

Knowledge, Attitudes and Practices Regarding Sexually Transmitted Infections Among Adolescents Aged 11–19 Years in Cité Des Palmiers, Douala, Cameroon

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Abstract

Sexually transmitted infections (STIs) remain a major public health concern among adolescents, particularly in low- and middle-income countries where access to sexual and reproductive health information and services remains limited. This study assessed the knowledge, attitudes, and practices regarding STIs among adolescents aged 11–19 years living in households in the Cité des Palmiers Health District in Douala, Cameroon. A community-based descriptive cross-sectional study was conducted from December 2024 to August 2025 among 205 adolescents selected using a simple probabilistic sampling technique. Data were collected using a structured questionnaire and analyzed using Microsoft Excel 2010 and SPSS version 19.0. Females represented 52.2% of respondents while males accounted for 47.8%. Most participants demonstrated relatively good knowledge regarding STI transmission and prevention methods. Sexual intercourse was the most commonly identified mode of STI transmission, reported by 88.3% of respondents ($p < 0.001$), while mother-to-child transmission and blood transfusion were identified by 61.5% and 57.6% respectively ($p < 0.05$). However, 35.1% of respondents incorrectly identified kissing as a mode of STI transmission, indicating persistent misconceptions among some adolescents. Condom use was the most recognized preventive strategy, identified by 74.6% of respondents ($p < 0.001$), followed by abstinence (58.0%), faithfulness to one sexual partner (50.7%), and avoiding multiple sexual partners (46.8%) ($p < 0.05$). Despite this relatively good level of awareness, risky sexual practices remained common, including previous sexual

intercourse (44.9%), multiple sexual partners (30.4%), and low uptake of previous HIV testing (28.3%). The study concludes that although adolescents possessed relatively good knowledge regarding STI prevention, unsafe sexual practices and misconceptions remain prevalent. Strengthening adolescent-focused sexual health education and improving access to adolescent-friendly reproductive health services are therefore strongly recommended.

Keywords: Adolescents; Sexually transmitted infections; Sexual practices; STI prevention knowledge.

1. Introduction

1.1 Burden of Sexually Transmitted Infections Among Adolescents

Sexually transmitted infections (STIs) constitute a major global public health challenge, affecting millions of people annually, particularly adolescents and young adults. According to the World Health Organization (WHO), more than one million curable STIs are acquired every day worldwide, with chlamydia, gonorrhoea, syphilis, and trichomoniasis accounting for approximately 374 million new infections each year (WHO, 2024). Adolescents remain among the most vulnerable populations due to a combination of biological, behavioural, social, and economic factors that increase their susceptibility to risky sexual behaviours and STI acquisition. STIs are infections caused by bacteria, viruses, or parasites and are transmitted primarily through vaginal, anal, or oral sexual intercourse. Some infections may also be transmitted through blood transfusion and from an infected mother to her child during pregnancy, childbirth, or breastfeeding. The most common bacterial STIs include gonorrhoea, chlamydia, and syphilis, while viral STIs include human immunodeficiency virus (HIV), human papillomavirus (HPV), genital herpes, and hepatitis B virus infection.

1.2 Adolescent Vulnerability to STIs

Adolescence is a developmental stage characterized by curiosity, experimentation, peer influence, and emotional transitions, all of which may predispose young people to unsafe sexual behaviours. In sub-Saharan Africa, the burden of STIs among adolescents remains particularly high due to inadequate sexuality education, poverty, gender inequalities, and limited access to youth-friendly health services (Mavedzenge et al., 2011). Despite ongoing reproductive health interventions, Cameroon continues to experience a substantial burden of STIs among adolescents and young adults.

Several studies conducted in African settings have demonstrated that although many adolescents have heard about STIs, misconceptions regarding their transmission, symptoms, and prevention remain widespread (Asekun-Olarinmoye et al., 2014). Inadequate parent-adolescent communication regarding sexual and reproductive health further contributes to unsafe **sexual practices**. Additionally, cultural taboos surrounding discussions of sexuality often limit adolescents' access to accurate and comprehensive sexual health information.

1.3 Consequences of Sexually Transmitted Infections

Untreated STIs can result in serious health consequences, including infertility, ectopic pregnancy, pelvic inflammatory disease, neonatal infections, cervical cancer, and increased susceptibility to HIV infection. Beyond their physical health effects, STIs may also have psychological, social, and economic consequences for affected individuals and their families. Consequently, assessing adolescents' knowledge, attitudes, and practices regarding STIs is essential for designing effective interventions aimed at reducing transmission and improving reproductive health outcomes.

1.4 Sexually Transmitted Infections Situation in the Cité des Palmiers Health District

The Cité des Palmiers Health District in Douala is characterized by high population density and rapid urbanization, factors that may increase adolescents' exposure to risky sexual behaviours. Urbanization, population mobility, peer pressure, and exposure to diverse social influences may further heighten adolescents' vulnerability to STI transmission in this setting. However, limited data are available regarding adolescents' knowledge, attitudes, and practices concerning STIs within this health district. Understanding these factors is critical for developing targeted public health interventions and adolescent-friendly reproductive health programs.

1.5 Study Objective

This study aimed to assess the knowledge, attitudes, and practices regarding sexually transmitted infections among adolescents aged 11–19 years residing in households within the Cité des Palmiers Health District, Douala, Cameroon. Specifically, the study sought to evaluate adolescents' knowledge of STIs, describe their attitudes toward STI prevention, and identify sexual practices associated with STI transmission.

2. Method

2.1 Study Area

The study was conducted in the Cité des Palmiers Health District located in Douala, Littoral Region, Cameroon. The district serves densely populated urban and peri-urban communities and covers a heterogeneous population.

2.2 Study Population and Participant Characteristics

The study population consisted of adolescents aged 11–19 years residing in households within the Cité des Palmiers Health District, Douala, Cameroon. Adolescents were eligible for inclusion if they were permanent residents of the selected households, aged between 11 and 19 years, available during the data collection period, and willing to participate in the study. For participants below 18 years of age, parental or guardian consent was obtained in addition to

participant assent. Adolescents who declined participation or returned incomplete questionnaires were excluded from the study. The study included both male and female adolescents from different educational, religious, and socio-economic backgrounds to ensure adequate representation of the target population.

2.3 Sampling Procedures

A simple probabilistic sampling technique was employed to ensure an equal chance of selecting study participants. First, two blocks were selected at random from all the blocks located in the Cité des Palmiers Health Area. This random selection helped to minimize selection bias and improve the representativeness of the study population as earlier advocated by Polit & Beck (2021). Following the selection of the blocks, households within these blocks were visited systematically by the research team. In each household, adolescents who met the study's eligibility criteria, such as age range and willingness to participate, were identified. Eligible adolescents encountered during household visits was invited to participate until the required sample size was attained. Consecutive recruitment has already been used elsewhere (Setia, 2016). This approach combining probability sampling at the block selection stage with consecutive sampling at the household level, are frequently used in epidemiological and community health research conducted in low-resource settings (Kothari, 2004)

2.3.1 Sample Size Calculation

The Cochran formula was used to calculate the minimum sample size for this study:

$$n = \frac{Z^2 p(1-p)}{d^2}$$

Where:

- n = required sample size
- Z = standard normal value corresponding to the confidence level (1.96 for 95% confidence)
- p = 15.8%: estimated prevalence or proportion from previous studies (Ndongo, 2011).
- d = margin of error (0.05)

A minimum sample size of 205 adolescents was obtained.

2.3.2 Measures and Covariates

Data were collected using a structured, pretested questionnaire developed from previously published instruments assessing adolescents' knowledge, attitudes, and practices (KAP) regarding sexually transmitted infections (STIs). The questionnaire was adapted to the local context and administered in a language easily understood by participants. Prior to data collection, the instrument was pretested among a group of adolescents outside the study area to assess clarity, relevance, and comprehensibility of the questions. Feedback obtained during the pretest was used to refine the wording and sequence of items.

The primary outcome measures included adolescents' knowledge regarding STIs, attitudes toward STI prevention, and sexual practices associated with STI transmission risk. Knowledge-related variables assessed awareness of common STIs, modes of transmission, signs and symptoms, potential complications, and preventive measures such as condom use, abstinence, faithfulness to one sexual partner, and avoidance of multiple sexual partnerships. Knowledge scores were generated based on the number of correct responses provided by participants.

Attitudinal variables evaluated participants' perceptions and beliefs regarding STI prevention, sexuality education, condom use, HIV testing, healthcare-seeking behavior, and personal susceptibility to STIs. Sexual practice variables included history of sexual intercourse, age at sexual debut, condom use during the last sexual encounter, number of sexual partners, previous HIV testing, and other behaviors associated with increased STI risk.

Covariates included socio-demographic characteristics such as age, sex, educational level, religion, marital status, living arrangements, and household characteristics. These variables were collected to assess their potential influence on STI-related knowledge, attitudes, and practices.

Data were collected through confidential face-to-face interviews conducted by trained research assistants. Prior to the survey, research assistants received training on the study objectives, questionnaire administration procedures, ethical considerations, confidentiality, and techniques for interviewing adolescents on sensitive reproductive health issues. This training helped ensure consistency in data collection and minimize interviewer bias. Privacy was maintained throughout the interview process to encourage honest and accurate responses.

To enhance data quality, completed questionnaires were reviewed daily by the principal investigator for completeness, consistency, and accuracy. Any missing or inconsistent responses identified during fieldwork were verified whenever possible. Data were coded and entered into Microsoft Excel 2010 before being exported to the Statistical Package for the Social Sciences (SPSS) version 19.0 for analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the data. Chi-square tests were performed to assess associations between selected variables, with statistical significance set at $p < 0.05$.

2.3.3 Research Design

This study employed a community-based descriptive cross-sectional research design. The study was observational in nature, and participants were observed and assessed under natural conditions without any manipulation, intervention, or experimental treatment by the researchers. Data were collected at a single point in time to assess adolescents' knowledge, attitudes, and practices regarding sexually transmitted infections (STIs) within the study area. No experimental or control groups were created, and participants were not assigned to different study conditions. Consequently, random assignment was not applicable. Instead, eligible adolescents were recruited from selected households within the Cité des Palmiers Health District using a

probability-based sampling approach. The study therefore represents a non-experimental, between-subject observational design in which information was collected from different individuals and analyzed to describe patterns of STI-related knowledge, attitudes, and practices among adolescents aged 11–19 years.

2.4 Statistical Analysis

Data were coded, entered into Microsoft Excel 2010, and exported to Statistical Package for Social Sciences (SPSS) version 19.0 for analysis. Descriptive statistics including frequencies, percentages, means, and standard deviations were used to summarize the data. Chi-square tests were performed to assess associations between selected knowledge, attitude, and practice variables. Statistical significance was set at $p < 0.05$ with a 95% confidence interval.

2.3.5 Ethical Considerations

Ethical approval for this study was obtained from the Institutional Ethics Committee of the Faculty of Medicine and Pharmaceutical Sciences, University of Douala (Approval No.: UD/FMPS/IEC/2025/4425). Administrative authorization was obtained from the Littoral Regional Delegation of Public Health and the Cité des Palmiers Health District authorities before commencement of data collection. Participation was entirely voluntary. Written informed consent was obtained from parents or guardians for participants younger than 18 years, while assent was obtained from the adolescents themselves. Participants aged 18–19 years provided written informed consent directly. Confidentiality, anonymity, privacy, and the right to withdraw from the study at any stage without penalty were guaranteed throughout the study.

3. Results

A total of 205 adolescents aged 11–19 years were recruited and participated in the study. Data collection was conducted during April 2025.

Table 1 shows the socio-demographic characteristics of respondents. females constituted a slightly higher proportion of the respondents, accounting for 52.2%, compared to 47.8% males. Regarding age distribution, the majority of participants were aged 17–19 years (45.4%), followed by those aged 14–16 years (36.1%), while respondents aged 11–13 years represented the smallest proportion (18.5%). These findings indicate that the study population was predominantly composed of older adolescents.

Table 1. Socio-Demographic Characteristics of Respondents (N = 205)

Variable	Category	Frequency	Percentage (%)
Sex	Female	107	52.2
	Male	98	47.8
	Total	205	100
Age Group (Years)	11–13	38	18.5
	14–16	74	36.1
	17–19	93	45.4
	Total	205	100

Table 2 presents respondents’ knowledge regarding STI transmission and prevention methods. The findings indicate that the majority of participants possessed relatively good knowledge of the major modes of STI transmission and preventive measures. Sexual intercourse was the most commonly recognized mode of STI transmission, identified by 181 respondents (88.3%), and chi-square analysis demonstrated a statistically significant association between respondents’ awareness and correct identification of this transmission route ($\chi^2 = 18.42, p < 0.001$). Knowledge regarding mother-to-child transmission and transmission through blood transfusion was reported by 61.5% and 57.6% of respondents, respectively, and both variables were significantly associated with overall STI knowledge ($p < 0.05$).

Despite the generally satisfactory level of awareness, 35.1% of respondents incorrectly identified kissing as a mode of STI transmission. This association was not statistically significant ($\chi^2 = 2.53, p = 0.112$), suggesting the persistence of misconceptions among some adolescents.

Concerning STI prevention methods, condom use emerged as the most recognized preventive strategy, identified by 74.6% of respondents. Chi-square analysis revealed a significant association between knowledge of condom use and overall STI prevention awareness ($\chi^2 = 15.67, p < 0.001$). Similarly, knowledge of abstinence (58.0%), faithfulness to one sexual partner (50.7%), and avoiding multiple sexual partners (46.8%) demonstrated statistically significant associations with STI prevention knowledge ($p < 0.05$). These findings suggest that although adolescents generally possess adequate knowledge regarding STI transmission and prevention, important misconceptions remain and may influence preventive behaviours.

Table 2. Knowledge Regarding STI Transmission and Prevention Methods among Respondents (N = 205)

Variable Category	Item	Frequency	Percentage (%)	p-value
Knowledge Regarding STI Transmission	Sexual intercourse	181	88.3	<0.001
	Mother-to-child transmission	126	61.5	0.021
	Blood transfusion	118	57.6	0.034
	Kissing	72	35.1	0.112
Knowledge regarding STI Prevention Methods	Condom use	153	74.6	<0.001
	Abstinence	119	58.0	0.017
	Faithfulness to one partner	104	50.7	0.042
	Avoiding multiple partners	96	46.8	0.049

Table 3 shows respondents’ attitudes towards STI prevention and sexual health. Most adolescents demonstrated positive attitudes towards STI prevention and sexual health. A large majority agreed that sexuality education is important (85.9%) and recognized condom use as an effective preventive measure against STIs (82.0%). Chi-square analysis showed significant positive attitudes regarding sexuality education, condom use, HIV testing before sexual intercourse, and recognition of the risks associated with multiple sexual partners ($p < 0.05$). However, 47.8% of respondents reported feeling embarrassed to seek STI-related healthcare services, indicating the persistence of stigma and barriers to accessing adolescent sexual health services.

Table 3. Attitudes of Respondents Towards STI Prevention and Sexual Health (N = 205)

Attitude Statement	Frequency	Percentage (%)
Believed condom use is important for STI prevention	168	82.0
Agreed that adolescents should receive sexuality education	176	85.9
Believed HIV testing is important before sexual intercourse	149	72.7
Agreed that abstinence can prevent STIs	137	66.8
Believed discussing sexual health with parents is important	121	59.0
Felt embarrassed to seek STI-related healthcare services	98	47.8
Believed adolescents are personally at risk of STIs	142	69.3
Agreed that multiple sexual partners increase STI risk	158	77.1

Figure 1 shows the sexual practices among the respondents. Nearly half of respondents (44.9%) had previously engaged in sexual intercourse. Among sexually active adolescents, only 50.0% reported condom use during their last sexual encounter, while 30.4% acknowledged having multiple sexual partners, exposing them to an increased risk of sexually transmitted infections.

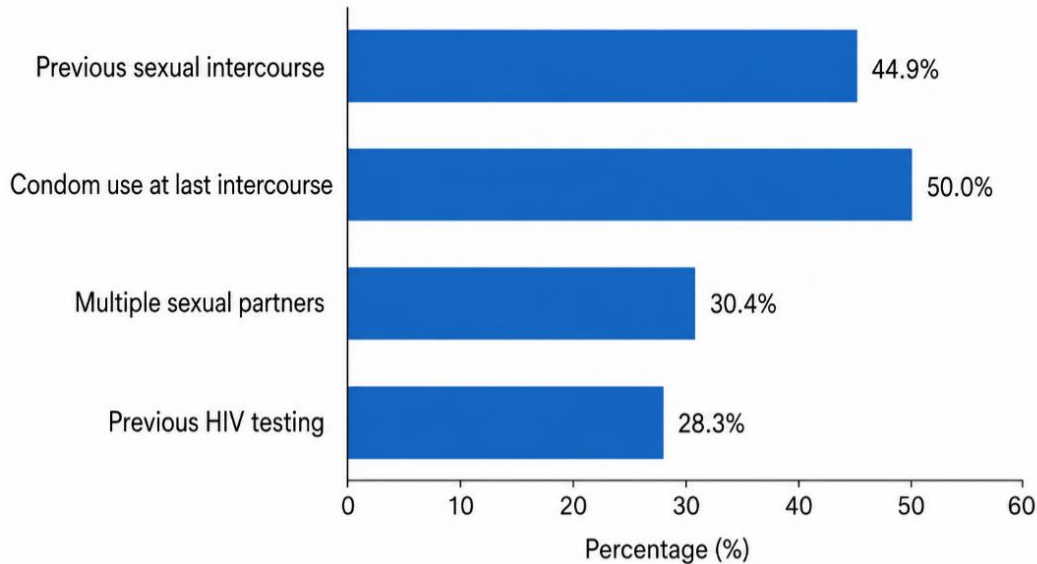


Figure 1. Sexual Practices Among Respondents

4. Discussion

The present study assessed adolescents’ knowledge, attitudes, and sexual practices regarding sexually transmitted infections (STIs) in the Cité des Palmiers Health District, Douala, Cameroon. The findings revealed that although most respondents possessed relatively good knowledge and generally positive attitudes regarding STI transmission and prevention, risky sexual behaviours and misconceptions remained prevalent among many adolescents. These findings are consistent with reports from the World Health Organization and UNAIDS, indicating that adolescents continue to constitute a highly vulnerable group for acquiring STIs and HIV infection, particularly in sub-Saharan Africa, where access to accurate sexual health information and adolescent-friendly healthcare services remains inadequate.

The predominance of female respondents observed in this study is comparable to findings reported in other adolescent reproductive health studies conducted in Africa. The majority of respondents were aged 17–19 years, suggesting that older adolescents constituted the largest proportion of the study population. This age category is commonly associated with increased sexual experimentation, emotional relationships, and peer influence, factors known to contribute to risky sexual practices among adolescents (Fatusi & Blum, 2008).

The study demonstrated relatively high levels of knowledge regarding STI transmission. Sexual intercourse was the most commonly identified mode of STI transmission, recognized by 88.3% of respondents, with a statistically significant level of awareness ($p < 0.001$). Knowledge regarding mother-to-child transmission and blood transfusion was also relatively satisfactory. These findings are comparable to those reported by Ndongo (2011) among secondary school students in Cameroon, where adolescents demonstrated adequate awareness of the major modes

of STI transmission. The relatively high level of awareness observed in this study may be attributed to school-based sexuality education, peer interactions, media exposure, and internet access. Asekun-Olarinmoye et al. (2014) similarly reported that mass media and internet exposure significantly influenced adolescents' sexual knowledge and behaviours in Nigeria. Nevertheless, misconceptions remained evident, as 35.1% of respondents incorrectly identified kissing as a mode of STI transmission. This finding indicates that although adolescents may possess general awareness of STIs, gaps in accurate scientific knowledge **still exist**. Such misconceptions may contribute to fear, stigma, and inappropriate preventive behaviours.

Regarding STI prevention methods, condom use was the most recognized preventive strategy, identified by 74.6% of respondents, and was significantly associated with overall STI knowledge ($p < 0.001$). Abstinence, faithfulness to one sexual partner, and avoiding multiple sexual partnerships were also recognized by several participants. These findings are consistent with previous studies emphasizing that adolescents are generally aware of major STI preventive measures due to HIV/AIDS awareness programmes and reproductive health campaigns (Kirby, 2007; Mavedzenge et al., 2011). In addition to knowledge, the findings of this study revealed generally positive attitudes toward STI prevention and sexual health. Most respondents believed that sexuality education is important and acknowledged condom use as an effective strategy for preventing STIs. A considerable proportion also recognized the importance of HIV testing before sexual intercourse and agreed that multiple sexual partners increase the risk of STI acquisition. These findings suggest that many adolescents possess positive perceptions toward STI prevention and demonstrate awareness of behaviours that may reduce the risk of infection.

Despite the relatively good level of knowledge and positive attitudes observed, risky sexual practices remained common among respondents. Nearly half of the participants had previously engaged in sexual intercourse, while only half of the sexually active adolescents reported condom use during their last sexual encounter. Furthermore, approximately one-third of respondents reported having multiple sexual partners, thereby increasing their vulnerability to STIs and HIV infection. Similar findings have been documented in studies conducted in Kenya, Uganda, Nigeria, and Cameroon, where adolescents often engage in unsafe sexual practices despite being aware of preventive measures (Bearinger et al., 2007; Mavedzenge et al., 2011). Adolescents may engage in such behaviours because of peer pressure, emotional attachment, poverty, low self-esteem, inadequate negotiation skills, curiosity, or misconceptions regarding condom use. The discrepancy observed between knowledge and actual sexual practices in this study further demonstrates that awareness alone does not necessarily translate into behavioural change.

Another important finding of this study concerns adolescents' attitudes toward healthcare utilisation. Although respondents generally demonstrated positive attitudes toward STI prevention, nearly half reported feeling embarrassed to seek STI-related healthcare services. This may reflect the persistence of stigma, fear of judgment, cultural taboos, and confidentiality concerns surrounding adolescent sexual and reproductive health. Similar barriers have been

reported in several African settings where adolescents often avoid accessing reproductive healthcare services because of fear, discrimination, or negative attitudes from healthcare providers. Furthermore, the relatively low uptake of HIV testing observed among respondents suggests the need to strengthen adolescent-friendly healthcare services and increase awareness regarding the benefits of early HIV screening and counselling. The Centers for Disease Control and Prevention and the United Nations Population Fund emphasize the importance of confidential, accessible, and youth-friendly sexual health services in improving STI prevention and early detection among adolescents.

Overall, the findings of this study indicate that adolescents in the Cité des Palmiers Health District possess relatively good knowledge and positive attitudes regarding STI transmission and prevention. However, misconceptions, inconsistent condom use, multiple sexual partnerships, embarrassment when seeking healthcare services, and low HIV testing uptake remain important public health concerns. These findings highlight the need for comprehensive adolescent sexual health interventions involving schools, families, healthcare providers, media platforms, and community stakeholders. Strengthening comprehensive sexuality education, promoting accurate reproductive health information, improving adolescent-friendly healthcare services, and encouraging parent–adolescent communication may contribute significantly to reducing STI transmission and improving adolescent reproductive health outcomes in Cameroon and similar settings.

5. Conclusion

The present study demonstrated that adolescents in the Cité des Palmiers Health District possess relatively good knowledge and generally positive attitudes regarding sexually transmitted infections. Nevertheless, misconceptions regarding STI transmission, inconsistent condom use, multiple sexual partnerships, embarrassment in seeking STI-related healthcare services, and low uptake of HIV testing remain important concerns. These findings indicate a gap between knowledge and actual sexual behaviour.

Strengthening comprehensive sexuality education, promoting adolescent-friendly reproductive health services, encouraging HIV testing, and fostering parent–adolescent communication are essential strategies for reducing STI transmission and improving adolescent sexual and reproductive health outcomes in Cameroon.

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