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Prevalence of Sexually Transmitted Infections and Associated Factors among Commercial Sex Workers in Modjo Town East–Shewa, Ethiopia, 2018 G.C: Cross-Sectional Study

Kitila FL[1], Amare YW[2]* and Gamada BD[1]

[1]Department of Public health, College of Health Science, Arsi University, Ethiopia
[2]Department of Midwifery, college of health Science, Arsi University, Ethiopia

***Corresponding author:** Yirga Wondu, Master of maternal and reproductive health nursing, Department of Midwifery, college of health Science, Arsi University, Asella, Ethiopia, Email: wonyir@gmail.com

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Abstract

Background: Sexually transmitted diseases refer to those conditions caused by pathogens that can be acquired and transmitted through unprotected sexual intercourse. It is known for causing a variety of clinical syndromes, including abnormal genital discharge, genital ulcer/sore, inguinal bubo, and lower abdominal pain in females. Sexually transmitted infections are a major public health concern in developing countries. In a number of countries the prevalence of HIV and sexually transmitted infections are higher among female sex workers than other women.

Objective: To determine the prevalence of sexually transmitted Infection and associated factors among commercial sex workers in Modjo town, East shewa, Ethiopia.

Methods: Cross sectional study, design was employed to examine prevalence of sexually transmitted infections and associated factors among commercial sex workers in Modjo town. Two hundred fifty commercial sex workers were selected using systematic random sampling procedure and data was collected using pre-tested semi structured questionnaire. Data was entered into Epi Info version 7, checked, coded and analyzed using SPSS version 21 software. The degree of association between outcome and predictors was assessed using Odds ratio with 95% confidence interval. In all cases, P-values less than 0.05 were considered statistically significant

Result: The magnitude of sexually transmitted infections among commercial sex workers with at least one syndrome in the study area was 40.7%. Among them, 68(27.6%), 30(12.2%), and 21(8.5%) of the total respondents had experienced vaginal discharge, vaginal ulcer, and inguinal bubo syndromes, respectively. Drug use (AOR=6.95, 95% CI= 1.62-29.72), condom slippage (AOR=3.73, 95% CI=1.79-7.75) and having children (AOR=1.86 95% CI 1.01-3.41) were significantly associated with sexually transmitted infections.

Conclusion: A considerable proportion of commercial sex workers were infected by sexually transmitted infections. Had samples for laboratory been collected and examined, the actual prevalence in the study area could even be worse than the current finding.

Keywords: Sexually Transmitted Infections; Associated Factors; Commercial Sex Workers; Modjo Town

Abbreviations: AIDS: Acquired Immune Deficiency Syndrome; AOR: Adjusted Odds Ratio; CDC: Communicable Disease Control; COR: Crude Odds Ratio; DHS: Demographic and Health Surveys; EDHS: Ethiopia Demographic and Health Surveys; EPHI: Ethiopian Public Health Institution; FMOH: Federal Ministry of Health; LAP: Lower Abdominal Pain; MDG: Millennium Development Goal; NGO: Non-Governmental Organization; OR: Odds Ratio; PID: Pelvic Inflammatory Disease; STD: Sexually Transmitted Disease; STI: Sexually Transmitted Infection; UNAIDS: United Nations on AIDS; UNCEF: United Nation Children Fund; WHO: World Health Organization.

Background

Sexually transmitted diseases (STDs) refer to those conditions caused by pathogens that can be acquired and transmitted through unprotected sexual intercourse. Bacteria, viruses, protozoa, fungi, and ectoparasites can cause them [1,2]. It is known for causing a variety of clinical syndromes, including abnormal genital discharge, genital ulcer/sore, inguinal bubo, and lower abdominal pain in females [3].

STDs are global public health problems, which cause acute illness, infertility, long-term disability, and death, with severe medical and psychological consequences in millions of males, females, and infants [4]. Sexually transmitted infections (STIs) are a major public health concern in developing countries. They are increasing with the advent of human immunodeficiency virus (HIV) infection, particularly in sub-Saharan Africa. Sex workers (SWs) are the most vulnerable population [5].

Women sell sex work in a variety of environments. Harcourt and Donovan described „direct" sex work as sexual services in which the primary purpose of the interaction is to exchange sex for a fee; women involved in direct sex work typically rely on this as their primary source of income. Working in a brothel is the most common and well known example of involvement in direct sex work. In contrast, women in „indirect" sex work often have legitimate occupations providing non-sexual services to patrons in places like bars and massage parlors, and through this occupation they also solicit sex to clients [6].

In low and middle-income countries, symptomatic STIs are treated by syndromic management (presumptive treatment for symptomatic people without the use of laboratory tests), but most STIs are asymptomatic and go unnoticed and untreated. Both symptomatic and asymptomatic STIs can cause serious morbidity, including pregnancy complications, cancer, infertility, and enhanced HIV transmission [7]. Different scholars who are working in the area believe that the magnitude of STDs is considerably increasing from day to day.

In a number of countries the prevalence of HIV and sexually transmitted infections (STIs) are higher among female sex workers than other women [8].

Eighty-six percent of the world"s burden of STDs occurs in the developing countries having greatest burden in the poorest countries, many of which are in sub-Saharan Africa. In this part of the world, identification and management of STDs are limited and the STDs disproportionately affect females. The morbidity from STDs (excluding HIV) in females aged 15–49 years ranks second next to maternal causes [4].

Female commercial sex workers have been viewed both by laypersons and epidemiologists as one of the high-risk groups for infections and transmission of STDs [5,9]. Therefore, this study aims to give insight on the prevalence and associated factors with STIs among commercial sex workers in Modjo town.

Methods and Materials

Study Design and Period

Cross-sectional study was conducted among female sex workers in mojo town, East shewa Ethiopia, from July 10-17 in 2018.

Study Area

Modjo is a town located in the East Shewa of oromia regional state about 75 km east of the capital city of Addis Ababa. According to the 2007 Ethiopian census report and based on annual population growth rate, Modjo has estimated a total population of 54,265 and almost half of 27,130 (49.9%) are males. Administratively the town is divided into two sub cities. The Town has one District hospital, one private hospital, one government health centers and 26 Hotels, 22 Bar & restaurants and 60 Groceries. According to Modjo town health office, a total of 952 commercial sex workers were found in the town.

The town been identified by the Government as the key node for the emerging Ethiopian intermodal trade logistics system. Most of medium and large manufacturing firms connected to international markets are located in the surrounding areas of Addis Ababa and the numbers of these firms has been rising every year. It is envisaged that Modjo is playing an increasingly important role as the main port in Ethiopia to facilitate the prompt evacuation of import traffic from Djibouti. The average traffic flows on the Djibouti-Addis Ababa corridor, which passes through Modjo town, is 300-

350 trucks per day.

Source and Study Population

Source population: The source populations for the study were all commercial sex workers in mojo town
Study population: The study populations were randomly selected commercial sex workers.

Inclusion and Exclusion Criteria

Inclusion criteria: Commercial sex workers willing to take part on the study were included in the study.
Exclusion criteria: Critically ill commercial sex workers, Age less than 18 years old and not voluntary to participate on the study.

Sample Size and Sampling Procedures

Sample size determination: The required sample size for first objective was determined using single population proportion formula by considering the following parameters and assumption.

P= 20.6% proportion of STI from the previous study conducted on the related topic using similar population group) [5].

d= Margin of error 5 % with 95% confidence level.
Z α/2 = 1.96 (level of significance)

$$n = \frac{Z^2\ \alpha/2 * p(1-p)}{W^2} = \frac{1.96^2 * 0.206\ (1\text{-}0.206)}{0.05^2} = 251$$

Considering 10% possible non-response rate, the final sample size was **276 participants**.

Sample size for the second objective or factors associated with STI among commercial sex workers [5].

Variable	STI	Proportion	Sample Size
Sex without	Yes	P1 = 5.1	308
condom with		P2 = 15.4	
paying	NO	Ratio1:1,Power	
clients		80	

Table 1: Sample size calculation for the second objectives.

Using EPI INFO stat calculation the sample of association factor for STI using 10 % non-respondent rate is 339.

Which is n = 308+ 10%*308= 339

So the large sample size for both objectives was objective two, which is 339

Since the total number of commercial sex workers in Modjo is 952, we use finite population correction formula to come up with the final sample size.

$$nf = \frac{n0\ (339/1+339/952)}{1+n_0/N} = 250$$

Therefore, the final sample size was 250

Sampling procedure: Initially, hotel, bars and night clubs where the commercial sex workers had been working was selected randomly. After selection of the hotels, bars and night clubs, the sample size of the study was proportionally allocated to each selected facility. Then, all study participants who fulfilled the inclusion criteria were interviewed.

Variables of the study

➢ **Dependant Variable**

- STIs syndrome

➢ **Independent Variables**

- Socio-demographic variables (age, educational status, marital status, religion, ethnicity, place where the participant were raised, year of employment, occupation of family)
- Unsafe sex, alcohol use, drug use, forced sex, condom use, year of employment, family occupation, place of growth and others.

➢ **Operational Definitions**

Syndromic approach:

- Diagnosing using a collection of sign and symptoms
- The occurrence of sexually transmitted infections was identified if commercial sex worker had experienced symptoms of vaginal discharge or genital ulcer or inguinal
- Bubo or more than one of these symptoms in the last 12 months of the survey).

Sexual assault:

- Sexual abuse or rape case which occurred on someone Unprotected/Unsafe sex:
- Sexual practice without condom
- Sexual practice with in short period of time of knowing someone and without knowing HIV test result of each other

Data Collection Procedures (Instruments, Personnel, Measurements) & Quality Assurance

Semi structured interview-administered questionnaire was used for data collection, which was adapted from different literature. The questionnaire is initially prepared in

English, then translated in to Amharic, and back translated to English to ensure the consistency of two versions by language experts. Pre-test was conducted on 5% of the sample size in Adama town. Necessary corrections were made based on the finding of pre-test before actual data collection.

Three diploma nurses having previous experience of data collection in such study group collected data. Two BSc nurses were recruited to conduct supervision during data collection.

Moreover, two days training were given for data collectors and supervisors on how to maintain confidentiality of the information, methods of obtaining informed consent and the contents of the questionnaire in detail. Before actual data collection, respondents were briefed about the purpose of the study and informed consents were taken. Each filled questionnaire was checked for completeness and consistency.

Data Processing and Analysis

The collected data was entered in to Epi info Version 7 software for data exploration and cleaning then the cleaned data was exported to SPSS version 21 for analysis. Descriptive statistics was used to assess the prevalence of sexually transmitted infections among commercial sex workers. Bivariate and multivariate regression was run to determine the relationship between outcome and predictors. The crude and adjusted odds ratios with the corresponding 95% confidence intervals were computed. A P-value<0.05 was considered statistically significant.

Ethical considerations

The study was carried out after getting permission from the ethical review board of Arsi University, College of Health science. Informed consent was obtained from each respondent after explanation of the objective of the study. Those who were not participating in the study were not forced. Confidentiality of the information was obtained and assured. The instrument and procedures did not cause any harm to the study subjects and the data collectors.

Result

Socio Demographic Characteristics

Two hundred forty six commercial sex workers were participated in this study giving overall response rate of 98.4%. Nearly half of respondents 116(47.2%) belongs to the age groups of 18-24 years. The mean age was 24.4593+ SD 4.4708. More than half, 128(52%) of the respondents were orthodox Christians. More than one-third, 79(32.1%) of respondent's belongs to Amhara ethnic groups (Table 2).

Variables(n=246)	Frequency	Percentage (%)
Age		
<18 years	17	6.9
18-24 years	116	47.2
25-30years	89	36.2
>30 years	24	9.8
Ethnicity		
Oromo	67	27.2
Amhara	79	32.1
Tigrie	39	15.9
Gurage	35	14.2
Others	26	10.6
Religion		
Orthodox	128	52
Muslim	59	24
Protestant	37	15
Catholic	19	7.7
Others	3	1.2
Educational status		
Illiterate	54	22

Able to read and write	91	37
Elementary	66	26.8
High school	29	11.8
College and above	6	2.4
Place of growth		
Urban	111	45.1
Rural	135	54.9
Family occupation		
Farmers	77	31.3
Daily workers	57	23.2
Government employee	37	15
Privet employee	47	19.1
Own business	28	11.4
Raised by		
Mothers only	37	15
Fathers only	33	13.4
Both	87	35.4
Relatives	66	26.8
Non family	23	9.3
Occupation before sex work		
Unemployed	52	21.1
Student	79	32.1
Servant	76	30.9
Tea/coffee service	31	12.6
Others	8	3.3
Married before		
Yes	118	48
No	128	52
Type of sex work		
Home based	25	10.2
Bar based	121	49.2
Street based	66	26.8
Phone based	34	13.8
Years of employment as sex worker		
≤ 1	58	23.6
01-Mar	146	59.3
≥3	42	17.1

Table 2: Socio demographic characteristics of female commercial sex workers in Modjo town, East Shewa, Ethiopia, 2018 G.C.

Sexual Behavior of Female Commercial Sex Workers

The findings of this study revealed that majority of respondents, 216(87.8%) have had sex before they commenced commercial sex work before the age of 18 years. The mean and standard deviation of age at first sexual initiation was 16.12+SD 2.18 years. It was found that 96 (39%) of the respondents initiated sex through friends.

However, almost quarter of the total respondents 58(23.6%) reported violence as part of their first experiences of sex. Regarding the number of sexual partners, 106 (43.1%), participants reported two sexual clients per day. Moreover, 59(24%) of participants had sex without condom for all sex with non-paying clients during their sexual life. In addition, 89(36.2%) participants had sex without condom with highly paying clients. In relation to substance use, 202(82.1%) of participants had used alcohol and 195(79.3%) of the respondents reported using other drugs prior to sex (Table 3).

Variables(n=246)	Frequency	Percentage (%)
Age at first sexual intercourse		
<18	216	87.8
>18	30	12.2
Reason for the first sexual intercourse		
Marriage	49	19.9
Friendly	96	39
Gift/money	43	17.5
Violence	58	23.6
Do you have children		
Yes	134	54.5
No	112	45.5
If yes, how many		
One	66	49.2
Two	48	35.8
More than two	20	15
Average number of clients per day		
One	81	32.9
Two	106	43.1
More than two	59	24
Do you have nonpaying client		
Yes	174	70.7
No	72	29.3
Do you use condom with nonpaying client		
Yes	115	46.7
No	59	24
Reason for not using condom with nonpaying		
My boy friend	29	49.1
Regular client	15	25.4
Forced	10	17
Others	5	8.5
Sex without condom with paying clients		
Yes	157	63.8
No	89	36.2
Reason for sex without condom with paying client		

Love	55	22.4
High payment	74	30.1
Intoxicated	18	7.3
Forced	10	4.1
Anal sex practice		
Yes	24	9.8
No	222	90.2
Condom slipped		
Yes	150	61
No	96	39
Condom breakage		
Yes	189	76.8
No	57	23.2
Alcohol use during sexual intercourse		
Yes	202	82.1
No	44	17.9
Drug use prior to sexual intercourse		
Yes	195	79.3
No	51	20.7

Table 3: Sexual behavior of female commercial sex workers in Modjo town, East Shewa, Ethiopia, 2018G.C.

Prevalence of STI

Among 246 commercial sex workers, 100 (40.7%) of participants had experienced one or more of the three symptomatic characteristics of STDs in the last 12 months of the study period. Among them, 68 (27.6%), 30(12.2%), and 21 (8.5%) of the total respondents had experienced vaginal discharge, vaginal ulcer, and inguinal bubo syndromes, respectively. Therefore, the overall STI prevalence in this study was 40.7 % (Figure 1).

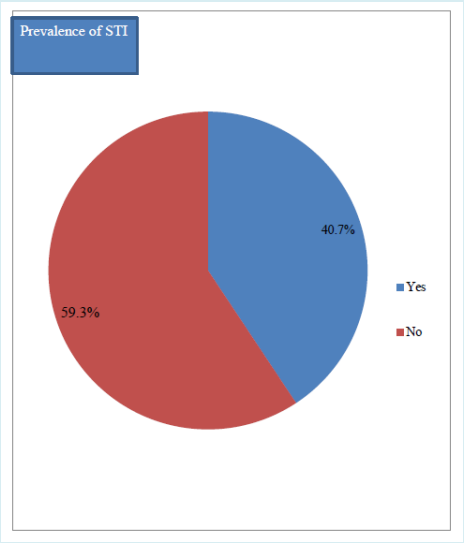

Figure 1: Prevalence of sexually transmitted infection among commercial sex workers in Modjo town, South East Ethiopia, 2018 G.C.

Factors Associated with STI

In multivariable logistic regression, drug use (AOR=6.95, 95% CI= 1.62-29.72), condom slippage (AOR=3.73, 95% CI=1.79-7.75) and having children (AOR=1.86 95% CI 1.01-3.41) are known to have significant association with sexually transmitted infection among commercial sex workers (Table 4).

Variables (n=246)	STI		COR (95%CI)	AOR(95%C)
	Yes	No		
Year of employment as sex workers				
≤1	21	37	1	1
01-Mar	60	86	1.229(0.655,2.305)	0.824(0.378,1.794)
≥3	19	23	1.455(0.648,3.272)	0.965(0.359,2.598)
Sex without condom with paying client				
Yes	63	94	0.942(0.555,1.598)	0.831(0.441,1.564)
No	37	52	1	1
Alcohol drinking				
Yes	97	105	12.625(3.786,42.099)*	3.322(0.74,14.912)
No	3	41	1	1
Average number of clients per day				
One	31	50	1	1
Two	49	57	1.387(0.770,2.498)	1.268(0.644,2.495)
More than two	20	39	0.827(0.410,1.667)	1.115(0.485,2.562)
Having children				
Yes	43	91	1	1
No	57	55	2.913(1.036,3.683)*	1.861(1.015,3.411)**
Condom slipped				
Yes	81	69	4.757(2.622,8.634)*	3.733(1.797,7.754)**
No	19	77	1	1
Condom breakage				
Yes	88	101	3.267(1.626,6.566)*	0.796(0.319,1.984)
No	12	45	1	1
Drug use/canabis				
Yes	97	98	115.837(4.771,52.565)*	6.943(1.622,29.719)**
No	3	48	1	1

(*show association on bivariate analysis **statistical significant).

Table 4: Bivariate and multiple logistic regression analysis of factors associated with STI among commercial sex workers in Modjo town, South East Ethiopia, 2018.

Discussion

Among 246 female commercial sex workers (FCSWs) participated in this study, 40.7% of participants had experienced one or more of the three symptomatic characteristic of STDs in the last 12 months of the study period. Of them, 27.6%, 12.2%, and 8.5% of the respondents had reported vaginal discharge, vaginal ulcer, and inguinal bubo syndromes, respectively. The prevalence of vaginal discharge in this study was higher; however, vaginal ulcer and inguinal bubo syndromes were lower than the study findings in Finoteselam [5].

Shockingly, the prevalence of sexually transmitted

infection among commercial sex workers in the study area was high. This finding was higher than study conducted in Netherlands, 9.5% [10], Malawi, 20 % [11], Nepal,17.5% [12] and Finoteselam northwest Ethiopia, 20.6 % [5]. This variation could be due to the emergence of "hotspots" in the study area such as, dry port, large-scale commercial farms, infrastructure developments (such as express road construction sites from Modjo to Hawasa), factories, trade routes and new industrial zones that attracts mobile groups, which in turn results in high prevalence of STIs among commercial sex workers. Furthermore, low awareness of the study participants could also be the other reason for high prevalence.

Compared to this study, higher prevalence of STIs has been reported in Iran (84.9%) [13] and India (74.6%) [14]. In fact, reported STIs represent only the tip of the iceberg because most infections are entirely asymptomatic, especially for women. In our study, we only took symptomatic cases in the last 12 months. Had samples for laboratory been collected and examined, the actual prevalence in the study area could even be worse than the current finding. This could be the reason for lower prevalence in our study compared with Iran and India.

In the current study, the odd of being infected by STIs is increased by almost sevenfold among commercial sex workers who use illicit drugs (cannabis) as compared with those who did not use. This finding is consistent with a study conducted in India revealing drug-using FSWs more likely to test positive for one or more STIs (59% vs. 33.5%) compared to their non-drug using counterparts [15]. This could be because consumption of drugs is known to affect the decision-making power of the commercial sex workers. This in turn will expose them to experience risky sexual practice that results with high chance of being infected with STIs.

The finding of this study is in line with the studies conducted in Finoteselam and Iran with regard to condom slippage [5,13]. Commercial sex workers who encountered condom slippage during sexual intercourse in the past 12 months were three times more likely to be infected with STIs compared to their counterparts. This could be because of lack of intervention regarding proper condom usage. Surprisingly, commercial sex workers having no children were almost two times more likely to be infected with STIs compared with those who had children. This could be partly explained by the fact that responsibilities associated with motherhood decreases vulnerability to STIs.

As a limitation, this study dealt with very sensitive and private issues. For that reason, the possibility of underestimation could not be ruled out. Besides, the study did not test for STDs but used self-reported data on syndromes of STDs to determine both the prevalence of STDs and the factors that affect them. This might underestimate the prevalence and is subject to recall bias too.

Declaration

We, authors declare that this article has not been published or submitted anywhere for publication.

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Authors Contribution: All the three authors participated in the design and analysis of the study. Firaol Lemessa searched the database, and wrote the first and the second draft of the article. The rest two authors took a part in reviewing the whole components of the research article and approved for the final version.

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