	3	19.1 (16.74-21.46)	53
HIV can be transmitted through infected mother to her fetus	70.8 (65.4-76.2)	197	2.5 (0.6-4.3)	7	26.7 (24.05-29.35)	74
HIV can be transmitted through breastfeeding	55 (49.11-60.9)	153	9 (5.9-12.7)	25	35.9 (33.02-38.78)	100
HIV can be transmitted through sharing meals with infected person	18.7 (14-23.3)	52	56.1 (50.1-61.9)	156	25.2 (22.60-27.80)	70
HIV can be transmitted through mosquito bite	28.7 (23.4-34.1)	80	11.15 (9.26-13.04)	31	59.9 (56.96-62.84)	167
Correct Condom use can prevent HIV transmission	77.6 (72.7-82.6)	216	1.7 (0.2-3.3)	5	20.5 (18.08-22.92)	57
Anti-HIV medications can prevent mother-to-child transmission of HIV	15.47 (13.3-17.64)	43	0	0	83.8 (78.9-87.7)	235
Perceived HIV vulnerability	59.2 (49.7-65.8)	165	40.8 (34.2-50.4)	113	0	0

Table 3: Attitudes toward HIV/AIDS among 278 FSWs in Shiraz (2010–2011)

HIV/AIDS attitude	Yes	N	No	N
	Percent (95%CI)		Percent (95%CI)	
Willingness to share a meal with HIV infected person	35.9 (29-42.5)	100	64.1 (57.5-71)	178
Willingness to provide care for a family (man) with HIV in home	56.8 (50.8-64.5)	158	43.2 (35.5-49.2)	120
Willingness to buy food from a vendor who is living with HIV	54.6 (48.4-61.4)	152	45.4 (3.8-51.6)	126
Willingness to keep a secret if family member is infected with HIV	92.7 (88.3-96)	258	7.3 (4-10.7)	20
A teacher with HIV should continue teaching classes	82.6 (77.8-87.2)	230	17.4 (12.8-22.3)	48
A student with HIV should be allowed to continue going to school	82.2 (76.9-87.2)	229	17.7 (12.8-23.1)	49

A study by Basuki and colleagues in Indonesia reported a higher number of sex workers, indicating that sexual intercourse is the most important method of HIV transmission whereas fewer mentioned injections compared to those of our study.¹⁶

Previous studies reported many negative attitudes of the subjects towards HIV-positive persons compared our study.¹¹ Only one-third of the participants of our study had shared a meal with HIV infected individuals; this shows a gap in knowledge and an area in need of targeted educational programs.

Moreover, the leniency towards polygamy increases the tendency to engage with multiple sexual partners and may lead to HIV infection among some Muslim communities. The majority of HIV positive women were infected through their spouses, who had sexual encounter with multiple partners or used injecting drugs.¹¹

The main reason for not using a condom was clients' objection in our study, similar to reports of a study from Somalia.⁷ A study conducted in four cities of Iran showed cost and client objection as the two main reasons for not using condoms.¹¹

Basuki also reported that the main reasons for not using condoms were the misconceptions that boyfriends, native Indonesians and healthy looking clients cannot transmit STIs.¹⁶

A difference was observed in condom use with paying and non-paying partners, among participants of our study, as other studies showed a tremendous difference in condom use with paying and non-paying partners.^{5, 16, 17, 18} Condom use with clients and non-paying partners in our study was higher than reports from our neighboring country, Pakistan.⁹ The minority of FSWs in Somalia used condom; the majority of this group stated it was suggested by clients.⁷ A study from Nepal revealed the reason for not using condom by nearly all FSWs was poverty and lack of negotiation skill to convince the clients.¹⁹

FSWs in our study experienced anal sex with non-paying partners more than paying partner and it appears that it was more difficult to initiate condom usage with non-paying partners as more than half of the participants did not use condom in anal sex with non-paying sex partners. In addition, the unprotected sexual behaviors during oral sex were reported in almost half of the subjects in our study. Unprotected

anal sex is associated with an increased risk of HIV transmission and unprotected oral sex is a mode of transmission for syphilis and gonorrhoea.^{9, 20} Non-vaginal sex as a route of HIV/STI can be neglected by this isolated group; therefore, there is a need for educational programs regarding protective behaviors.

About forty percent of sex workers in our study experienced sexual intercourse during menstruation. Sexual violence and force to have sex were reported among our participants more than those of Pakistan study.⁹ As we know, HIV transmission can be enhanced by STIs co-infection due to their damaging effects, such breaking skin or mucosal defenses, increasing inflammatory exudates secretions, and increased chances of bleeding.²¹ Therefore, successful HIV prevention programs require addressing important issues such as sexual violence in this marginalized population group.²²

Nearly half of our participants had done a HIV test; it was done more than the participants in Vietnam and Somalia. We observed condom use, drug use, oral and anal sex, heard of HIV infection and were HIV positive at the time of study were predicting factors of taking a HIV test by FSWs under the study (Table 4); however, in Vietnam past attendance in rehabilitation center was associated with having a HIV test. Presumed HIV vulnerability might be the reason for this observed attitude.^{6, 7}

A study from Togo, a western African country, reported 62.2% of FSWs have been tested for HIV, and almost all of them knew their HIV status; however, only half of the women in our study had HIV test, and the majority knew the result.²³ To perform the test, VCT center, and DIC were the first and second place among participants of our study, respectively.

Commercial sex was the main source of income for most women in our study, similar to the findings from China and Somalia.^{5, 7} Almost half of the women were

the provider of the family's income and their children compromised the majority of those under their guardianship. In Pakistan, more than half of FSWs reported sharing sex work income with a mediator, their husband or the police.⁹ So we should develop social care and support system for this vulnerable group and protect them from shifting into high risk behavior to earn money.

The type of sexual activity (anal, vaginal), cost of condom, basic knowledge of HIV, and having HIV test (before our study) were associated with condom use among the participants of our study in univariate analysis. (Table 5) Although a study from Vietnam showed a number of clients used condom.⁶ In Nairobi, condom use was higher for HIV-positive women, which were aware of their infection compared to women unaware of their status.²⁴

Three-quarters of our study participants had received HIV education messages. First and second source of message were TV, peer group, but most of them prefer receiving the message from health workers and peer group. Continued awareness campaigns for FSWs by peer educators should be encouraged to explain the importance of screening test and encourage them to know their HIV status.

Addressing the problem of inconsistent condom use among FSWs and its dependency on the partner type requires HIV prevention interventions to promote consistent condom use across the partner type. Targeting couples rather than individuals may also be necessary.¹⁸

This study has some limitations. In the beginning of the study, the monetary incentive was little; so referred FSWs were from low economic level that needed more money. Then, we increased the monetary incentive and recruited FSWs from all of classes. Due to official holidays during the project, we encountered slow progression. The temporal relationship between

Table 4: Factors associated with HIV testing among 278 FSWs in Shiraz (2010–2011)

Variable	Coefficient	OR (95%CI)	P value
Age	-0.018	0.982 (0.95-1.01)	0.291
Marital status			
Single (baseline)	–	1	–
Married	0.053	1.050 (0.113-9.88)	0.963
Others*	0.079	1.080 (0.117-9.98)	0.944
Multiple partner	-0.486	0.615 (0.154-2.45)	0.491
Type of sex			
Vaginal	0.716	2.047 (0.515-8.127)	0.309
Anal	-0.897	0.408 (0.18-0.927)	0.032
Oral	-1.231	0.292 (0.104-0.817)	0.019
Condom use	0.702	2.018 (1.139-3.57)	0.016
Drug use	0.780	2.182 (1.332-3.575)	0.002
Heard about HIV	1.770	5.870 (2.84-12.13)	0.000
HIV ⁺	2.930	18.86 (2.44-145.46)	0.005
HSV ⁺	0.796	2.210 (0.979-5.025)	0.056

*Such as: divorced, concubine, widowed, headed for divorce

Table 5: Factors associated with condom use among 278 FSWs in Shiraz (2010–2011)

Variable	Coefficient	OR (95%CI)	P value
Age	0.024	1.024 (0.992-1.058)	0.143
Marital status			
Single (baseline)	–	1	–
Married	-0.034	0.708 (0.076-6.591)	0.762
Others*	-0.092	0.912 (0.099-8.409)	0.935
Multiple partner	-0.345	0.702 (0.177-2.793)	0.616
Type of sex			
Vaginal	2.004	7.410 (1.991-27.622)	0.003
Anal	-1.001	0.368 (0.161-0.838)	0.017
Oral	-0.208	0.812 (0.282-2.328)	0.699
Awareness of STI	0.157	1.170 (0.621-2.206)	0.627
Free condom	0.653	1.920 (1.148-3.087)	0.048
Heard about HIV	0.704	2.022 (1.09-3.75)	0.026
HIV test	0.702	2.018 (1.139-3.57)	0.016

*Such as: divorced, concubine, widowed, headed for divorce

dependent and independent variables is difficult to find by a cross-sectional study. We recommend a cohort study among FSWs¹⁵.”

Successful interventions in reducing the burden of HIV/AIDS epidemics require more understanding of sexual behaviors, attitudes and practices of the community at risk. Formulating a practical HIV prevention programs is not achievable without acknowledging the vulnerabilities that place FSWs at risk of HIV infection. Regular health checks seems to be the most simple and effective step towards early diagnosis and treatment of STIs and should be made compulsory for all FSWs. Since this isolated community proved often difficult to reach, we propose easier testing methods such as mobile or home-based HIV testing.

Finally, it is recommended that more qualitative research should be needed for better evaluation of practices, attitudes and knowledge of this community at risk. Our last word is to policy makers and health workers to help improve FSWs' knowledge about STIs, offer medical care and an HIV test to all sex workers and reinforce stronger harm reduction methods, such as easier access to sterile needle and condom.

Conflict of interest: None declared

References

- Mills S, Saidel T, Magnani R, Brown T. Surveillance and modelling of HIV, STI, and risk behaviours in concentrated HIV epidemics. *Sex Transm Infect* 2004 Dec; 80 Suppl 2: ii57-62.
- National AIDS Committee Secretariat, Ministry of Health and Medical Education. Islamic Republic of Iran. AIDS Progress Report On Monitoring of the United Nations General Assembly Special Session on HIV and AIDS. March 2012, <http://www.unaids.org/en/dataanalysis/knowyourresponse/countryprogressreports/2012countries>
- Ruxrungtham K, Brown T, Phanuphak P. HIV/AIDS in Asia. *Lancet* 2004; 364(9428): 69–82.
- Ghahfarokhi SM, Forouzan AS, Roshanfekar P, Mohammadi MA, MasoumehDejman M, Vameghi M, et al. HIV/AIDS related knowledge and attitude among female sex workers in Tehran/Iran. *Retrovirology* 2010; 7(Suppl 1): P130.
- Zhang XD, Temmerman M, Li Y, Luo W, Luchters S. Vulnerabilities, health needs and predictors of high-risk sexual behaviour among female adolescent sex workers in Kunming, China. *Sex Transm Infect* 2013 May; 89(3): 237-44.
- Grayman JH, Nhan DT, Huong PT, Jenkins RA, Carey JW, West GR, et al. Factors associated with HIV testing, condom use, and sexually transmitted infections among female sex workers in NhaTrang, Vietnam. *AIDS Behav* 2005 Mar; 9(1): 41-51.
- Kriitmaa K, Testa A, Osman M, Bozicevic I, Riedner G, Malungu J, et al. HIV prevalence and characteristics of sex work among female sexworkers in Hargeisa, Somaliland, Somalia. *AIDS* 2010 Jul; 24Suppl 2: S61-7.
- Wingood GM, DiClemente RJ. The influence of psychosocial factors, alcohol, drug use on African-American women's high-risk sexual behavior. *Am J Prev Med* 1998 Jul; 15(1): 54-9.
- Mishra S, Thompson LH, Sonia A, Khalid N, Emmanuel F, Blanchard JF. Sexual behaviour, structural vulnerabilities and HIV prevalence among female sex workers in Pakistan. *Sex Transm Infect* 2013 Sep; 89Suppl 2: ii34-42.
- Kolahi AA, Rastegarpour A, Abadi AR, Nabavi M, Sayyarifard A, Sohrabi MR. The knowledge and attitudes of a female at-risk population towards the prevention of AIDS and sexually transmitted infections in Tehran. *J Res Med Sci* 2011 Nov; 16(11): 1452-8.
- Ramezani Tehrani F, Malek-Afzali H. Knowledge, attitudes and practices concerning HIV/AIDS among Iranian at-risk sub-populations. *East Mediterr Health J* 2008 Jan-Feb; 14(1): 142-56.
- Zargooshi J. Characteristics of gonorrhoea in

- Kermanshah, Iran. *Sex Transm Infect* 2002 Dec; 78(6): 460-1.
- 13 MR Mohebbi. Female sex workers and fear of stigmatization. *Sex Transm Infect* 2005 Apr; 81(2): 180-1.
- 14 Joulaei H, Motazedian N. Primary Health Care Strategic Key to Control HIV/AIDS in Iran. *Iran J Public Health* 2013 May 1; 42(5): 540-1.
- 15 Kazerooni PA, Motazedian N, Motamedifar M, Sayadi M, Sabet M, Lari MA, et al. The prevalence of human immunodeficiency virus and sexually transmitted infections among female sex workers in Shiraz, South of Iran: by respondent-driven sampling. *Int J STD AIDS* 2014 Feb; 25(2): 155-61.
- 16 Basuki E, Wolffers I, Devillé W, Erlaini N, Luhpuri D, Hargonoet R, et al. Reasons for not using condoms among female sex workers in Indonesia. *AIDS Educ Prev* 2002; 14(2), 102–16.
- 17 van Veen MG, Gtz HM, van Leeuwen PA, Prins M, van de Laar MJ. HIV and sexual risk behavior among commercial sex workers in the Netherlands. *Arch Sex Behav* 2010; 39(3): 714–23.
- 18 Ulibarri MD, Strathdee SA, Lozada R, Staines-Orozco HS, Abramovitz D, Semple S, et al. Condom use among female sex workers and their non-commercial partners: effects of a sexual risk intervention in two Mexican cities. *Int J STD AIDS* 2012 Apr; 23(4): 229-34. doi: 10.1258/ijsa.2011.011184.
- 19 Ghimire L, Smith WC, van Teijlingen ER, Dahal R, Luitel NP. Reasons for non- use of condoms and self- efficacy among female sex workers: a qualitative study in Nepal. *BMC Womens Health* 2011 Sep 26; 11: 42.
- 20 Baggaley RF, White RG, Boily MC. HIV transmission risk through: systematic review, meta-analysis and anal intercourse: systematic review, meta-analysis and implications for HIV prevention. *Int J Epidemiol* 2010 Aug; 39(4): 1048-63.
- 21 Schmid G, Markowitz L, Joesoef R, Koumans E. Bacterial vaginosis and HIV infection. *Sex Transm Infect* 2000 76(1): 3-4.
- 22 Beattie TS, Bhattacharjee P, Ramesh BM, Gurnani V, Anthony J, Isac S, et al. Violence against female sex workers in Karnataka state, south India: impact on health, and reductions in violence following an intervention program. *BMC Public Health* 2010 Aug 11; 10: 476.
- 23 Pitché P, Gbetoglo K, Saka B, Akakpo S, Landoh DE, d'Almeida S, et al. HIV prevalence and behavioral studies in female sex workers in Togo: a decline in the prevalence between 2005 and 2011. *Pan Afr Med J* 2013 Jun 21; 15: 62.
- 24 Musyoki H, Kim A, Geibel S, Muraguri N, Okal J, Dadabhai S, et al. High prevalence of HIV infection among female sex workers in Nairobi, Kenya: results of a respondent-driven sampling study, 2010-2011. MOPE242 Poster Exhibition. Available from: <https://www.google.com/#q=prevalence+of+HIV+infection+among+female+sex+workers+in+Nairobi%2C+Kenya%3A+results+of+a+respondent-driven+sampling+study%2C+2010-2011>