

Factors Associated with HIV Testing Behaviors among Female Sex Workers in Rajshahi City, Bangladesh

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ABSTRACT Female sex workers are usually at high risk of transmission of HIV/AIDS. The aim of the study was to identify factors related to HIV testing behavior among FSWs in Rajshahi city, Bangladesh. A cross-sectional survey was conducted on 200 FSWs. The present study revealed that sixty-eight percent of FSWs in Rajshahi city have been tested for HIV. It was noted that FSWs who were between 21-30 years of age, had secondary, or higher level of education, came from a richer family, had been tested for sexually transmitted infections (STI), and traded sex at residence, were more likely to have been tested for HIV. FSWs used condoms while having sex, and regularly asked new clients on their HIV testing status, that were more likely had been tested for HIV. This information would allow health authorities to target FSWs who may not be aware of their health, and controlling HIV/AIDS in this country.

INTRODUCTION

HIV/AIDS is one of the major concerns for health authorities worldwide because it generally affects the young, and reproductive sectors of a population. UNAIDS reported that ninety percent of HIV positive people are living in poor and middle-income countries (Larose et al. 2011).

Overall negative outcomes from HIV/AIDS will be worse in economically poor and densely populated nations where financial and social resources to manage the infected participants and support of their dependents are very limited.

Bangladesh is a densely populated nation with a fast growing urban population with a growth rate of about six percent every year. Most of the FSWs are trading sex in urban areas. Female sex workers (FSWs) are considered to be an important at-risk group for HIV infection in Bangladesh (Uddin et al. 2014; Mondal et al. 2009; Azim et al. 2008; Rahman et al. 1998). Transmission through blood donation/transfusion is another mode of disease spread with the presence of 97 blood donation centers in the coun-

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try as organized by the Ministry of Health and Family Welfare (MOHFW) (Plan 2000). Information on the rate of HIV testing in high risk groups like injecting drug users (IDUs) and female sex workers (FSWs) will assist with prevention measures of this epidemic. It will allow more effective planning and execution of education programs in order to reduce the disease load in the community. Disease transmission can be potentially reduced by early treatment of those already infected and providing support for vulnerable groups (Leta et al. 2012).

Rajshahi is one of the fast growing cities in Bangladesh with population density of 4,890 per square kilometer and is located at the border with India separated by the Padma river (Uddin et al. 2014). Many people regularly travel between Bangladesh and India through this city for business, employment, touring, and education purposes (Wikipedia). India is a high-risk country for HIV/AIDS, and in 2014 the UN reported that India has the third highest number of HIV-infected people in the world.

Daily, the number of FSWs, and their clients are increasing in Rajshahi. As a result, population expose to the risk of HIV/AIDS by the sex trade is very high in Rajshahi city (Goni and Rahman 2012). In Bangladesh, the sex trade is not legal outside of registered brothels. Since there are no brothels in Rajshahi city, sex trades usually conducting business on the streets, in hotels, and in private residences (Uddin et al. 2014), making it difficult for authorities to locate, and contact FSWs as well as for researchers to conduct surveys.

Some studies have been carried out in regard to HIV testing behavior among FSWs. It was investigated that the factors related to HIV testing behavior among FSWs in southwest China, and they reported that FSWs who never had HIV testing were more likely to engage in high risk behaviors (Hong et al. 2012; Chanda et al. 2017; Inambao et al. 2017). They also identified a number of psychological and structural barriers to HIV testing. Tsereteli et al. (2013) studied HIV testing behavior among FSWs in Georgia, and they established the relationship between epidemiological factors, and HIV testing behaviors.

Due to the extensive range of the spread of HIV/AIDS through FSWs, and their clients, it is, therefore essential to be able to investigate HIV testing behaviors, and observe the epidemio-

logical factors such as age, residence, education level, marital status, economic condition, sex trading place, use condoms while having sex, and asking HIV testing for new client, in order to ensure that corrective measures can be undertaken.

Objective

The purpose of this study is to investigate epidemiological factors associated with HIV testing behaviors among FSWs in Rajshahi city, Bangladesh. This will allow the authorities to identify FSWs with high and lower rates of HIV testing so that appropriate measures can be directed toward selected groups.

METHODOLOGY

Materials

A total of 200 female sex workers (FSWs) were enrolled in the present cross-sectional study. The participants were Bangladeshi citizens, and living in Rajshahi city. The age of the FSWs at the time of measurement was 16-41 years old, with an average age of 24.52 ± 6.26 years. FSWs were interviewed from February to September of 2012 using a semi-structured pre and post tested questionnaire containing pre-coded and open-ended questions. Four different parts in the questionnaire dealt with general information, demographic, socio-economic, and sex behavior characteristics.

Sample Size Determination and Sampling Procedure

The social, cultural, and religious values of Bangladesh strongly oppose commercial sex, and therefore FSWs are generally reluctant to participate in any survey. FSWs frequently change their names, addresses, and contact numbers to avoid being identified. The current study was designed according to the principles of good clinical practice. First, cell phone numbers were collected from 500 FSWs from non-government organizations (NGOs) who were working for the welfare of FSWs in Rajshahi city. An appropriate mathematical formula was used to calculate the sample size. This was based on a consideration of eighty percent power of study and five percent level of significance. This formula pro-

vided 199 as a significant sample size for the present study. Two hundred and fifty among 500 FSWs were selected by applying simple random sampling. The principle author and one of the co-authors contacted peer educators and discussed about the research. The selected FSWs were explained properly the purpose of the research for social wellbeing by peer educators. Peer educators were employed by NGOs who were also FSWs and they continuously communicate with other FSWs. Peer educators discussed about the research with other FSWs, and they informed whether selected FSWs agreed or not. Among the 250 selected FSWs, 50 did not agree to be interviewed. Two of the investigators eventually interviewed 200 FSWs. A standard questionnaire was designed in the local language (Bengali) for taking information from the subjects. Most interviews were conducted at a venue suggested by the FSWs.

Analysis of Data

First, the Z-proportional test was used in this study to find a significance difference between two proportions ('Yes' and 'No' for HIV testing behavior). The outcome variable in this study was HIV testing behavior, and the question asked to assess the variable was, have you ever had an HIV test? The Chi-square test was utilized for testing the independency between HIV testing behavior, and other selected variables. Associated factors with HIV testing behavior were considered as independent variables for multiple logistic regression analysis (MLR). MLR was selected to examine the effect of selected independent factors on HIV testing behavior ('Yes' or 'No' for HIV testing). In this model, HIV testing behavior is considered as a dependent variable.

The underlying MLR model corresponding to each variable is:

$$\log [P/(1-P)] = \beta_0 + \sum \beta_j X_j$$

Where,

- ♦ P=the probability of Yes (HIV testing) (coded 1)
- ♦ 1-P = the probability of No (HIV not testing) (coded 0)
- ♦ X_j = independent variables:
- ♦ Age: age $\leq 20=1$, $21 \leq \text{age} \leq 30 = 2$, and age $\geq 31 = 3$
- ♦ Residence: urban =1, rural =2, and slum=3
- ♦ Education Level: uneducated = 0, primary =1, and secondary = 2

- ♦ Marital Status: married=1 and single =0
- ♦ Economic condition: rich=1, and poor=0
- ♦ Sexually transmitted infections testing: Yes =1, and No= 0
- ♦ Sex trading place: street =1, hotel=2, and residence =3
- ♦ Interested to use condom for safe sex: Yes =1, and No =0
- ♦ Asking HIV testing of new client: Yes =1, and No=0
- ♦ Informed about HIV test: Yes =1, and No=0
- ♦ β_0 = intercept term
- ♦ β_i = unknown logistic regression coefficients ($i = 1, 2, 3 \dots 9$).

The parameter β_i refers to the effect of X_i on the log odds such that $Y = 1$, controlling the other independent variables (X_j). The multicollinearity problem among independent variables was checked by the standard error (SE), if the magnitude of the SE lies between 0.001, and 0.5, it is judged that there is no evidence of multicollinearity. Statistical significance was accepted at $p < 0.05$. All statistical analyses were performed using IBM Statistical Package for the Social Science software version 19 (SPSS, Chicago, IL, USA).

RESULTS

Among the 200 FSWs interviewed, sixty-eight percent had already been tested for HIV, while thirty-two percent had not. Difference between the two proportions based on Z-test was statistically significant ($p < 0.01$). The mean age of FSWs was 24.52 ± 6.26 years (Table 1).

The χ^2 -test was used to detect the presence of an association between HIV testing behavior, and the selected factors. Slightly less than half (45%) of the FSWs interviewed were between 21-30 years old, and about the same percentage (45%) were from a slum environment. Only 42.5 percent of the FSWs had secondary, and higher education, while twelve percent were uneducated. Most of them (84.5%) were married, and were living with their husband. Most (67.5%) of the FSWs were considered to be rich, and about seventy-seven percent FSWs had been tested for STI testing before. Many FSWs (40.5%) had traded sex at hotels, followed by private residence (39%), and the streets (20.5%). Among the 200 FSWs, 80.5 percent were interested in using condoms while having sex with their cli-

Table 1: Mean age and distribution of HIV testing behavior among female sex workers (FSWs)

	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Minimum</i>	<i>Maximum</i>
Age of FSWs	200	24.52	6.26	16	41
	<i>Frequency</i>	<i>Percentage</i>	<i>Z-score</i>	<i>p-value</i>	
Have you ever had an HIV test?	Yes	136	68.00	7.2	p<0.01
	No	64	32.00		
	Total	200	100.0		

ents, but only 10.5 percent of them routinely asked their new clients about their HIV status. Chi-square test demonstrated that all selected variables were significantly associated with HIV testing behavior except residence and marital status, and hence, these two variables were then excluded from further analysis (Table 2).

MLR analysis demonstrated that FSWs who were 21-30 years old were more likely to undergo HIV testing than those who were less than 20 years ($p<0.01$, OR = 0.374; CI: 0.184-0.760), and those who were between 31-41 years old ($p<0.01$,

OR = 0.221; CI: 0.096-0.508). FSWs with secondary, or higher education were more likely to undergo HIV testing, 0.074 ($p<0.01$) and 0.303 ($p<0.01$) times higher than uneducated, and primary educated counterparts, respectively. FSWs who came from rich family backgrounds were 0.531 ($p<0.05$) times more likely to have HIV testing done compared to those from poor family backgrounds (Table 3). FSWs who had previously been tested for STI were also more likely to have HIV testing compared those who had no history of STI testing ($p<0.01$, OR=0.151; CI:

Table 2: Association between HIV testing behavior and selected factors

		<i>HIV testing behavior</i>			
		<i>Yes</i>	<i>No</i>	<i>χ²-value</i>	<i>p-value</i>
<i>Sex Trading Place with Client</i>	Street (20.5%)	21 (51.2%)	20 (48.8%)	10.281	p<0.05
	Hotel (40.5%)	53 (65.4%)	28 (34.6%)		
	Residence (39%)	62 (79.5%)	16 (20.5%)		
<i>Residence</i>	Urban (25%)	39 (78.0%)	11 (22.0%)	3.502	p<0.174
	Rural (29.5%)	40 (67.8%)	19 (32.2%)		
	Slum (45.5%)	57 (62.6%)	34 (37.4%)		
<i>Age Group</i>	Age ≤20 (36.5%)	45 (61.6%)	28 (38.4%)	14.933	p<0.01
	21 ≤Age ≤30 (45%)	73 (81.1%)	17 (18.9%)		
	31 ≤Age ≤41 (18.5%)	18 (48.6%)	19 (51.4%)		
<i>Have You Ever had a Sexually Transmitted Infections (STIS) Test</i>	Yes (77%)	120 (77.9%)	34 (22.1%)	30.293	p<0.01
	No (23%)	16 (34.8%)	30 (65.2%)		
<i>Have You Informed about HIV Test?</i>	Yes (83.5%)	132 (79.0%)	35 (21.0%)	56.710	p<0.01
	No (16.5%)	4 (12.1%)	29 (87.9%)		
<i>Education Level of FSWs</i>	No education (12%)	7 (29.2%)	17 (70.8%)	28.737	p<0.01
	Primary education (45.5%)	57 (62.6%)	34 (37.4%)		
	Secondary and higher education (42.5%)	72 (84.7%)	13 (15.3%)		
<i>Marital Status</i>	Married (84.5%)	118 (69.8%)	51 (30.2%)	1.664	p<0.197
	Single (15.5%)	18 (58.1%)	13 (41.9%)		
<i>Social Status</i>	Poor (32.5%)	38 (58.5%)	27 (41.5%)	4.026	p<0.05
	Rich (67.5%)	98 (72.6%)	37 (27.4%)		
<i>Are You Interested to Use Condom for Safe Sex?</i>	Yes (80.5%)	120 (74.5%)	41 (25.5%)	16.200	p<0.01
	No (19.5%)	16 (41.0%)	23 (59.0%)		
<i>Do You Ask New Client about His HIV Testing?</i>	Yes (10.5%)	19 (90.5%)	2 (9.5%)	5.447	p<0.05
	No (89.5%)	117 (65.4%)	62 (34.6%)		

Table 3: Effect of socio-economic factors on HIV testing behavior among female sex workers

Variable	Group	Coefficients	S.E.	p-value	Adjusted odds ratio (AOR)	95% CI for AOR	
						Lower	Upper
Sex Trading Place							
Age Group	Street vs Residence ^R	-1.306	0.420	p<0.01			
	Hotel vs Residence ^R	-0.716	0.365	p<0.01	0.271	0.119	0.617
				p<0.05	0.488	0.239	0.999
	Age ≤ 20 Vs 21≤	-0.983	0.361	p<0.01			
	Age ≤30 ^R			p<0.01	0.374	0.184	0.760
STI Test	31≤Age ≤41 Vs	-1.511	0.425	p<0.01	0.221	0.096	0.508
	21≤Age ≤30 ^R						
	No vs Yes ^R	-1.890	0.365	p<0.01	0.151	0.074	0.309
Informed HIV	No vs Yes ^R	-3.308	0.566	p<0.01	0.037	0.012	0.111
Education of FSWs							
Social Status	No vs Secondary and higher ^R	-2.599	0.541	p<0.01	0.074	0.026	0.215
	Primary vs Secondary and higher ^R	-1.195	0.371	p<0.01	0.303	0.146	0.627
	Poor vs Rich ^R	-0.632	0.317	p<0.05	0.531	0.285	0.989
Use Condom	No vs Yes ^R	-1.437	0.372	p<0.01	0.238	0.115	0.493
Having Sex							
Asking HIV	No vs Yes ^R	-1.616	0.760	p<0.05	0.199	0.045	0.881
Testing of New Client	Constant	3.55	1.04	p<0.01	34.827		

Note: R denotes reference group

0.074-0.309). Sex trade on residence based FSWs were more likely to have HIV testing than street based (p<0.01, OR = 0.217; CI: 0.119-0.617), and hotel based (p<0.01, OR=0.488; CI: 0.239-0.999) FSWs. Those who practiced use of condom during sex with their clients were more likely to have HIV testing than their counterparts (p<0.01, OR= 0.238; CI: 0.115-0.493), and a similar tendency was also noted for those who routinely asked their new clients about their HIV testing status (p<0.05, OR = 0.199; CI: 0.045-0.881) (Table 3).

DISCUSSION

There were several socio-demographic studies on FSWs, and their commercial sex activities in Bangladesh (Uddin et al. 2014; Gazi et al. 2008). However, the study on rates of HIV testing behavior and factors related to willingness to undergo the test have not been reported. It was noted that only sixty-eight percent of FSWs in Rajshahi city have been tested for HIV. Although that rate was relatively high when compared to the forty-eight percent reported in a study based on the cities of Guilin and Beihai in China (Hong et al. 2012), Zambia (Chanda et al. 2017). It is still an alarmingly high figure considering that Bang-

ladesh is very densely populated country with very limited resources to counter the negative outcome of HIV/AIDs on the population. Moreover, Bangladesh is also a major source of labor for many other developing countries including India, and other South East Asian nations, and thus, problems with HIV/AIDs would also adversely affect the productivity of those younger populations.

This study has demonstrated that sex traded at residence and hotel-based FSWs were more likely to have HIV testing than street-based FSWs. Higher percentage of street-based FSWs were from slum, or rural areas, and many received little, or only a primary level of education. Lack of knowledge and time were considered to be the main reasons for low rate of HIV testing among street-based FSWs (Mondal et al. 2008). In Rajshahi city, this group of FSWs is more likely to spread HIV/AIDs infection because their potential clients are mainly rickshaw pullers, day laborers, and transport workers who may also be unaware about HIV/AIDs. FSWs aged 21-30 years old were generally more aware, and willing to undergo HIV testing, while those above 30 years of age may have a false sense of security because they have survived over the years as reported in another study (Uddin et al. 2014).

Awareness programs on availability, and importance of HIV testing, and behavior change communication (BCC) programs should be organized for all FSWs in all major cities of Bangladesh including Rajshahi. Risk of HIV/AIDS among FSWs in low and middle income countries like Bangladesh, China, India, and Nepal is about 14 times higher than the global population in general (Baral et al. 2012). Frequent change in place of stay, and migration between cities were some of the barriers for FSWs to gain proper information about HIV/AIDS, and HIV testing (Uddin et al. 2014). Eighty-three percent of all FSWs in the current study were aware about HIV testing. Females were noted to be four times more vulnerable than men to be infected with HIV/AIDS, and this should serve as a strong reason for them to protect themselves (Tsereteli et al. 2013).

One of the major factors that influence the effort towards prevention of HIV/AIDS is education. In Rajshahi, the rate of HIV testing among FSWs with secondary level or higher education was higher than FSWs who were uneducated, and those with primary education. Educated FSWs were closer to mainstream of the society, and they have been more exposed to information related to health in the form of electronic and print media.

The study showed that most of the FSWs were married, and were living with their spouses. Most (61.7%) married women in Bangladesh preferred to use oral contraceptive pills, and the use of condoms (21.4%) was less popular (Ferdousi et al. 2010). In Bangladesh, oral contraceptive pills were being distributed through health clinics by government, and non-governmental organizations. This provides a good opportunity where awareness on HIV/AIDS, and availability of HIV testing can be disseminated. However, unmarried FSWs were generally more hesitant to attend these clinics due to social barriers, and so they may not have access to this information.

Clients of FSWs are the most important source and mode of spread for HIV/AIDS. This study showed that most of the FSWs did not ask new clients about their HIV testing status. FSWs that had already undergone HIV testing were more interested to know about the HIV testing status of their new clients.

In Rajshahi city the sex trade is based on the sexual act, and not on the time spent. Young FSWs are keen to look for new customers, and may not have time to discuss matters like HIV/

AIDS testing. Use of condoms is an effective method to reduce, or control the HIV/AIDS epidemic (Hong et al. 2012). This study showed that FSWs who had HIV testing done generally prefer the use of condoms during the sex trade, while those who had not been tested were less likely to do so. Increasing awareness on the infection prevention, and promoting the use of condoms should contribute towards reduction, and control of HIV/AIDS.

In the present study only the HIV testing behaviors and factors associated with HIV testing among FSWs were investigated. Thus, it is essential to estimate the prevalence, and investigate the epidemiological factors associated with HIV/AIDS patients among FSWs in Rajshahi, and other big cities in Bangladesh. Clearly, more research will be required with FSWs in Bangladesh.

CONCLUSION

In conclusion, the study showed that sixty-eight percent of FSWs in Rajshahi city had been tested for HIV. Factors associated with higher rate of HIV testing included age between 21-30 years, higher level of education, richer family background, and history of STI testing. FSWs that had been tested for HIV were more likely to use condoms, and asked their new clients on their HIV testing status. This information will help the health authorities target groups of FSWs who have not undergone HIV testing. This should contribute towards better control of HIV/AIDS, which is at epidemic levels in this country.

RECOMMENDATIONS

The findings of this study may have some policy implications and recommendations that would be helpful for the health authorities and policymakers to achieve considerable improvement in the area of HIV testing behavior among Bangladeshi FSWs. This study suggests that government and non-government health authorities should take proper initiatives for making awareness about the benefit of HIV testing among promoting the awareness about the benefit of early initiation of breastfeeding among FSWs in Bangladesh.

Ethics Approval and Consent to Participate

There is no brothel in Rajshahi city, Bangladesh. FSWs are trading sex without registration, and they do not like to expose themselves

socially as a sex worker for numerous reasons. The ethical approach to interviewing this population is challenging. To overcome this problem, the researchers approached to get an interview and it maintained strict confidentiality and would use the data only for research purpose. Written consent was taken from each participant after a detailed oral explanation about the present study. All rules and regulations of the ethics committee, *Institute of Biological Science (IBSc), Rajshahi University, Bangladesh* have been followed in this study. The research has been approved by the ethical committee of IBSc.

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