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Prevalence and Factors Associated with Sexually Transmitted Diseases among Patients Attending Rwamagana Level II Teaching Hospital, Rwanda.

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Abstract

Background: Sexually transmitted diseases (STDs) continue to be a concerning challenge, with over 374 million new cases reported annually, predominantly in low- and middle-income countries, which represent about 90% of these infections. Therefore, this study aimed to assess the prevalence and factors associated with sexually transmitted diseases among patients attending Rwamagana Level II Teaching Hospital.

Methods: This was a hospital-based cross-sectional study design conducted from December 2025 to January 2026, which used quantitative approach to assess the prevalence and factors associated with STIs among patients attending Rwamagana Level II Teaching Hospital. A total of 440 participants were chosen relying on simple random sampling from the hospital's catchment area population of 484,953. Data were collected using structured questionnaires complemented by laboratory testing and analyzed using univariate, bivariate, and multivariate logistic regression methods at a significance level of 0.05.

Findings: The study found an overall STDs prevalence of 4.8%, with gonorrhea (1.8%) and chlamydia (1.4%) being the most commonly identified infections. Multivariate analysis demonstrated that behavioral and sexual practice-related factors were the most factors associated with STI occurrence, including having two or more current sexual partners (AOR = 3.982; 95% CI: 1.462–10.851; p = 0.003), early sexual debut before 18 years of age (AOR = 3.245; 95% CI: 1.504–6.995; p = 0.002), recreational drug use (AOR = 3.876; 95% CI: 1.983–7.574; p = 0.001), non-use of condoms with casual partners (AOR = 4.115; 95% CI: 1.876–9.029; p = 0.001), and engagement in same-gender sexual activity (AOR = 2.984; 95% CI: 1.214–7.331; p = 0.017).

Conclusion: The study concluded that sexual behavioral factors are the core links to STDs and recommends strengthening preventive behavioral interventions, promoting condom use, integrate harm-reduction strategies, expand STI screening, prioritize inclusive sexual health education, and treatment access.

Keywords: Prevalence, Factors, Sexual Transmitted Diseases.

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INTRODUCTION

Worldwide, STIs impact individuals across all socioeconomic strata. According to the WHO, over 1.2 million STIs are acquired each day, and in 2019 alone, around 375 million new cases among 4 common STIs, gonorrhea, chlamydia, trichomoniasis and syphilis were reported (WHO, 2022). Untreated STIs are able to expose to grave health consequences, like increased risk of HIV transmission, chronic pain and infertility, with the population aged 16-25 and vulnerable populations, disproportionately impacted (UNAIDS, 2023). Research by Fenton and Fairley (2022) supports these findings, highlighting that individuals in vulnerable groups often lack adequate access to preventive and treatment services, exacerbating the spread of STIs in both developed and developing regions.

In developed countries, STI rates have fluctuated in recent years. In the United States, for example, gonorrhea and syphilis rates have surged, with syphilis cases rising by 74% between 2015 and 2021, largely due to factors like reduced public health funding and challenges in education related to sexual health (CDC, 2023). A latest study by Newman et al. (2023) also links these increases to changes in sexual behavior and the underfunding of STI prevention services. In Western Europe, STIs have similarly increased, particularly among MSM and young adults, prompting intensified screening and prevention programs (Newman et al., 2023).

In LMICs, STIs have an even greater impact, with WHO estimating that around 90% of new STI cases occur in these countries, where limited healthcare infrastructure and socioeconomic factors heighten STI prevalence (WHO, 2022). The lack of routine screening also means STIs often go undiagnosed and underreported, creating further health risks (UNFPA, 2023). Studies by Korenromp et al. (2021) found that inconsistent access to health resources and social stigma surrounding STIs in LMICs contribute significantly to high rates of untreated infections, resulting in complications that could otherwise be prevented.

In Africa, the burden is especially high, with approximately 25% of PLWH globally being located in Africa (UNAIDS, 2023). Besides HIV, other bacterial and viral STIs like gonorrhea, syphilis, and human papillomavirus (HPV) are widespread, with studies suggesting prevalence rates as high as 30% among high-risk populations and up to 10% within the general population (Mohammed et al., 2023). The high burden of STIs in Africa is compounded by inadequate healthcare access, stigma, and misinformation, impacting treatment-seeking behavior (UNAIDS, 2023). A study by Chersich et al. (2022) emphasizes that misinformation and limited resources for sexual health education in African countries are primary obstacles to lowering STI prevalence.

In East Africa, the STI prevalence is particularly concerning. The East African Community (EAC) reported STI prevalence rates between 15% and 40% in high-risk groups, including sex workers (EAC, 2022). Despite regional efforts, challenges such as cultural taboos, limited healthcare facilities in rural areas, and financial constraints continue to hinder effective STI treatment and prevention (Nduati et al., 2023). Additionally, the prevalence of HIV in East Africa has driven public health efforts toward managing co-infections, as individuals with HIV are at elevated risk of acquiring and spreading other STIs (UNAIDS, 2023). A recent study by Otieno and Mburu (2023) found that targeted community health programs for high-risk groups can improve STI prevention but are often under-resourced in rural East African settings.

In Rwanda, while significant strides have been made in sexual health, STIs still pose a notable health challenge. According to the Rwanda Biomedical Center (RBC), common STIs like syphilis have a prevalence of about 2-3% in the general population, with chlamydia and gonorrhea around 3-5% (RBC, 2023). Young

people and sex workers remain particularly vulnerable, and while Rwanda has implemented STI prevention programs and integrated sexual health services in healthcare facilities, limited awareness, stigma, and inconsistent preventive measures persist (RBC, 2023). A recent survey by Mugwaneza et al. (2023) highlights the significant role of cultural perceptions in influencing STI transmission and treatment in Rwanda, especially in rural areas where resources are limited.

In Rwamagana District, located in Rwanda's Eastern Province, STI prevalence data specifically for the region remains limited but aligns with national trends. Rwamagana Level II Teaching Hospital, a primary healthcare facility in the district, has reported cases consistent with broader national data, with youth and high-risk populations particularly affected. The district's proximity to urban centers and population mobility are additional factors likely influencing STI prevalence (Ministry of Health Rwanda, 2023). Although Rwamagana benefits from national prevention programs, challenges remain in reaching all demographics with screening, treatment, and education.

Given the persistent high burden of STIs globally and their profound health consequences, particularly in LMICs like Rwanda, this study is crucial for understanding the specific prevalence and associated factors influencing STI transmission among patients at Rwamagana Level II Teaching Hospital. Research underscores that factors like social stigma, and inadequate sexual health education contribute to heightened STI risk, especially among high-risk groups, including adolescents and women (Mohammed et al., 2023; Ndayisenga et al., 2022). In Rwanda, studies have identified a lack of STI knowledge and inconsistent condom use as prevalent issues that drive infection rates, with rural areas being disproportionately affected (Mukamana& Uwase, 2021). This study, by focusing on Rwamagana District, will provide valuable insights into these local STI trends and associated risk factors, building upon findings from recent research to inform targeted interventions and healthcare strategies that can effectively reduce STI transmission and improve sexual health outcomes in Rwanda.

The add value of this study to the science

This study:

- contributes to science by providing robust, context-specific epidemiological evidence on the prevalence and behavioral determinants of sexually transmitted infections in a Rwandan hospital setting.
- Clarifies the empirical identification of priority behavioral risk pathways relevant to Rwanda's sociocultural context (early sexual debut, partner concurrency, condom non-use, and substance use), providing an evidence base to refine national STI prevention strategies and integrate them more effectively into existing sexual and reproductive health services.

METHODS

Study Design

A hospital based cross-sectional study was conducted from December 2025 to January 2026, using a quantitative approach (Babbie, 2016) to determine the prevalence and factors associated with STIs among patients attending Rwamagana Level II Teaching Hospital.

Study Settings and Population

Rwamagana District served as a study location, especially at Rwamagana Level II Teaching Hospital in Rwanda. The district of Rwamagana is situated in the province of East, approximately 50 kilometers east of Kigali, the capital city. The district is characterized by a mix of urban and rural areas, with a diverse population engaged in agriculture, trade, and various services (Rwamagana District, 2023).

Understanding the dynamics of sexually transmitted infections (STIs) within this context was crucial, as the socio-economic diversity of the district could influence STI prevalence and the factors linked to infection among patients seeking care at that hospital.

Rwamagana Level II Teaching Hospital was selected due to its role as a primary healthcare facility serving the local population, providing essential medical services including STI testing and treatment. The hospital plays a key role in implementing national health programs aimed at improving sexual health and preventing STIs in the region. Its catchment area includes both urban and rural communities, which allowed the work to capture complete knowledge of the factors linked to STI prevalence in the district (Rwamagana District, 2023).

The population was made of patients attending Rwamagana Level II Teaching Hospital seeking healthcare services, particularly those related to STIs. According to the annual report of this hospital, it serves 484,953 people (Rwamagana Level II Teaching Hospital, 2024).

Inclusion and Exclusion Criteria

Participants included in the study were patients attending Rwamagana Level II Teaching Hospital who were willing to participate and had undergone laboratory testing for STIs. Patients were excluded if they were not attending the hospital, were unwilling to participate, or did not have laboratory test results.

Sample Size and Sampling

The study sample size (n) was computed based on the following Yamane sample size formula (Babbie & Mouton, 2018; Kumar, 2019). According to this formula, Sample size n was: 484,953. After the calculation, the sample size was 400. After having added 10% for bias related to non-response, the sample was composed of 440 individuals who reside near Rwamagana Level II Teaching Hospital. A simple random sampling helped to make sure that anyone had an equivalent chance to be one of the participants (Kumar et al., 2018). A sampling structure was set up by listing all patients attending Rwamagana Level II Teaching Hospital during the data collection period. Once the sampling frame was created, a sampling generator helped to select respondents from this list. This method guaranteed that the selection process was unbiased and that the sample accurately echoed the diverse demographics of the patient residents, including age, gender, and socioeconomic status. The sampling also accounted for patients from various departments within the hospital, capturing individuals with different health-seeking behaviors and clinical presentations.

The dependent and independent variable of this study

Independent variables in this study include socio-demographic characteristics (gender, age, education level, marital status, residence, household size, and occupation), behavioral factors and comorbid diseases. These independent variables affect the dependent variable, which is Sexual transmitted infection. This dependent variable includes various STI such as urethral and rectal Chlamydia trachomatis (CT), Neisseria Gonorhea(NG), Syphilis, Human Papillomavirus (HPV), Herpes Simplex Virus (HSV), Trichomoniasis. In this context, the dependent variable refers to the outcome being measured, while the independent variables are the factors that may influence that outcome.

Study instruments.

To collect data, an adapted and structured questionnaire, alongside laboratory testing for selected STIs were designed to assess the prevalence and factors associated with STIs among patients attending Rwamagana Level II Teaching Hospital was used (Rwema et al., 2022). The questionnaire consisted of several sections, each addressing specific aspects of

STI-related factors, including socio-demographic characteristics, behavioral factors, and comorbidities.

Validity and reliability of the instrument

To ensure the validity and reliability of the data, significant accent concerned validation of the instruments of collecting data. The Content Validity Index (CVI) was assessed as a key gauge of the robustness of the measurement tools, including the questionnaires (Yusoff et al., 2019). Guarantying reliability was essential for the dependability and accuracy of the data collected to be used in this work. In order to achieve this, a pilot test was conducted with approximately 10% of the sample, and the data obtained during this phase were used to perform a reliability analysis to assess the internal regularity of the questionnaire. Cronbach's alpha (α) coefficient was calculated for the instrument, and 0.71 or superior was considered good enough, indicating adequate reliability (Taber et al., 2018).

Statistical analysis

To analyse data, SPSS 21.0 helped to ensure accurate data management and statistical processing. The dataset was first subjected to coding, cleaning, and validation to identify and correct inconsistencies, missing values, and entry errors prior to formal analysis.

Descriptive statistics were generated through univariate analysis to sum up the characteristics of the study population and to find out the overall prevalence of STIs. To present socio-demographic variables, behavioral factors, and comorbidity profiles in tabular and graphical formats, percentages and frequencies were used. Bivariate analysis was performed using χ^2 tests to examine the associations between independent variables and STI status. Variables that demonstrated statistical significance at the bivariate level were subsequently entered into a multivariate logistic regression model to control potential confounding factors and to identify independent factors associated with STI occurrence. Significance of statistics was set a $p<0.05$ and results were interpreted using AORs and 95% of CI.

RESULTS

A total of 440 patients attending Rwamagana Level II Teaching Hospital were included in this study. Regarding gender distribution, females constituted a slightly higher proportion of the respondents at 51.8% (n = 228), while males accounted for 48.2% (n = 212). About 47.7% (n = 210) of the study population were young to early middle-aged adults aged 25–34 years. Those aged 18 up to 24 years accounted for 22.7% (n = 100), while those aged 35 years and above comprised 29.5% (n = 130).

With respect to educational attainment, 52.0% (n = 229) have attained primary school. Participants with secondary education constituted 25.9% (n = 114), while only 8.2% (n = 36) had attained tertiary education. A notable proportion of the study population, 13.9% (n = 61), reported having no formal education. Marital status analysis showed that married participants formed the largest group at 44.5% (n = 196). Single respondents accounted for 30.7% (n = 135), while widowed and divorced participants represented 9.3% (n = 41) and 8.9% (n = 39), respectively. A smaller proportion of participants were cohabiting, comprising 6.6% (n = 29).

Regarding place of residence, the majority of participants resided in rural areas, representing 68.9% (n = 303), whereas 31.1% (n = 137) were from urban settings. Household size data revealed that most respondents lived in medium-sized households with 4–6 members, accounting for 56.6% (n = 249). Participants from large households of seven or more members constituted 22.7% (n = 100), while those from small households of 1–3 members represented 20.7% (n = 91). In terms of occupation, employed participants formed the largest proportion at 37.7% (n = 166). Unemployed respondents accounted for 31.1% (n = 137), while students represented 26.4% (n

= 116). A smaller proportion of participants retired, comprising 4.8% (n = 21).

Table 1. Socio-Demographic Characteristics of Patients Included in the Study.

Variable: (n = 440)	Category	N	%
Age (years)	18–24 years – Adolescents and young adults	100	22.7
	25–34 years	210	47.7
	>35	130	29.5
Gender	Male	212	48.2
	Female	228	51.8
Marital status	Widowed	41	9.3
	Single	135	30.7
	Cohabiting	29	6.6
	Divorced	39	8.9
	Married	196	44.5
Education level	Primary	229	52.0
	University	36	8.2
	No official education	61	13.9
	Secondary	114	25.9
Residence	Urban	137	31.1
	Rural	303	68.9
Household size	4 up to 6 members	249	56.6
	1 up to 3 members	91	20.7
	Large household: 7 members and above (>=7)	100	22.7
Occupation	Employed	166	37.7
	Unemployed	137	31.1
	Student	116	26.4
	Retired	21	4.8

Source: Researcher, 2025

Table 2 showed the prevalence of selected STIs among the 440 patients attending Rwamagana Level II Teaching Hospital. Overall, a relatively low prevalence of laboratory-confirmed sexually transmitted diseases (STDs) was observed, with 4.8% (n = 21) of participants testing positive for at least one infection, while the majority, 95.2% (n = 419), tested negative. Among the specific infections assessed, gonorrhea was the most commonly detected, with a prevalence of 1.8% (n = 8). Chlamydia followed closely, identified in 1.4% (n = 6) of the participants. Syphilis was detected in 1.1% (n = 5) of the study population, while trichomoniasis had the lowest prevalence at 0.5% (n = 2). For clarity and ease of interpretation, Figure 1 presents the prevalence of STIs among patients attending Rwamagana Level II Teaching Hospital.

Table 2: Prevalence of sexual transmitted infection among patients attending Rwamagana Level II Teaching Hospital.

Variable: (n = 440)	Category	N	%
Gonorrhea	P	8	1.8
	N	432	98.2
Chlamydia	P	6	1.4
	N	434	98.6
Syphilis	P	5	1.1
	N	435	98.9
Trichomoniasis	P	2	.5
	N	438	99.5
Overall prevalence of STDs	P	21	4.8
	N	419	95.2

Note: P=Positive; N=Negative
Source: **Researcher, 2025**

Figure 1 illustrates the prevalence of STIs among patients attending Rwamagana Level II Teaching Hospital. The findings point out that a small fraction of the population tested positive for at least one sexually transmitted infection, accounting for 4.8% of participants, while the vast majority, 95.2%, tested negative.

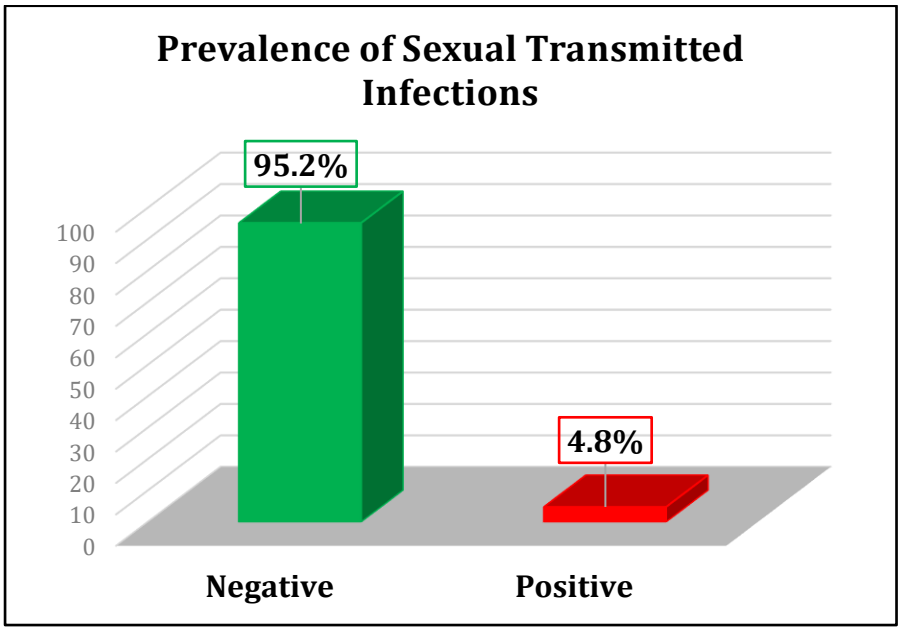

Figure 1. Prevalence of sexual transmitted infection among patients attending Rwamagana Level II Teaching Hospital.

The bivariate examination observed that the level of education had a link to the prevalence of sexually transmitted infections (p = 0.047). Participants with no formal education accounted for the highest proportion of STI-positive cases (9.8%), followed by those with primary education (5.7%). In contrast, lower proportions of infection were observed among

participants with secondary (0.9%) and tertiary education (2.8%). Marital position also was linked to the prevalence of STIs (p = 0.049). (Table 3)

Table 3: Bivariate Associations between Socio-Demographic Characteristics and sexual transmitted infections among patients attending Rwamagana Level II Teaching Hospital.

Variable:	Category	STIs Positive	STIs Negative	p-value (χ^2)
Gender	Male	14(6.6)	198(93.4)	0.082
	Female	7(3.1)	221(96.9)	
Age (years)	18–24 years	7(7.0)	93(93.0)	0.340
	25–34 years	7(3.3)	203(96.7)	
	(>=35 years)	7(5.4)	123(94.6)	
Education level	Secondary	1(0.9)	113(99.1)	**0.047**
	University	1(2.8)	35(97.2)	
	Primary	13(5.7)	216(94.3)	
	No official education	6(9.8)	55(90.2)	
Marital status	Divorced	4(10.3)	35(89.7)	**0.049**
	Married	6(3.1)	190(96.9)	
	Single	6(4.4)	129(95.6)	
	Widowed	1(2.4)	40(97.6)	
	Cohabiting	4(13.8)	25(86.2)	
Residence	Urban	7(5.1)	130(94.9)	0.824
	Rural	14(4.6)	289(95.4)	
Household size	1 up to 3	7(7.7)	84(92.3)	0.086
	4 up to 6	7(2.8)	242(97.2)	
	7 and above (>=7)	7(7.0)	93(93.0)	
Occupation	Employed	7(4.2)	159(95.8)	0.980
	Unemployed	7(5.1)	130(94.9)	
	Student	6(5.2)	110(94.8)	
	Retired	1(4.8)	20(95.2)	

Source: Researcher, 2025

Cohabiting participants recorded the highest proportion of STI-positive cases (13.8%), followed by divorced individuals (10.3%). Lower proportions were observed among single (4.4%), married (3.1%), and widowed participants (2.4%).

In contrast, gender, age group, place of residence, household size, and occupation did not show a link to the prevalence of sexually transmitted infections among patients attending Rwamagana Level II Teaching Hospital.

Table 4: Bivariate Associations between Behavioral Factors and sexual transmitted infections among patients attending Rwamagana Level II Teaching Hospital.

Variable: (n = 440)	Category	STIs Positive	STIs Negative	p-value (χ^2)
Current Number of Sexual Partners	One sexual partner	4(1.9)	205(98.1)	**0.007**
	Two or more sexual partners (>=2)	17(7.4)	214(92.6)	
Older Sexual Partners than Respondent	Yes	7(3.7)	183(96.3)	0.350
	No	14(5.6)	236(94.4)	
Regular sexual partner	Yes	4(2.1)	187(97.9)	**0.021**
	No	17(6.8)	232(93.2)	
Early Sexual Debut (Age at 1st Sexual Intercourse)	<18 years-Early sexual debut	20(11.3)	157(88.7)	**0.001**
	>=18 years-Not early sexual debut	1(0.4)	262(99.6)	
Alcohol use	Never	7(3.6)	188(96.4)	**0.001**
	Occasionally	1(1.6)	62(98.4)	
	Frequently	2(1.9)	101(98.1)	
	Daily	11(13.9)	68(86.1)	
Tobacco smoking	Yes	3(4.1)	71(95.9)	0.751
	No	18(4.9)	348(95.1)	
Recreational Drug Use	Yes	3(42.9)	4(57.1)	**0.001**
	No	18(4.2)	415(95.8)	
Sex with Same Gender	Yes	2(28.6)	5(71.4)	**0.003**
	No	19(4.4)	414(95.6)	
Did you use a condom during your last sexual intercourse with a regular partner?	Yes	0(0.0)	25(100.0)	0.249
	No	21(5.1)	394(94.9)	
Did you use a condom during your last sexual intercourse with a casual partner?	Yes	1(0.9)	111(99.1)	**0.026**
	No	20(6.1)	308(93.9)	
In the past 6 months, how would you rate your access to condoms?	Very good	10(9.5)	95(90.5)	0.65
	Good	10(3.3)	257(96.7)	
	Fair	1(5.3)	18(94.7)	
	Poor	0(0.0)	9(100.0)	

Source: Researcher, 2025

The bivariate analysis of behavioral factors showed that the current number of sexual partners had a link to the prevalence of STIs (p = 0.007). Participants reporting two or more sexual partners accounted for 7.4% of STI-positive cases, compared to 1.9% among those with only one sexual partner. Having a regular sexual partner was also significantly associated with STI status (p = 0.021), with 6.8% of participants without a regular partner testing positive, compared to 2.1% among those with a regular partner.

Early sexual debut demonstrated a strong significant association with STI prevalence (p = 0.001). Respondents who became sexually

active before reaching 18 years of age accounted for 11.3% of STI-positive cases.

Whereas only 0.4% of those who initiated sexual activity at 18 years or older tested positive. Alcohol use had a link to STI position (p = 0.001), with 13.9% of participants who consumed alcohol daily testing positive, compared to 3.6% among those who never drank, 1.6% among occasional users, and 1.9% among frequent users.

Recreational drug use had a link to the prevalence of STIs (p = 0.001), with 42.9% of users testing positive compared to 4.2% of non-users. Sex with the same gender was also significantly associated with STI status (p = 0.003), with 28.6% of participants engaging in same-gender sexual activity testing positive, compared to 4.4% among those who did not.

Table 5: Bivariate Associations between Comorbidities and sexual transmitted infections among patients attending Rwamagana Level II Teaching Hospital.

Variable: (n = 440)	Category	STIs Positive	STIs Negative	p-value (χ^2)
HIV	Positive	2(15.4)	11(84.6)	0.068
	Negative	19(4.4)	408(95.6)	
Depression	Yes	2(6.9)	27(93.1)	0.579
	No	19(4.6)	392(95.4)	
Stigma	Yes	7(20.6)	27(79.4)	**0.001**
	No	14(3.4)	392(96.6)	

Source: Researcher,2025

Condom use at the time of their last sexual intercourse with a non-regular partner was significantly associated with STI prevalence (p = 0.026), with 6.1% of participants who did not use a condom testing positive, compared to 0.9% among those who used one. In contrast, having older sexual partners, tobacco smoking, use of a condom during the latest sexual encounter with a steady partner, and self-rated access to condoms did not show significant associations with STI status.

The bivariate analysis of comorbidities and sexually transmitted infections showed that stigma was significantly associated with STI prevalence (p = 0.001). Participants who reported experiencing stigma accounted for 20.6% of STI-positive cases, compared to 3.4% among those who did not report stigma. In contrast, HIV status and depression were not significantly associated with STI prevalence. The results of the multivariate logistic regression in table 6 indicated that patients who reported having two or more current sexual partners were approximately four times more likely to be diagnosed with an STI than those who had only one partner (AOR = 3.982; 95% CI: 1.462–10.851; p = 0.003). Early sexual debut also was found to be a significant predictor of STI occurrence. Respondents who became sexually active before reaching 18 years of age had more than three times elevated chances of acquiring an STI measure up to persons who began sex when they are older than 18 (AOR = 3.245; 95% CI: 1.504–6.995; p = 0.002). Substance-related behaviors showed a differential pattern of association. While frequent or daily alcohol use was not significantly associated with STIs after controlling for additional indicators (AOR = 1.327; 95% CI: 0.694–2.536; p = 0.391), recreational drug use remained a strong independent predictor. Participants who reported using recreational drugs were almost four times to have an STI measured up to non-users (AOR = 3.876; 95% CI: 1.983–7.574; p = 0.001).

Table 6: Multivariate Analysis of factors associated with transmitted infections among patients attending Rwamagana Level II Teaching Hospital.

Factors	Category	AOR	95%C.I (Lower–Upper)	P-value
Education level	No/Primary education	1.412	0.732–2.726	0.214
	Secondary/Tertiary education (Ref.)	—	—	—
Marital status	Not married (Single/Widowed/Divorced/Cohabiting)	1.896	0.941–3.821	0.073
	Married (Ref.)	—	—	—
Current number of sexual partners	Two or more (≥2)	3.982	1.462–10.851	**0.003***
	One partner (Ref.)	—	—	—
Regular sexual partner	No	2.118	0.954–4.701	0.064
	Yes (Ref.)	—	—	—
Early sexual debut	<18 years	3.245	1.504–6.995	**0.002***
	≥18 years (Ref.)	—	—	—
Alcohol use	Frequent/Daily	1.327	0.694–2.536	0.391
	Never/Occasional (Ref.)	—	—	—
Recreational drug use	Yes	3.876	1.983–7.574	**0.001***
	No (Ref.)	—	—	—
Sex with same gender	Yes	2.984	1.214–7.331	**0.017***
	No (Ref.)	—	—	—
Condom use with casual partner (last intercourse)	No	4.115	1.876–9.029	**0.001***
	Yes (Ref.)	—	—	—
Stigma	Yes	1.589	0.812–3.111	0.178
	No (Ref.)	—	—	—

* Statistically significant at **p < 0.05**

Source: Researcher,2025

Sexual behavior-related protective and risk factors also demonstrated significant effects. Individuals who preferred not to use a condom during their last sexual encounter with a casual partner had more than four times elevated chances of STI infection measured up to to those who reported condom use (AOR = 4.115; 95% CI: 1.876–9.029; p = 0.001). Furthermore, participants who engaged in same-gender sex were nearly three times to have an STI than persons who did not report such behavior (AOR = 2.984; 95% CI: 1.214–7.331; p = 0.017).

In contrast, several socio-demographic and psychosocial factors were not separately linked to STI occurrence in the adjusted model. The level of education was not linked to STI status, as participants with no or primary education had comparable odds of infection to persons having studied higher (AOR = 1.412; 95% CI: 0.732–2.726; p = 0.214). Similarly, marital status was not significantly associated with STI occurrence, although unmarried participants demonstrated a slightly higher, but non-significant, likelihood of infection compared to married participants (AOR = 1.896; 95% CI: 0.941–3.821; p = 0.073).

Additionally, the presence or absence of a regular sexual partner was not significantly related to STI status after adjustment for confounders (AOR = 2.118; 95% CI: 0.954–4.701; p = 0.064). Stigma also did not emerge as an independent predictor of STI infection in

this analysis (AOR = 1.589; 95% CI: 0.812–3.111; p = 0.178), suggesting that its influence may be mediated through other behavioral or social pathways rather than exerting a direct effect.

Discussion of findings

The study found that the overall prevalence of STIs among patients seeking care at Rwamagana Level II Teaching Hospital was 4.8%, indicating a relatively low burden of infection among the general outpatient population. This finding is consistent with a study conducted in rural Kenya, which reported a prevalence of 5.1% among outpatient attendees (Ng'ang'a et al., 2020). The similarity may be attributed to shared rural characteristics such as smaller sexual networks, lower partner concurrency, and relatively reduced exposure to high-risk sexual behaviors compared to urban populations.

When compared with global estimates, the prevalence in this study appears lower. For instance, Rowley et al. (2019) estimated that approximately 1 in 20 individuals globally are affected by STIs, suggesting a broader burden than that observed in this study. Similarly, Korenromp et al. (2020) reported syphilis prevalence ranging from 0.5% to 2.5% among pregnant women, which, although lower for a specific infection, still indicates a persistent global concern. The slightly lower prevalence observed in the current study may reflect differences in study population, as it included general outpatients rather than specific high-risk or vulnerable groups.

At the African level, the findings of this study are considerably lower than those reported in several studies. For example, Unitaid (2021) documented that up to 30% of individuals in high-risk populations in Africa test positive for at least one STI. Studies in Nigeria and South Africa also reported higher prevalence rates of 18.7% for chlamydia (Adekanle et al., 2023) and 12% for gonorrhea among adolescents (Mogasale et al., 2022), respectively. These higher rates can be explained by the focus on high-risk groups and urban populations, where factors such as multiple sexual partnerships, higher population density, and increased mobility contribute to elevated transmission rates.

In the East African context, the prevalence reported in this study is also lower than findings from neighboring countries. For instance, STI prevalence among high-risk groups ranges between 15% and 40% (EAC, 2022), with studies reporting 25% among sex workers in Kenya (Nduati et al., 2023) and 22% prevalence of chlamydia among adolescents in Tanzania (Mshana et al., 2023). Similarly, UNAIDS (2023) reported that up to 30% of men who have sex with men (MSM) in Uganda have untreated STIs. The contrast with the current study is largely due to differences in the populations studied, as high-risk groups inherently face greater exposure to STI transmission.

Within Rwanda, the prevalence found in this study (4.8%) aligns closely with national estimates reported by the Rwanda Biomedical Center, which indicate that syphilis affects about 2–3% of the population, while chlamydia and gonorrhea range between 3–5% (RBC, 2023). However, it is lower than findings from urban-based studies, such as Ndayisaba et al. (2022), who reported an 8% prevalence among young adults in Kigali, and significantly lower than the 35% prevalence among sex workers reported by Mugisha et al. (2023). Additionally, a survey by the Ministry of Health Rwanda (2023) indicated that STI prevalence among youth in Rwamagana District could reach 10%, which is higher than the current study findings. These differences may be explained by variations in age groups, risk behaviors, and study settings, with youth and key populations generally exhibiting higher vulnerability.

The multivariate analysis indicated that education level was not a statistically significant predictor of STI occurrence after adjusting for potential confounders. Although

patients with no or primary education had slightly higher odds of infection compared to those with secondary or university education, this association was not statistically significant (AOR = 1.412; 95% CI: 0.732–2.726; p = 0.214). This finding contrasts with global evidence reported by Low et al. (2020), which demonstrated that individuals with lower socioeconomic status were significantly more likely to contract STIs (AOR = 2.4; p < 0.001). Similarly, studies in sub-Saharan Africa have consistently linked low education levels with higher STI prevalence (Adegboyega et al., 2020). The difference in findings may suggest that in Rwamagana District, access to sexual health information and services may be relatively widespread across education levels, reducing disparities in STI risk.

Similarly, marital status did not show a statistically significant association with STI occurrence in this study, although unmarried individuals had higher odds of infection (AOR = 1.896; p = 0.073). This finding diverges from studies such as Adejumo et al. (2019), which reported that marital stability plays a protective role against STI exposure. The inconsistency may reflect changing social dynamics, including partner mobility and hidden high-risk behaviors within marital relationships, which are not always captured in self-reported data.

In contrast, behavioral factors were strongly associated with STI occurrence. Participants with multiple sexual partners had nearly four times higher odds of infection (AOR = 3.982; p = 0.003), which is consistent with findings from Nigeria, where Duku et al. (2023) reported a similarly strong association (AOR = 4.2; p < 0.001). This agreement highlights multiple partnerships as a key driver of STI transmission across different settings. Early sexual debut was also significantly associated with STI occurrence (AOR = 3.245; p = 0.002), aligning with global literature (Biddlecom et al., 2018), which emphasizes that early initiation increases lifetime exposure to sexual risk behaviors.

Regarding substance use, alcohol consumption was not significantly associated with STI occurrence (AOR = 1.327; p = 0.391), suggesting that its effect may be indirect. However, recreational drug use showed a strong and significant association (AOR = 3.876; p = 0.001), consistent with findings from East African studies such as Munyaneza et al. (2020), which link drug use to impaired decision-making and increased likelihood of engaging in unsafe sexual practices. This supports the broader understanding that substance use, particularly drugs, plays a critical role in shaping risky sexual behavior.

Sexual practices and preventive behaviors were also important determinants. Participants who did not use condoms during their last sexual encounter with a casual partner had over four times higher odds of STI infection (AOR = 4.115; p = 0.001). This finding strongly aligns with global evidence from Brazil, where Borgato et al. (2021) reported that inconsistent condom utilization significantly increased STI risk (AOR = 3.1; p < 0.001). Additionally, individuals engaging in same-gender sexual activity had higher odds of infection (AOR = 2.984; p = 0.017), which is consistent with regional and global studies highlighting the need for targeted interventions in key populations with higher exposure to transmission networks (WHO, 2021).

In contrast, psychosocial factors such as stigma and having a regular sexual partner were not statistically significant predictors in this study. This differs from findings in South Africa, where stigma was significantly associated with higher STI risk (AOR = 2.5; p < 0.01) (Chin et al., 2022), and from studies in Rwanda showing that stigma reduces healthcare-seeking behavior and increases infection risk (Mugisha et al., 2023). Similarly, Ndayisaba et al. (2022) found that limited knowledge significantly increased STI risk (AOR = 2.5; p < 0.01), which was not directly observed in this study. These differences suggest that psychosocial factors in this context

may operate indirectly through behavioral pathways such as condom use, number of sexual partners, and substance use rather than acting as independent predictors.

Study limitations

This study had also got several limitations. The cross-sectional design limits the ability to establish causal relationships between identified risk factors and STI outcomes. Self-reported behavioral data may be subject to recall and social desirability bias, particularly for sensitive variables such as sexual practices and substance use. Furthermore, the study was conducted in a single health facility, which may limit external generalizability to other settings, especially high-risk populations not captured in routine healthcare services

Study Implications

The findings of this study confirm that behavioral factors, such as multiple sexual partnerships, early sexual debut, non-use of condoms, and drug use, play a major role in driving STI transmission in Rwamagana District, consistent with regional and global evidence. However, differences in socio-demographic and psychosocial influences highlight the importance of context-specific approaches. This suggests that STI prevention efforts should prioritize locally tailored behavior change interventions that address the unique social and cultural dynamics of the population. Policies should focus on strengthening targeted STI prevention strategies by promoting sexual health education, increasing access to condoms, and integrating substance use prevention with STI programs. Emphasis should also be placed on community-based interventions that address risky behaviors and are adapted to the local context to improve effectiveness.

Conclusions

This study found a low prevalence of sexually transmitted infections among patients attending Rwamagana Level II Teaching Hospital. The occurrence of STIs was independently associated with behavioral and sexual practice–related factors, including early sexual debut, multiple sexual partners, recreational drug use, inconsistent condom use with casual partners, and same-gender sexual activity. Socio-demographic and psychosocial variables showed no independent association with STI occurrence after adjustment. The hospital should strengthen targeted behavioral interventions and comprehensive sexual health education focusing on safer sexual practices. Routine STI screening and consistent condom promotion should be enhanced to further reduce the risk of infection in the catchment population.

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Author contributions

“MM conceptualized and designed the study, conducted data collection and analysis, interpreted the findings, and drafted the manuscript. “CN provided supervision, contributed to methodological and critical review of the manuscript, and approved the final version for publication.

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Data availability

The dataset generated and analyzed during the current research is not publicly available due to participant confidentiality and privacy

considerations but may be available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the Declaration of Helsinki and received ethical approval from the Mount Kenya University Ethical Review Committee (Reference No: MKU04/ERC/0097). Permission to conduct the study was also obtained from Rwamagana Level II Teaching Hospital. Written informed consent was obtained from all participants prior to data collection. Participants were informed of the study objectives, potential benefits, and their right to withdraw at any time without consequences. All personal data were anonymized to ensure confidentiality and privacy protection.

Competing interests

The authors declare that they have no competing interests.

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