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Sexual Practices and HIV/AIDS Vulnerability Among Adolescents in Lokoja, North-Central Nigeria: Mixed-Method Cross-Sectional Study

[1]Edward Ukwubile Egwuaba, [2]Patricia, Chinwe Iloka, [3]Blessing Adeyi Sunday, [2]Ann Chinwe Akpunonu, [2]William Amechi Chukwuma, [4]Anselm Uchechukwu Abonyi, [4]Cali Ojmba, [2]Priscilla, Ifeoma Nwakoby [5]Enoch, Nnamdi Nwakoby

[1]Department of Sociology, Faculty of Social Sciences, Chukwuemeka Odumegwu Ojukwu University, Igbariam, Anambra State, Nigeria
[2]Department of Private and Public Law, Faculty of Law, Chukwuemeka Odumegwu Ojukwu University, Igbariam, Nigeria
[3]Department of Sociology, Faculty of Social Sciences, Prince Abubakar Audu University, Anyigba, Kogi State, Nigeria
[4]Department of Commercial and Property Law, Faculty of Law, Chukwuemeka Odumegwu Ojukwu University, Igbariam, Nigeria
[4]Department of Commercial and Property Law, Faculty of Law, Chukwuemeka Odumegwu Ojukwu University, Igbariam, Nigeria
[5]Department of Microbiology, Faculty of Natural Sciences, Chukwuemeka Odumegwu Ojukwu University, Uli Campus, Nigeria

Corresponding author: Edward Ukwubile Egwuaba, Department of Sociology, Faculty of Social Sciences, Chukwuemeka Odumegwu Ojukwu University, Igbariam, Anambra State, Nigeria.
eu.egwuaba@coou.edu.ng:+2349064068287

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ABSTRACT

Background: Adolescents are particularly vulnerable to HIV due to unsafe sexual practices and limited access to sexual and reproductive health services. In Nigeria, risky behaviours contribute substantially to HIV transmission, yet evidence on the interaction between knowledge, behaviour, and socio-economic factors among adolescents in Lokoja is limited. This study assessed sexual practices, condom use patterns, sources of HIV/AIDS information, and factors influencing HIV vulnerability among adolescents in Lokoja, North-Central Nigeria.

Methods: A mixed-methods descriptive cross-sectional study was conducted among 400 adolescents aged 10–19 years. Multistage sampling was used for the quantitative survey, while purposive sampling recruited participants for six focus group discussions (FGDs). Quantitative data were analysed using SPSS version 25 with descriptive statistics and chi-square tests. Qualitative data were analysed thematically to explore perceptions, experiences, and socio-cultural influences on sexual behaviour.

Results: Of respondents, 45.5% reported ever having sexual intercourse, and 34.5% were currently sexually active. Among sexually active adolescents, 30.8% used condoms consistently, 46.2% occasionally, and 23% never. School teachers (38%) and media (31%) were the main sources of HIV information. Risky behaviours were significantly associated with multiple sexual partners, inconsistent condom use, and peer influence. FGDs highlighted barriers including peer pressure, economic constraints, and limited parental guidance.

Conclusion: Adolescents in Lokoja engage in risky sexual behaviours despite HIV knowledge. Interventions should promote consistent condom use, strengthen peer and parental education, improve adolescent-friendly services, and address socio-economic determinants.

Keywords: Adolescents, Sexual Behaviour, HIV/AIDS, Condom Use, Knowledge-behaviour gap, Transactional sex

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INTRODUCTION

Adolescence is a critical stage of human development characterised by rapid physical, psychological, and social changes. During this period, individuals often begin exploring sexual relationships and developing their sexual identities, which can significantly influence long-term health behaviours.[1] While this exploration is a normal developmental process, adolescents are particularly vulnerable to engaging in risky sexual behaviours that increase their susceptibility to sexually transmitted infections (STIs), including Human Immunodeficiency Virus (HIV).[2] Globally, HIV remains a major public health concern, with sub-Saharan Africa bearing the highest burden of infections among adolescents and young people.[3]

In Nigeria, adolescents constitute a significant proportion of the population at risk of HIV infection. This vulnerability is influenced by several behavioural and structural factors, including early sexual debut, multiple sexual partnerships, inconsistent condom use, and limited access to accurate sexual and reproductive health information.[4 - 6] National surveys further indicate that, although awareness of HIV/AIDS is widespread among Nigerian adolescents, consistent condom use and access to youth-friendly health services remain inadequate.[7]

In Lokoja, the capital city of Kogi State, adolescents' vulnerability to HIV may be further heightened by rapid urbanisation, population mobility, and expanding social networks that shape peer interactions and sexual decision-making.[8,9] Adolescents in such urban environments often face conflicting social norms regarding sexuality, economic pressures, and limited parental supervision. Evidence suggests that peer influence and social expectations can significantly shape adolescents' sexual behaviour, sometimes encouraging experimentation and risky practices.[10,11]

Despite sustained national HIV prevention initiatives and awareness campaigns, knowledge alone does not necessarily translate into safer sexual practices among adolescents.[12,13] Structural and socio-economic factors, such as poverty, gender power imbalances, and limited negotiation skills, frequently undermine adolescents' ability to adopt protective behaviours.[14,15] Consequently, adolescents may remain exposed to HIV infection despite relatively high levels of awareness.

although several studies have examined adolescent sexual behaviour and HIV risk in Nigeria, most focus on national trends or specific regions, leaving limited empirical evidence from urban centres such as Lokoja.[16,17] This lack of location-specific data represents a critical gap that hinders the development of targeted and contextually appropriate interventions. To address this, the present study is guided by the Health Belief Model (HBM), a widely used framework in health behaviour research.[18]

The model posits that individuals' health behaviours are influenced by their perceptions of susceptibility to a health problem, the severity of the condition, the benefits of preventive actions, and barriers to adopting protective behaviours. In the context of adolescent sexual behaviour and HIV prevention, perceived susceptibility refers to adolescents' beliefs about their likelihood of contracting HIV, while perceived severity reflects their understanding of the potential health and social consequences of infection. Perceived benefits involve adolescents' belief that preventive actions such as condom use, HIV testing, or abstinence can effectively reduce risk,[25] whereas perceived barriers including stigma, embarrassment when purchasing condoms, peer pressure, or limited access to youth-friendly services may discourage adoption of protective practices.[22] Exposure to HIV education through schools, media campaigns, and health programmes can act as cues to action, while self-efficacy, or confidence in negotiating condom use or refusing unsafe sex, influences whether adolescents translate knowledge into protective behaviours.[23] The HBM informed the design of the questionnaire and focus group discussion guide, emphasising adolescents' perceptions of HIV susceptibility, benefits of preventive behaviours, and barriers to safe sexual practices, ensuring that both quantitative and qualitative measures captured cognitive, social, and structural determinants of HIV vulnerability.

Given these gaps, this study investigates sexual practices and HIV vulnerability among adolescents in Lokoja, North-Central Nigeria. It seeks to determine the prevalence of sexual activity, assess adolescents' knowledge of HIV transmission and prevention, identify behaviours that increase HIV risk, explore the influence of peer pressure on sexual decision-making, and examine patterns of condom use among sexually active adolescents. By addressing these areas, the study aims to provide empirical evidence to guide adolescent-focused HIV prevention strategies and public health interventions in urban Nigeria.

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METHODOLOGY

Study Design: This study used a convergent parallel mixed-methods design to examine sexual practices and HIV vulnerability among adolescents in Lokoja, North-Central Nigeria.[14,18] Quantitative data were collected via a structured questionnaire from 400 adolescents aged 10–19 years, capturing socio-demographics, sexual behaviours, condom use, HIV knowledge, and peer influence, and analysed using descriptive and inferential statistics, including chi-square tests and logistic regression.[16,19] Qualitative data were obtained from six focus group discussions with adolescents aged 15–19 years, exploring perceptions of sexual behaviour, peer pressure, cultural norms, and barriers to safe sex.[17,22] Integrating both datasets allowed triangulation of numerical patterns with contextual insights, enhancing the depth, rigor, and validity of the findings.[23, 24]

Study Area: The study was conducted in Lokoja, the capital city of Kogi State in North-Central Nigeria. Lokoja is an urban centrecharacterised by a diverse population, increasing urbanisation, and expanding educational and social institutions that attract young people from surrounding communities.[8, 9]

Study Population: The study population comprised adolescents aged 10–19 years residing in Lokoja for at least six months prior to the study. Both in-school and out-of-school adolescents were included to capture a representative cross-section of the adolescent population with diverse educational and socio-economic backgrounds [7,17]. For focus group discussions, adolescents aged 15–19 years were purposively selected to provide in-depth insights into sexual behaviours, decision-making processes, and perceptions of HIV risk.

Sample Size Determination: The minimum sample size for the quantitative survey was calculated using the standard formula for descriptive cross-sectional studies[2]:

$$n = (Z^2 \cdot p \cdot q)/d^2$$

Where: n= minimum required sample size; Z= standard normal deviate at 95% confidence interval (1.96); p= estimated prevalence of sexual activity among adolescents (0.50, due to lack of local data); q= 1 − p (0.50); d= margin of error (0.05)

$$n = (〖1.96〗^2 \cdot 0.50 \cdot 0.50)/〖0.05〗^2$$
$$= (3.8416 \cdot 0.25)/0.0025$$
$$= 384.16$$

To account for potential non-response or incomplete data, the sample size was rounded up to 400 respondents.

Sampling Technique: A multistage sampling approach was employed for quantitative data collection:

1. *Selection of wards (communities):* Lokoja comprises 12 urban wards. The wards were stratified, and four wards were randomly selected using a simple random sampling technique (balloting). This ensured representation across the city's diverse urban communities.
2. *Selection of schools and youth centres:* In each selected ward, two secondary schools and one youth centre were randomly chosen from an official list obtained from the Kogi State Ministry of Education and youth affairs office. This provided access to both in-school and out-of-school adolescents.
3. *Selection of respondents*: Within each selected school, adolescents were recruited using systematic random sampling from class registers. For youth centres, attendance lists were used, and participants were selected systematically based on the sampling interval derived from the total number of eligible adolescents.

For qualitative data, purposive sampling was applied to select participants for six focus group discussions (FGDs), ensuring diversity in age, gender, and schooling status to capture a range of perspectives on sexual behaviour and HIV vulnerability.

Eligibility

Inclusion Criteria: Adolescents aged 10–19 years residing in Lokoja for at least six monthsWilling participants who provided informed consent (≥18 years) or parental consent with participant assent (<18 years)

Exclusion Criteria: Adolescents with severe illness during data collection. Adolescents unwilling to participate

Data Collection Instruments

Quantitative Data: A structured, interviewer-administered questionnaire was used to collect data on socio-demographic characteristics, sexual behaviours, HIV knowledge, peer influence, and social determinants of sexual behaviour.[4, 5] The questionnaire was adapted from previously validated instruments used in similar Nigerian adolescent studies[11, 12] and modified to reflect the local context of Lokoja.

Validity: The questionnaire was reviewed by two public health experts and one adolescent health specialist for content and face validity.

Reliability: A pre-test was conducted among 20 adolescents in a neighbouring ward. Internal consistency was assessed using Cronbach's alpha,

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yielding a coefficient of 0.81, indicating good reliability.

Qualitative Data: A semi-structured focus group discussion (FGD) guide was used to explore adolescents' perceptions, experiences, and socio-cultural influences on sexual behaviour, condom use practices, and barriers to HIV prevention. The FGD guide was also pre-tested and refined to ensure clarity and relevance to the study objectives.

The questionnaire was pre-tested among 20 adolescents in a neighbouring ward to ensure clarity, comprehension, and reliability. Internal consistency was assessed using Cronbach's alpha, yielding a value of 0.81, indicating good reliability. Prior to data collection, research assistants underwent two days of training on the study objectives, ethical conduct, interview techniques, and handling sensitive questions to ensure standardized administration. Adjustments were made to the questionnaire based on pre-test findings before the main survey.

***Qualitative Data: A semi-structured FGD guide was used to explore*:** Influences on sexual behaviour; Condom use practices; Barriers to HIV prevention; Peer, family, and socio-economic factors affecting sexual decision-making

Data Collection Procedure

Data collection lasted four weeks and was conducted by trained research assistants. Written informed consent was obtained from participants aged 18–19 years, while parental consent and participant assent were obtained for those under 18. Privacy and confidentiality were maintained throughout both quantitative and qualitative data collection.

Quantitative Analysis: Data were coded and entered into SPSS version 25 for analysis.

Descriptive statistics: Frequencies, percentages, means, and standard deviations summarized socio-demographic characteristics, knowledge, and sexual behaviours.

Operational definition of HIV vulnerability: For this study, HIV vulnerability was defined as the presence of one or more of the following risk behaviours: early sexual debut (<15 years), engagement in multiple sexual partnerships, inconsistent or non-use of condoms, transactional sex, and exposure to peer pressure promoting unsafe sexual practices. Adolescents exhibiting any of these behaviours were classified as "vulnerable" to HIV.

Inferential statistics:

Bivariate analysis: Chi-square tests were used to assess associations between individual sexual behaviours and HIV vulnerability.

Multivariate analysis: Logistic regression was performed to identify independent predictors of HIV vulnerability while controlling for potential confounders such as age, gender, schooling status, and socio-economic factors. Adjusted odds ratios (AOR) with 95% confidence intervals (CI) were reported, and statistical significance was set at $p < 0.05$.

Qualitative Analysis: Focus group discussion (FGD) recordings were transcribed verbatim and carefully reviewed against field notes to ensure accuracy. Data coding was conducted manually and using NVivo version 12 to organize and categorize responses. A preliminary coding framework was developed based on the research objectives, literature on adolescent sexual behaviour, and emerging patterns from the transcripts.

Thematic development followed an iterative process:

1. **Open coding:** Initial codes were generated from the data line-by-line to capture meaningful units of information.
2. **Axial coding:** Related codes were grouped into categories reflecting broader patterns in perceptions, behaviours, and social influences.
3. **Selective coding:** Core themes were identified that represented the key factors influencing adolescent sexual behaviour and HIV vulnerability.

Themes were continuously refined through constant comparison, ensuring that nuances in the data were preserved. Triangulation with quantitative findings enhanced validity, providing a comprehensive understanding of adolescents' sexual practices, barriers to safe sex, and socio-cultural determinants of HIV risk.

***Ethical Considerations*:** Ethical approval was obtained from the Chukwuemeka Odumegwu Ojukwu University Research Ethics Committee (Approval Number: CHU/REC/2025/004), which oversees community-based health research across Nigeria. Participation was voluntary, and confidentiality was ensured using unique codes instead of personal identifiers. Participants could withdraw at any time.

RESULTS

This section presents evidence from quantitative and qualitative analyses examining sexual behaviour, HIV/AIDS awareness, and vulnerability among adolescents in Lokoja, North-Central Nigeria. Findings

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focus on sexual activity patterns, condom use, information sources, and key social and behavioural factors influencing HIV risk.

Table 1 shows that the majority of respondents were aged **1**5–19 years (58%)**,** with a slight predominance of females (51%). Most adolescents were in-school (78%), reflecting the predominance of school-based recruitment, while 22% were out-of-school.

These findings suggest that the sample was largely composed of older adolescents who are more likely to engage in sexual activity and access HIV-related information in school settings, reflecting the predominance of school-based recruitment, although out-of-school adolescents were also included through youth centres**.** Understanding the socio-demographic profile is essential for targeting interventions effectively . **Table 1:** Socio-demographic characteristics of adolescents in Lokoja, North-Central Nigeria (n = 400)

Variable	Freq (n)	Percent (%)
Age group (years)		
10–14	168	42.0
15–19	232	58.0
Sex		
Male	196	49.0
Female	204	51.0
Educational status		
In-school	312	78.0
Out-of-school	88	22.0
Religion		
Christianity	246	61.5
Islam	154	38.5

Source: Field Survey, 2025

Table 2 indicates that 45% of adolescents had ever had sexual intercourse, and 32.5% were currently sexually active. Early sexual debut (<15 years) was reported by 20%, while 15% had multiple sexual partners. Additionally, 17.5% reported that their sexual activity was influenced by peers.

This demonstrates a substantial proportion of adolescents engaging in sexual behaviour that increases their vulnerability to HIV. The early initiation and multiple partnerships highlight the need for early sexual health education and peer-focused interventions.

Table 2: Sexual activity status of respondents (n=400)

Sexual activity variable	Yes n (%)	No n (%)
Ever had sexual intercourse	182 (45.5)	218 (54.5)
Currently sexually active	138 (34.5)	262 (65.5)
Sexual debut before 15 years	76 (19.0)	324 (81.0)

Source: Field Survey, 2025

Table 3 shows that most adolescents had good knowledge of HIV transmission and prevention: 90% knew HIV is transmitted through unprotected sex, 80% were aware of transmission via sharing needles, 85% understood that casual contact does not transmit HIV, and 75% recognised that consistent condom use prevents infection.

These results indicate adequate awareness of HIV/AIDS among adolescents, likely reflecting the influence of school-based education and media. However, as later tables show, knowledge does not always translate into safe sexual practices, underscoring the knowledge-behaviour gap.

Table 3: Knowledge of HIV/AIDS among adolescents in Lokoja (n = 400)

Knowledge item	Correct -n (%)	Incorrect – n (%)
HIV can be transmitted through unprotected sex	332 (83.0)	68 (17.0)
Consistent condom use reduces HIV risk	298 (74.5)	102 (25.5)
HIV can be transmitted through blood contact	286 (71.5)	114 (28.5)
HIV can be prevented through abstinence	310 (77.5)	90 (22.5)

Source: Field Survey, 2025

Table 4 presents the risky sexual practices among adolescents who had ever had sexual intercourse (n = 182). About **35%** reported having multiple sexual partners, while 50.5% exhibited inconsistent condom use**.** Detailed condom use patterns showed that 49.5% used condoms consistently**,** 32.4% used them occasionally**,** and 18.1% did not use condoms at all**.** Additionally, 15.4% engaged in transactional sex**,** and 41% had sex under peer pressure**.** These results indicate that a substantial proportion of sexually active adolescents engage in behaviours that increase their risk

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of HIV infection and other sexually transmitted infections, highlighting the need for targeted interventions such as peer education, behavioural change programmes, and adolescent-friendly sexual health services.

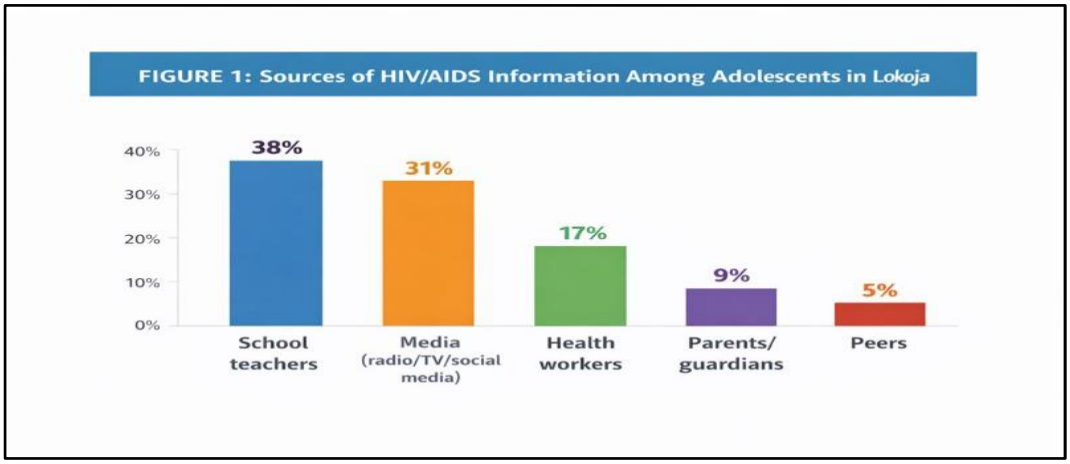

Table 4: Risky Sexual Behaviours and Condom Use Patterns Among Sexually Active Adolescents (n = 182)

Risk behaviour	Yes n (%)	No n (%)
Multiple sexual partners	64 (35.2)	118 (64.8)
Condom use pattern:		
– Consistent use	90 (49.5)	92 (50.5)
– Occasional use	59 (32.4)	123 (67.6)
– Non-use	33 (18.1)	149 (81.9)
Transactional sex	28 (15.4)	154 (84.6)
Sex under peer pressure	74 (40.7)	108 (59.3)

Source: Field Survey, 2025

Among the 182 adolescents who reported sexual activity, a composite measure of HIV risk was used to classify participants as "HIV risk present" if they engaged in one or more high-risk behaviours, including early sexual debut, multiple sexual partnerships, inconsistent or non-use of condoms, transactional sex, or peer-influenced sexual activity. Adolescents who reported none of these behaviours were classified as "HIV risk absent."

Table 5 shows that HIV risk was significantly associated with several sexual practices. Adolescents reporting multiple sexual partners were more likely to be classified as at risk (46/64, 71.9%) compared to those with a single partner (52/118, 44.1%) (χ^2 = 18.62, p < 0.001). Similarly, adolescents with inconsistent condom use had a higher prevalence of HIV risk (68/92, 73.9%) than those who used condoms consistently (30/90, 33.3%) (χ^2 = 21.47, p < 0.001). Peer influence was also strongly associated with HIV vulnerability; 54 of 74 adolescents (73.0%) who reported being influenced by peers were at risk, compared with 44 of 108 (40.7%) who were not influenced (χ^2 = 16.05, p < 0.001).

These findings highlight that multiple sexual partnerships, inconsistent condom use, and peer influence are key behaviours associated with increased HIV vulnerability among adolescents in Lokoja. It is important to note that these associations reflect bivariate relationships; multivariate analysis (e.g., logistic regression) would be necessary to determine independent predictors while controlling for potential confounders.

Figure 1 shows the distribution of HIV/AIDS information sources among adolescents in Lokoja. School teachers were the most common source (38%), followed by media platforms including radio, television, and social media (31%). Health workers accounted for 17%, while parents/guardians (9%) and peers (5%) contributed less.

Qualitative Findings

Six FGDs were conducted with adolescents aged 15–19 years, comprising both males and females, and including both in-school and out-of-school participants. Each group had 6–8 participants, ensuring diversity in age, gender, and schooling status.

These descriptive statistics provide context for interpreting the study's quantitative findings and qualitative themes related to sexual behaviour, condom use, peer influence, and HIV vulnerability among adolescents in Lokoja.

"Most of my friends are already in relationships, and if I say no, they tease me."(FGD2, Female, 16 years)

"We know about HIV and how to prevent it, but sometimes we forget to use condoms." (FGD4, Male, 17 years)

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"Sometimes I don't have money to buy condoms, and my partner refuses to use them." (FGD3, Female, 18 years)
"Some adolescents engage in transactional sexual relationships despite being aware of the associated risks." (FGD5, Male, 19 years)

These qualitative insights complement the quantitative findings, emphasizing the contextual, social, and economic factors that drive adolescents' risky sexual behaviours. They highlight that interventions must go beyond knowledge provision to address peer influence, socio-economic pressures, and access to adolescent-friendly sexual health services.

DISCUSSION

This study examined sexual practices, condom use patterns, sources of HIV/AIDS information, and behavioural factors influencing HIV vulnerability among adolescents in Lokoja, North-Central Nigeria. The findings provide important insights into adolescent sexual behaviour and highlight key determinants that may sustain HIV risk among young people in this urban setting.

The prevalence of sexual activity (45%; n = 182) observed in this study is consistent with previous Nigerian studies reporting that approximately 40–60% of adolescents have engaged in sexual intercourse before adulthood.[4–6] Similar patterns have been documented in other sub-Saharan African countries, where adolescent sexual activity remains relatively common, particularly in urban environments characterised by social mobility and peer network influence.[9,10] The proportion of adolescents currently sexually active in this study (34.5%; n = 130) further indicates that a substantial proportion of young people remain exposed to behaviours that increase vulnerability to HIV infection. Early sexual debut (<15 years; 19%, n = 76) and engagement in multiple sexual partnerships (15%, n = 60) observed in this study correspond with earlier research in Nigeria and other African settings, which highlights early initiation of sexual activity as a critical predictor of risky sexual behaviour and HIV exposure among adolescents.[7,11] Studies have consistently demonstrated that adolescents who initiate sexual activity at an earlier age are more likely to report inconsistent condom use and multiple sexual partners later in adolescence.[12,18]

Condom use patterns among adolescents in this study remain suboptimal. Only 30.8% (n = 56) of sexually active respondents reported consistent condom use, while nearly half used condoms occasionally and about one quarter reported never using them. These findings align with several Nigerian studies that report low levels of consistent condom use among adolescents despite relatively high awareness of HIV prevention strategies.[5,6,16] Although some studies conducted in other African urban settings report slightly higher levels of condom use, many still highlight inconsistent usage among adolescents due to behavioural and contextual barriers.[20,21] The discrepancy between HIV knowledge and protective behaviour observed in this study reflects the well-documented knowledge–behaviour gap in adolescent sexual health research.[24,25] Qualitative findings from the focus group discussions further revealed that peer pressure, partner refusal, embarrassment associated with condom acquisition, and financial dependence on partners were major barriers to consistent condom use. These factors have also been reported in other studies examining adolescent sexual behaviour in Nigeria and sub-Saharan Africa.[14,22]

Regarding sources of HIV/AIDS information, the present study found that school teachers (38%) and mass media (31%) were the primary sources of HIV-related knowledge among adolescents. This pattern is consistent with existing evidence indicating that formal school-based education and media campaigns remain the most prominent channels for disseminating HIV information to young people.[13,14] However, parental communication and peer-led education were reported far less frequently. Previous studies have similarly noted that discussions about sexuality and reproductive health within families remain limited in many African societies due to cultural taboos and social norms surrounding sexual communication.[12,15] The limited involvement of parents and community structures in adolescent sexual health education may therefore reduce opportunities for adolescents to receive guidance and support in navigating sexual decision-making.

The statistical associations identified in this study demonstrate that adolescents engaging in multiple sexual partnerships, inconsistent condom use, and peer-influenced sexual activity were significantly more likely to exhibit HIV vulnerability. These findings are consistent with regional literature highlighting behavioural and social determinants, rather than knowledge deficits alone, as the major drivers of adolescent HIV risk.[17,22] Socio-economic pressures, gender power dynamics, and limited negotiation skills often shape adolescents' ability to adopt protective behaviours, particularly among economically

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disadvantaged youth [23]. Consequently, adolescents may possess adequate awareness of HIV transmission but remain unable to translate this knowledge into safer sexual practices.

Overall, the integration of quantitative and qualitative findings in this study provides a comprehensive understanding of adolescent sexual behaviour and HIV vulnerability in Lokoja. The findings reinforce broader evidence from Nigeria and sub-Saharan Africa indicating that awareness alone is insufficient to reduce HIV risk among adolescents [3,19]. Instead, effective HIV prevention strategies must address the complex interplay of behavioural, social, and structural determinants influencing adolescent sexual practices. Interventions should therefore incorporate comprehensive sexuality education, peer-led behaviouralprogrammes, parental engagement, and improved access to adolescent-friendly health services. These approaches align with national HIV prevention priorities coordinated by the National Agency for the Control of AIDS and global recommendations for strengthening adolescent health programmes in high-burden settings [20,21].

Strength of the Study

This study has several strengths that enhance the credibility and relevance of its findings. The use of a mixed-methods design**,** combining quantitative surveys with qualitative focus group discussions, provided a comprehensive understanding of adolescent sexual behaviour and HIV vulnerability. The large sample size of 400 adolescents**,** including both in-school and out-of-school participants, improved the reliability and representativeness of the data. Additionally, the study addressed an important geographical research gap by focusing on Lokoja in North-Central Nigeria, where limited empirical evidence exists. Finally, the use of multiple data collection methods enabled methodological triangulation, strengthening the validity and depth of the study's findings.

Limitations of the Study

Despite its contributions, the study has several limitations. The cross-sectional design prevents the establishment of causal relationships between adolescents' sexual behaviours and HIV vulnerability. In addition, the reliance on self-reported data on sensitive issues such as sexual activity and condom use may have introduced recall and social desirability biases, potentially leading to underreporting.

The study's geographical focus on Lokoja also limits the generalizability of the findings to adolescents in other regions of Nigeria with different socio-cultural and economic contexts. Furthermore, the limited number of focus group discussions may have restricted the range of qualitative perspectives captured. Finally, the analysis was mainly based on bivariate associations**,** and the absence of multivariate analysis means that potential confounding factors may not have been fully controlled. Future studies should consider more advanced statistical approaches to identify independent predictors of HIV vulnerability among adolescents.

Implications of the Study Findings

The study highlights key implications for public health practice, policy, and research on adolescent sexual and reproductive health in Nigeria. Despite relatively high HIV awareness among adolescents in Lokoja, a knowledge–behaviour gap persists, as many still engage in risky sexual practices. This indicates the need for behavioural change interventions that strengthen life skills, risk perception, and informed decision-making.

The findings also emphasize the influence of peer networks on adolescent behaviour, suggesting that peer-led education and youth mentorship programmes could effectively promote safer practices. Additionally, socio-economic challenges and limited access to adolescent-friendly health services contribute to HIV vulnerability, underscoring the need for a multisectoral response involving health, education, and social support systems.

Furthermore, although schools and media are major sources of HIV information, parent–child communication on sexual health remains limited. Strengthening school-based sexuality education and encouraging family engagement could help reduce risky behaviours. Overall, the study supports the need for adolescent-centred policies and interventions and provides context-specific evidence to guide future research and public health strategies.

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Table 5: Association between sexual practices and HIV/AIDS vulnerability among adolescents (n = 182)

Variable	HIV risk present n (%)	HIV risk absent n (%)	χ^2	p-value
Number of sex partners				
Multiple sexual partners	46 (71.9)	18 (28.1)	18.62	<0.001
Single partner	52 (44.1)	66 (55.9)		
Condom use consistency			21.47	<0.001
Inconsistent use	68 (73.9)	24 (26.1)		
Consistent use	30 (33.3)	60 (66.7)		
Peer influence	54 (73.0)	20 (27.0)	16.05	<0.001
Not influenced	44 (40.7)	64 (59.3)		

Source: Field Survey, 2025

Notes: "HIV risk present" = ≥1 high-risk behaviour as defined above. Chi-square tests show associations, not independent predictors. Multivariate analysis (logistic regression) is recommended for controlling confounders.

Recommendations

Based on the study findings, the following strategies are recommended to reduce HIV vulnerability among adolescents in Lokoja:

Strengthen Comprehensive Sexuality Education: Schools and community programmes should provide age-appropriate, culturally responsive sexual and reproductive health education to promote informed decision-making, delay sexual initiation, and encourage safer sexual practices.

Expand Peer-Led Interventions: HIV prevention programmes should incorporate trained peer educators, as peer-led initiatives can effectively influence adolescent behaviour, improve message credibility, and encourage the adoption of safer sexual practices.

Improve Access to Adolescent-Friendly Health Services: Health facilities should ensure the availability of confidential, non-judgmental, and easily accessible services, including HIV testing, counselling, contraceptives, and reproductive health information tailored to adolescents.

Promote Parental and Family Engagement: Interventions should encourage open and supportive communication between parents and adolescents on sexual and reproductive health issues. Empowering parents with the necessary skills can help adolescents make informed choices and reduce engagement in risky behaviours.

Strengthen Policy Support and Advocacy: Policymakers and public health stakeholders should prioritize adolescent sexual and reproductive health in national and local health agendas. Evidence-based strategies should be integrated into policies to ensure adequate resources, effective programme implementation, and ongoing monitoring of HIV prevention efforts.

CONCLUSION

Adolescents in Lokoja demonstrate moderate to high knowledge of HIV/AIDS; however, many continue to engage in behaviours that increase their vulnerability to infection, including early sexual debut, multiple sexual partnerships, and inconsistent condom use. Peer influence, partner dynamics, and socio-economic constraints further shape these behaviours, indicating that knowledge alone does not necessarily translate into safe sexual practices. While school teachers and media remain the primary sources of HIV information, limited parental and peer engagement, alongside barriers such as peer pressure, cultural expectations, inadequate negotiation skills, and restricted access to adolescent-friendly health services, continue to heighten risk. Overall, the findings highlight that adolescent sexual behaviour is influenced by a complex interaction of individual, social, and structural factors, underscoring the need for comprehensive interventions that extend beyond awareness campaigns to address the broader determinants of HIV vulnerability.

DECLARATIONS

Author Contributions: Edward Ukwubile Egwuaba contributed to the conceptualization and design of the study, data collection, data analysis, interpretation of findings, and drafting of the original manuscript.Chinwe Patricia Iloka contributed to data collection, methodological refinement, validation of findings, and critical review of the manuscript.BlessingAdeyi Sunday

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contributed to field investigation**,** data organization, and manuscript editing. Ann Chinwe Akpunonu contributed to supervision, validation of results, and intellectual review of the manuscript.William Amechi Chukwuma contributed to supervision, coordination of field activities, and manuscript editing.Abonyi Anselm Uchechukwu contributed to data interpretation, provision of research resources, and manuscript editing.Cali Ojmba contributed to statistical analysis, visualization of results. Ifeoma Priscilla Nwakoby contributed to the data collection, data analysis, and interpretation of findings. Nnamdi Enoch Nwakoby contributed to the to field investigation, data organization, and manuscript editing.

All authors meet the TNHJ authorship criteria, approved the final version of the manuscript, and agree to be accountable for all aspects of the work.

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