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Knowledge Level of Sexually Transmitted Infections among Adolescents and Students

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ABSTRACT

Introduction: Sexually transmitted diseases (STD) are a major public health challenge worldwide due to their high prevalence, diverse etiology, and potential for serious complications, including oncogenic risk (HPV) and chronic multiorgan damage. Effective epidemiological control is based on two fundamental pillars: the level of public knowledge about risk factors and transmission routes, and the implementation of robust early screening programs. *Aim of the study*: Examine the level of knowledge among youth and students about sexually transmitted diseases. *Material and methods*: A total of 101 people took part in an online survey aimed at assessing their level of knowledge. A diagnostic study design was used, with a questionnaire as the primary research tool. *Results*: The majority of respondents were students (64.36%) and women (77.23%). The most frequently mentioned STD were HIV (86.14%), AIDS (80.20%), and gonorrhea (80.20%). Statistical analysis revealed significant correlations between knowledge level, study group, and place of residence- students and urban residents scored higher in terms of knowledge about diseases and prevention methods than high school students and countryside residents ($p<0.05$). *Conclusions*: The results obtained indicate the necessity of improving health education among adolescents and students, especially in the area of STD prevention.

Keywords: sexually transmitted diseases, sexually transmitted infections, awareness, sexual education

1. INTRODUCTION

Sexually Transmitted Diseases (STDs) are a global public health problem due to their high prevalence and serious health consequences, which is particularly evident in the spread of human immunodeficiency virus (HIV) infection. Etiologically, STD are divided into bacterial infections (e.g., syphilis, gonorrhea), viral diseases (e.g., human papilloma virus- HPV) and caused by protoza e.g., trochomoniasis (Zalewska and Olejniczak, 2024). Many of these infections are asymptomatic, which is why raising awareness of their transmission, diagnosis, and prevention is crucial for effective public health management (Bhowmik and Biswas, 2022). The primary prevention strategy for STD remains safe sexual behavior, in particular the consistent and correct use of condoms, as well as early diagnosis and treatment of existing infections that increase the risk of STD (Rajewski, 2025).

Infection with HIV, which belongs to the Retroviridae family, leads to progressive immune system decline through replication mainly in CD4+ lymphocytes, culminating in acquired immunodeficiency syndrome (Chéret, 2025). Viral transmission occurs via three main ways: sexual contact, through blood- mainly through shared non- sterile injection equipment and vertically. The acute phase of the diseases may be asymptomatic or present with nonspecific symptoms. HIV antibody screening tests are most reliable when performed approximately 12 weeks after potential exposure (Shaw and Hunter, 2012; Parczewski and Witak- Jedra, 2022).

Cervical cancer, whose primary etiologic factor is human papillomavirus (HPV) infection, is a serious oncological problem. However, the development of this cancer is also predisposed by additional risk factors, such as coinfections, smoking, and specific patterns of sexual activity (Magiera et al., 2023; Włoszek et al., 2025).

Beyond the oncological risks associated with HPV, epidemiological attention must be directed toward other bacterial sexually transmitted diseases, including syphilis, which is caused by the spirochete Treponema pallidum. It is characterized by a progressive multi-systemic course, from an initial painless ulcer to potential neurological and cardiovascular complications in the late stage (Satyaputra et al., 2021). In contrast, gonorrhea, whose symptoms in the acute phase most frequently affect the genitourinary system and manifest as dysuria and pathological discharge from the urethra or vagina, although it is often asymptomatic (Tolstrup et al., 2018; Van de Laar and Spiteri, 2012).

Furthermore, a crucial element of prevention involves the control of fungal infections e.g., Candida spp., where the risk factors is not only transmission but also disturbance of the natural flora caused by factor such as inadequate intimate hygiene, weakened immunity, or antibiotic therapy (Dulska et al., 2019).

In view of the complex etiology and diverse symptomatology of sexually transmitted infections, ranging from asymptomatic infections to conditions with oncogenic and systemic potential, public knowledge level and early diagnostics remain the fundamental pillars of effective epidemiological control and public health protection (Grabowska et al., 2020).

Aim of the study

This study aims to examine the level of knowledge among young people and students about sexually transmitted diseases, their risk factors, primary symptoms, and methods of prevention.

2. MATERIAL AND METHODS

For the study, we developed a proprietary survey consisting of 18 closed-ended, single- and multiple-choice questions and administered it using an online form. Questions 1 to 4 assessed the sociodemographic characteristics of respondents, while questions 5 to 18 focused on their knowledge of sexually transmitted diseases, including symptoms, risk factors, and prevention. The survey link was shared via social media. Participation in the study was voluntary and anonymous. The study group consisted of 101 respondents- high school and university students. The collected research material was statistically analyzed using the IBM SPSS Statistics package (version 27). Results were analyzed using the chi-square test, which allowed for the assessment of statistical significance of differences between groups and the existence of statistically significant correlations between categorical variables. The results obtained from the analysis were considered statistically significant at $p<0.05$. An application was submitted to the Bioethics Committee at the University of Rzeszów (KBE No. 09/05/2020) to obtain a positive opinion on the study.

3. RESULTS

Demographic and social characteristics of respondents

A total of 101 respondents participated in the study. Women represented 77.23% (n=78) of the participants, while men represented 22.77% (n=23) of the respondents. Regarding age, the largest group was people aged 24 to 26 (62.38%, n=63). Nearly one in five respondents was aged 17 to 20 years (21.78%, n=22), and the remaining 15.84% (n=16) were aged 21 to 23 years. More than half of the participants, nearly 56.44% (n=57), lived in cities, while 43.56 (n=44) were inhabitants of rural areas. The study covered 64.36% (n=65) university students and 35.64% (n=36) high school students.

Respondents' knowledge of sexually transmitted diseases

This study examined knowledge of sexually transmitted diseases. The most frequently indicated STDs were HIV 86.14% (n=87), AIDS 80.20% (n=81), and gonorrhea 80.20% (n=81). Slightly fewer people indicated syphilis 75.25% (n=76). About half of the respondents

mentioned HPV (55.45%, n=56) and HSV (46.53%, n=47). In the study group, only single individual respondents indicated mononucleosis and chlamydia. Respondents could select more than one answer.

Knowledge of methods for preventing sexually transmitted diseases

The vast majority of respondents declared that they were familiar with some methods for preventing STDs, 87.13% (n=88). In the study group, only 6.93% (n=7) of respondents declared they did not know such methods, and the remaining 5.94%, (n=6) chose the answer "I don't know". The most frequently indicated method of prevention was the use of condoms 90.10%, (n=91). Most participants pointed to the avoidance of casual sexual contact 78.22%, (n=79). More than half of the respondents mentioned proper hygiene (59.41%, n=60). Less than half of the respondents (48.51%, n=49) indicated preventive examinations and vaccinations as methods of prevention. Prophylactic use of medication was indicated less frequently (13.86%, n=14). Interestingly, almost one in ten respondents (7,92%) reported using coitus interruptus. Respondents could select more than one option.

Knowledge of symptoms and risk groups

More than half of the respondents declared that they knew the symptoms of sexually transmitted diseases (66.34%, n=67). Both a lack of knowledge about the symptoms and a lack of opinion on the matter were declared by 16.83% (n=17) of respondents. The vast majority of respondents (69.31%, n=70) believed that adolescents are a high-risk group for STDs. A different opinion was reported by 12.87% of participants (n=13). The remaining 17.82% (n=18) of respondents answered that they did not know.

Knowledge about HIV infection

The majority of respondents indicated that HIV can be transmitted during sexual intercourse 93.07%, (n=94). Approximately 1/5 (19.80%) of respondents indicated contact with the blood of an infected person (9.90%). According to a small group of respondents (6.93%, n=7), HIV can be transmitted through sharing dishes with an infected person. The study group could choose more than one answer. The study also examined knowledge about when HIV antibody testing provides the most reliable results. Approximately one-third of the participants (32.67%, n=33) reported that the reliable anti-HIV antibody results can be obtained after 3 months (32.67%, n=33). One in ten respondents mentioned 12 weeks (9.90%). Nearly 17.82% of respondents (n=18) reported that reliable results can be obtained after just 3 weeks. In turn, 14.85% (n=15) of those surveyed indicated that the most reliable results are possible after 2 weeks. The remaining 24.75% of respondents (n=25) reported that they did not know.

Knowledge of cervical cancer risk factors

The most frequently reported factors were human papillomavirus (HPV) infection (62.38%, n=63) and genetic predisposition (52.48%, n=53). Approximately one-quarter of respondents pointed to having multiple sexual partners (26.73%), and somewhat fewer to smoking (22.77%, n=23). Poor personal hygiene was indicated slightly less commonly (22.77%). The least frequently mentioned factors were sexual contraception 14.85% (n=15), aged 16.83% (n=17), and early onset of sexual intercourse 11.88% (n=12). More than half of the respondents recognized that HPV is responsible for the risk of developing cervical cancer (62.38%, n=63). About one-third of respondents indicated gonorrhea (35.64%). Every fourth respondent mentioned HIV (25.74%) and syphilis (24.75%). In addition, 17.82% (n=18) of participants indicated herpes (HSV). Respondents could choose more than one answer. Respondents could select more than one option.

Knowledge about gonorrhea

The most frequently mentioned symptom of gonorrhea was a burning sensation 64.36%, (n=65). Slightly more than half of the respondents reported itching and redness of the skin (51.49%, n=52) and abnormal discharge from the reproductive tract (52.48%, n=53). Every third respondent mentioned a rash (35.64%), and lower abdominal pain (34.65%). In turn, 25.74% (n=26) of respondents indicated an elevated temperature. Respondents could select more than one option.

Knowledge about human papillomavirus (HPV)

The most frequently indicated risk factor for human papillomavirus (HPV) infection was sexual contact with a casual partner (82.18%). Less than half of the respondents reported a lack of personal hygiene (45.54%). Additionally, 14.85% of respondents (n=15) reported smoking, and six of them indicated poor nutrition. Respondents could select more than one option.

Knowledge about syphilis

More than half of the respondents (55.45%) knew that Treponema pallidum, a bacterium causes syphilis. Less than half of the respondents indicated a fungal infection (44.55%). Every third respondent believed that viruses were responsible for syphilis (36.63%). In turn, the smallest group of respondents indicated protozoa (11.88%, n=12). Only one respondent chose the answer "I do not know". Respondents could choose more than one option.

Knowledge about fungal infections

The most frequently cited risk factors for genital fungal infections were poor personal hygiene of the genitals (75.25%) and sexual intercourse with casual partners (67.33%). Less than half of the respondents mentioned the frequent and prolonged use of antibiotics (47.52%). In turn, the smallest group of the respondents indicated hormonal disorders (25.74%, n=26). Respondents could select more than one answer

Sources of knowledge about sexually transmitted diseases

Young people most often reported learning about sexually transmitted diseases from the Internet (86.14%, n=87). Approximately one-third of the participants had their expertise from television (32.67%) or medical personnel (37.62%, n=38). Specialist literature was reported as a source of knowledge by nearly one in four respondents (24,75%), while slightly more respondents (27.72%, n=28) reported magazines. One person pointed to a family member as a source of knowledge about STDs. Respondents could select more than one option.

Analysis of statistical correlations in test results

Statistical analysis revealed differences in the assessment of knowledge about the symptoms of sexually transmitted infections between university students and high school students ($p<0.05$). A higher percentage of students reported knowledge of the symptoms (Table 1).

Table 1. Knowledge of the symptoms of sexually transmitted infections in each study group.

Group	Yes (%)	No (%)	Did not know (%)
Students	78.46	9.23	12.31
High school students	44.44	30.56	25.00
Chi- square	$\chi^2 = 12.518$; $p= 0.002$		

The analysis found a correlation between age and knowledge of specific STD prevention methods ($p<0.05$). The highest percentage of people declaring knowledge of these methods was noted among those aged 24-26, whereas the lowest percentage was noted among participants aged 17-20 (Table 2).

Table 2. Knowledge of some methods of preventing sexually transmitted diseases, depending on the age of the study group

Age of respondents	Yes (%)	No (%)	Did not know (%)
17-20	72.73	13.64	13.64
21-23	81.25	18.75	0
24-26	93.65	1.59	4.76
Chi-square	$\chi^2= 11.434$; $p= 0.022$		

Table 3. Knowledge about the detection time of HIV antibodies depending on the place of residence.

Place of residence	3 months (%)	2-3 weeks (%)	Did not know (%)
Town	29.82	38.60	31.58
Village	59.09	25.00	15.91
Chi-square	$\chi^2= 18.864$; $p= 0.012$		

The production of antibodies detectable before HIV testing can take up to 12 weeks. A negative result obtained after this time confirms that no infection has occurred. The analysis found a correlation between knowledge about the detection time of HIV antibodies and place of residence ($p<0.05$). A higher percentage of rural residents knew the correct answer (Table 3).

The analysis found a correlation between place of residence and medical personnel being indicated as a source of knowledge about sexually transmitted diseases ($p<0.05$). Among urban residents, a higher percentage of people sought information about sexually transmitted diseases from specialists (Table 4).

Table 4. Place of residence and medical personnel as sources of knowledge about sexually transmitted diseases.

Place of residence	Yes (%)	No (%)
Town	47.37	52.63
Village	25.00	75.00
Chi-square test	χ^2=4.384; p= 0.036	

Based on the respondents' responses, the general knowledge of young people about sexually transmitted diseases was assessed. The level of understanding among participants depended on their place of residence. Among urban residents, a higher percentage of people reported high levels of knowledge about sexually transmitted diseases (Table 5).

Table 5. Place of residence and the level of knowledge about sexually transmitted diseases.

Place of residence	High (%)	Average (%)	Low (%)
Town	64.91	19.30	15.79
Village	43.86	20.45	36.36
Chi- square test	χ^2= 12.219; p= 0.002		

The analysis found differences in the level of knowledge about sexually transmitted diseases between university students and high school students ($p<0.05$). Students demonstrated a higher level of expertise (Table 6).

Table 6. Study group and their level of knowledge about sexually transmitted diseases.

Group	High (%)	Average (%)	Low (%)
Students	63.08	20.00	16.92
High school students	41.67	19.44	38.89
Chi- square test	χ^2= 6.435; p= 0.040		

4. DISCUSSION

Promoting effective prevention and sexuality education among young people is crucial. Sexually transmitted diseases (STD) are increasingly affecting young people, and the age of sexual initiation is decreasing. In the study by Zalewska & Olejniczak (2024) found that in countries where health education is insufficiently developed, STD incidence increases, especially between 25 and 29 years old. The authors emphasize that effective prevention should focus on youth, as this group faces the highest risk of infection and the lowest level of knowledge.

In our study, the majority of respondents were women, and the largest age group was 24 to 26 years old, mostly students. The most frequently mentioned sexually transmitted diseases were HIV, AIDS, gonorrhea, and syphilis. Respondents reported knowledge of methods for preventing sexually transmitted infections. The most commonly cited methods were condom use and avoiding casual sexual contact. Similar results were obtained by Grabowska et al., (2020), who found that young adults, despite declaring knowledge of preventive measures, often fail to practice them, which increases the risk of infection. These findings are consistent with other studies, such as Janiszewska et al., (2019), who showed that despite having basic knowledge about HIV and AIDS, awareness of the mechanisms of infection remains insufficient.

The study conducted among youth and students showed that most of them know the symptoms of sexually transmitted infections. They are also aware that this group is at increased risk of infection, which is confirmed by Olejniczak et al., (2012), who also indicated young people as the group most at risk of contracting the disease.

The Internet, medical personnel, and television were identified as the primary sources of information regarding sexually transmitted infections and sexual initiation. According to Bączek et al., (2020), adolescents use the Internet as the primary source of knowledge about sexual health. However, this may lead to the spread of unreliable information.

Primary care physicians, pediatricians, gynecologists, urologists, and venereologists should be prepared for the growing need to diagnose and treat STDs in minors. They also play a crucial role in sex education, particularly in schools and youth centers (Zalewska & Olejniczak, 2024). Disseminating knowledge about effective STD prevention methods is a key priority in the care of adolescents, as confirmed by previous research (Bączek et al., 2020; Janiszewska et al., 2019).

5. CONCLUSION

In the study group, significant differences in knowledge about sexually transmitted diseases were found depending on age, level of education, and place of residence. Students and urban residents demonstrated a higher level of expertise, as they more often used reliable sources of information, such as medical personnel. The Internet is the primary source of knowledge for young people, but it does not always guarantee access to reliable information. Considering the numerous negative consequences of the sexual taboo in the education system, it is essential to improve the quality of classes on health and sexuality. The main task should be to provide young people with reliable and practical information that will allow them to lead a safe and informed sexual life in the future.

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Authors' Contributions

Conceptualization: Izabella Prządo
Methodology: Łukasz Karaś
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Writing – original draft: Izabella Prządo
Writing – review & editing: Łukasz Karaś, Patrycja Patronik, Sabina Krupa- Nurcek All authors have read and agreed with the final, published version of the manuscript.

Informed consent

Written & Oral informed consent was obtained from individual participants included in the study.

Ethical approval

An application was submitted to the Bioethics Committee at the University of Rzeszów (KBE No. 09/05/2020) in order to obtain a positive opinion on the study. The study was done in conformity with ethical guidelines. Participation was entirely voluntary, and all respondents provided informed consent. The participants' anonymity and confidentiality were ensured, and the data obtained were utilized purely for the study. The ethical guidelines for Human Subjects are followed in the study.

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Conflict of interest

The authors declare that they have no conflicts of interest, competing financial interests or personal relationships that could have influenced the work reported in this paper.

Data and materials availability

All data associated with this study will be available based on reasonable request to the corresponding author.

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