




Prevalence of HIV and Syphilis and Related Risk Behaviors Among Female Sex Workers in the Democratic Republic of the Congo

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ABSTRACT

Objectives: Examine the prevalence of HIV and syphilis and related risk behaviors among female sex workers (FSW) in the Congo.

Methods: A cross-sectional study of 400 FSW was carried in Kinshasa from April to July 2021 using time location sampling approach. A structured questionnaire was used to collect information on sociodemographic characteristics, sexual behavior, mode of HIV transmission, and drug use. Rapid tests for HIV and syphilis were administered. Logistic regression identified the factors associated with the risk of developing HIV infection.

Results: The prevalence of HIV and syphilis was 7.2% (n=29) and 11.5% (n= 46), respectively. The mean age of the participants was 21 years. Over half of them (53.2%) had the first intercourse between 7 and 15 years of age; 62.5% initiated commercial sex between 16 and 20 years of age. The average number of paying clients the week preceding the survey was 17.6 with SD±12.0. The average number of non-paying clients during the same period was 5.5 with SD±2.0. Most of the participants (95.8%) reported using condom during their last sexual encounter with a paying client compared to 29% with a non-paying client.

Multiple logistic regression analysis showed that being diagnosed with syphilis [OR: 7.34; 95%; CI: 3.12, 17.29] and ever been married [2.28; 95%; CI: 0.96, 5.41] were associated with HIV infection. Consumption of a locally brewed alcohol (lotoko) [OR: 2.23; 95% CI: 0.91, 5.45] was marginally associated with the risk of HIV infection.

Conclusion: The high prevalence of HIV and syphilis in this marginalized group is a matter of great public health concern. More effective interventions are needed to address the vulnerability to HIV among FS.

Keywords: HIV/AIDS, syphilis, female sex workers, behavior, ESPOIR, Democratic Republic of the Congo

INTRODUCTION

Sub-Saharan Africa (SSA) is home to only 12% of the global population, yet accounts for 71% of the global burden of HIV infection. The trends in new HIV infections across countries in SSA have shown a decline by more than 33% from an estimated 2.2 (2.1-2.3) million in 2005 to 1.5 (1.3-1.6) million in 2013 (Kharsany and Karim, 2016). Although this decline highlights overall advances in the fight against HIV, they may mask sustained or expanding spread of HIV infection among most at risk populations, including female sex workers (FSW), men who have sex with men, and injecting drug users.

Sex work, defined here as the exchange of sex for money, varies substantially around the world. Those who sell sex might work with or without a controller (e.g., a pimp), through establishments such as bars, brothels, or saunas, or in public

spaces such as parks, streets, or festivals. Additionally, a growing portion of sex work is arranged through the phone or internet (Baral et al., 2012; Harcourt and Donovan, 2005). FSW are women who have been professionally involved in sex for money as their source of income (Baral et al., 2012). FSW bear a disproportionately large burden of HIV infection worldwide.

Varieties of behavioral, biological, and structural factors heighten HIV acquisition and transmission among FSW (Ramjee and Daniels, 2013; Shannon et al., 2014). High-risk behavioral factors among FSW include high numbers of sexual partners, migrancy, inconsistent use of condoms, and unprotected sex (Coetzee et al., 2017). Biologically, FSW experience high prevalence of sexually transmitted infections (STIs) such as syphilis, gonorrhea, and chlamydia. STIs increase the risk of HIV transmission. Structural factors such as gender inequality, poverty, violence, stigma, discrimination, social isolation, social exclusion, and power

dynamics of sex work and legal and regulatory policies regarding sex work have been shown to contribute to sex workers' increased risk of HIV infection by limiting their ability to negotiate safer sex or accessing health services (Platt et al., 2018; Scorgie et al., 2012).

The prevalence of HIV among FSW varies by geographical regions. The estimated prevalence of HIV infection among FSWs was 0.3% in the Middle East and North Africa compared to 29.3% in Sub-Saharan region (Beyrer et al., 2015). The estimated HIV prevalence among FSW in the Southern African Development Community economic block, the most affected region in SSA, is 42.0% (95% CI: 0.41-0.43). The estimated pooled HIV prevalence ranged from 16% (95% CI: 0.13-18) in Democratic Republic of Congo (DRC), 59% (95% CI: 0.57-0.62) in South Africa, and 71% (95% CI: 0.65-0.76) in Malawi (Yah et al., 2017).

In DRC, the estimated HIV prevalence in the general population is 1.2% (Kakisingi et al., 2020). Although the HIV prevalence in the DRC is lower compared to 5.2% in most African countries, other prevalence estimates have suggested much higher HIV rates particularly in the eastern urban regions of the country (Messina et al., 2010). Wide disparities in the prevalence of HIV were reported among the different categories of FSW: 11.8% in hotel-based FSW, 24.0% in home-based FSW and 20.0% in street-based FSW; 10.0% in homeless FSW; and 6.6% in clandestine FSW (Vandepitte et al., 2007).

The ongoing political instability has driven the DRC into a deep socioeconomic crisis, pushing both young men to fend for themselves and young women into prostitution to survive. In this changing context, there is a need for up-to-date information about HIV among FSW. The purpose of this study was to determine the prevalence of HIV and syphilis, and identify the factors associated with HIV infection among FSW in Kinshasa in the DRC. A good understanding of these factors may inform the development of more effective HIV interventions in the country.

METHODS

Study Population and Sample Size Estimation

The study population consisted of women aged 15 years and above who exchanged sex for money/goods and had been living in Kinshasa for the past 12 months before recruitment.

The sample size was determined using the online Raosoft sample size calculator (http://www.raosoft.com/sample_size.html). The total population of FSW in Kinshasa was estimated at 20,000 individuals. Using the confidence level of 95% with 5% margin of error with the response rate of 50%, a sample size of 357 was needed for the study. Adjusting for out migrations, or nonresponse, a total of 400 FSW were recruited.

Sampling and Recruitment

Of the 24 administrative communes in Kinshasa, seven were randomly selected to participate in the study. They included Bumbu, Kalamu, Kimbanseke, Lemba, Ndjili, Ngaliema, and Selembao. Key informants and FSW representatives in these communes were consulted to identify three sites, where FSW conglomerate and the most productive

times for conducting the survey at these sites. Time location sampling approach was used. 21 sites were conveniently selected. Although FSW who were present at the visited sites could be invited to participate in the survey, 'first come, first serve' approach was used to carry out five interviews at each site per day until the sample size of 400 participants was reached.

Data Collection Instrument and Procedures

Tools from previous surveys of FSW in SSA were used to obtain comparable results. The initial questionnaire in English was translated into Lingala, the language spoken in Kinshasa. The questionnaire was using a small sample of FSW. Trained interviewers administered the questionnaire between April and July 2021 to collect information on sociodemographic characteristics, sexual behaviors, condom use during last 30 days and condom use with paying and non-paying sexual partners, STI symptoms, HIV knowledge, alcohol consumption and drug use.

Laboratory Tests

A finger-tip blood sample was utilized for syphilis and HIV testing, with results reported as positive or negative. A trained nurse administered a rapid HIV test, Determine Combo (Abbott Inc., Chicago, USA), a fourth generation assay able to simultaneously detect HIV-1 p24 antigen and HIV-1/2 antibodies. The high-test sensitivity of 95% (88-98%) and specificity of 100% (90-100%) make this test suitable as a point-of-care rapid HIV test in clinics and outreach testing sites.

The Abbott Determine Rapid Syphilis TP assays is a treponemal test used in resource-poor settings that lack laboratory facilities. The test has a sensitivity of 96.9 to 99.2% and a specificity of 95.5% to 100%. A unique nonidentifying secret code was developed for each participant and was placed on all the study documents to identify the participant. Participants underwent a voluntary pre and post HIV testing. Those who tested positive were referred to participating government clinics for care.

Statistical Analysis

Data was double entered into the computer, using Epidata, by two researchers independently and were checked for accuracy and completeness. Inconsistent condom use was defined as not using condoms 100% of the time during sexual encounter the week before with any kind of partner (non-paying or paying partners). Simple frequency distribution was used to determine the prevalence of HIV and syphilis as well as other HIV risk factors (condom use, marijuana use, etc.).

Univariate logistic regression was used to assess the significance of association between each independent variable and HIV infection at 5% level of significance. Odds ratio and their 95% confidence intervals were calculated for each independent variable. All variables with a p value ≤ 0.10 in the univariate analysis were included in the final model for multivariate logistic regression. Multivariate logistic regression was used to examine the associations of independent variables and the outcome of interest (HIV positive test), simultaneously adjusting for potential confounders using SPSS version 25.

Table 1. Characteristics of the female sexual workers (N=400)

Variables	n	%
Age (Mean: 31.21 SD: ±8.1)		
18-24	98	24.5
25-34	164	41.0
35-44	114	28.5
≥45	24	6.0
Attended school		
Did not attend school	116	29.0
Attended school	284	71.0
Education		
Primary	66	23.3
Secondary	212	74.8
University	8	2.1
Residence		
Bumbu	80	15.0
Kalamu	100	25.0
Kimbanseke	77	19.3
Lemba	100	15.0
N'Djili	23	5.8
Ngaliema	28	7.0
Selembao	12	3.0
Ever married		
Ever married	182	45.5
Never married	218	54.5
Other sources of Income		
No	143	35.8
Yes	257	64.3
Supporting family		
Supporting family	334	83.5
Not supporting family	66	16.5

Ethical Considerations

To conduct this study, ethical approval was obtained from Central Michigan University Internal Review Board and from the School of Public Health of Kinshasa (Congo) Ethical Committee.

RESULTS

Characteristics of Sample

Table 1 presents the characteristics of the 400 FSW who participated in the study. Their mean age was 31.2 years with a standard deviation (SD) of ±8.1. About 41% of participants were 25 to 34 years old. Most of them (71%) attended schools. About three in four participants (74%) had a secondary level of education. Although over half (54.5%) of the participants never been married, 83.5% have children or support other family members at home.

HIV Knowledge among the FSW

Table 2 presents the level of HIV knowledge among the FSW. About half (49.7%) of the participants knew somebody who was infected with HIV. Most participants knew that living with one faithful partner (95.7%), abstaining from sexual relations (82.7%), or consistently wearing condoms (79.8%) protects someone against HIV infection. However, most FSW (90.0%) thought that a mosquito's bite transmits HIV infection.

Table 2. Level of knowledge about HIV

Variables	n	%
Do you know somebody infected with HIV?		
Yes	197	49.7
No	194	48.9
No answer	5	1.4
Can one protect himself against HIV by wearing condom?		
Yes	316	79.8
No	45	11.4
Do not know	35	8.8
Can mosquitoes bite transmit HIV infection?		
Yes	355	90.1
Do not know	39	9.9
Can somebody be protected against HIV by living with one faithful partner?		
Yes	268	95.7
No	112	29.3
Can people protect themselves by abstaining from sexual relationships?		
Yes	317	82.7
No	66	17.3

Risk-Related Behaviors

Table 3 summarizes sexual behaviors, condom use, and drug use among FSWs. Over half of the participants (53.2%) reported having had the first intercourse between 7 and 15 years of age. The mean age was 17.6 years with a SD±10.0 years. About 62.5% of the participants initiated commercial sex between 16 and 20 years of age. The mean age at first commercial sex was 23.4 years with a SD±13.6 years. During the week preceding the survey, FSW reported having sexual relationships with an average of 17.6 paying clients; whereas the average number of non-paying partners during the same period was 5.5.

Table 3. Sexual behaviors and condom use with clients and non-paying sex partners of FSWs and alcohol or drugs use

Variables	n	%
Age (years) at first intercourse (Mean: 17.66; SD: 10.01)		
07-15	207	53.2
16-20	181	46.5
GE 21	1	0.3
Age (years) at first commercial intercourse		
07-15	50	12.9
16-20	242	62.5
GE 21	95	24.5
Number of partners last week		
≤10	196	50.5
≥11	192	49.5
During the last seven days		
Number of paying clients (Mean: 17.61; SD: 12.0)		
Number of non-paying clients (Mean: 5.51; SD: 22.0)		
During last encounter with paying clients. Did you use condom?		
Yes	383	95.8
No	17	5.2
Who suggested condom use when having sex with clients usually?		
The FSW decide	353	92.2
The clients decide	8	2.1
Both sides decide	22	5.7
Frequency of consistent condom use with clients last week		
Used condoms consistently	389	97.3
Did not use condoms consistently	11	2.7

Table 3 (Continued). Sexual behaviors and condom use with clients and non-paying sex partners of FSWs and alcohol or drugs use

Variables	n	%
During last encounter with non paying clients last time. Did you use condom (N=93)		
Yes	27	29.0
No	64	68.8
DNK	2	2.2
Who suggested condom use when having sex with clients usually?		
The FSWs decide	20	74.1
The clients decide	3	11.1
Both sides decide	4	14.8
Frequency of consistent condom use with clients last week		
Used condoms consistently	43	46.7
Did not use condoms consistently	49	53.3
During the past four weeks, did you drink alcohol?		
Every day	155	38.7
Sometimes (once a week)	231	57.8
No response/do not know	14	3.5
People use different types of drugs. Have ever used the following?		
Marijuana		
No	286	71.5
Yes	114	28.5
Lotoko		
No	248	62.0
Yes	152	38.0
HIV diagnosis		
No	371	92.8
Yes	29	7.2
Syphilis diagnosis		
No	354	88.5
Yes	46	11.5

Most of the participants (95.8%) used a condom during the last sexual encounter with a paying client. About 97.3% of FSW reported using condoms consistently with paying partners. However, only 29% of FSW reported using condoms during the last sexual encounter with a non-paying client.

Drug Use

An estimated 38.0 % of the participants (n=152) reported drinking Lotoko (a locally brewed alcoholic beverage) versus 28.5% (n=114) who reported using marijuana. Lotoko is not commonly used by women in the community.

HIV and Syphilis Prevalence

Rapid HIV test was positive in 29 participants (7.2%); whereas syphilis test was positive in 46 participants (11.5%).

Factors Associated with HIV

The results of the unadjusted and adjusted analyses are shown in **Table 4**. The unadjusted analysis showed that FSW aged 25-34 years were less likely than those aged 35 years and older to have HIV infection, but the difference was not statistically significant. [OR: 0.82; 95% CI: 0.37-1.85]. FSW who attended school were less likely to have HIV infection compared to those who did not attend school [OR: 0.76; 95% CI: 0.34-1.68].

FSW who reported ever being married were two times more likely to be diagnosed with HIV infection than those who have never being married [OR: 2.42; 95% CI: 1.09-5.35]. FSW who reported caring for children or other family members were more likely to be diagnosed with HIV infection than those who

Table 4. Factors associated with HIV infection among female sex workers by a univariate and logistic regression analysis

Variables	No HIV-positive (%)	Unadjusted odds ratio (95% CI)	P	Adjusted odds ratio (95% CI)	P
Age					
≤24	3/98 (3.1)	0.304	0.084-1.096	0.162	
25-34	13/164 (7.9)	0.82	0.370-1.851		
≥35 years	13/138 (9.4)	1			
Attended school					
Yes	19/284 (6.7)	0.760	0.342-1.688	0.499	
No	10/116 (8.6)	1			
Ever been married					
Yes	19/182 (10.4)	2.425	1.097-5.357	0.025	3.192 1.189-8.566 0.021
No	10/218 (4.6)	1		1	
Number of sexual partners					
≤10	15/196 (7.7)	1.141	0.528-2.467	0.737	
≥11	13/192 (6.8)	1			
Responsible for children or relatives					
Yes	27/334 (8.1)	1.590	0.726-3.482	0.148	
No	2/66 (3.0)				
Age at first commercial sex					
7-15	14/207 (6.8)	0.87	0.403-1.875	0.898	
≥16	14/182 (7.7)	1			
Diagnosed with syphilis					
Yes	12/46 (26.1)	6.997	3.085-15.867	0.000	9.401 3.758-23.50 0.000
No	17/354 (4.8)	1		1	
Marijuana					
Yes	11 (9.6)	1.590	0.726-3.486	0.243	
No	18 (6.3)	1			
Lotoko consumption					
Yes	12 (7.9)	1.165	0.540-2.511	0.697	2.238 0.918-5.450 0.077
No	17 (6.9)	1		1	

did not, but the difference was not statistically significant [OR: 1.59; 95% CI: 0.72-3.48].

FSW who reported consistent condom use with paying clients were less likely to be diagnosed with HIV infection than those who reported inconsistent condom, but the difference was not statistically significant [OR: 0.77; 95% CI: 0.09, 6.27].

FSW who were diagnosed with syphilis were 6 times more likely to be diagnosed with HIV infection than those who did not have syphilis and the difference was statistically significant [OR: 6.99; 95% CI 3.08, 15.86].

Finally, FSW who reported using marijuana were more likely to be diagnosed with HIV infection than those who did not use marijuana, but the difference was not statistically significant [OR: 1.59; 95%CI: 0.72, 3.48].

The adjusted logistic regression analysis showed that being diagnosed with syphilis [OR: 7.34; 95% CI: 3.12, 17.29], having ever been married [OR: 2.28; 95% CI: 0.96, 5.41] were the only factor associated with HIV infection among FSW. Using Lotoko [OR: 2.23; 95% CI: 0.91, 5.45] was marginally associated with the risk of HIV infection.

DISCUSSION

This study investigated the prevalence of HIV and syphilis infection and related risky behaviors among FSW in the DRC. The results showed a high HIV prevalence of 7.2% among FSW compared to 1.2% in the general population. The high HIV prevalence among FSW is consistent with previous studies conducted in the DRC or elsewhere in Africa (Kakisingi et al., 2020; Mutagoma et al., 2017; Niama et al., 2017). However, the prevalence of 7.2% among FSW represents a decline in the prevalence of HIV in this population compared to 35% reported in 1991 or 12.5% in 2002 (Nzila et al., 1991; Vandepitte et al., 2007). The differences in survey time periods, in the settings, recruitment processes, and data collection methods may account for the noticeable differences among these studies. This downward trend may result also from the global HIV prevention and treatment programs carried out over the past decade to bring the HIV epidemic under control.

In Central Africa, the burden of syphilis has been well documented in selected groups such as blood donors and pregnant women (Niama et al., 2017; Taylor et al., 2014). In 2011 and 2014, the prevalence of syphilis among pregnant women attending sentinel antenatal clinics was 4.2% and 2.8% (Musema et al., 2020; Taylor et al., 2014), respectively. Our results showed that the prevalence of syphilis among FSW in Kinshasa was as high as 11.5%. The prevalence in DRC is higher than the 7.5% reported in neighboring Congo Brazzaville (Niama et al., 2017). 2.2% in Togo (Halatoko et al., 2017), or 1.09% in Brazil (Ferreira-Júnior et al., 2018). The high prevalence of syphilis among FSW in DRC constitutes a serious public health threat for the country. Epidemiologic studies have shown that sexually transmitted diseases (STDs) including syphilis, and particularly genital ulcers, are associated with an increased risk of HIV acquisition (Hall, 2006). Coinfection of STDs with HIV prolongs or augments the infectiousness of individuals with STDs. These infections may

greatly amplify one another. This “epidemiological synergy” may be responsible for the explosive growth of the HIV pandemic in some populations (Wasserheit, 1992). Effective interventions to control STD are essential to prevent HIV transmission and improve people’s health.

The increased vulnerability to HIV among ever married FSW is another important finding of this study. Women who reported ever being married were three times more likely to be diagnosed with HIV infection than those who never being married. In a cross-sectional study of 664 heterosexual couples in Rakai District (Uganda), Nabukenya et al. (2020) found that gender inequalities and high levels of masculinity norms inhibited access to HIV prevention and treatment services among women. In patriarchal societies, suggesting condom use or refusing unprotected sex in a marriage or cohabiting relationship is seen as questioning male authority (Madiba and Ngwenya, 2017). Furthermore, the age difference between partners is another important HIV risk factor in this population. Age difference between partners creates power imbalances in relationships particularly in patriarchal societies such as those found in South Africa, where age and seniority are of considerable importance in social life (Langen, 2005).

The payment of bride price (also known as dowry), still in practice in the DRC and many African countries, perpetuates the subordination of women in society. Dowry constitutes a considerable obstacle for women attempting to leave abusive relationships (Human Rights Watch, n. d.).

A systematic review of the literature on alcohol use and sexual risk behavior in southern Africa, the region of the world with the greatest HIV/AIDS burden, showed a consistent association between alcohol use and sexual risks for HIV infection (Kalichman et al., 2007). A meta-analysis also indicated that alcohol consumption was associated with greater intentions to engage in unprotected sex (Scott-Sheldon et al., 2016). This finding underscores the need for interventions that prevent alcohol consumption in high-risk groups.

To conclude, the authors are proposing important activities to consider when designing a comprehensive HIV prevention program to curb the spread of HIV among FSW. The acronym, ESPOIR (French word for hope), summarizes the six important activities. They are listed, as follows:

1. Educate FSW about the modes of HIV transmission.
2. Encourage FSW to know their sero-status.
3. Make pre-exposure prophylaxis accessible to FSW and treat FSW as needed.
4. Create employment opportunities for FSW through job trainings.
5. Organize regular medical checkup for FSW to prevent STIs and monitor disease progression among HIV-infected FSW.
6. Banish harmful rituals and norms.

This study has several limitations. As a cross-sectional survey, no effort was made to validate the self-reported answers to the questions about sexual behaviors and drug use. Information bias (such as under reporting, recall bias, and non-disclosure) may have occurred, affecting the estimates of

the strength of the associations between the predictors and the outcome. Considering that some of the questions examined sensitive issues such as condom use, drug use etc., the risk of providing socially desirable answers is quite high. Despite these limitations, the results of the survey remain very informative and can inform the development of new interventions in the DRC.

CONCLUSION

FSW and their partners remain vulnerable to HIV infection. High transmission of HIV in this group could reverse progress made to control HIV infection worldwide. The authors invite policy makers to integrate the six aforementioned activities (included in the acronym “ESPOIR”) in future interventions addressing HIV infection among FSW.

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