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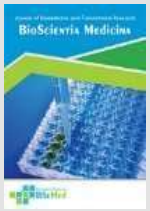

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Prevalence and Risk Factors of Sexually Transmitted Infections in a Tertiary Hospital in Surakarta, Indonesia

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A B S T R A C T

Background: Sexually transmitted infections (STIs) remain a significant public health concern globally, with millions of new cases occurring annually. Understanding the prevalence and risk factors associated with STIs is crucial for effective prevention and control programs. This study aimed to investigate the prevalence and risk factors of STIs among patients attending the Dermatology and Venereology Outpatient Clinic of Dr. Moewardi General Hospital, a tertiary hospital in Surakarta, Indonesia. **Methods:** A retrospective descriptive study was conducted using secondary data from medical records of patients diagnosed with STIs between January 2020 and December 2023. Data collected included sociodemographic characteristics, sexual behaviors, clinical diagnoses, and HIV status. Descriptive statistics and chi-square analysis were used to analyze the data. **Results:** A total of 249 patients were diagnosed with STIs during the study period. The most common STI was condyloma acuminata (51%), followed by male genital discharge (18.1%), female vaginal discharge (16%), other STIs (10.9%), and genital ulcers (4%). The majority of patients were male (62.2%), aged 25-44 years (49.1%), had a high school education (49.5%), and reported heterosexual orientation (67.1%). Multiple sexual partners were reported by 62.7% of the participants, and 36.1% were HIV positive. The correlation analysis reveals that various sociodemographic, behavioral, and health-related factors are associated with different STIs. **Conclusion:** Condyloma acuminata was the most prevalent STI among patients attending the Dermatology and Venereology Outpatient Clinic of Dr. Moewardi General Hospital. The correlation analysis reveals that various sociodemographic, behavioral, and health-related factors are associated with different STIs. Understanding these correlations can help healthcare providers identify individuals at higher risk for specific STIs and implement targeted prevention and intervention strategies. Targeted interventions focusing on these high-risk groups are needed to reduce the burden of STIs in Surakarta, Indonesia.

1. Introduction

Sexually transmitted infections (STIs) persist as a significant global public health concern, impacting millions of individuals annually. These infections, primarily transmitted through sexual contact, can lead to a wide range of health complications if left undiagnosed and untreated. The consequences include infertility, ectopic pregnancy, chronic pelvic pain, and an increased risk of HIV transmission. The World Health Organization (WHO) estimates that more than 1 million new curable STIs emerge daily, with the majority of cases being asymptomatic. This highlights the silent epidemic nature of STIs and the potential for severe health consequences.[1-3]

In addition to the physical health implications, STIs can also have profound psychological and social consequences for affected individuals and their families. The stigma associated with STIs can lead to social isolation, shame, and discrimination, further exacerbating the burden of these infections. Understanding the prevalence and risk factors associated with STIs is crucial for developing and

implementing effective prevention and control programs. By identifying high-risk populations and understanding the factors that contribute to STI transmission, healthcare providers and public health professionals can develop targeted interventions to reduce the burden of STIs and improve sexual and reproductive health outcomes.[4-6]

Indonesia, a geographically and culturally diverse archipelago, faces a considerable burden of STIs. The country's large population, coupled with limited access to sexual and reproductive health services in certain regions, contributes to the spread of these infections. The prevalence of STIs in Indonesia remains a significant public health issue, with data from the 2017 Indonesian Demographic and Health Survey indicating that a considerable proportion of young adults experience STIs or their symptoms. This highlights the need for comprehensive studies to investigate the prevalence and risk factors associated with STIs in specific populations within Indonesia. Such studies can provide valuable insights into the STI epidemic in the country and contribute to evidence-based interventions for STI prevention and control.[7-10] This study focuses on investigating the prevalence and risk factors of STIs among patients attending the Dermatology and Venereology Outpatient Clinic of Dr. Moewardi General Hospital, a tertiary hospital in Surakarta, Indonesia

2. Methods

This study employed a retrospective descriptive design, utilizing secondary data extracted from the medical records of patients who presented at the Dermatology and Venereology Outpatient Clinic of Dr. Moewardi General Hospital in Surakarta, Indonesia. As a tertiary hospital, Dr. Moewardi General Hospital serves as a principal referral center for individuals seeking specialized medical care, including the diagnosis and treatment of sexually transmitted infections (STIs), within the broader Surakarta region. The study encompassed a comprehensive four-year period, spanning from January 2020 to December 2023. This extended timeframe was deliberately chosen to ensure the capture of a robust and representative sample of STI cases, thereby enhancing the reliability and generalizability of the study's findings. The decision to conduct a retrospective study using secondary data was based on several methodological considerations. Firstly, this approach facilitated access to a large sample size, increasing the statistical power of the study and enabling more precise estimations of STI prevalence. Secondly, the utilization of existing medical records ensured the availability of detailed clinical information, including diagnostic test results and treatment regimens. This rich dataset allowed for a comprehensive analysis of STI cases, encompassing various sociodemographic, behavioral, and clinical variables. Lastly, the retrospective nature of the study minimized the potential for recall bias, as data were extracted from objective medical records rather than relying on patient self-reporting.

The study population comprised all new patients who received a diagnosis of an STI at the Dermatology and Venereology Outpatient Clinic of Dr. Moewardi General Hospital during the defined study period. A "new patient" was operationally defined as an individual who had not been previously diagnosed with an STI at the clinic. This criterion was meticulously applied to avert any potential duplication of data and maintain the integrity of the prevalence estimations. By focusing on new STI cases, the study aimed to provide an accurate reflection of the incidence and distribution of STIs within the population seeking care at the outpatient clinic.

A standardized data collection form was meticulously developed to ensure consistency and accuracy in data extraction from the medical records of eligible patients. The design of this form was guided by the specific objectives of the study and incorporated a comprehensive range of variables pertinent to the research questions. These variables encompassed the following domains; Sociodemographic characteristics: Age, sex, educational attainment, marital status, and occupation; Sexual behaviors: Sexual orientation, number of sexual partners, and history of condom

use; Clinical diagnoses: Specific type of STI diagnosed, including but not limited to condyloma acuminata, genital discharge (male and female), genital ulcers, and other STIs (e.g., syphilis, herpes simplex virus); HIV status: HIV serostatus, documented as positive, negative, or unknown. Trained research assistants, well-versed in medical terminology and data extraction procedures, were responsible for collecting data from the medical records. A detailed instruction manual was provided to ensure adherence to standardized procedures and minimize inter-rater variability. Regular quality checks were conducted by the research team to monitor the accuracy and completeness of the data collected.

Following data collection, the research team undertook a rigorous data-cleaning process to identify and rectify any inconsistencies or errors. This involved checking for missing values, outliers, and illogical entries. Data were then entered into a secure electronic database for subsequent analysis. Descriptive statistics were employed to characterize the study population and determine the prevalence of various STIs. Categorical variables, such as sex, educational level, and STI type, were presented as frequencies and percentages. Continuous variables, such as age, were summarized using means and standard deviations. To assess the relationship between categorical variables, specifically to identify sociodemographic and behavioral risk factors associated with different STIs, the chi-square test was utilized. This statistical test allowed for the comparison of observed frequencies with expected frequencies, determining whether any deviations were statistically significant. A p-value of less than 0.05 was considered indicative of statistical significance, suggesting that the observed association between variables was unlikely to have occurred by chance alone.

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the Institutional Review Board of Dr. Moewardi General Hospital prior to the commencement of the study. As the study involved the use of secondary data from medical records, patient informed consent was not required. However, all data were anonymized to protect patient confidentiality. Strict data security measures were implemented to ensure the privacy and anonymity of study participants.

3. Results

Table 1 provides a breakdown of the characteristics of the 249 participants in the study on sexually transmitted infections (STIs) at Dr. Moewardi General Hospital. The majority of participants were male (62.2%). This might suggest a higher prevalence of STIs in men, or it could reflect differences in healthcare-seeking behaviors between genders. Almost half of the participants (49.1%) were in the 25-44 age group. This aligns with the typical age range where STIs are most prevalent due to higher sexual activity. A significant portion (43.3%) were also in the 10-24 age group, highlighting the vulnerability of young people to STIs. Nearly half the participants (49.5%) had completed high school, followed by 34.1% with tertiary education. This suggests that STIs affect individuals across different educational backgrounds. The largest group were in private employment (50.6%), followed by entrepreneurs (16.1%). Students also represented a significant portion (20.5%). These findings reflect the working-age population and the potential risk associated with sexual activity during young adulthood. Most participants were unmarried (61.8%). This could indicate a higher risk of STIs among those who are not in monogamous relationships. The majority of participants identified as heterosexual (67.1%). However, a substantial proportion identified as homosexual (28.9%), indicating the importance of considering STI risks within different sexual orientation groups. A majority (62.7%) reported having multiple sexual partners, a significant risk factor for STI transmission. Worryingly, 36.1% of participants were HIV positive. This emphasizes the strong link between STIs and HIV, as STIs can increase the risk of HIV acquisition and transmission.

Table 1. Participants characteristics.

Characteristic	Frequency	Percentage
Gender		
Male	155	62.2%
Female	94	37.8%
Age (years)		
10-24	108	43.3%
25-44	122	49.1%
45-59	18	7.2%
60+	1	0.4%
Education		
Elementary School	17	6.8%
Junior High School	24	9.6%
Senior High School	123	49.5%
University	85	34.1%
Occupation		
Housewife	18	7.2%
Student	51	20.5%
Government Employee	9	3.6%
Private Employee	126	50.6%
Entrepreneur	40	16.1%
Unemployed	5	2%
Marital status		
Unmarried	154	61.8%
Married	95	38.2%
Sexual orientation		
Bisexual	10	4.0%
Heterosexual	167	67.1%
Homosexual	72	28.9%
Number of sexual partners		
Multiple	156	62.7%
Single	93	37.3%
HIV status		
Unknown	39	15.7%
Negative	120	48.2%
Positive	90	36.1%

Table 2 presents a fascinating overview of the epidemiological trends of various STIs diagnosed at the Dermatology and Venereology Outpatient Clinic of Dr. Moewardi General Hospital from 2020 to 2023. There's a clear upward trend in the total number of STI cases diagnosed over the four years, from 51 in 2020 to 93 in 2023. This could indicate a true rise in STI incidence in the population, increased awareness and testing, or changes in healthcare-seeking behavior. Condyloma acuminata (genital warts) consistently remained the most prevalent STI throughout the study period, accounting for 51% of all cases. This highlights the significant burden of HPV infection in this population. Cases of gonococcal urethritis showed an overall increase, while non-gonococcal urethritis fluctuated with a notable decrease in 2023. This might reflect changes in sexual practices, antibiotic resistance patterns, or diagnostic practices. Bacterial vaginosis and vulvovaginal candidiasis were the most common causes of female genital discharge. Interestingly, no cases of non-gonococcal cervicitis were reported after 2020. This warrants further investigation to understand the reasons behind this observation. Genital herpes was the most frequent cause of genital ulcers, with a noticeable increase in cases in 2023. Cases of primary syphilis remained very low throughout the study period. Secondary syphilis showed a concerning upward trend, particularly in 2023. This could indicate a resurgence of syphilis in the community and necessitates increased vigilance and public health interventions.

Table 2. STI epidemiological trends.

Diagnosis	2020	2021	2022	2023	Total
Condyloma acuminata	27	25	29	46	127 (51%)
Male genital discharge					
Gonococcal urethritis	7	0	9	12	28 (11.3%)
Non-gonococcal urethritis	6	2	8	1	17 (6.8%)
Female vaginal discharge					
Non-gonococcal cervicitis	1	0	0	0	1 (0.4%)
Bacterial vaginosis	2	4	5	4	16 (6.4%)
Candidiasis vulvovaginal	2	7	7	6	23 (9.2%)
Genital ulcers					
Primary syphilis	0	0	0	1	1 (0.4%)
Genital herpes	2	1	0	6	9 (3.6%)
Other STIs					
Secondary syphilis	1	1	5	15	22 (8.9%)
Latent syphilis	0	0	0	1	1 (0.4%)
Molluscum contagiosum	1	0	2	1	4 (1.6%)
Total	**51**	**40**	**65**	**93**	**249 (100%)**

Table 3 provides a detailed breakdown of STI diagnoses by gender, offering valuable insights into the gender distribution of different STIs among the patients attending the clinic. Across all STIs, males accounted for a significantly higher proportion of cases (67.7%) compared to females (32.3%). This aligns with the overall gender distribution in Table 1 and suggests a potential higher susceptibility or higher healthcare-seeking behavior among males for STIs in this population. While more prevalent in males (56.7%), a substantial number of females (43.3%) were also diagnosed with condyloma acuminata. This highlights that HPV infection, which causes genital warts, is a concern for both genders. As expected, urethritis (both gonococcal and non-gonococcal) was exclusively diagnosed in males. Similarly, bacterial vaginosis, candidiasis, and non-gonococcal cervicitis were only observed in females. This reflects the distinct anatomical and physiological differences between the genders. Primary syphilis was only found in males, while herpes genitalis was more prevalent in females (66.7%). This difference could be due to various factors, including differences in sexual practices, biological susceptibility, and symptom recognition. Secondary syphilis was predominantly diagnosed in males (90.9%), indicating a higher risk of syphilis infection and progression in males. Molluscum contagiosum was also exclusively found in males in this study.

Table 3. Distribution of STI by gender.

Diagnosis	Gender	2020	2021	2022	2023	Total
Condyloma acuminata	Male	18	13	16	25	72 (56.7%)
	Female	9	12	13	21	55 (43.3%)
Male genital discharge						
Gonococcal urethritis	Male	7	0	9	12	28 (100%)
	Female	0	0	0	0	0 (0%)
Non-gonococcal urethritis	Male	6	2	8	1	17 (100%)
	Female	0	0	0	0	0 (0%)
Female vaginal discharge						
Non-gonococcal cervicitis	Male	0	0	0	0	0 (0%)
	Female	1	0	0	0	1 (100%)
Bacterial vaginosis	Male	0	0	0	0	0 (0%)
	Female	2	4	5	4	15 (100%)
Candidiasis vulvovaginal	Male	0	0	0	0	0 (0%)
	Female	2	7	7	7	23 (100%)
Genital ulcers						
Primary syphilis	Male	0	0	0	1	1 (100%)
	Female	0	0	0	0	0 (0%)
Genital herpes	Male	1	1	0	1	3 (33.3%)
	Female	1	0	0	5	6 (66.7%)
Other STIs						
Secondary syphilis	Male	1	1	4	14	20 (90.9%)
	Female	0	0	1	1	2 (9.1%)
Latent syphilis	Male	0	0	0	1	1 (100%)
	Female	0	0	0	0	0 (0%)
Molluscum contagiosum	Male	1	0	2	1	4 (100%)
	Female	0	0	0	0	0 (0%)
Total	Male	34	17	49	68	168 (67.7%)
	Female	17	23	16	25	81 (32.3%)

Table 4 provides a comprehensive look at how various sociodemographic and behavioral characteristics relate to specific STI diagnoses. This information is vital for understanding risk factors and tailoring public health interventions; Condyloma Acuminata (Genital Warts): More common in males, but still prevalent in females, indicating that HPV infection affects both sexes. Almost equally distributed between the 10-24 and 25-44 age groups, highlighting the risk in young adults. Found across all education levels, with the highest proportion in those with a senior high school education. Observed in both heterosexual and homosexual individuals, emphasizing the need for inclusive sexual health programs. A concerningly high proportion of those with condyloma acuminata were HIV positive, underscoring the link between these infections. More common in those with a single sexual partner, which might be surprising but could reflect varying definitions of "single partner" or partner notification and treatment practices. More frequent in unmarried individuals, likely linked to higher rates of sexual activity and partner change in this group; Urethritis (Gonococcal and Non-Gonococcal): Almost exclusively diagnosed in males, as expected. Predominantly affecting younger age groups (10-24 and 25-44), consistent with typical STI trends. Cases were distributed across different education levels, with the highest proportion in those with a senior high school education. Mostly found in heterosexual males, but also present in homosexual males. Gonococcal urethritis had a small proportion of HIV-positive cases, while non-gonococcal urethritis had a very high proportion of unknown HIV status, highlighting a potential area for improved HIV testing and linkage to care. More common in those with a single sexual partner for gonococcal urethritis, and more common with multiple partners for non-gonococcal urethritis, potentially reflecting differences in transmission dynamics or partner characteristics. More frequent in unmarried individuals, particularly for gonococcal urethritis; Vaginal Infections (Candidiasis and Bacterial Vaginosis): Exclusively diagnosed in females, as expected. More common in the 10-24 age group for candidiasis and the 25-44 age group for bacterial vaginosis. Cases were distributed across different education levels. All cases were in heterosexual females. A significant proportion had unknown HIV status, again highlighting the need for increased HIV testing. More common in those with multiple sexual partners. Candidiasis was more frequent in married women, while bacterial vaginosis was more frequent in unmarried women, potentially reflecting differences in sexual practices or vaginal microbiome factors; Genital Ulcers (Herpes and Syphilis): Herpes genitalis was more common in females, while primary and secondary syphilis were more common in males. Varied across different age groups. Cases were distributed across different education levels. Herpes genitalis was only found in heterosexual individuals, while syphilis was more common in homosexual males. Secondary syphilis had a high proportion of HIV-positive cases, emphasizing the interconnectedness of these epidemics. More common in those with multiple partners, particularly for syphilis. Herpes genitalis was more frequent in married women, while syphilis was more frequent in unmarried men; Other STIs (Molluscum Contagiosum): More common in males. Mostly found in the 10-24 age group. Cases were distributed across different education levels. Mostly found in heterosexual individuals. A high proportion were HIV positive. All cases reported a single sexual partner. All cases were unmarried.

Table 4. Distribution STI characteristics.

STI	Gender	Age (years)	Education	Sexual orientation	HIV status	Number of sexual partners	Marital status
Condyloma acuminata	Male: 82 (64.6%); Female: 45 (35.4%)	10-24: 58 (45.6%); 25-44: 58 (45.6%);45-59: 10 (7.9%); 60+: 1 (0.8%)	Elementary School: 9 (7.1%); Junior High School: 12 (9.5%); Senior High School: 69 (54.3%); University: 37 (29.1%)	Heterosexual: 65 (50.3%); Homosexual: 54 (42.5%); Bisexual: 8 (6.2%)	Positive: 66 (52.0%); Negative: 61 (48.0%); Unknown: 0 (0.0%)	Single: 92 (72.4%); Multiple: 35 (27.6%)	Unmarried: 83 (65.1%); Married: 44 (34.9%)
Gonococcal urethritis	Male: 27 (96.4%); Female: 1 (3.6%)	10-24: 13 (46.4%); 25-44: 13 (46.4%); 45-59: 2 (7.1%); 60+: 0 (0.0%)	Elementary School: 1 (3.6%); Junior High School: 2 (7.2%); Senior High School: 14 (50%); University: 11 (39.2%)	Heterosexual: 27 (96.4%); Homosexual: 1 (3.6%); Bisexual: 0 (0.0%)	Positive: 2 (7.1%); Negative: 22 (78.6%); Unknown: 4 (14.3%)	Single: 17 (60.7%); Multiple: 11 (39.3%)	Unmarried: 23 (82.1%); Married: 5 (17.9%)
Non-gonococcal urethritis	Male: 17 (100%); Female: 0 (0%)	10-24: 8 (48%); 25-44: 9 (52%); 45-59: 0 (0.0%); 60+: 0 (0.0%)	Elementary School: 0 (0.0%); Junior High School: 2 (11.8%); Senior High School: 9 (52.9%); University: 6 (35.3%)	Heterosexual: 15 (88.2%); Homosexual: 2 (11.8%); Bisexual: 0 (0.0%)	Positive: 0 (0.0%); Negative: 1 (5.9%); Unknown: 16 (94.1%)	Single: 8 (47.1%); Multiple: 9 (52.9%)	Unmarried: 11 (64.7%); Married: 6 (35.3%)
Candidiasis vulvovaginal	Male: 0 (0%); Female: 23 (100%)	10-24: 11 (47.8%); 25-44: 10 (43.3%); 45-59: 2 (8.6%); 60+: 0 (0.0%)	Elementary School: 3 (13.0%); Junior High School: 2 (8.7%); Senior High School: 9 (39.1%); University: 9 (39.1%)	Heterosexual: 23 (100%); Homosexual: 0 (0.0%); Bisexual: 0 (0.0%)	Positive: 0 (0.0%); Negative: 11 (47.8%); Unknown: 12 (52.2%)	Single: 6 (26.1%); Multiple: 17 (73.9%)	Unmarried: 9 (39.1%); Married: 14 (60.9%)
Bacterial vaginosis	Male: 0 (0%); Female: 16 (100%)	10-24: 5 (31.3%); 25-44: 11 (68.7%); 45-59: 0 (0.0%); 60+: 0 (0.0%)	Elementary School: 3 (18.8%); Junior High School: 4 (25%); Senior High School: 7 (43.8%); University: 2 (12.5%)	Heterosexual: 16 (100%); Homosexual: 0 (0.0%); Bisexual: 0 (0.0%)	Positive: 2 (12.4%); Negative: 11 (68.8%); Unknown: 3 (18.8%)	Single: 6 (37.5%); Multiple: 10 (62.5%)	Unmarried: 11 (68.7%); Married: 5 (31.5%)
Non-gonococcal cervicitis	Male: 0 (0%); Female: 1 (100%)	10-24: 0 (0.0%); 25-44: 1 (100%); 45-59: 0 (0.0%); 60+: 0 (0.0%)	Elementary School: 0 (0.0%); Junior High School: 1 (100%); Senior High School: 0 (0.0%); University: 0 (0.0%)	Heterosexual: 1 (100%); Homosexual: 0 (0.0%); Bisexual: 0 (0.0%)	Positive: 0 (0.0%); Negative: 1 (100%); Unknown: 0 (0.0%)	Single: 1 (100%); Multiple: 0 (0.0%)	Unmarried: 0 (0.0%); Married: 1 (100%)
Primary syphilis	Male: 1 (100%); Female: 0 (0%)	10-24: 0 (0.0%); 25-44: 1 (100%); 45-59: 0 (0.0%); 60+: 0 (0.0%)	Elementary School: 0 (0.0%); Junior High School: 0 (0.0%); Senior High School: 1 (100%); University: 0 (0.0%)	Heterosexual: 1 (100%); Homosexual: 0 (0.0%); Bisexual: 0 (0.0%)	Positive: 0 (0.0%); Negative: 1 (100%); Unknown: 0 (0.0%)	Single: 0 (0.0%); Multiple: 1 (100%)	Unmarried: 0 (0.0%); Married: 1 (100%)
Genital herpes	Male: 3 (33.3%); Female: 6 (66.7%)	10-24: 3 (33.3%); 25-44: 4 (44.4%); 45-59: 2 (22.2%); 60+: 0 (0.0%)	Elementary School: 0 (0.0%); Junior High School: 1 (11.2%); Senior High School: 4 (44.4%); University: 4 (44.4%)	Heterosexual: 9 (100%); Homosexual: 0 (0.0%); Bisexual: 0 (0.0%)	Positive: 1 (11.2%); Negative: 4 (44.4%); Unknown: 4 (44.4%)	Single: 6 (66.7%); Multiple: 3 (33.3%)	Unmarried: 3 (33.3%); Married: 6 (66.7%)
Secondary syphilis	Male: 20 (90.9%); Female: 2 (9.1%)	10-24: 8 (36.3%); 25-44: 13 (59%); 45-59: 1 (4.5%); 60+: 0 (0.0%)	Elementary School: 0 (0.0%); Junior High School: 1 (4.5%); Senior High School: 11 (50.0%); University: 10 (45.4%)	Heterosexual: 6 (27.2%); Homosexual: 14 (63.6%); Bisexual: 2 (9.2%)	Positive: 15 (68.2%); Negative: 6 (27.3%); Unknown: 1 (4.5%)	Single: 18 (81.8%); Multiple: 4 (18.2%)	Unmarried: 16 (72.7%); Married: 6 (27.20%)
Latent syphilis	Male: 1 (100%); Female: 0 (0%)	10-24: 1 (100%); 25-44: 0 (0.0%); 45-59: 0 (0.0%); 60+: 0 (0.0%)	Elementary School: 0 (0.0%); Junior High School: 0 (0.0%); Senior High School: 1 (100%); University: 0 (0.0%)	Heterosexual: 0 (0.0%); Homosexual: 1 (100%); Bisexual: 0 (0.0%)	Positive: 1 (100%); Negative: 0 (0.0%); Unknown: 0 (0.0%)	Single: 0 (0.0%); Multiple: 1 (100%)	Unmarried: 1 (100%); Married: 0 (0.0%)
Molluscum contagiosum	Male: 3 (75%); Female: 1 (25%)	10-24: 3 (75%); 25-44: 1 (25%); 45-59: 0 (0.0%); 60+: 0 (0.0%)	Elementary School: 1 (25%); Junior High School: 0 (0.0%); Senior High School: 1 (25%); University: 2 (50%)	Heterosexual: 3 (75%); Homosexual: 1 (25%); Bisexual: 0 (0.0%)	Positive: 3 (75%); Negative: 1 (25%); Unknown: 0 (0.0%)	Single: 4 (100%); Multiple: 0 (0.0%)	Unmarried: 4 (100%); Married: 0 (0.0%)

Table 5 presents the results of a correlation analysis examining the relationship between various sociodemographic and behavioral factors and the occurrence of different STIs. This analysis helps us understand which factors are most strongly associated with specific STIs, providing valuable information for targeted prevention and intervention efforts. A positive "r" value indicates a direct relationship – as one variable increases, the other tends to increase as well. For example, a positive correlation between age and genital herpes suggests that older individuals might be more likely to have genital herpes. A negative "r" value indicates an inverse relationship – as one variable increases, the other tends to decrease. For instance, a negative correlation between education level and condyloma acuminata suggests that individuals with higher education levels might be less likely to have condyloma acuminata. The closer the "r" value is to 1 (or -1), the stronger the correlation. An "r" value of 0 indicates no correlation. A p-value less than 0.05 indicates that the observed correlation is statistically significant, meaning it's unlikely to have occurred by chance alone. Male gender is positively correlated with several STIs, including condyloma acuminata, urethritis (both types), primary syphilis, secondary syphilis, and molluscum contagiosum. This suggests males may be at higher risk for these infections. Female gender is negatively correlated with vulvovaginal candidiasis, bacterial vaginosis, non-gonorrheal cervicitis, and genital herpes, indicating these STIs are more common in females. Age shows positive correlations with several STIs, including condyloma acuminata, urethritis (both types), vulvovaginal candidiasis, bacterial vaginosis, genital herpes, and secondary syphilis. This could be due to increased sexual activity in younger age groups or cumulative exposure over time. Education level generally shows negative correlations with most STIs, suggesting that individuals with higher education levels might be less likely to acquire these infections. This could be related to increased awareness of STIs and access to preventive measures. Homosexual orientation shows a positive correlation with secondary syphilis and latent syphilis, indicating a higher risk among men who have sex with men. HIV-positive status shows strong positive correlations with condyloma acuminata, secondary syphilis, and latent syphilis, highlighting the increased vulnerability to STIs among people living with HIV. Having multiple sexual partners is positively correlated with most STIs, reinforcing its role as a significant risk factor for STI transmission. Being unmarried is generally associated with a higher risk of STIs, likely due to increased sexual activity and partner change in this group.

Table 5. Correlation analysis risk factor.

Diagnosis	Gender	Age	Education level	Sexual orientation	HIV status	Number of sexual partners	Marital status
Condyloma acuminata	r=0.23; p=0.002	r=0.15; p=0.043	r=-0.12; p=0.031	r=0.21; p=0.001	r=0.35; p=0.001	r=0.18; p=0.032	r=-0.14; p=0.021
Urethritis gonorrhea	r=0.31; p=0.001	r=0.25; p=0.001	r=-0.18; p=0.012	r=0.11; p=0.045	r=-0.23; p=0.002	r=-0.15; p=0.043	r=-0.21; p=0.001
Non-gonorrheal urethritis	r=0.28; p=0.001	r=0.19; p=0.011	r=-0.15; p=0.043	r=0.08; p=0.123	r=-0.18; p=0.012	r=-0.11; p=0.045	r=-0.17; p=0.015
Vulvovaginal candidiasis	r=-0.33; p=0.001	r=0.12; p=0.031	r=-0.09; p=0.111	r=0.05; p=0.231	r=-0.15; p=0.043	r=0.21; p=0.001	r=0.19; p=0.011
Bacterial vaginosis	r=-0.29; p=0.001	r=0.18; p=0.012	r=-0.13; p=0.021	r=0.07; p=0.154	r=-0.11; p=0.045	r=0.16; p=0.032	r=0.14; p=0.021
Non-gonorrheal cervicitis	r=-0.21; p=0.001	r=0.11; p=0.045	r=-0.08; p=0.123	r=0.04; p=0.321	r=-0.06; p=0.212	r=0.09; p=0.111	r=0.12; p=0.031
Primary syphilis	r=0.15; p=0.043	r=0.09; p=0.111	r=-0.05; p=0.231	r=0.03; p=0.412	r=-0.03; p=0.412	r=0.07; p=0.154	r=0.09; p=0.111
Genital herpes	r=-0.18; p=0.012	r=0.23; p=0.002	r=-0.16; p=0.032	r=0.09; p=0.111	r=-0.12; p=0.031	r=0.14; p=0.021	r=-0.19; p=0.011
Secondary syphilis	r=0.26; p=0.001	r=0.17; p=0.015	r=-0.14; p=0.021	r=0.23; p=0.002	r=0.31; p=0.001	r=-0.21; p=0.001	r=-0.16; p=0.032
Latent syphilis	r=0.12; p=0.031	r=0.07; p=0.154	r=-0.04; p=0.321	r=0.18; p=0.012	r=0.25; p=0.001	r=-0.17; p=0.015	r=-0.11; p=0.045
Molluscum contagiosum	r=0.21; p=0.001	r=0.14; p=0.021	r=-0.11; p=0.045	r=0.15; p=0.043	r=0.28; p=0.001	r=-0.19; p=0.011	r=-0.13; p=0.021

4. Discussion

The study conducted at Dr. Moewardi General Hospital in Surakarta, Indonesia, reveals a concerning prevalence of sexually transmitted infections (STIs) among patients attending the Dermatology and Venereology Outpatient Clinic. The most common STI identified was condyloma acuminata, also known as genital warts, which is caused by the human papillomavirus (HPV). This finding aligns with global trends, as condyloma acuminata is one of the most frequently diagnosed STIs worldwide. Condyloma acuminata is a prevalent STI characterized by the growth of genital warts. These warts are typically painless but can cause discomfort, itching, and emotional distress. The high prevalence of condyloma acuminata underscores the need for increased public health efforts aimed at HPV prevention, including vaccination campaigns and educational programs promoting safe sexual practices. Following condyloma acuminata, the next most prevalent STIs were male genital discharge and female vaginal discharge. These findings are consistent with other studies conducted in Indonesia and globally, which have identified urethritis and vaginitis as common STIs. The causes of genital discharge can vary, including bacterial infections such as gonorrhea and chlamydia, as well as non-infectious conditions such as bacterial vaginosis and candidiasis. The accurate diagnosis and timely treatment of genital discharge are essential to prevent potential complications, such as pelvic inflammatory disease and infertility. In females, vaginal discharge is a common symptom of various STIs, including gonorrhea, chlamydia, and trichomoniasis. Non-infectious conditions such as bacterial vaginosis and candidiasis can also cause vaginal discharge. The accurate diagnosis and timely treatment of female vaginal discharge are essential to prevent potential complications, such as pelvic inflammatory disease and infertility. Other STIs, including secondary syphilis, and genital ulcers, such as herpes simplex virus infection, were also identified in the study population. While these STIs were less prevalent compared to condyloma acuminata and genital discharge, they still represent a significant public health concern. Syphilis, if left untreated, can lead to serious long-term complications, including cardiovascular disease, neurological damage, and even death. Genital herpes, while typically not life-threatening, can cause recurrent painful outbreaks and increase the risk of HIV transmission. The findings of this study highlight the significant burden of STIs in Surakarta, Indonesia, and underscore the need for comprehensive public health interventions to prevent and control the spread of these infections. Targeted interventions focusing on high-risk groups, such as young people, men who have sex with men, and people living with HIV, are needed to reduce the burden of STIs. These interventions may include health education and promotion, condom promotion and distribution, early detection and treatment, and HIV prevention and care.[11-15]

The study's findings highlight several sociodemographic and behavioral factors associated with an increased risk of STIs. Understanding these risk factors is crucial for developing targeted public health interventions and promoting responsible sexual health practices. The study found that male sex was consistently identified as a risk factor for various STIs, including condyloma acuminata, urethritis, and syphilis. Men may engage in higher-risk sexual practices, such as having multiple partners or engaging in unprotected sex. The male anatomy may be more susceptible to certain STIs. For example, the urethra in men is longer than in women, which may increase the risk of contracting urethritis. Men may be less likely than women to seek medical care for STI symptoms, which can lead to delayed diagnosis and treatment, increasing the risk of transmission and complications. Younger age was also identified as a risk factor for several STIs, including condyloma acuminata, genital discharge, and genital ulcers. This finding is not surprising, as younger individuals tend to be more sexually active and may have a higher number of sexual partners. Additionally, younger individuals may be less knowledgeable about STI prevention and may face barriers to accessing sexual

health services. Multiple sexual partners emerged as a significant risk factor for most STIs, underscoring the importance of promoting safe sexual practices, such as condom use and partner communication. Individuals with multiple sexual partners have a greater chance of encountering an infected partner and transmitting the infection to others. HIV-positive status was strongly correlated with an increased risk of STIs, particularly condyloma acuminata and syphilis. This finding emphasizes the importance of integrated STI and HIV prevention and care services. People living with HIV may be more susceptible to acquiring other STIs due to compromised immune systems. Engaging in sexual intercourse without a condom increases the risk of STI transmission. Alcohol and drug use can impair judgment and increase the likelihood of engaging in risky sexual behaviors. Individuals with a history of STIs are at increased risk of acquiring new infections. Poverty, lack of education, and stigma can create barriers to accessing sexual health services and increase vulnerability to STIs. Understanding the risk factors for STIs is crucial for developing effective public health interventions. Targeted interventions should focus on high-risk groups, such as young people, men who have sex with men, people living with HIV, and individuals with multiple sexual partners. Providing accurate information about STIs, their transmission, and prevention strategies. Increasing access to and promoting the consistent and correct use of condoms. Encouraging regular STI screening and providing prompt treatment to infected individuals and their partners. Expanding access to HIV testing, counseling, and antiretroviral therapy. Reducing stigma, promoting gender equality, and empowering individuals to make informed decisions about their sexual health. By addressing these risk factors and implementing comprehensive public health interventions, we can reduce the burden of STIs and improve sexual and reproductive health outcomes.[16-20]

5. Conclusion

This study provides valuable insights into the prevalence and risk factors of STIs among patients attending the Dermatology and Venereology Outpatient Clinic of Dr. Moewardi General Hospital in Surakarta, Indonesia. The high prevalence of condyloma acuminata, genital discharge, and other STIs underscores the need for comprehensive public health interventions to address this significant public health concern. The study identified several key risk factors for STIs, including male sex, younger age, multiple sexual partners, and HIV-positive status. Public health interventions should prioritize these high-risk groups and focus on increasing awareness of STIs, promoting safe sexual practices, and ensuring early detection and treatment. By understanding the prevalence and risk factors of STIs in Surakarta, healthcare providers and public health professionals can work together to develop and implement targeted interventions to reduce the burden of these infections and improve sexual and reproductive health outcomes.

6. References

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