

Full Length Research Paper

Factors associated with HIV testing among female sex workers in Botswana

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Botswana continues to have a high level of HIV prevalence, with about 17% of the population living with HIV AIDS (BAIS IV, 2013). Female sex workers are classified among the most at risk population group in the country. However, sub-national disaggregated data on new infections are not available. Hence, there is a need to focus great attention on other proxies of infection. The present study examines predictors of HIV testing among female sex workers (FSWs) in Botswana. The FSWs were recruited into the study using the time-location cluster sampling method (TLS) to collect data on prevalence and incidence of HIV and other STIs and their risk factors for HIV. The logistic regression analysis was performed to estimate crude odds ratios and identify the factors associated with having an HIV test among the FSWs. HIV prevalence among sex workers in Botswana was found to be 3 times higher than in the general population. Analysis of the results shows that the sex workers most likely to seek HIV testing were young women with no children. The odds of testing for HIV were almost 4 times more for FSWs who had first sex older as compared to the odds of testing for those who are 17 to 19 years old. Lack of or inconsistent condom use and currently having symptoms of STIs such as lower abdominal pain and genital ulcerations were also factors associated with HIV testing. Results further show that FSW hold little discrimination and stigma related attitudes towards PLWA. FSWs have little participation in the HIV prevention, treatment and care efforts currently accessed by the general population. It is recommended is that this framework should also be extended to FSW's and their clients in order to curb HIV and STIs.

Key words: Female sex workers, HIV testing, Botswana, prevalence, associated factors, odds ratio.

INTRODUCTION

According to WHO (2013), a total of 95 million people had HIV in 119 countries which provided results in 2010. Despite these global strides, Africa remains the most disproportionately affected by HIV, especially sub-Saharan African region which was a host to 70% of the all new infections in 2012 with women accounting for

approximately 57% of all people living with HIV. Despite the increase in the supply of antiretroviral (ARV) drug, the epidemic continues to spread more rapidly in sub-Saharan Africa (UNAIDS, 2012). Botswana with a population of 2.2 million in 2011, ranks among the countries most affected by HIV. Prevalence in the general

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population aged 18 months to 64 years was estimated at 17.6% in 2008 and has since increased to 18.5% in 2013, with women having a higher estimated prevalence of 20.8% than men at 15.6% (Central Statistics Office (CSO), 2009).

In most parts of sub-Saharan Africa, less than one in 10 people know their HIV status. HIV testing rates are also consistently lower among men than women, and men tend to have lower CD4 cell counts when accessing treatment (Gupta, 2000). According to UNAIDS (2012), coverage of HIV testing and counselling is low in most parts of the world, especially among adolescents and key populations such as female sex workers, men who have sex with other men and injecting drug users. UNAIDS estimates indicate that female sex workers are 13.5 times more likely to be living with HIV than other women globally (UNAIDS, 2012). In Botswana, female sex workers accounted for 12.5% of all new infections and HIV prevalence among this, most at risk group is estimated at 61.9% (Ministry of Health, 2013). This group represents the most at risk part of the population and changing their HIV-risky sexual behaviours is crucial in declining the pandemic. McGarridge et al. (2005) found out that high risk sexual and drug injection behaviours are the main factors associated with HIV testing in Britain, especially among female sex workers. The same findings were supported by Miller et al. (1996) as they stated that "...having more than one sex partner and never using a condom in the past year were strong predictors of testing". Studies in different countries have shown that HIV testing among female sex workers is still poor (Matovu and Makumbi, 2007; Machekano et al., 2000; WHO/UNAIDS/UNICEF, 2007; Kalichman, 2003; Weiser et al., 2006). Findings from recent demographic and health surveys in the 12 countries (Botswana, Cameroon, Ethiopia, Ghana, Kenya, Lesotho, Malawi, Mozambique, Nigeria, Democratic Republic of Congo, United Republic of Tanzania and Uganda) show that in half of the 12 countries, not more than 10% of female sex workers had been tested for HIV and had received their results in 2005 (WHO/UNAIDS/UNICEF, 2007). A report by World Health Organisation (WHO, 2013) continued to point at stigma and discrimination, fear of receiving an HIV-positive status, lack of confidentiality, long distances to Voluntary Confidential HIV testing (VCT) sites, and long delays in returning HIV test results as factors discouraging people to access traditional VCT systems for testing, prevention and treatment, hence this fuels the cycle of new infections, especially among female sex workers.

Babalola et al. (2005) pointed out that among Nigerian female sex workers, readiness for testing was associated with knowledge of HIV, knowing a source of VCT, perceived risk and having discussed condom use for prevention. Knowing that healthy looking people can be infected was also associated with HIV testing. In China, HIV testing remains low in Southwest China, especially

among female sex workers despite the recognized importance of HIV testing in prevention, care and treatment. Millions of female sex workers were found to play a critical role in China's escalating HIV epidemic. Hong et al. (2012) revealed in their study that among the 48% of female sex workers who ever took HIV testing, older age, less education, working in higher-income commercial sex venues and better HIV knowledge were associated with HIV testing. They further indicated that those who never took HIV testing were more likely to engage in high-risk behaviours including inconsistent condom use with clients and stable partners. A study carried out in Iran showed that FSWs are the second most affected sub-population by HIV and only 27.5% had tested in the past year. Another study by Shokoohi et al. (2016) showed that FSWs who perceived themselves at risk of HIV had received free condoms and started sex work at an older age and those who knew an HIV testing site had significant higher chance of having a recent HIV test result. Some studies confirmed that as compared to those who had been tested, individuals who were not tested for HIV demonstrated significantly greater AIDS related stigmas; showing greater shame, guilt and social disapproval to people living with HIV (Kalichman and Simbayi, 2003). Others found out that transactional sex, gender-based violence, substance abuse and socio-economic disadvantaged were factors associated with HIV testing among women in Soweto (Dunkle et al., 2004)

Although, studies elsewhere have identified the barriers to accessing VCT, this study characterises the factors associated with HIV testing among female sex workers in Botswana. Understanding these factors may help improve HIV testing policy and scale up testing among female sex workers or develop effective programs, specifically targeted at this high risk group.

MATERIALS AND METHODS

The study uses secondary data from a cross-sectional population-based study of 950 female sex workers conducted in three districts of Gaborone, Kasane and Francistown with samples sizes of 410, 130 and 410 subjects, respectively. The study was part of the 2012 Botswana Biological and Behavioural Surveillance Survey (BBSS) baseline study to collect data on prevalence and incidence of HIV and other STI's and the risk factors for HIV among the FSWs, men who have sex with other men and people injected with drugs.

The time-location cluster sampling method (TLS) was adopted to recruit the female sex workers into the study. TLS is a form of cluster sampling that contains dimensions of both time and location. First, a mapping exercise of all venues where FSWs solicited clients in the urban centres of each of the three districts was used to create a time location sampling frame. The mapping team consisted of 10 mappers (active FSW peer educators in the different districts) and a supervisor. TLS clusters were selected using probability proportionate to size with a fixed number of FSWs recruited from each cluster. The cluster size was 10, and 37 clusters were selected in each district in order to reach the sample size of 370.

When the estimated number of FSWs in a district was less than the sample size of 370, as in Kasane, a 'take-all' approach was

used in which all FSWs were recruited for the survey. During the second stage, all or a subsample of randomly selected population members who appeared at the site during a designated time interval of fixed length (in this case 4 hours) were interviewed. The selection method was found to be more representative because all members of a target population access the locations at some point. Secondly, TLS is a probability sampling method, because all population members have a non-zero chance of selection as long as the TLS frame is complete and because the selection probabilities can be calculated by taking the time and space dimensions into account. No eligible FSWs refused to participate in the study (Ministry of Health, 2013).

Measures

For analysis, the outcome variable was: "Have you ever been tested for HIV?" which was asked the respondents. The independent variables were divided into behavioural factors and socio-demography variables. The dataset includes the following background information categorized as: age, nationality, level of education, marital status, occupation, sexual debut, age started sex work. Variables related to sex work and sexual practices included consistent condom use with sex partners (regular clients, boyfriends, married partners, casual partners, boyfriend not cohabiting), volume of clients per week, place of sex, alcohol consumption as well as sexually transmitted infections (STIs).

Statistical analysis

The Statistical Package for Social Sciences (SPSS) version 24 computer software was used for the various analyses. The characteristics of FSW who ever had an HIV test were compared with those who never had an HIV test using Pearson's Chi-square test. The logistic regression analysis was performed to estimate crude odds ratios (OR, 95% confidence interval) and to identify the factors associated with having an HIV test among the FSWs. Multivariate logistic regression analysis was used for evaluating the effects of a select group of predictor variables on the probability of testing for HIV while controlling for other variables in the model.

RESULTS

Sample characteristics

A total of 948 female sex workers were sampled. The mean age was 29 years (Table 1). A relatively small portion (3.9%) of the respondents were either married or cohabiting, while the majority (57.9%) of the female sex workers were single and 26.5% have not cohabited boyfriends. The level of unemployment was fairly high, with 67.7% reporting not being employed and 15.9% having formal employment and another 15.7% reporting other types of employment. Senior/higher certificate and junior secondary education were reported as the highest education level attained at 46.5 and 41.2%, respectively. Close to half (47.6%) of the female sex workers have at least two children and 15.8% have no children. One third of the FSW's in the study started sex work at 21 years and below, while slightly more than one third was 27 years and above when they started sex work. About 50% of the FSW reported having a partner/boyfriend with

whom they have sex 5-6 times in the last month. A significant number of them solicit their clients mainly from bars, and also through the telephone, or on highways or hotels or at home. Some individuals reported physical violence (21.2%), forced sex (17.7%) or forced not to use condom (21.2%). Harassment or abuse by police was reported by 9.4% of the FSWs.

Table 2 shows the differences in demographic and behavioural characteristics between FSWs who ever tested for HIV and those who never tested for HIV. About two thirds of the sex workers are Batswana and the rest are Zimbabweans. The median age of FSWs is 28 years and 33.6% reported they started sex work at the age of 21 and below. There was significant difference in the ages of FSWs who tested and those who never tested. The FSWs who tested reported having one or more children as compared to those who never tested (85.8 vs. 70.7%). About 56% of the FSW who ever tested was single as compared to 66.7% of those who have not tested, while 11.2% of those who once married (divorced, separated and widowed) tested as compared to 15.5%. When compared with FSW who tested for HIV, FSWs who never tested were more likely to have consumed alcohol everyday in the past month, and they reported inconsistent use of condom or never using condom with regular clients (17.5 vs. 28.4%), and with boyfriend they do not cohabit with (37 vs. 57.9%). Self perceived risk for HIV was lower among FSW who tested as compared to those who have not tested (58.1 vs. 71.8%) and a lower percentage of them reported having 16 or more clients per week as compared to those who have not tested (61.3 vs. 69.6%). However, the two groups did not differ significantly in terms of educational status, age debut, age started sex-work and place of sex. The never tested FSWs were significantly more likely to report having lower abdominal pains (19.7 vs. 29.4%), foul smelling discharge (15.9 vs. 24.5%) and genital ulcerations (3.4 vs. 8.7%). There was significant difference between the two groups in their stigma and discrimination related attitudes with those who tested holding less stigma and discrimination attitudes than those who have not tested. Overall, FSW who ever tested were more likely to know where they can get advice on AIDS and get a confidential HIV test as compared to those who never tested.

The results of factors associated with having an HIV test are given in Table 3. Analysis of the multivariate results after controlling for the significant factors in univariate analysis show that those aged ≤ 24 (OR=7.203, CI: 1.06-49.07), having no children (OR=4.62, CI=0.82-26.02), those whose sexual debut is 17-19 (OR=0.25, CI: 0.08-0.81), consistent condom use every time (OR=0.22, CI: 0.08-0.60), currently having lower abdominal pains (OR=3.74, CI:1.36-10.29), currently having burning pain on urination (OR=0.09, CI=0.009-0.947) and genital ulceration (OR=4.969, CI=1.19-20.80) were all found to be factors significantly associated with having an HIV test, as well as the belief

Table 1. Socio demographic characteristics of female sex workers.

Variable	Percentage	Frequency (n=948)
Nationality		
Motswana	68.4	648
Zimbabwean	31.2	296
Other	0.3	3
Age		
<=24	25	237
25-29	32.2	305
30-34	24.6	233
35+	18.6	173
Number of children		
None	15.8	150
One	36.6	347
Two	28.7	272
Three and more	18.9	179
Marital status		
Married/cohabiting	3.9	37
Single	57.9	549
Once married	11.7	111
Boyfriend not cohabiting	26.5	251
Education		
Primary and lower	12.3	117
Junior	41.2	391
Senior/higher	46.5	440
Age started sex work		
<=21	33.6	319
22-26	31.9	302
27+	34.5	327
Other occupation		
None	67.7	642
Formal employment	15.9	151
Others	15.7	149
Age at first sex		
<=16	25.9	246
17-19	38.2	362
20+	35.9	340

that a teacher should be allowed to teach when they have HIV (OR=0.095, CI=0.016-20.80).

DISCUSSION

BBSS (2013) study where the data used in this paper

was derived is the first systematic survey on female sex workers in Botswana. Botswana's HIV prevalence among FSW's is 61.9%, more than 3 times that of the general population [Ministry of Health, 2013]. Although, Botswana introduced universal access to ART in 2002 for all patients with CD4 counts less than 200 or with AIDS defining illness and the routine HIV testing for all citizens

Table 2. Association between HIV testing and socio-demographic characteristics of FSWs.

Variable	Ever tested (N=845)		Never tested (N=102)		χ^2	p-Value
	n	%	n	%		
Nationality					5.627	0.229
Motswana	588	69.5	60	58.8		
Zimbabwean	254	30.0	42	41.2		
Other	3	0.3	0	0		
Age					14.287	0.03*
<=24	202	23.9	35	34.0		
25-29	285	33.7	20	19.4		
30-34	199	23.6	34	33.0		
35+	159	18.8	14	13.6		
Mean age (29.13)						
Median age (28)						
Number of children					15.553	0.001*
None	120	14.2	30	29.1		
One	316	37.4	31	30.1		
Two	248	29.3	24	23.1		
Three and more	161	19.1	18	17.5		
Marital status					8.234	0.041*
Married/Cohabiting	35	4.1	2	1.9		
Single	481	56.9	68	66.7		
Once married	95	11.2	16	15.5		
Boyfriend not cohabiting	234	27.7	17	16.5		
Education					1.018	0.602
Primary and lower	103	12.2	14	13.6		
Junior	345	40.8	46	44.7		
Senior/higher	397	47.0	43	41.7		
Age started sex-work					3.959	0.138
<=21	279	33.0	40	38.8		
22-26	278	32.9	24	23.3		
27+	288	34.1	39	37.9		
Other occupation					2.486	0.289
None	566	67.3	77	74.8		
Formal employment	139	16.6	12	11.7		
Others	135	16.1	14	13.6		
Paid not to use condom					1.916	0.166
Yes	247	29.3	37	35.9		
No	596	70.7	66	64.1		
Forced not to use condom					2.316	0.128
Yes	173	20.7	28	27.2		
No	664	79.3	75	72.8		
Self-perceived risk for HIV					7.280	0.026*
No/Small risk.	177	21.7	16	15.5		
Moderate	165	20.2	13	12.6		

Table 2. Cont'd.

High	474	58.1	74	71.8		
Alcohol consumption					6.581	0.087
Everyday	94	11.1	14	13.7		
Once a week	395	47.1	48	47.1		
Once a month	131	15.6	7	6.9		
Never	219	26.1	33	32.4		
Age at first sex					2.593	0.273
<15	321	38	28	27.2		
15-20	261	30.9	40	38.8		
20+	263	31.1	35	34		
Condom use with regular clients					7.038	0.03*
Every time	531	63.2	55	53.4		
Almost every time	162	19.3	19	18.6		
Sometimes/never	147	17.5	29	28.4		
Client volume per week					4.975	0.083
<=8	91	10.8	7	6.9		
9-15	236	27.9	24	23.5		
16+	519	61.3	71	69.6		
Condom use with boyfriend not cohabiting					6.478	0.039*
Every time	203	49.0	12	31.6		
Almost every time	58	14.0	4	10.5		
Sometimes/never	153	37.0	22	57.9		
Current have lower abdominal-pains					5.268	0.072
Yes	167	19.7	30	29.4		
No	678	80.1	72	70.6		
Current have excessive vaginal discharge					0.281	0.596
Yes	162	19.8	22	21.4		
No	682	80.2	80	78.6		
Current have foul smelly discharge					4.656	0.031*
Yes	134	15.9	25	24.5		
No	711	84.1	77	75.5		
Current have burning urine					0.503	0.478
Yes	75	8.9	7	6.8		
No	770	91.1	86	93.2		
Current have swelling groin					2.213	0.137
Yes	20	2.4	5	4.9		
No	825	97.6	98	95.1		
Current have genital ulceration					76.717	0.01**
Yes	29	3.4	9	8.7		
No	816	96.6	94	91.3		

Table 2. Cont'd.

Current have fever					1.524	0.217
Yes	71	8.5	5	5.0		
No	764	91.5	96	95.0		
Share a meal					21.151	0.000**
Yes	781	92.4	81	78.6		
No	64	7.6	22	21.4		
Give care					2.526	0.112
Yes	826	97.8	98	95.1		
No	19	2.2	5	4.9		
Teacher allowed to continue					19.693	0.000**
Yes	830	98.3	93	91.2		
No	14	1.7	9	8.8		
Buying					5.383	0.020*
Yes	759	89.9	84	82.4		
No	85	10.1	18	17.6		
Status of family remain a secrete					2.317	0.128
Yes	265	31.5	39	39.0		
No	577	68.5	61	61.0		

*Significant at 5% level; **significant at 1% level.

in 2004, with the goal of increasing the proportion of individuals aware of their status, these programs have not benefitted the high risk sub-populations of FSW (Kenyon, 2005). The laboratory confirmed results on HIV testing of this subpopulation show that 56% of the 912 who complete the HIV screening procedure tested HIV positive. The descriptive analysis show that the majority of the FSWs (89.2%) in the study claimed to have tested for HIV in the last 12 months. About 58.5% of those who tested reported a negative HIV status while 28.6% reported a positive HIV status. Of those who reported that they were HIV positive, about 38% of them reported being on ART. This means that all those with laboratory confirmed HIV infection the majority were not on ART. Of those who were HIV negative, the majority were also unaware of their status. This could be because they have never collected their results for fear of knowing ones HIV status.

Documented studies have shown that HIV-related stigma is a barrier to testing in Africa and elsewhere (Weiser, 2006; Arnott and Crago, 2009; Mtetwa et al., 2013; NACA, 2003). However, the results of this study showed social stigma and discrimination as an insignificant factor on having an HIV test. Importantly, the FSWs have less stigma related attitudes towards PLWA because all the questions on their opinion in relating to PLWA were not statistically significant except that the

odds for testing for those who think a teacher must not be allowed to teach when they have HIV is more than 10 times the odds for testing for those who think the teacher must be allowed to teach.

Analysis of the study results show young FSWs are more likely to have an HIV test and those who reported not having children. The odds of testing for HIV is over 7 times for those who are 24 years and younger as compared to those who are 35 years and older. This is inconsistent with a study by McGarrigle et al. (2005) where HIV testing was associated with old age among men than women. Similarly, FSWs who have no children were 4 times more likely to take an HIV test as compared to those who have 3 or more children and no significant difference for those who have one or two children. What could lead to this finding is not clear. One would expect the odds of testing to increase with the number of children, particularly with the hope that if one receives a positive test results they would enrol in the ART programme and prolong their lives to continue taking care of the children. The odds of taking an HIV test for those whose sexual debut is 20 years and above are almost 4 times of those who are 17 to 19 years and there is no significant difference for those who are under 16 years of age. The FSWs reported a high rate of symptomatic STIs which may increase their risk of contracting and transmitting HIV. Significantly, lower abdominal pains,

Table 3. Factors associated with ever taking an HIV test.

Variable	Sig	Exp(B)	95% CI for Exp(B)	
			Lower	Upper
Age (35+)	0.016*			
<=24	0.044*	7.203	1.057	49.066
25-29	0.748	1.369	0.202	9.284
30-34	0.885	1.153	0.167	7.960
Number of children (3 or more)	0.001**			
None	0.083	4.621	0.821	26.020
One	0.177	0.279	0.044	1.778
Two	0.975	1.026	0.217	4.851
Age at first sex(20+)	0.037*			
<=16	0.938	1.043	0.363	3.000
17-19	0.020*	0.252	0.079	0.806
Condom use with boyfriend not cohabiting (sometimes/never)	0.007**			
Every time	0.003**	0.215	0.078	0.595
Almost every time	0.066	0.202	0.037	1.109
Lower Abdominal pain	0.011*	3.738	1.359	10.285
Burning urination	0.045*	0.095	0.009	0.947
Genital ulceration	0.028*	4.969	1.187	20.802
Teacher allowed	0.014*	0.099	0.016	0.620
Constant	0.036	0.535		

*Significant at 5% level; **Significant at 1% level.

burning pain on urination and genital ulcerations were predictors of having an HIV test. FSWs who experienced lower abdominal pains had an AOR of 3.74 of reporting an HIV test, while FSW burning pain on urination had an AOR of 0.1 and those with reported genital ulcerations had AOR of 4.97. Almost half of those who reported having STI's accessed health service either at the government clinic or health worker. This confirms findings of previous studies that those who feel at risk because of STIs symptoms are more likely to seek testing (Xu, 2011; Wang et al., 2009). However, some FSWs underestimate their risk of contracting HIV, as this factor and the volume of clients serviced were not found to be significant. Similar finding were recorded by Wang et al. (2009) and made suggestions for educational programs to which can help raise HIV awareness and teach them to understand that HIV infections are often not asymptomatic. Major efforts to increase HIV testing among FSWs would be beneficial if they are encouraged to go for post test counselling and getting results. These efforts will encourage the FSWs to change their risky behaviours and for those who have positive sero-prevalence to take treatment and improve on their general health well-being.

There was significant evidence of inconsistent condom use with cohabiting boyfriends. Respondents who sometimes or never use the condom are more than four times likely to go for an HIV test than those who reported using the condom every time and almost every time. About 62% of the FSWs reported consistent condom use with their clients. However, these factors turned out insignificant in the model together with condom use with casual partners. Although, few FSW (3.7%) reported having boyfriends/married partners, simple analysis on condom use presented similar findings to other studies that they are less likely to use condoms with their boyfriends/married partners or casual partners to show trust and their level of intimacy (Grayman et al., 2005).

It has been observed that where coverage of prevention services is high, high levels of condom use have followed. Botswana has made significant interventions in HIV treatment programs and has developed a strong health care system to provide for services to PLWA. This framework should also be extended to FSW's and their clients in order to curb STIs and HIV infections. The study shows that HIV prevalence among sex workers is high in Botswana and there is little

participation in HIV prevention, treatment and care efforts. Similar observations were made in a study by Cowan et al. (2013) even though the Zimbabwean National Aids Council (NAC) initiated a programme for FSWs targeted at overcoming challenges related to access. Despite some of these huddles, there has been evidence of marked HIV reduction and social stigma where robust interventions are in place for FSWs and their clients (Chetsich et al., 2007; Shannon et al., 2015).

Limitations

The use of secondary data in this study imposed restrictions for further investigations and clarifications to be made in relation to HIV/AIDS prevalence among the respondents. Some of the required variables were available but not presented in a way the researcher would have preferred to use them hence we resorted to a recoding process which in itself has limitations. The data further exposes this research paper to the errors and would like to request that the results be interpreted with caution.

Conclusions

This is a baseline study conducted to collect data on the emerging sub-population, of whom little is known about their sexual behaviour in Botswana. The study demonstrated that female sex workers were disproportionately more vulnerable to HIV and other STIs. It is also known that by nature, sex workers engage in multiple concurrent partnerships which can serve as a “bridge” for HIV transmission between the most-at-risk groups and general population. The government of Botswana can curb the impact of HIV by scaling up prevention efforts among the most-at risk groups by removing the barriers and allowing them to participate in HIV prevention, treatment and care efforts.

Conflict of Interests

The authors declare that they have no conflict of interest.

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