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## Magnitude and Associated Factors for Sexually Transmitted Infections Among Hawassa Industrial Park Workers, Southern Ethiopia

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### ABSTRACT

Sexually Transmitted Infections (STI) are a group of infectious diseases spread through unprotected sexual intercourse, resulting in curable and incurable diseases. The syndrome is a variety of clinical signs and symptoms caused by pathogens that can be acquired and transmitted through sexual activity. Around the world estimated about 376 million people become infected each year with one of four common curable STIs where about 86 million new cases of curable STIs occurred in the African region. The objective of this study to assess the magnitude and associated factors for Sexually transmitted infections in 2020 among Hawassa industrial park workers, Southern Ethiopia. The multistage sampling technique was used to select a total of 663 study participants. The data were entered into the Epi-Data version 4.4 and analyzed by SPSS version 21. Both bivariate and multivariable logistic regression analyses were employed P-values of <0.05 and AOR with 95%CI was used to determine the presence of association between covariates and dependent variable. The Self-reported STI magnitude in the last 12 months was 18.7% (18.54-18.91) among the Hawassa industrial park workers. Hometown residence [AOR=2.29; 95%CI: 1.34-3.92], drinking alcohol (AOR=3.26; 95%CI: 1.74-6.09), view/read pornography (AOR=4.38; 95%CI: 2.67-7.18) and poor knowledge (AOR=2.69; 95%CI: 1.65-4.420) were significantly associated with the magnitude of STIs. The Self-reported magnitude of STIs among Hawassa Industrial Park was found to be high.

### INTRODUCTION

Sexually transmitted infections (STIs) are a group of infectious diseases transmitted through unsafe sexual intercourse as the primary mode of transmission. (Workowski K, 2015). Please follow the referencing style of the journal (APA 6/7th Edition). The organisms causing STIs can also be spread through other routes such as blood transfusion, tissue transfer, skin-to-skin sexual contact, mother-to-child, and blood or blood products (WHO, 2014) (FMOH, 2015). To date more than 30 pathogens; bacterial, viral, fungus, protozoa and ectoparasites have been identified that can be transmitted through sexual intercourse. Commonly known curable STIs is Syphilis, Gonorrhea, Chlamydia, Trichomoniasis, Chancroid, Lymph granuloma venereum and Donovan's. The STIs that are preventable, but not curable are the viral STIs which includes HIV, Human papilloma virus, Hepatitis B virus and Herpes simplex virus (De Schryver A MA, 1990).

Conventionally, a supposed STIs has been diagnosed by either clinical appearance alone, which is often inaccurate and incomplete or a laboratory-based test, which is complex, very expensive, and commonly delay treatment (FMOH, 2015). Also, clinical diagnosis of several STIs is problematic due to broad-based signs and symptoms. Etiologic-confirmed diagnosis is scientific, But the service is often unreachable in many developing countries or may be located in urban centers (Sahu L MP, 2005). Another strategy, the syndromic approach, offers an alternative approach, which depends on the ability to identify and treat the syndromes caused by an STI, with minimal

or no requirement for laboratory diagnostic support (Tesfaye F et al., 2000) (Mehul T et al., 2013). Instead, it is based on the identification of a group of signs and symptoms associated with a number of well-known etiologies approach that can be attained and spread through sexual intercourse. Treatment is provided for the majority of the etiologies locally responsible for the syndrome (De Schryver A MA, 1990). Commonly known STI syndromes are: Urethral discharge in men, Genital ulcer/sores, Vaginal discharge, Inguinal bubo, Scrotal swelling, Lower abdominal pain in women and Neonatal conjunctivitis (FMOH, 2015) (CSA, 2017). Also, It is inclusive approach because in addition to the provision of treatment, it includes: patient education, condom supply, counseling, partner notification and management, and HIV testing and counseling (FMOH, 2015).

According to the WHO 2019 estimate around the world, about 376 million people become ill each year with one of four common STIs: Syphilis, Gonorrhoea, Chlamydia and Trichomoniasis. It is projected about 86 million new cases of curable STIs occurred in Africa regions (WHO, 2019). In developing countries prevalence and their complications are amongst the top five disease groups for which adults seek health care (Mehul T et al., 2013). Their burden in Sub-Saharan African countries is very high. It is estimated that 80-90% of the global burden of STIs found in the developing countries because there is inadequate or inaccessible diagnosis and treatment facilities (WHO, 2007). However, large scale up of health care investments and strategies applied for the prevention and treatment of STIs in Ethiopia the issue continues

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to be a young adults' health problem. The prevalence of STIs rises from 1.15% in 2005 to 4% in 2016 among 15-49 years old (CSA, 2017).

Its magnitude, health and socio-economic impacts are still not well known due to a combination of social stigma, under-reporting, asymptomatic nature of infections and lack of diagnostic facilities (WHO, 2013). The reason for high prevalence is risky sexual practices (RSP) and low use of preventive services among young age groupies. The health of these group is a key element for social and economic development of the country, overlooking the SRH of these groupies can lead to high social and economic costs, both immediately and in the years ahead (WHO, 2007). Majority of STIs are asymptomatic and only part of the symptomatic population seeks health care and even a smaller number of cases are reported. Which can lead to the development of serious complications with severe consequences for the individuals and community (Mehul T et al., 2013). About 70-80% of infected women are asymptomatic and so do not seek treatment. They are risky for complications and possibly infecting others (FMOH, 2015).

It may increase the risk of HIV acquisition, mother-to-child transmission of STIs can result in adverse pregnancy outcomes. also, late treatment or untreated infection can lead to pelvic inflammatory disease, ectopic pregnancy, infertility and cervical cancer (WHO, 2014). The association between STIs and HIV has an epidemiologic interaction and share the same risk factors. So, it is very critical to strengthen STI prevention and control program not only to improve quality of life and control their complications, but also to prevent the spread of HIV infection (FMOH, 2015) (Mehul T et al., 2013). Counselling can improve people's ability to recognize the syndromes of STIs, and increase the likelihood they will seek care early. As well, people seeking treatment for STIs also face several challenges including limited resources, social stigma, poor quality services, and No follow-up of sexual partners (WHO, 2014). Although sexual abstinence is the preferred method for STI prevention among young age group, it is not practical for many of the individuals. Therefore, consistent and correct condom use is a rational method of preventing the transmission STIs (WHO, 2007).

In Hawassa city, urbanization and rural-urban migration is a growing phenomenon for a job opportunity that set for younger age groups to employ at the newly established Hawassa industrial park (HIP), that predisposes them to high risk for STIs. Report from symptomatic presentation of STIs among people living in rural areas of Lucknow shows that about 11.18% were diagnosed STIs based on syndromic approaches (Mishra S et al., 2016). Another Community-based survey on STIs associated symptoms and health-seeking behaviors among Iranian adults shows that, 39.9% of women and 17.6% of men reported having at least one STI associated syndromes under consideration at the time of study (Nasirian M et al., 2015).

According to Ethiopian demographic and health survey 2016, Overall 4% of women and men age 15-49 reported having syndromes of STI in the last 12 months (CSA, 2017). Other studies conducted among Wolaita Sodo University and University of Gonder students shows that 12 month period self-reported prevalence of STIs to be 19.5% and 18.2% respectively (Yohannes B et al., 2013) (Ayanaw B et al., 2019). Similar studies conducted among high school students at Bahir-dar and HIV patients in Ayder referral hospital, Northern Ethiopia reported that the prevalence of STIs is 13.1% and 8.5% reported to have syndromes of STIs respectively (Gebremichael H et al., 2017) (Gebrelibanos A et al., 2015).

Study conducted among young women in Northern Ethiopia shows that self-reported prevalence of STIs in the last 12 months was 21.3% (Fisseha G AE, 2015). Surveillance conducted in Ethiopia in 8 health facilities located in Amhara, Oromia and Addis Ababa reported that commonest syndrome was vaginal discharge 50%, urethral discharge 31%, genital ulcer/sores 9%, lower abdominal pain 7.3%, and two syndrome were present in few patients 3% (FMOH, 2015).

National survey in New Caledonia among youths shows that hometown residence showed significant association with the prevalence of the STIs (Corsenac P et al., 2012). Another study at Debre Birhan high school students shows that, residence being urban had positive association with knowledge of syndromes of STIs (Adera A, et al., 2015). Similarly, living with families and relatives helps the parent/relatives to monitor their children and improve decision-making capacity on RSPs (Bettinger J et al., 2004). Another study conducted among young people in South Africa shows that, study subjects aged 20-24 years and women had more than twice the odds of having a curable STI compared to study participants aged 15-19 years and men, respectively (Francis S et al., 2018). Also, divorced individuals were about 5 times more likely to have had risky sexual activities than married individuals (Kassa M et al., 2013).

One study among seasonal migrant workers in Metema, Northwest Ethiopia shows that study subjects who got a daily income above USD 5.00 were 2.2 times more likely to have RSPs during the prior 6 months than those having a daily income lower than USD 5.00 (Tiruneh K et al., 2015). Migrants were frequently forced into physically demanding works with poor living conditions and little benefits, while having to live apart from their partners and families, may develop new sexual partners and involve in high RSPs that may increase the chance of STIs (Tiruneh K et al., 2015).

Study among people living in rural area of Lucknow shows that significant association between educational status and prevalence of STIs (Mishra S et al., 2016). Respondents whose educational level less than fourth grade were 12 times more likely to be engaged in RSPs than whose educational level tenth grade or more (Kassa M et al., 2013). Similarly occupation and social classes were also marked as significant socio-economic factors



associated with the prevalence of the STIs (Mishra S et al., 2016). Having good knowledge on modes of transmission, prevention methods and complications of STIs helps to protect themselves from STIs and its complication (Ayanaw B et al., 2019). Also, many studies shows that those who have poor knowledge of STI were more likely to have STIs than students with good knowledge (Yohannes B et al., 2013) (Ayanaw B et al., 2019). Adverse impacts associated with substance use include, increase the chance of unprotected sex, decrease the selection of sexual partners, increase the number of sexual partners and careless sexual activity. Such combinations significantly increase their vulnerability to the STIs (Winters K., 1999).

Study shows that overall, 53.8% of them used at least one substance in lifetime. Commonly used substances are: alcohol 41.7%, khat 30.3%, cigarette 11.3% and illicit substances 3.9% (Derese A et al., 2014). Alcohol use found significantly associated with RSPs including unprotected sex, multiple sexual partners (MSPs), paying for sex and selling sex that increases likelihoods of STIs (Weiser S et al., 2006). Those using alcohol having about 3 times higher chances of RSPs compared to those not using it (Alemu A et al., 2015). khat chewer were 3.4 times more likely to have RSPs than those who didn't chew khat. Moreover, those who smoke shisha were 3.44 times more likely to have risky sexual behaviour as compared to those who didn't smoke shisha (Gizaw A et al., 2014). Different reasons were stated for the substance use such as, to get personal pleasure, increase work performance, peer pressure, to get relief from tension, to be sociable and for other reasons (Alemu A et al., 2015). View/read pornographic materials could change the normal sexual desire and care taking of exposing to RSPs (Ayanaw B et al., 2019). Those who attend sex films, movies frequently were about 2 times more likely to be involved in RSPs than those who didn't view/read pornographic materials (Henok A et al., 2015).

Risky sexual practice is any human sexual practices which put individual's physical, social and psychological health at the risk (Malhotra S et al., 2008). It also includes early sexual practices, unprotected sexual intercourse, and MSPs occur in a wider context. although RSPs doesn't always shows a high-risk lifestyle, it often clusters with other risky behaviors such as substance use and violence participation (Blum R MK, 2005). Early age sexual initiation was significantly associated with increased risk of STIs (Upchurch D et al., 2004). Those who first sexual start from 15-19 years were about 3 times more likely to have had RSPs than from 20-24 years (Kassa M et al., 2013). And those who have no sexual partner currently was riskier sexually practices than those who had current partner currently (Kassa M et al., 2013).

Studies conducted among Wolaita Sodo and Madawulabu University students revealed that those who had MSPs in a lifetime were more likely to have STIs than those who had one sexual partner in the life time (Yohannes B et al., 2013) (Setegn T et al., 2013). Similar studies conducted

among school youth at Bahirdar and young women in Northern Ethiopia revealed that those who had MSPs in the last 12 months had higher chances of experiencing STIs compared to those with one partner (Gebremichael H et al., 2017) (Fisseha G, 2015). One study conducted among migrant daily laborers in Metema district show that Isolated work sites lead to a lack of social cohesion and social norms governing behavior of workers, which may lead to engagement in RSPs, about 68% of sexually active respondents reported non-marital sexual intercourse in the last 6 months (Tiruneh K et al., 2015).

Studies conducted in Wolaita Sodo university students and young women in Northern Ethiopia, those who had never used condom during intercourse had higher odds of experiencing STIs than those who had ever used condom in their lifetime (Yohannes B et al., 2013) (Fisseha G, 2015). The most common reasons stated for not using at all or inconsistently using condom are partners refusal, condom inaccessibility, trust of partner, forgetfulness after alcohol intake, religious prohibition, hurry to have sex and additional reasons for not using condoms (Alemu A et al., 2015) (Abeje A AA, 2017). Also, those who reported themselves to have had extra-marital sexual contacts in the last year had higher prevalence of STI (Rostami F et al., 2017).

People who experienced a syndrome of STI may delay to seek care timely or do not seek care despite the available service. Health-seeking behavior affects people's actions when they suspect an infection (Voeten H et al., 2004). Perceived severity of STI was also one of the predictor factors for early health care-seeking behavior (Tsadik M et al., 2019). According to EDHS 2016 report only 32% of those who had syndromes STI sought advice or treatment (CSA, 2017). The most important reasons for not receiving treatment by study subjects were feeling guilty of telling problem to the health worker, thinking symptom as incurable, thinking symptom not serious, thinking symptom as curable without treatment, lack of money, not knowing where to get treatment, and others including lack of time (Yohannes B et al., 2013).

## METHODS AND MATERIALS

### Study design and period

Institution based cross-sectional study was conducted among Hawassa industrial park workers from July 26 to August 26, 2020.

Self-reported syndromic approach was used to assess magnitude and associated factors for STIs among HIP workers.

### Source and study Population

Source population was HIP workers and Workers in randomly selected factory sheds during the study period were Study population.

### Inclusion and Exclusion criteria

All HIP workers were included, and HIP workers who are severely ill during study period and Recruitment time less

than 30 days were excluded.

### Operational definitions

Early sexual initiation: Having sexual intercourse before the age of 18 years (CSA, 2017).

Risky sexual practices: Workers who have at least one of the following: inconsistent condom use with non-regular partner, having multiple sexual partners, starting sexual intercourse before age of 18 years and sexual intercourse with CSWs.

Knowledge about STI: It was measured using a series of 36 knowledge questions about STIs. Those who scored mean and above were taken as good knowledgeable.

STI cases for Male/Female: They were considered STIs cases if he/she reported at least one of history of urethral discharge, genital ulcer/sores, scrotal swelling, inguinal bubo, abnormal vaginal discharge, or lower abdominal pain syndromes in the last 12 months.

Sexually active: workers who had sexual intercourse at least once prior to the study.

### Sample size determination

The sample size was determined using single population proportion formula by taking the prevalence of STIs (50%) because absence of similar studies among industry workers at national level.

$n$  = Minimum sample size

$Z$  = Standardized normal distribution value for the 95%CI, which is (1.96).

$p$  = Prevalence of STIs (50%).

$d$  = Margin of error 5% (0.05)

Design effect of 1.5

Non-response rate of 15%

$nf$  = Final sample size

Using population proportion formula:  $n = \frac{z^2_{\alpha/2} p(1-p)}{d^2}$

$n = \frac{(1.96)^2 (0.5) (0.5)}{(0.05)^2}$

$n = 3.84 \times 0.25 / 0.0025 = 384$

$n = 384$ , Multiplied by design effect of 1.5 and non-response rate (15%) was added

Final sample size ( $nf$ ) =  $[(384 \times 1.5) + 15\%] = 663$

### Sampling technique and procedures

There are 52 sheds in HIP and about 30,000 regular workers within it. Multistage sampling technique was used to select representative study subjects. Simple random sampling technique (lottery method) was used to select the factory shed from the total of 52 sheds by taking 29% (15 sheds) of the total factory sheds. To assure the representativeness of the data, the sample size was proportionally allocated to all (15 sheds) proportional to their number of workers. Finally, the study participants were selected from factory sheds using a simple random sampling technique by using attendance sheet.

### Data Collection Procedures

Data was collected using structured self-administered questionnaires. The questionnaire was first prepared in English, and translated into Amharic then, translated

back into English, to check the consistency. Data was collected using a structured questionnaire with open and closed end questions.

### Data Quality Management

One week prior to data collection a pre-test was conducted on 5% (Setegn T et al., 2013) of the sample size at MOHA soft drink factory in Hawassa. Depending on the result of pretest, correction and modification were done on questionnaire before applying on the study population.

### Data Processing and Analysis

Data was cleaned, coded and entered in SPSS version 21.0 software for further analysis. Frequencies and cross tabulations were used to summarize descriptive statistics of the data. Tables and texts were used for data presentation. Bivariable logistic regression analysis was used to identify candidate variables for multivariable logistic regression at P-value of  $\leq 0.25$ . The strength of association was determined using multivariable logistic regression at p-value  $< 0.05$ , and 95% CI of adjusted Odd Ratio (AOR).

## RESULTS AND DISCUSSION

Socio-demographic and Economic characteristics

In this study, 657 study participants were involved in the study making a response rate of (99 %). The mean age of study participants was 27 years ( $SD \pm 3.2$  years). Among study participants 117 (17.8%) were male and 540 (82.2%) were females, 530 (80.7%) were single in marital status, and 363 (55.3%) were Protestant. About 452 (68.8%) respondents stayed for more than one year at HIP. The mean income of the respondents was 2350 ETB ( $SD \pm 1183$ ) and 405 (61.6%) were from rural residential. And about 298 (45.4%) of the respondents have secondary educational attainment.

### Knowledge of respondents about STIs

The overall Knowledge of study participants shows that, about 323(49.2%) of the study participants had good knowledge of STIs. About 651(99.1%) respondents have heard about STIs. About 641 (97.6%) of the respondents know at least one mode of STI transmission. Among the total of 657 study participants 640 (97.4%) were known at least one preventive methods of STI. Regarding the syndromes of STIs, 640 (97.4%) of the study participants know how STIs manifest. About 216 (32.9%) respondents know asymptomatic case transmits STIs. Among total respondents about 54 (90.4%) study subjects reported that early treatment has benefit, and 490 (74.6%) study participants know that STI have complication.

### Non sexual behavioral characteristics

Respondents were asked their experience of non-sexual risky practices to assess their exposure to substances and pornographic materials; and the findings shows that, about 96 (14.6%) drink alcohol, 67 (10.2%) chew khat,

**Table 1:** Socio-Demographic characteristics of HIP Workers, Southern Ethiopia, 2020.

Variables		Frequency	Percent
Sex	Male	117	17.8
	Female	540	82.2
Age	18-22	59	9.0
	23-27	306	46.6
	28-32	268	40.8
	33-37	24	3.6
Length of Stay at HIP	Less than 6 months	37	5.6
	6-12 months	168	25.6
	Greater than 12 months	452	68.8
Religion	Protestant	363	55.3
	Orthodox	184	28.0
	Muslim	67	10.2
	Catholic	43	6.5
Ethnic groups	Sidama	350	53.3
	Oromo	96	14.6
	Amhara	85	12.9
	Wolayita	62	9.4
	Kambata	35	5.3
	Other*	29	4.5
Marital status	Single	530	80.7
	Married	112	17.0
	Divorced	15	2.3
Living arrangement	Living alone	234	35.6
	Friends	199	30.3
	Wife or husband	108	16.4
	Family	76	11.6
	Relatives	40	6.1
Income of respondents	450-1000	25	3.8
	1001-1500	208	31.7
	1501-5000	379	57.7
	5001-6500	45	6.8
Hometown residence	Urban	252	38.4
	Rural	405	61.6
Education status	Read and write	20	3.0
	Primary	92	14.0
	Secondary	298	45.4
		247	37.6

\*others: Hadiya, Silte, Gurage, Halaba

**Table 2:** Knowledge of STI among HIP Workers, Southern Ethiopia, 2020 (n=657)

			Frequency	Percent
Heard about STI		Yes	651	99.1
		No	6	0.9
Common curable STI	Syphilis	Yes	620	94.4
		No	37	5.6
	Gonorrhea	Yes	536	81.6
		No	121	18.4
	Chlamydia	Yes	155	23.6
		No	502	76.4
	Trichomoniasis	Yes	105	16.0
		No	552	84.0
Transmission routes of STI		Yes	641	97.6
		No	16	2.4
Routes of STI transmission	Sexual intercourse	Yes	641	97.6
		No	16	2.4
	Blood/blood product	Yes	343	52.2
		No	314	47.8

	Sharp materials	Yes	284	43.2
		No	373	56.8
	Mother to child	Yes	396	60.3
		No	261	39.7
STI prevention methods		Yes	640	97.4
		No	17	2.6
STI prevention methods	Abstinence	Yes	631	96.0
		No	26	4.0
	Condom use	Yes	487	74.1
		No	170	25.9
	Faithful partner	Yes	380	57.8
		NO	277	42.2
STI syndromes		Yes	640	97.4
		No	17	2.6
Common syndromes of STI	Genital ulcer or sores	Yes	460	70.0
		No	197	30.0
	Urethral discharge in male	Yes	589	89.6
		No	68	10.4
	Vaginal discharge	Yes	608	92.5
		No	49	7.5
	Lower abdominal pain in women	Yes	357	54.3
		No	300	45.7
	Scrotal swelling	Yes	317	48.2
		No	340	51.8
	Inguinal bubo	Yes	145	22.1
		No	512	77.9
Neonatal conjunctivitis	Yes	153	23.3	
	No	504	76.7	
Asymptomatic case transmits STI		Yes	216	32.9
		No	441	67.1
Early treatment has benefit for STI		Yes	594	90.4
		No	63	9.6
STI has Complications		Yes	490	74.6
		No	167	25.4
Complications of STI	Still birth	Yes	375	57.1
		No	282	42.9
	Abortion	Yes	438	66.7
		No	219	33.3
	Infertility	Yes	281	42.8
		No	376	57.2
	Ectopic pregnancy	Yes	229	34.9
		No	428	65.1
Increase HIV transmission	Yes	240	36.5	
	No	417	63.5	
	Some kind of cancer	Yes	165	25.1
			492	74.9
Absolute treatment for STI		Yes	619	94.2
		No	38	5.8
Place of absolute treatment for STI available	Hospital	Yes	556	84.6
		No	101	15.4
	Health center	Yes	432	65.8
		No	225	34.2
	Family guidance association	Yes	281	42.8
		No	376	57.2
	Private health centers	Yes	233	35.5
			424	64.5
Overall Knowledge of STI		Poor	334	50.8
		Good	323	49.2

**Table 3:** Non-sexual behavioral characteristics of HIP Workers, Southern Ethiopia, 2020

Variables		Frequency	Percent
Chew khat	Yes	67	10.2
	No	590	89.8
khat chewing frequency	Daily	6	9.0
	More than once in a week	23	34.3
	Weekly	31	46.3
	Monthly and above	7	10.4
Drink alcohol	Yes	96	14.6
	No	561	85.4
Alcohol drinking frequency	Daily	25	26.0
	More than once in a week	18	18.8
	Weekly	21	21.9
	Monthly and above	32	33.3
Shisha smoke	Yes	16	2.4
	No	641	97.6
Shisha smoking frequency	More than once in a week	3	18.8
	Weekly	3	18.8
	Monthly and above	10	62.5
Over all substance use	Yes	126	19.2
	No	531	80.8
Reason for substance use (n=126)	Satisfaction	76	60.3
	Work hard	13	10.3
	Peer pressure	20	15.9
	Relief tension	17	13.5
View/read Pornographic materials	Yes	185	28.2
	No	472	71.8
Pornography types	Mobile video	99	53.5
	Internet	51	27.6
	Movies or television	31	16.8
	Reading materials	4	2.2

and 16 (2.4%) smoke shisha in the last 12 months. Overall, 126 (19.2%) of them used at least one substance in the last 12 months. About 185 (28.2%) of study participants view/read pornographic materials in the last 12 months.

### Sexual behavior of the Respondents

About 647 (98.5%) respondents had a history of sexual intercourse in life time. The mean age reported at first sexual intercourse was 18.8 ( $\pm$  2.7) years. About 577 (89.2%) of the study participants has MSPs in lifetime. Only 119 (28.4%) sexually active study participants used a condom for every sexual intercourse in lifetime. During the last 12 months, 453 (73.2%) of study participants reported to have MSPs, and 398 (64.3%) didn't used a condom during sexual intercourse. About 29 (4.7%) had sexual intercourse for the benefit/gift in the last 12 months.

### Self-reported STI syndromes and health-seeking behavior

The number of respondents who have a syndrome of STI in a lifetime was 182 (28.1%) with (95%CI; 28.03-28.72) and among them 121 (18.7%) with (95%CI; 18.54 - 18.91) were within the last 12 months among sexually active study participants. Out of these 15 (12.4%) were males and 106 (87.6%) were females.

### Factors associated with sexually transmitted infections

Bivariate and Multivariable analysis were applied to identify the factors significantly associated with the magnitude of STIs. The bivariate analysis shows that, sex of respondents, marital status, hometown residence, monthly income, education status, drinking alcohol, view/read pornographic materials, age at first sex, didn't use condom ever, MSPs in the last 12 months, didn't use condom in the last 12 months, no current sexual partner, sex for the benefit/gift and poor knowledge of STIs found to have a statistically significant association with the magnitude of STIs. Variables such as; sex of respondents, marital status, hometown residence, monthly income, education status, drinking alcohol, view/read pornographic materials, current sexual partner and knowledge of STIs were considered in multivariate logistic regression analysis.

This study shows that 121 (18.7%) with (95%CI; 18.54-18.91) of sexually active HIP workers had self-reported STIs syndromes in the last 12 months. The finding of this study is comparable with studies conducted among Wolaita sodo university and University of Gondar students, 19.5% and 18.2% respectively (Yohannes B et al., 2013) (Ayanaw B et al., 2019). However, it is somewhat lower than studies conducted among young women in Northern Ethiopia 21.3% (Fisseha G, 2015). This difference could be due to the study subjects of Northern



**Table 4:** Sexual practices among HIP Workers, Southern Ethiopia, 2020 (n=657)

Variables		Frequency	Percent
Ever had sexual intercourse(n=657)	Yes	647	98.5
	No	10	1.5
Extra-marital sex(n=112)	Yes	5	4.5
	No	107	95.5
Age at first sex(n=647)	< 18	324	50.1
	≥18	323	49.9
No. of life time sexual partners(n=647)	1	70	10.8
	≥2	577	89.2
Condom ever used(n=647)	Yes	419	64.8
	No	228	35.2
Condom use frequency(n=419)	Always	119	28.4
	Mostly	141	33.7
	Sometimes	159	37.9
Reason for not use condom always (n=528)	Trust partner	222	42.0
	Partner refuse	127	24.1
	I didn't get it	73	13.8
	I dislike it	70	13.3
	Ashamed to buy	36	6.8
Sexual intercourse in the last 12 months(n=647)	Yes	619	95.7
	No	28	4.3
No. of sexual partners in the last 12months(n=619)	1	166	26.8
	≥2	453	73.2
Condom use in the last 12 months(n=619)	Yes	221	35.7
	No	398	64.3
Having current sexual partners(n=657)	Yes	254	38.7
	No	403	61.3
Having sex for the benefit/Gift(n=619)	Yes	29	4.7
	No	590	95.3
Sex after substance use(n=619)	Yes	13	2.1
	No	606	97.9
Sex with CSWs(n=117)	Yes	12	10.3
	No	105	89.7
Condom use with CSWs(n=12)	Yes	8	66.7
	No	4	33.3

Ethiopia were only women and selection was from health facilities there is a high chance to find suspected cases. While, the finding from this study is higher when compared with the EDHS 2016 national report 4% (CSA, 2017) people living in rural areas of Lucknow 11.18% (Mishra S et al., 2016), population based survey in the city of São Paulo, Brazil 6.3% (Monteiro V et al., 2016) and School youths at Bahir-dar 13.1% (Gebremichael H et al., 2017). This could be due to EDHS survey, People living in rural areas of Lucknow and population-based survey in Brazil was community-based, in which most study subjects could be all age groups and also may be differences in data collection method. The difference from study conducted among school youth in Bahir dar may be due to differences in age group, living condition and work habit of the HIP workers.

This study shows that those workers with poor knowledge of STIs were 2.7 times more likely to develop STIs than workers with good knowledge of STIs. The finding consistent with other studies conducted at the Wolaita Sodo university 4.8 times and University of Gondar students 3.3 times more risky than good knowledge of

STI (Yohannes B et al., 2013) (Ayanaw B et al., 2019). Overall, 334 (50.8%) of the study subjects have poor knowledge on STI. This finding was consistent with a studies conducted among University of Gondar students 55.3%, young women in Northern Ethiopia 40.4% and Madawalabu University students 57.5% have poor knowledge of STI (Ayanaw B et al., 2019) (Fisseha G AE, 2015) (Setegn T et al., 2013).

This study indicated that having drunk alcohol statistically significant association with risks of STIs. Those workers who had drunk alcohol were about 3.2 times more likely to have risky for STIs when compared to those who didn't drink alcohol. The finding of this studies was consistent with study conducted among the female partners of inmates in Brazil, alcohol drinkers were 1.7 times more likely to have a STI than non-drinkers (Martins C et al., 2018).

Exposing to pornographic materials could alter the normal sexual desire and care taking of exposure to STIs. This study shows that about 28.2% of respondents were view/read pornography materials in the last 12 months. Those who view/read pornographic materials were 4.4

**Table 5:** STI syndromes in the Last 12 months among HIP Workers, Southern Ethiopia, 2020

Variables		Frequency	Percent
Self-reported STIs(n=121)	Male	15	12.4
	Female	106	87.6
STI Syndromes among Males(n=15)	Genital ulcer or sore	4	26.6
	Urethral Discharge	5	33.3
	Inguinal bubo	2	13.3
	Scrotal swelling	4	26.6
STI Syndromes among Females (n=106)	Genital ulcer or sore	23	21.7
	Vaginal discharge	63	59.4
	Inguinal bubo	4	3.8
	Lower abdominal pain	16	15.1
Treatment history(n=121)	Yes	92	76.0
	No	29	24.0
Place of treatment(n=92)	Hospital	27	29.3
	Health center	33	35.9
	Pharmacy	6	6.5
	Family guidance	4	4.3
	Private clinic	22	23.9
Reason for not taking treatment (n=29)	Thought syndrome is incurable	4	13.8
	Syndromes are not serious	5	17.2
	Well without treatment	8	27.6
	Don't know where it can be treated	8	27.6
	Lack of money	2	6.9
	Ashamed of health professionals	2	6.9
HIV status of respondents (n=657)	Negative	361	54.9
	Unknown	282	42.9
	Positive	14	2.1

times more likely to have STI than when compared with those who didn't view/read pornographic materials. The finding was comparable with studies conducted among University of Gondar students, 1.5 times more likely to have an STI than counterpart (Ayanaw B et al., 2019).

This study shows that those who comes from rural areas where 2.3 times more likely to have the risks for STIs when compared to those who are urban areas. This finding was consistent with community based survey in Adami Tullu, which shows that rural residents where 2.3 times more likely to have STIs than urban residents [6]. This difference may be poor knowledge on transmission and prevention methods of STIs in rural areas. Most of workers came from different rural areas having different cultures and values. They are vulnerable to RSPs in new environment, living away from the family, may limit workers to protect from peer pressure and could also be easily deceived with monetary incentives from persons who seek out sex because low monthly payment in HIP.

### LIMITATIONS

Since sexual behavior and practice is a private, intimate and sensitive issue, respondents may feel embarrassed to report syndromes (May subject to bias). So, self-administered questionnaires were used to keep privacy, and study participants were informed the purpose and confidentiality of the study before data collection. In this study STI was assessed only through the self-report of the workers, no physical and laboratory examination was done and since we are using a syndromic approach, we

may miss asymptomatic workers and we may misdiagnose signs and symptoms due to other health problems as similar manifestations with STI syndromes. So under/over reporting of STIs may be possible.

### CONCLUSION

The self-reported prevalence of STIs among Hawassa industry park workers was high. Hometown residence, drinking alcohol, view/read pornographic materials and poor knowledge of STIs were factors significantly associated with the magnitude of sexually transmitted infections. The findings in this study suggest that STI magnitude among HIP workers found to be higher than the general population, thus advances in STI prevention and control hard work targeting among HIP workers were required. Large scale studies including all other industry institutions and use of better diagnostic modalities were recommended.

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