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Original Research Article

A CROSS-SECTIONAL STUDY OF SEXUALLY TRANSMITTED INFECTIONS AMONG HIGH-RISK GROUPS ATTENDING SEXUALLY TRANSMITTED INFECTIONS CLINIC IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Sexually transmitted infections (STIs) remain a major public health concern, particularly among high-risk populations. This study aimed to assess the clinical and epidemiological profile of STIs, including age distribution, sexual behaviour, and HIV prevalence. **Materials and Methods:** A cross-sectional observational study was conducted among 460 patients attending the STI outpatient department of a tertiary care hospital over 18 months. Socio-demographic details, sexual behaviour, and clinical findings were recorded, and laboratory investigations including serological tests for syphilis, HIV, hepatitis B, and hepatitis C were performed. Data were analyzed using descriptive statistics, and associations were assessed using the Chi-square or Fisher's exact test, with $p<0.05$ considered statistically significant. **Results:** Among 460 participants, 64.1% were aged 20–39 years and 76.3% were male. High-risk sexual behaviour was common, with 93.0% reporting unprotected intercourse and 66.1% exposure to unknown partners. Vaginal intercourse was most frequent (56.1%), followed by oroceptive (42.0%) and anoreceptive (37.6%) practices. STIs were present in 40.9% of participants, with balanoposthitis (9.3%) and herpes genitalis (8.5%) being most common. HIV prevalence was 21.9%. Significant associations were observed between STIs and sexual behaviour ($p<0.0001$), mode of sex ($p=0.008$), circumcision status ($p=0.0001$), and HIV positivity ($p=0.019$). **Conclusion:** The study highlights a substantial burden of STIs among high-risk populations, emphasizing the need for targeted behavioural interventions, enhanced screening, and integrated STI–HIV management strategies.

INTRODUCTION

Sexually transmitted infections (STIs) remain a significant global public health concern, particularly among high-risk groups such as men who have sex with men (MSM), transgender individuals (TG), female sex workers (FSW), and injecting drug users (IDU).[1-3] These populations experience disproportionately higher rates of STIs due to a combination of behavioural, biological, and structural factors. The World Health Organisation estimates that more than 374 million new cases of curable STIs occur annually worldwide, with the burden being especially pronounced in low- and middle-income countries and among marginalized communities.[4,5] In India, while the general population's prevalence of curable STIs is estimated to be below 4%, the rates are considerably higher among key populations practicing high-risk behaviors.[1,2]

The clinical and epidemiological assessment of STIs in high-risk groups is crucial for informing targeted interventions and optimizing resource allocation. Recent studies underscore the importance of integrating robust surveillance systems and evidence-based strategies to address the unique needs of these populations.[6,7] Age-wise distribution analyses reveal that adolescents and young adults bear a substantial share of new STI cases, with nearly half of incident infections occurring in individuals aged 15 to 24 years.[8-10] This trend is attributed to early sexual debut, inconsistent condom

use, multiple sexual partners, and limited access to sexual health education and services.[11]

Sexual behaviour patterns among high-risk groups are diverse and influenced by sociodemographic factors such as age, marital status, substance use, and socioeconomic status.[2,12] Studies have shown that MSM and TG individuals often report higher numbers of sexual partners, lower adherence to barrier methods, and increased engagement in group sex or substance-facilitated sexual encounters compared to other groups.[2,13]

The intersection between STIs and HIV infection is particularly concerning. Co-infection with HIV not only complicates clinical management but also accelerates disease progression and increases transmission risk.[14,15] High prevalence rates of HIV have been documented among MSM, TGW (transgender women), FSWs, and IDUs across various regions, including Asia, Africa, and Latin America.[16,17] Integrated screening for both HIV and other STIs is therefore essential for effective prevention and care strategies.

Despite advances in diagnostic technologies such as nucleic acid amplification tests syndromic management remains the standard approach in many primary healthcare settings due to resource constraints. However, this method lacks sensitivity for asymptomatic infections common in high-risk populations.[18,19] There is a growing consensus on the need for combining syndromic management with laboratory diagnostics to improve detection rates.[18]

Therefore, understanding the clinical profiles, age distribution, behavioral patterns, and HIV co-infection rates among high-risk groups attending STI clinics is vital for designing effective public health interventions. This cross-sectional study aims to provide comprehensive clinical and epidemiological data on STIs among high-risk groups attending an STI outpatient department (OPD) at a tertiary care hospital. Specifically, it seeks to elucidate age-wise distribution patterns, characterize sexual behaviors including modes of sex and determine the prevalence of HIV infection within these vulnerable populations. Such data will contribute significantly to strengthening surveillance systems, guiding policy decisions, and tailoring prevention programs for those most at risk.

MATERIALS AND METHODS

This cross-sectional observational study was conducted in the STI Outpatient Department of Tirunelveli Medical College, Tamil Nadu, over a period of 18 months from January 2018 to June 2019. Ethical clearance was obtained from the Institutional Ethics Committee, and informed consent was obtained from all participants prior to inclusion in the study.

Inclusion & Exclusion Criteria

MSM, female sex workers, transgender individuals, individuals with multiple sexual partners, and those belonging to high-risk occupational groups such as drivers, housekeeping staff, and migrants. Patients attending the STI OPD with a history of high-risk sexual behaviour during the study period were considered eligible were included in the study. Individuals who were unwilling to provide informed consent, those with incomplete clinical or laboratory data, patients not belonging to defined high-risk groups, and individuals who were severely ill or unable to participate in the interview and examination were excluded from the study.

Methods

The study population comprised patients attending the STI OPD with a history of high-risk sexual behaviour, of whom a total of 460 registered individuals were included and analysed. The study subjects consisted of high-risk groups, including MSM, FSW, transgender individuals, and those with multiple sexual partners or engaged in high-risk occupations such as drivers, housekeeping staff, and migrants. All participants were interviewed using a structured proforma to obtain socio-demographic details, sexual history, condom usage, and presenting complaints. Pre- and post-test counselling for STIs and HIV, along with education on genital hygiene, safe sexual practices, and treatment adherence, was provided. A detailed general and genital examination was performed, and findings were supported by laboratory investigations. All patients underwent serological testing for syphilis (RPR, TPHA), HIV, hepatitis B (HBsAg), and hepatitis C (anti-HCV). In cases of genital ulcers, dark-field microscopy, Gram stain, tissue smear, and Tzanck smear were performed, while genital discharge was evaluated using wet mount, KOH preparation, and Gram stain. Culture and sensitivity tests were done where indicated. Routine investigations included complete blood count, urine analysis, and ultrasonography, with additional tests performed as clinically indicated. Patients received standard treatment as per guidelines, and partner notification and treatment were undertaken.

Statistical analysis

Categorical variables were expressed as frequencies and percentages. Associations between variables were assessed using the Chi-square test or Fisher's exact test, as appropriate. A p-value of <0.05 was considered statistically significant, and all tests were two-tailed with a 95% confidence level.

RESULTS

Of 460 participants, 64.1% (295) were aged 20–39 years and 76.3% (351) were male. Most were married (79.6%; 366). Common occupations included drivers (14.6%), housekeeping (12.2%),

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and migrants (7.2%); 57.2% (263) belonged to other occupations. [Table 1]

Table 1: Socio-Demographic Profile of Study Population

Variable	Category	n (%)
Age group	10–19	3 (0.7%)
	20–39	295 (64.1%)
	40–64	158 (34.3%)
	>65	4 (0.9%)
Gender	Male	351 (76.3%)
	Female	69 (15.0%)
	Transgender	40 (8.7%)
Occupation	Female sex worker	28 (6.1%)
	Coolie	2 (0.4%)
	Driver	67 (14.6%)
	Housekeeping	56 (12.2%)
	Migrants	33 (7.2%)
	Student	11 (2.4%)
	Others	263 (57.2%)
Marital status	Married	366 (79.6%)
	Unmarried	93 (20.2%)
	Widower	1 (0.2%)

Extra and pre-marital heterosexual contact behaviour was reported in 57.2% (263) and MSM in 42.8% (197). Exposure to unknown partners was frequent (66.1%). Condom use was low (7.0%). Most were uncircumcised (81.3%). [Table 2]

Table 2: Sexual Behaviour and Exposure Profile

Variable	Category	n (%)
Sexual behaviour	EMC/PMC	263 (57.2%)
	MSM	197 (42.8%)
Contact person	Known male	108 (23.5%)
	Known female	48 (10.4%)
	Unknown male	139 (30.2%)
	Unknown female	165 (35.9%)
Condom use	Protected	32 (7%)
	Unprotected	428 (93%)
Circumcision status	Uncircumcised	374 (81.3%)
	None	67 (14.6%)
	Castrated	17 (3.7%)
	Circumcised	2 (0.4%)

Vaginal intercourse was most common (56.1%), followed by ororeceptive (42.0%) and anoreceptive (37.6%) practices. [Table 3]

Table 3: Mode of Sex among High-Risk Groups

Mode of sex	10–19	20–39	40–64	>65	n (%)
Vaginal	1	181	76	0	258 (56.1%)
Anoreceptive	2	101	66	4	173 (37.6%)
Anoinsertive	2	80	44	4	130 (28.3%)
Ororeceptive	2	109	78	4	193 (42%)
Oroinsertive	2	93	59	4	158 (34.3%)

STIs were present in 40.9% (188). Balanoposthitis (9.3%) and herpes genitalis (8.5%) were most common. Oral mucosa was normal in 92.0%. [Table 4]

Table 4: Prevalence and Clinical spectrum of STIs

Variable	Category	n (%)
STI status	Present	188 (40.9%)
	Absent	272 (59.1%)
Type of STI	Balanoposthitis	43 (9.3%)
	Herpes genitalis	39 (8.5%)
	Warts	25 (5.4%)
	VVC	21 (4.6%)
	Early latent syphilis	16 (3.5%)
	Molluscum contagiosum	13 (2.8%)
	Late latent syphilis	7 (1.5%)
	Secondary syphilis	6 (1.3%)
	Scabies	6 (1.3%)
	Primary syphilis	5 (1.1%)
	Gonorrhoea	4 (0.9%)

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	NGU	2 (0.4%)
	Herpes labialis	1 (0.2%)
Oral mucosa	Normal	423 (92%)
	Oral candidiasis	35 (7.6%)
	Oral hairy leukoplakia	1 (0.2%)
	Herpes labialis	1 (0.2%)

HIV prevalence was 21.9% (101), while HBV (0.7%) and HCV (0.2%) were rare. Syphilis seropositivity was 7.4%, and diabetes was present in 4.3%. [Table 5]

Table 5: Co-infections and Comorbidities

Variable	Category	n (%)
HIV	Reactive	101 (21.9%)
	Non-reactive	359 (78.1%)
HBV (HBsAg)	Positive	3 (0.7%)
	Negative	457 (99.3%)
HCV	Positive	1 (0.2%)
	Negative	459 (99.8%)
Syphilis (RPR/TPHA)	Positive	34 (7.4%)
	Negative	426 (92.6%)
Diabetes mellitus	Present	20 (4.3%)
	Absent	440 (95.7%)

Among 188 cases, 56.9% were aged 20–39 years and 75.5% were male. EMC/PMC behaviour (76.6%) and unknown female contact (42.6%) predominated. [Table 6]

Table 6: Socio-Demographic and Behavioural Profile of STI Cases

Variable	Category	n (%)
Age group	20–39	107 (56.9%)
	40–64	80 (42.6%)
	>65	1 (0.5%)
Gender	Male	142 (75.5%)
	Female	43 (22.9%)
	Transgender	3 (1.6%)
Occupation	Driver	27 (14.4%)
	Female sex worker	26 (13.8%)
	Housekeeping	24 (12.8%)
	Migrants	11 (5.9%)
	Student	10 (5.3%)
	Coolie	2 (1.1%)
	Others	88 (46.8%)
Marital status	Married	140 (74.5%)
	Unmarried	47 (25.0%)
	Widower	1 (0.5%)
Sexual behaviour	EMC/PMC	144 (76.6%)
	MSM	44 (23.4%)
Contact person	Known male	43 (22.9%)
	Known female	22 (11.7%)
	Unknown male	43 (22.9%)
	Unknown female	80 (42.6%)

Recent exposure (<1 month) was reported in 50.5%. Genital ulcer (49.5%) and discharge (37.8%) were common findings. [Table 7]

Table 7: Clinical Findings and Temporal Association among STI Cases

Variable	Category	n (%)
Last contact	<2 weeks	38 (20.2%)
	2 weeks–1 month	57 (30.3%)
	1 month–1 year	59 (31.4%)
	>1 year	34 (18.1%)
Genital ulcer/fissure	Present	93 (49.5%)
Genital discharge	Present	71 (37.8%)
Papules	Present	45 (23.9%)
Lymph nodes	Present	51 (27.1%)

Herpes genitalis (39) and balanoposthitis (43) clustered within 1 month due to shorter incubation periods, whereas warts, early latent syphilis, and late latent syphilis showed variable periods of last sexual contact ranging from months to years. [Table 8]

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Table 8: Distribution of STI Diagnoses According to Period of Last Sexual Contact

Diagnosis	<2 weeks	2 weeks–1 month	1 month–1 year	>1 year	Total
Herpes genitalis	11	14	9	5	39
Gonorrhoea	1	1	2	0	4
Molluscum contagiosum	1	5	6	1	13
Warts	2	8	12	3	25
VVC	8	8	4	1	21
Scabies	2	1	2	1	6
Balanoposthitis	9	13	6	15	43
Primary syphilis	2	2	1	0	5
Secondary syphilis	1	2	3	0	6
Early latent syphilis	1	0	13	2	16
Late latent syphilis	0	1	1	5	7
NGU	0	2	0	0	2
Herpes labialis	0	0	0	1	1

EMC/PMC behaviour (p<0.0001), mode of sex (p=0.008), uncircumcised status (p=0.0001), and HIV positivity (p=0.019) were significantly associated with STIs; condom use and comorbidities were not (p>0.05). [Table 9]

Table 9: Risk Factors and Statistical Association with STIs

Variable	Category	n (%)	P value
Sexual behaviour	EMC/PMC	144 (76.6%)	<0.0001
	MSM	44 (23.4%)	
Mode of sex	Vaginal	87 (46.3%)	0.008
	Anoreceptive	82 (43.6%)	
	Anoinsertive	57 (30.3%)	
	Ororeceptive	98 (52.1%)	
	Oroinsertive	77 (41%)	
Condom use	Protected	14 (7.4%)	>0.05
	Unprotected	174 (92.6%)	
Circumcision	Uncircumcised	142 (75.5%)	0.0001
	None	41 (21.8%)	
	Castrated	3 (1.6%)	
	Circumcised	2 (1.1%)	
HIV	Positive	31 (16.4%)	0.019
HBV/HCV	Present	0	>0.05
Diabetes	Present	20 (10.6%)	>0.05

DISCUSSION

STI remain a significant public health concern, particularly among high-risk populations due to their association with behavioural and epidemiological factors. The present study was undertaken to assess the clinical and epidemiological profile of STIs among high-risk groups attending an STI clinic, with emphasis on age distribution, sexual behaviour, and HIV prevalence. The findings demonstrated a predominance of young to middle-aged males, with high-risk sexual practices, diverse modes of exposure, and a considerable burden of STIs.

The present study demonstrates that the study population was predominantly composed of young to middle-aged adults with male predominance, most of who were married and engaged in diverse occupations, reflecting the typical demographic characteristics of high-risk groups attending STI clinics. This finding is comparable to that reported by Rosita et al., where most STI cases occurred in the 20–49 years age group (82.8%).[20]

Similar observations were reported by Katusiime et al., where males (89.3%) and individuals aged 30–49 years (81.1%) predominated.[21] Likewise, Nuraeni et al. reported a predominance of males (97.4%) in the 16–44 years age group (95.5%), with a higher proportion of unmarried individuals and MSM, along with a substantial burden of concurrent STIs (32.1%), underscoring the role of demographic and behavioural factors in STI transmission.[22]

These findings align with our study, where young, sexually active males engage in higher-risk behaviours and frequent partner change, increasing exposure probability and facilitating sustained transmission of STIs.

It was observed that high-risk sexual behaviour was largely driven by extra- and pre-marital heterosexual contact, along with a considerable proportion of MSM, with frequent exposure to unknown partners and low condom usage. The pattern of sexual practices showed predominance of vaginal intercourse, followed by oral and anal routes, indicating multiple modes contributing to transmission. Similarly, Sarkar et al., who reported a high prevalence of multiple sexual partners (84.1%) and inconsistent condom use (65.1%) among MSM, with a substantial proportion experiencing STI symptoms (60.3%), underscoring the role of high-risk sexual behaviour in STI transmission.[23]

These findings are further supported by Chandra et al., who highlighted that socio-demographic factors, including marital status, substance use, and poor

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awareness, significantly contribute to risky sexual behaviour such as unprotected sex and multiple partnerships, thereby increasing the risk of STI transmission.[24]

These findings align with our results, where high-risk sexual practices, multiple partners, and inconsistent condom use increase STI transmission, highlighting the need for targeted behavioural interventions and awareness programs.

The findings further indicate a substantial burden of STIs among the study population, with infections such as balanoposthitis and herpes genitalis being more commonly encountered, while the majority had normal oral mucosal findings. Additionally, HIV emerged as a significant co-infection, whereas other viral infections and metabolic comorbidities were less frequently observed. These findings are comparable to those reported by Rathi et al., where balanoposthitis was the most common STI (37.8%), followed by herpetic genital ulcer disease (17.3%) and anogenital warts (9.3%), with viral STIs constituting 33.5% of cases and an HIV prevalence of 3.9%.[25] Comparable observations were reported by Soni et al., where balanoposthitis (37.98%) and herpes genitalis (18.65%) predominated, with an HIV prevalence of 2.37% and a higher occurrence of viral STIs, particularly herpes genitalis (46.29%), among HIV-positive individuals, reinforcing the association between STI burden and HIV co-infection.[26]

These findings align with our results, where predominant viral STIs and HIV co-infection increase disease burden, requiring early diagnosis, screening, and integrated management strategies.

Among affected individuals, recent sexual exposure was commonly reported, and clinical presentation frequently included genital ulcers, discharge, and other mucocutaneous manifestations. A temporal relationship was evident, wherein acute infections were more often associated with recent exposure, while latent infections were seen in those with longer intervals since last contact. Comparable observations were reported by Revankar et al., who documented a high prevalence of symptomatic STIs, particularly herpes genitalis (28.8%) and syphilis (26.8%), along with a significant proportion of individuals having multiple sexual partners (53.8%) and low condom usage (86.5%), indicating a substantial burden of clinically evident STIs, although temporal associations were not specifically assessed.[27]

These findings are partially supported by Rathi et al., who reported a high prevalence of genital ulcerative diseases, including herpetic genital ulcer disease (17.3%) and non-herpetic ulcers (3.28%), along with other symptomatic STIs such as balanoposthitis (37.8%), reflecting the significant clinical burden of symptomatic STIs among high-risk populations.[25]

These findings align with our results, where recent exposure leads to symptomatic STIs, while delayed diagnosis contributes to persistence and complications.

Analytical assessment revealed that high-risk sexual behaviour, specific modes of sexual practices, circumcision status, and HIV positivity were significantly associated with STIs, whereas condom use and other comorbid conditions did not show a significant association. These findings align with those reported by Jain et al., who demonstrated a significant association between high-risk sexual practices and STI occurrence, particularly with anal ($p < 0.001$; OR 5.3) and oral sex ($p < 0.001$; OR 13.2), while comorbidities did not show a significant association ($p = 0.133$), highlighting the predominant role of behavioural factors in STI transmission.[2] Comparable observations were noted by Mehta et al., who reported that behavioural factors such as multiple sexual partners (52.7%) and early sexual debut were associated with STI occurrence, along with low condom utilization (28.3%) and notable HIV seropositivity (7.7%), emphasizing the role of behavioural and epidemiological determinants in STI transmission.[28]

These findings align with our results, where behavioural factors and sexual practices drive STI risk, necessitating targeted interventions and preventive strategies.

Overall, the findings indicate interplay between socio-demographic factors, high-risk sexual behaviour, and clinical manifestations of STIs. Multiple partners, inconsistent condom use, and diverse sexual practices contributed to transmission. Symptomatic presentations such as genital ulcers and discharge were common, with viral STIs predominating. HIV co-infection further reflects the overlapping epidemiology of STIs.

Limitations

This study has certain limitations. Being a single-centre, cross-sectional study, the findings may not be generalizable to the broader population. Self-reported sexual behaviour is subject to recall and social desirability bias. The use of predominantly syndromic approaches may have led to underdiagnosis of asymptomatic infections. Additionally, temporal associations cannot establish causality due to the observational design.

CONCLUSION

There is a substantial burden of STIs among high-risk populations, predominantly affecting young adult males with significant behavioural risk factors. High prevalence of unprotected sexual practices, multiple partners, and diverse modes of exposure contributed to transmission dynamics. Balanoposthitis and herpes genitalis were the most common STIs, with a notable proportion of viral and bacterial infections and significant HIV co-infection. These findings highlight the need for targeted behavioural interventions, strengthened

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screening strategies, and integrated STI–HIV services to improve early diagnosis, reduce transmission, and enhance sexual health outcomes in high-risk groups.

REFERENCES

1. Bhatta M, Majumdar A, Ghosh U, Ghosh P, Banerji P, Aridoss S, et al. Sexually transmitted infections among key populations in India: A protocol for systematic review. medRxiv 2022. https://doi.org/10.1101/2022.12.04.22282962.
2. Jain V, Aggarwal S, Nigam K, Kamble B, Kundapur R, Konda D, et al. Risk at the Crossroads: Evaluating the risk of sexually transmitted infections in high-risk groups. Cureus 2025;17:e86459. https://doi.org/10.7759/cureus.86459.
3. Amesty S, Perez-Figueroa R, Stonbraker S, Halpern M, Donastorg Y, Perez-Mencia M, et al. High burden of sexually transmitted infections among under-resourced populations in the Dominican Republic. Ther Adv Infect Dis 2023;10. https://doi.org/10.1177/20499361231193561.
4. Naranjo-Márquez M, Bocchino A, Gilart E, Cotobal-Calvo EM, Procentese F, Palazón-Fernández JL. Risk determinants of sexual behaviors: Dating apps, history of sexually transmitted infections, substance use, and pornography consumption in health science students. Nurs Rep 2025;15:83. https://doi.org/10.3390/nursrep15030083.
5. Deng M, Chen J, Wang Z, Zheng R, Pang W, Sun R, et al. Trends in the incidence of common sexually transmitted infections at the global, regional and national levels, 1990–2021: results of the Global Burden of Disease 2021 study. Trop Med Health 2025;53. https://doi.org/10.1186/s41182-025-00744-2.
6. Mitjà O, Padovese V, Folch C, Rossoni I, Marks M, Rodríguez i Arias MA, et al. Epidemiology and determinants of reemerging bacterial sexually transmitted infections (STIs) and emerging STIs in Europe. Lancet Reg Health Eur 2023;34:100742. https://doi.org/10.1016/j.lanepe.2023.100742.
7. Dom NC, Dapari R, Harith Mohamad Syahriman MA, Mohd Sukri AA, Azwa Kamarudin NL, Aqilah Ahmad Bakhtiar NS, et al. Mapping the hidden epidemic: A scoping review of sexually transmitted diseases in Southeast Asia. Int J STD AIDS 2025;36:765–75. https://doi.org/10.1177/09564624251349598.
8. Zhang J, Ma B, Han X, Ding S, Li Y. Global, regional, and national burdens of HIV and other sexually transmitted infections in adolescents and young adults aged 10–24 years from 1990 to 2019: a trend analysis based on the Global Burden of Disease Study 2019. Lancet Child Adolesc Health 2022;6:763–76. https://doi.org/10.1016/s2352-4642(22)00219-x.
9. Kreisel KM, Spicknall IH, Gargano JW, Lewis FMT, Lewis RM, Markowitz LE, et al. Sexually transmitted infections among US women and men: Prevalence and incidence estimates, 2018. Sex Transm Dis 2021;48:208–14. https://doi.org/10.1097/olq.0000000000001355.
10. Du M, Yan W, Jing W, Qin C, Liu Q, Liu M, et al. Increasing incidence rates of sexually transmitted infections from 2010 to 2019: an analysis of temporal trends by geographical regions and age groups from the 2019 Global Burden of Disease Study. BMC Infect Dis 2022;22. https://doi.org/10.1186/s12879-022-07544-7.
11. Rivera P, Pichardo G, Brito G, Somoza A. Sexual practices among residents over 18 years of age in the Santa Rosa sector of baní, Dominican Republic: Risk factors associated with the transmission of sexually transmitted infections. Cureus 2025. https://doi.org/10.7759/cureus.88170.
12. Ufimtseva MA, Gurkovskaya EP, Komarov AA, Kosova AA, Nikolayeva KI, Struin NL, et al. Specifics of epidemiological anamnesis of sexually transmitted diseases in high-risk groups. PH&LE 2023:71–7. https://doi.org/10.35627/2219-5238/2023-31-10-71-77.
13. Luz I, Vinhaes E, Cruz I, Travassos AG, Luz E, Netto EM, et al. High prevalence of anal sexually transmitted infections among men who have sex with men and transgender women attending a clinic for prevention of anal cancer in Salvador, Brazil. Pathogens 2023;12:1297. https://doi.org/10.3390/pathogens12111297.
14. Zhang Q, Peng L, Yuan Y, Hu Z, Zeng Y, Zeng W, et al. High rates of Treponema pallidum, Neisseria gonorrhoeae, Chlamydia trachomatis, or Trichomonas vaginalis co-infection in people with HIV: a systematic review and meta-analysis. Eur J Clin Microbiol Infect Dis 2025;44:1–15. https://doi.org/10.1007/s10096-024-04966-w.
15. Suryanegara J, Pilar NA, Riswanto CD, Agusni RI, Sari M, Astindari, et al. Sexually transmitted infections among human immunodeficiency virus patients in a tertiary hospital in Surabaya, Indonesia. Berkala Ilmu Kesehatan Kulit Dan Kelamin (Periodical of Dermatology and Venerology) 2025;37:119–24. https://doi.org/10.20473/bikkk.v37.2.2025.119-124.
16. Mahmud S, Mohsin M, Muyeed A, Islam MM, Hossain S, Islam A. Prevalence of HIV and syphilis and their co-infection among men having sex with men in Asia: A systematic review and meta-analysis. Heliyon 2023;9:e13947. https://doi.org/10.1016/j.heliyon.2023.e13947.
17. Dias BDC, Sekgele W, Nhlapo D, Mahlangu MP, Venter JME, Maseko DV, et al. Extragenital sexually transmitted infections among high-risk men who have sex with men in Johannesburg, South Africa. Sex Transm Dis 2024;51:245–50. https://doi.org/10.1097/olq.0000000000001927.
18. Seloka MA, Phalane E, Phaswana-Mafuya RN. The control and prevention of sexually transmitted infections in primary healthcare facilities among key and priority population in sub-Saharan Africa: A systematic review. Afr J Reprod Health 2025;29:168–203. https://doi.org/10.29063/ajrh2025/v29i3.19.
19. Vialard F, Anand A, Leung Soo C, de Waal A, McGuire M, Carmona S, et al. Self-sampling strategies (with/without digital innovations) in populations at risk ofChlamydia trachomatisandNeisseria gonorrhoeae: a systematic review and meta-analyses. Sex Transm Infect 2023;99:420–8. https://doi.org/10.1136/sextrans-2022-055557.
20. Rosita R, Herawati Y, Kartika I, Iriani OS, Triwidiyantari D, Sari DP. Faktor Determinan Infeksi Menular Seksual Dan HIV/AIDS Di Puskesmas Ibrahim Adjie Kota Bandung Tahun 2022. Medika 2023;1:327–36. https://doi.org/10.59680/medika.v1i2.595.
21. Katusiime C, Schlech WF 3rd, Parkes-Ratanshi R, Sempa J, Kambugu A. Characteristics of sexually transmitted infections among high-risk HIV-positive patients attending an urban clinic in Uganda. J Int Assoc Provid AIDS Care 2016;15:36–41. https://doi.org/10.1177/2325957413506493.
22. Nuraeni S, Alfian SD, Puspitasari IM. Examining the prevalence and associated factors of sexually transmitted infections in people living with HIV/AIDS at a community health center in Bandung City, Indonesia. HIV AIDS (Auckl) 2025;17:29–37. https://doi.org/10.2147/HIV.S502969.
23. Sarkar S, Bhandari S, Sensarma P. Social correlates of sexual risk behaviors among urban men who have sex with men in Kolkata, India. South East Asia J Public Health 2015;4:17–24. https://doi.org/10.3329/seajph.v4i1.21834.
24. Chandra R, Kumar A, Dixit P, National Aids Control Organisation NACO, New Delhi. 588 Understanding risky sexual behavior among migrants in India: determinants and public health implications. Eur J Public Health 2025;35. https://doi.org/10.1093/eurpub/ckaf180.388.
25. Rathi S, Hajare SA, Jaiswal S, Agrawal S, Kherde A, Mishra D. Pattern of sexually Transmitted Infections: A retrospective study from a tertiary care hospital in central India. J Clin Diagn Res 2021. https://doi.org/10.7860/jcdr/2021/45933.14464.
26. Soni R, Mathur P, Mukhi J. A retrospective study of the pattern of sexually transmitted infections during a five-year period at tertiary care hospital in Central India. Int J Med Rev Case Rep 2022:1. https://doi.org/10.5455/ijmrcr.172-1664899903.
27. Revankar SS, Chandrashekhar MH, Reddy S. Prevalence of sexually transmitted infections in people living with human immunodeficiency virus/acquired immunodeficiency

ISSN (O): 2687-5365; ISSN (P): 2753-6556

syndrome: A retrospective study at a tertiary care center in central Karnataka. Indian J Sex Transm Dis AIDS 2025;46:48–51. https://doi.org/10.4103/ijstd.ijstd_129_24.
28. Mehta S, Rao R, Mehta S, Singh K. HIV seropositivity, patterns, and clinico-epidemiological profile of sexually transmitted infection patients attending the Suraksha Clinic of a tertiary care public hospital in southern Rajasthan, India-a cross-sectional study. Sci Rep 2025;15:41027. https://doi.org/10.1038/s41598-025-25015-2.

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