

# Awareness and Pattern of Sexually Transmitted Diseases: A Hospital Based Study

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## Abstract

**Introduction:** Sexually Transmitted Diseases (STDs) are infections that occur due to sexual contact. Various pathogens are contributing to STDs. There is a rising trend of STDs globally, but reported cases are low due to low screening and reporting.

**Objectives:** To identify patterns and awareness of Sexually Transmitted Diseases

**Materials and Methods:** This study was a prospective hospital-based study. Patients were included in the study according to the inclusion criteria. All data were recorded in a preset proforma. Routine laboratory investigations along with STD workup were done in patients.

**Results:** A total of 62 patients were included in the study according to the inclusion criteria. The age ranged from 17-52 years. There were 63% males and 37% females. Regarding awareness about symptoms of STDs, the patients responded with infertility in 22%, ulcers in 17%, followed by swelling, genital discharge, dyspareunia, and 24% gave multiple responses. Out of the total patients, 58% had multiple partners. Spouses were the commonest partner in 27%. The commonest diagnosis was syphilis, followed by gonococcal urethritis, non-gonococcal urethritis, warts, genital herpes, vulvovaginal candidiasis, molluscum contagiosum, and mixed infections.

**Conclusion:** Syphilis is the most prevalent STD, according to the current study. Due to the dearth of knowledge regarding STDs, the STD patients who visit our facility may only be the tip of the iceberg. It is necessary to spread awareness about STDs among individuals through social media and educational institutions, starting locally and moving up to the national level.

**Keywords:** Infection; Sexual Transmission; Syphilis

## Introduction

Sexually Transmitted Diseases (STDs) are a broad category, implying a variety of pathogens like viruses, bacteria, fungi, and protozoa which presents with various clinical symptoms. The culprit for transmission being sexual relationships between human beings.<sup>1</sup> An estimated 340 million new cases of curable Sexually Transmitted Infections (STIs) have been reported worldwide in both men and women among the age group 15-49 years. These curable STIs include *Trichomonas vaginalis* in over 170 to 190 million, *Chlamydia trachomatis* in over 90 million cases, followed by *Neisseria gonorrhoeae* in over 62 million, *Treponema pallidum* in 12 million cases and

*Haemophilus ducreyi* over 6 to 7 million incident cases.<sup>2</sup> Apart from these STIs, there are over a million cases of viral STIs which occur annually, namely Herpes Simplex Virus (HSV), Human Papilloma Virus (HPV), Hepatitis B Virus, and Human Immunodeficiency Virus (HIV).<sup>3</sup> In most of developing countries, 90% of the world's total STD population is observed.<sup>4</sup> Apart from causing acute morbidity in adults, STDs result in complications, including infertility, ectopic

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pregnancy, cervical cancer, congenital syphilis, low birth weight, etc.<sup>4</sup> STIs are asymptomatic in most of the cases and therefore can be difficult to diagnose. So, the worldwide incidence of new cases of STIs may be even higher, as mentioned above. An estimate of actual reported cases of STIs represents only 50-80% of the total reportable STIs indicating limited screening and reporting.<sup>5</sup>

Hence, studies on STIs are required to help report STIs in various study populations. This study is conducted to assess the STIs profile of the patients visiting a Tertiary Care Hospital.

## Materials and Methods

This prospective hospital-based study was conducted between August 2020 and May 2022. All patients visiting the Dermatology outpatient department of Nepal Medical College and Teaching Hospital during the study period were screened, and those who had clinical signs and symptoms of STD and also who came for STD workup due to fear of unprotected sexual exposure without any symptoms were included during the study period. The patients with non-STD who could not consent were excluded from the study. All data, including demographic variables (age, sex, residence, hospital ID), data about the sexual behavior of the patients, symptoms, and examination of the patients, were recorded in a preset proforma. Routine laboratory investigations were done including complete blood count, liver function test, renal function test, and urine routine. Serological tests like VDRL, TPHA, Hepatitis B, Hepatitis C, HIV 1 and HIV 2, and Herpes simplex virus were also sent. Other tests like gram stain, KOH (potassium hydroxide), wet mount, and skin biopsy were conducted wherever necessary. For statistical analysis, descriptive analysis was carried out, and chi-square testing was done to know any statistical significance, and a P value of <0.05 was considered to be significant using SPSS version 16.

## Result

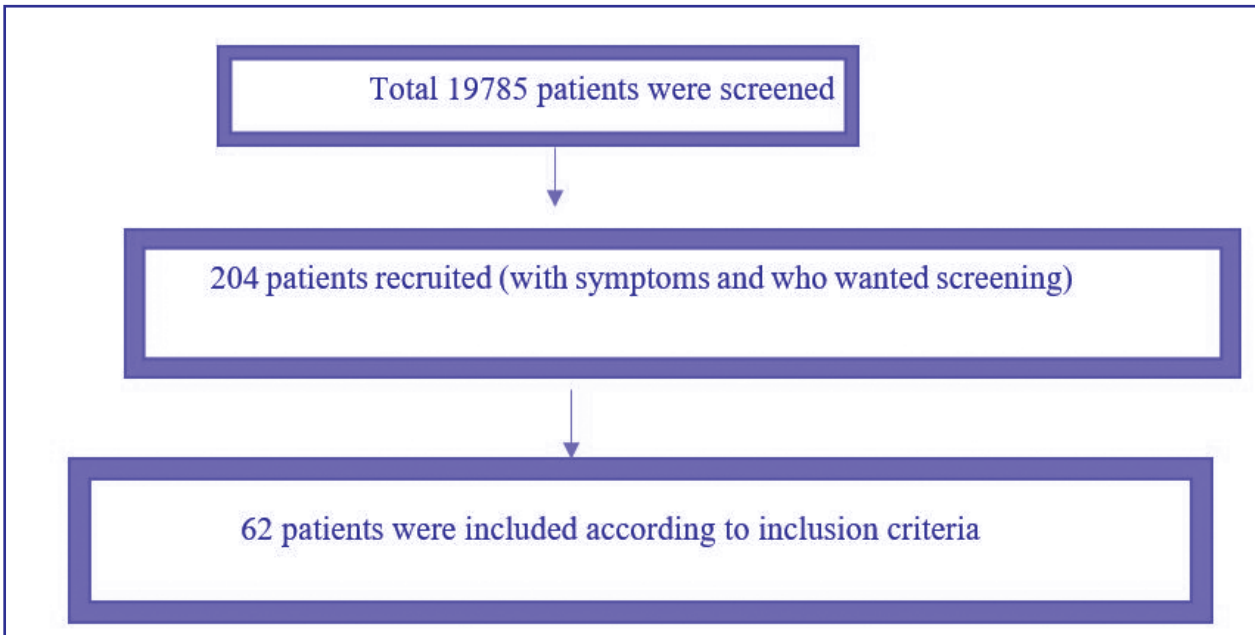
A total of 19,785 patients who attended the outpatient department of dermatology of our hospital were screened, a total of 204 patients were recruited (with symptoms and who wanted screening), and only 62(0.003%) patients were included in the study as per the inclusion criteria (Figure 1).

The age ranged from 17-52 years. The mean age of presentation was 30.53 years. There were 63% males and 37% females. Most patients were employed (60%), followed by students (22%). Among the patients presented, 68% were married, and 32% were unmarried. Most of the patients belonged to the middle class (85%), followed by the lower and upper classes (Table 1). When asked about what was the source of information for STD, they responded as, from friends in 31%, from teachers in 14%, the internet in 11%, from other sources in <10%, and in 24%, they

were unaware. Regarding awareness about symptoms of STDs, the patients responded with infertility in 22%, ulcers in 17%, followed by swelling, genital discharge, and dyspareunia, and 24% gave multiple responses. Attitude about awareness of prevention of STD, maximum number of patients responded through use of condoms in 43%, avoiding commercial sex workers 15%, and others in <10%. Inquiring about the attitude towards treatment of STDs, 28% responded as STDs are treatable, 10% were interested to know about the disease, and reproductive health should be taught in the school 7%, rest of the reasons were < 10%, and in around 46%, they were unaware (Table 2). Out of the total patients, 58% had multiple partners, 32% had single partners, and 10% did not reveal their partners. Spouses were the commonest partner in 27%, followed by friends, extramarital, men sex with men (MSM), and commercial sex workers, and in 14%, they did not respond. Sexual exposure was weekly in 33%, monthly in 25%, occasional in 19%, single in 6%, and do not remember in 17%. Duration of symptoms is less than a week in 32%, 2-4 weeks in 37%, 10% for 2-6 months, one year 7%, and >1 year in 5%. The patients presented with symptoms like urethral discharge in 26%, genital ulcer in 22%, genital growth in 27%, mixed infections in 10% (genital growth and urethral discharge, genital ulcer and genital growth), and vaginal discharge in 3%. In 12% there were no symptoms. On examination, papules were present in 19%, plaques in 7%, ulcers in 25%, and in 11% mixed lesions. Out of discharge, the color was greenish to yellowish in 70%, in 5% curdy white, and the rest were mixed discharge (yellowish discharge and curdy discharge, greenish to yellowish discharge). In laboratory examination, VDRL was reactive in 25%, TPHA was positive in 28%, HIV was positive in 3%, herpes simplex was positive in 4%; in gram stain, *Neisseria gonorrhoeae* was positive in 17%, KOH (Potassium hydroxide) was positive in 5%. Urine routine microscopy was found to be abnormal in 20%. The commonest diagnosis was syphilis, seen in 33%, in 25% warts, followed by gonococcal urethritis in 17%, non-gonococcal urethritis in 9%, genital herpes in 4%, in 3% vulvovaginal candidiasis, molluscum contagiosum in 2%, and mixed infection (discharge with warts, warts with syphilis, herpes with syphilis) in 7% (Figure 2). Patients diagnosed with primary and secondary syphilis were treated with Inj Benzathine penicillin 2.4 mu, intramuscularly single dose. In patients where the duration was unknown, a total of 3 doses weekly apart was given. Gonorrhoea was treated with Inj Ceftriaxone 250mg i.m with Azithromycin 1gm single dose. Warts were treated with cryotherapy and electrocautery. Vulvovaginal candidiasis was treated with single dose of fluconazole 150 mg orally. Molluscum contagiosum was treated with scooping and cryotherapy. Mixed infections for urethral and vaginal discharge were treated with a syndromic approach according to national guidelines for STDs. Patients were followed up till three months. In 1 month follow-up, 100%

improvement in presenting lesions and symptoms was seen in 3.2% of patients, 50% improvement was seen in 87% of patients, and 25% improvement was seen in 9.75% of patients. In 2 months of follow-up, another 17.5% of patients had 100% improvement, 26.2% of patients had 50% improvement, and the rest were lost to follow-up. In 3 months follow-up, 42.5% of patients had 100% improvements in their presenting lesions and symptoms. In statistical analysis, chi-square was found to be statistically significant ( $p < 0.05$ ) with

occupation (who were employed) and STD. Occupation was also found to be significant with multiple partners. Awareness about symptoms of STD, source of information on STD and symptoms of STD, multiple partners, frequency of exposure, and types of STD were found to be statistically significant ( $p < 0.05$ ) with males. Economic status was significant with types of STD, multiple partners, and type of partners. Marital status was found to be significant with types of STD (Table 4).



**Figure 1:** Flowchart showing enrollment of patients

		Number (%)
Age	<18years	5(8)
	18-40 years	35(57)
	>40years	22(35)
Sex	Males	39(63)
	Females	23(37)
Occupation	Employed	37(60)
	Students	14(22)
	Unemployed	6(10)
	Housewife	5(8)
Marital status	Married	42(68)
	Unmarried	20(32)
Economic status	Lower class	7(12)
	Middle class	53(85)
	Upper class	2(3)

**Table 1:** Demographic Profiles of the Patients

		Number (%)
Source of information of STD	Friends	19(31)
	Teachers	9(14)
	Internet	7(11)
	television	5(8)
	Newspaper	4(7)
	Teaching institution	2(3)
	Relatives	1(2)
Awareness about symptoms of STD	Unaware	15(24)
	Infertility	14(22)
	Ulcer	11(17)
	Swelling	9(15)
	Genital discharge	7(12)
	Dyspareunia	2(3)
	Multiple response	15(24)
Attitude about awareness of prevention of STD	Non-responders	4(7)
	Condoms	27(43)
	Avoiding commercial sex workers	9(15)
	Having monogamous relationship	4(6)
	Prompt treatment	2(3)
Attitude towards treatment of STD	Unaware	20(33)
	STD is treatable	17(28)
	Interested to know about the diseases	6(10)
	Reproductive health should be taught in the school	4(7)
	Know about complications	2(3)
	Thought treatment is free of cost	1(2)
	Unaware	29(46)
Non-responders	3(4)	

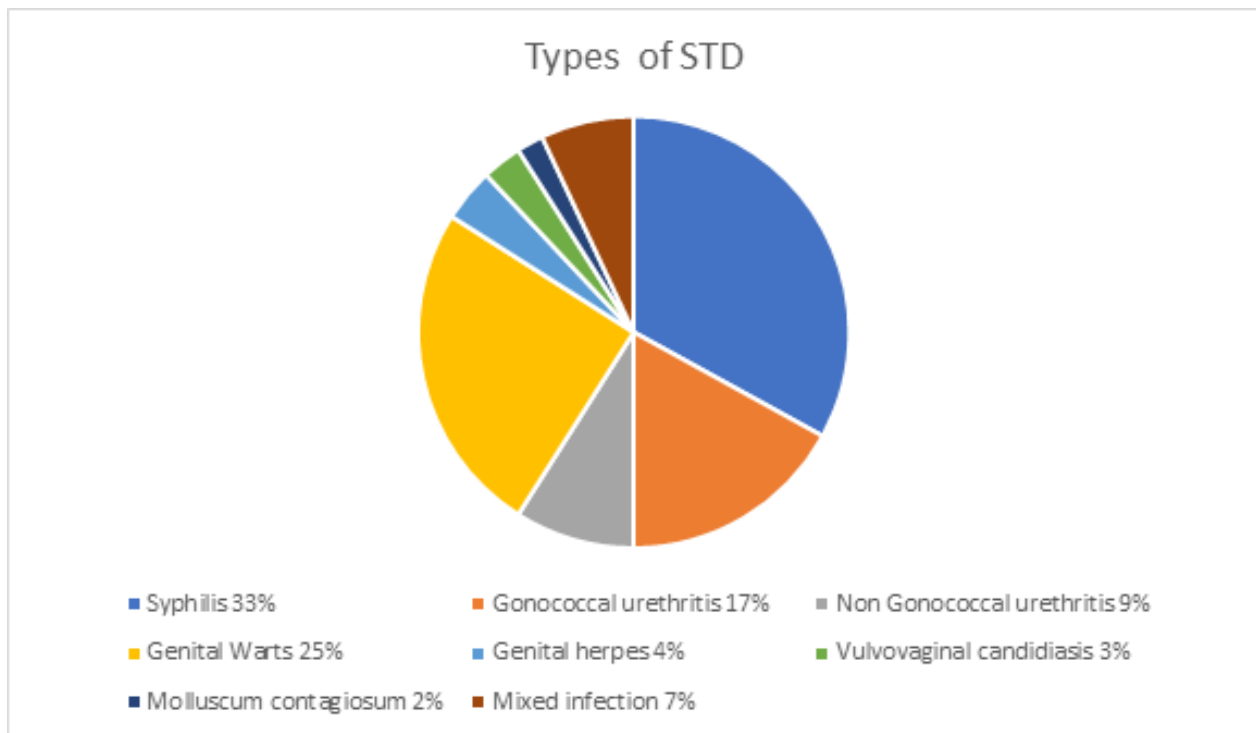
**Table 2:** Attitudes and Awareness of Patients towards STD

		Number (%)
Partners	Single	20(32)
	Multiple	36(58)
Type of Partner	Did not reveal	6(10)
	Spouse	17(27)
	Friends	16(26)
	Extramarital	10(16)
	Sex with men (MSM)	8(13)
	Commercial sex workers	2(4)
	Non-responders	9(14)
Sexual exposure	Weekly	20(33)
	Monthly	15(25)
	Occasional	12(19)
	Single	4(6)
	Don't remember	11(17)

**Table 3:** Sexual Behavior of the Patients

Factors		P.value
Occupation	Multiple partners	0.000
	Type of partner	0.002
	Frequency of exposure	0.000
	Type of STD	0.000
Sex	Source of information of STD	0.005
	Awareness about symptoms of STD	0.005
	Awareness about prevention and treatment of STD	0.690
	Multiple partners	0.002
	Frequency of exposure	0.000
	Duration of signs and symptoms	0.000
	Types of STD	0.00
Marital status (married)	Types of STD	0.005
Economic status	Awareness about symptoms of STD	0.002
	Multiple partners	0.000
	Type of partners	0.002
	Type of STD	0.000
Age	Type of STD	0.690

**Table 4:** Factors and its Statistical Significance



**Figure 2:** Different types of Sexually Transmitted Diseases

**Discussion**

STIs present with various symptoms and complications. However, many STIs are asymptomatic, requiring proper screening and reporting.<sup>5</sup> STDs are caused by infections, including bacterial infections, for which there is proven treatment with antibiotics. While treatment of STDs caused by viruses such as HSV, HPV, and HIV needs to be addressed further for a proper cure,<sup>2</sup> prevention is the key to reducing the complications of such STDs.

The study of the various profiles of STDs helps in their prevention. An update of such studies is required in this changing era of globalization and migration.<sup>6</sup> Out of 19,785 patients who attended the outpatient department of dermatology of our hospital from August 2020 to May 2022, 204 patients were recruited (with symptoms and who wanted screening), and only 62 (0.003%) patients were included in the study as per the inclusion criteria. Also, in a study from India, out of 10,957 patients who attended the outpatient

department of dermatology from April 2020 to March 21 during COVID time, only 90 (0.8%) had STDs. However, in the same study from India, during pre-COVID 2019–2020, 57,275 patients attended the OPD, among whom 272 (0.5%) had STDs.<sup>7</sup> Another study in Africa, conducted from January 2013 to June 2020, found that out of 3550 participants, STI prevalence was 7.7%.<sup>8</sup> Such variations in the prevalence of STI can be attributed to the place of study, study populations, and COVID times.

Among the study population, 63% were males, and 37% were females, showing a male preponderance. This is in concordance with other similar studies from Nepal.<sup>9–11</sup> Various studies from India also showed a similar male preponderance.<sup>12,13</sup> Females are predisposed to increase biological and social vulnerability to STIs, especially in a developing country like India.<sup>13</sup> However, in our study, a male preponderance was seen, as men have more freedom and fewer social restrictions in our part of the world.

In this study, the majority of the patients were employed. This is in accordance with other studies from Nepal.<sup>10,11</sup> Similar results were seen in the studies from Pakistan.<sup>14</sup> Adolescents' employment status can be a risk factor for STDs as these young, enthusiastic generations will engage with more people in their jobs rather than in colleges and get higher chances of STIs, especially among females.<sup>15</sup>

The majority of STDs in this study were observed among married ones, similar to other studies.<sup>7,9,13</sup>

In this study, most patients belonged to the middle class (84%). Similarly, being in the middle wealth quintile was associated with STI risk, whereas being in the richest quintile was protective.<sup>16</sup> Other studies have reported increased STI risk among urban females of the richest wealth quintile.<sup>17</sup> The middle-class population might be exposed to STIs due to their lack of knowledge about risky sexual behavior and easy accessibility to social networks.

Regarding STDs, the majority of the information was received from friends (31%), followed by teachers (14%), the internet (11%), television (8%), newspapers (7%), teaching institutions (3%), and relatives (2%); and in 24% of the patients, they were unaware. Similarly, the internet (62%) and friends (32%) were reported as the principal sources of information about STIs in a study.<sup>18</sup> In a study from Turkey among university students, sources of information related to STDs were found to be books, magazines, and newspapers (79.3%), radio-TV (61.6%), the internet (44.4%), and friends (36.6%).<sup>19</sup> Another study among youth showed the internet (71.7%) as the main source of information about STDs, followed by the school (35.1%), television (30.2%), awareness campaigns (28%), friends (27%), health institutions (15.7%), parents (11.2%), and radio only (2.3%).<sup>20</sup> Most of our study population were hospital patients, and their commonest source of information regarding STDs was their friends, who would have advised them to visit the nearest hospital

for their STDs. The internet has been rampant among all segments of the population, including students, youth, and hospital-visiting patients, and hence can be used as a source of awareness about STDs.

Regarding awareness about the various symptoms of STDs, the patients responded with infertility (22%), ulcers (17%), swelling (15%), genital discharge (12%), dyspareunia (3%), and 24% gave multiple responses. Infertility was also the most common complication of STIs reported.<sup>21</sup> Another study from Dharan showed symptoms of STDs as genitourinary symptoms in 43%, weight loss, weakness, and loss of appetite in 32%, prolonged diarrhea or wound infection in 20%, prolonged high-grade fever in 10.6%, and 36.7% responding that they were unaware of the symptoms.<sup>22</sup> A study from Nigeria showed that the three most commonly known symptoms of STIs were weight loss (77.4%), painful micturition (68.9%), and genital ulcers (54.1%).<sup>23</sup> Such wide variations in understanding of the symptoms of STDs can be due to differences in knowledge among the various population groups within and outside the country. Hence, a proper awareness program about the symptoms of STDs is required throughout the nation and other developing countries.

In our study, about 43% of the patients responded that, through condom use, prevention of the STD was possible. While avoiding commercial sex workers (15%), monogamous relationships (6%), and prompt treatment (3%) of STDs were thought to prevent STDs, the rest (33%) had no clue about it. The use of condoms to avoid STIs was reinforced by most patients in various studies.<sup>21,24</sup> Such a finding shows the favorable attitude of the patients towards prevention.

Only 28% of our study's patients believed STDs were treatable. While another study from the USA specifically reported that 50.3% considered syphilis incurable, over 40% reported chlamydia and 38% reported gonorrhea as incurable STI.<sup>25</sup> These reflect the lack of knowledge of STIs among different populations in developing and developed countries.

In our study, when asked about the number of partners, 58% reported they had multiple partners, 32% had a single partner, and the rest (10%) did not reveal their partners. Another study revealed that the most predisposing factor for STDs was multiple sexual partners (90%).<sup>26</sup> Research and prevention programs on sexual and reproductive health issues to address risky sexual behaviors such as multiple sexual relationships should be emphasized.<sup>17</sup>

Sources of STIs in our study population were spouses in 27%, friends in 26%, extramarital in 16%, men having sex with men in 13%, commercial workers in 4%, and 14% did not respond. Another study from Nepal reported that the major infection source for females was their spouse, while premarital and extramarital exposures were for males.<sup>9</sup> Unsafe extramarital sex brings with it the risk of sexually transmitted infections. Women should be made aware that their monogamy

does not necessarily protect them from the risk of having STIs, and hence, safe sex practice should be emphasized in both.<sup>27</sup>

Regarding the duration of symptoms, 32% of the patients reported them within a week, 37% in 2-4 weeks, 10% in 2-6 months, 7% in 1 year, and 5% presented with symptoms for greater than one year. Still, there is a delay in presentation to hospitals. Other studies have found that delayed health care-seeking behavior, defined as symptom duration greater than seven days following the onset of STI-associated symptoms, is common (28–82% of cases).<sup>28</sup> Such a delay can be due to multiple factors, like the asymptomatic nature of some STIs, lack of knowledge, stigma, easy accessibility to pharmacies, self-medication, and superstition beliefs in our part of the world.

In our patients, most of them presented with urethral discharge (26%), genital ulcer (22%), genital growth (27%), mixed infections (10%), and vaginal discharge (3%). Gyawalee et al., also reported that most of their patients presented with discharge syndrome (18.3%), followed by ulcers (14.7%).<sup>9</sup> Another study from Nepal also showed genital discharge syndrome as the most common presentation in their study.<sup>10</sup> Studies from India showed the most common STD was genital ulcer disease.<sup>13,29</sup> Another study from India also found genital ulcers to be the most common STI, followed by urethral discharge syndrome.<sup>30</sup> In their study, Al-Mutairi et al., reported that the most common presenting symptom was urethral discharge, followed by genital ulcers.<sup>31</sup> Overall, various studies indicated urethral discharge

and genital ulcers were the frequent presentations of the patients.

The commonest diagnoses in our study were syphilis (33%), gonococcal urethritis (17%), non-gonococcal urethritis (9%), warts (25%), genital herpes (4%), vulvovaginal candidiasis (3%), molluscum contagiosum (2%) and mixed infections in 7%. Karki et al., also mentioned that syphilis was the most common in their study. The second-commonest was condyloma acuminata, seen in 601 (22.6%) cases.<sup>32</sup> In a study by Paudel et al., condyloma acuminata (53.5%) was the most common, followed by gonorrhoea (24.2%). The next most common presentation was syphilis (8.9%), genital herpes (5.1%), and multiple STIs (6.4%).<sup>11</sup>

Another study from Nepal reported genital warts to be the commonest presentation, followed by syphilis.<sup>9</sup> Several studies in Nepal revealed a rising trend in syphilis cases. The reason for this could be due to the screening of syphilis during pregnancy in our hospitals and also the screening of Nepali migrant workers for their working visa before they visited to a foreign country.

## Conclusion

Syphilis is the most prevalent STD, according to the current study. Due to the dearth of knowledge regarding STDs, the STD patients who visit our facility may only be the tip of the iceberg. It is essential to raise people's awareness of STDs through social media and educational institutions, beginning locally and progressing nationally.

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