

Evaluation of a Peer-Led School-Based Sexual and Reproductive Health Intervention among Adolescents in Kaduna State, Nigeria: A Mixed-Methods Operational Research Study

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Abstract

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Background: Adolescents in northern Nigeria face substantial sexual and reproductive health and rights (SRHR) challenges. This study evaluated the outcomes, acceptability, and implementation experiences of a peer-led school-based SRHR intervention in Kaduna State, Nigeria.

Methods: A mixed-methods operational research study was conducted between May and June 2025 across 36 secondary schools in eight Local Government Areas of Kaduna State. A total of 1,441 adolescents completed the pre-test and 1,245 completed the post-test questionnaire. The pre-test and post-test questionnaires were not individually linked. Quantitative data were analysed using Welch's independent-samples t-test, Pearson's chi-square test, and multivariable linear regression. The primary outcome was the composite SRHR knowledge score based on 18 scored knowledge items, with a maximum score of 18. Qualitative data from eight Local Government Area implementation reports and a post-intervention meeting involving Kaduna State AIDS Control Agency staff were analysed thematically.

Results: Mean SRHR knowledge score increased from 8.10 ± 5.01 at pre-test to 16.54 ± 2.57 at post-test (mean difference 8.45, 95% CI: 8.15–8.74; $p < 0.001$; Cohen's $d = 2.08$). Good knowledge increased from 24.6% to 93.3%, while poor knowledge decreased from 51.1% to 2.8% ($p < 0.001$). Post-test exposure was independently associated with higher knowledge scores ($\beta = 8.49$, 95% CI: 7.52–9.46; $p < 0.001$). Willingness to undergo HIV testing increased from 63.1% to 92.4% ($p < 0.001$). Qualitative findings indicated high acceptability of peer-led sessions, greater participation with gender-sensitive facilitation, correction of misconceptions, and logistical challenges affecting implementation.

Conclusion: The peer-led school-based SRHR intervention was associated with substantial improvements in knowledge and willingness to undergo HIV testing among adolescents. The findings support peer-led, gender-sensitive SRHR education with strengthened school–health-service linkages, while controlled longitudinal studies are needed to assess sustained effects and causal impact.

Keywords: Adolescents; Sexual and reproductive health; Peer education; Nigeria; School-based intervention

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Introduction

Adolescence (10–19 years) is a critical developmental window marked by rapid physical, emotional, cognitive, and social changes that shape lifelong health trajectories, educational attainment, and socioeconomic well-being.¹ Globally, adolescents face substantial sexual and reproductive health and rights (SRHR) challenges, including unintended pregnancies, sexually transmitted infections (STIs), HIV, gender-based violence (GBV), harmful traditional practices, and limited access to youth-friendly health services.^{2,3} These challenges are particularly acute in low- and middle-income countries, where adolescents account for a disproportionate burden of poor SRHR outcomes.⁴

Sub-Saharan Africa bears one of the highest burdens of adolescent SRHR problems worldwide.⁵ Despite progress in HIV prevention, adolescents and young people in the region continue to experience high rates of new HIV infections, low testing uptake, and poor adherence to prevention and treatment services.⁶ Additionally, Human Papillomavirus (HPV) infection and cervical cancer prevention remain pressing concerns. Although HPV vaccination is

safe and highly effective, persistent vaccine hesitancy driven by misinformation, fears of infertility, and inadequate awareness continues to limit uptake among adolescents and their caregivers in many African settings.⁷

In Nigeria, adolescents encounter multiple intersecting barriers to optimal SRHR. These include inadequate comprehensive sexuality education, widespread misinformation, stigma surrounding reproductive health discussions, and limited access to youth-friendly services.⁸ The situation is more challenging in northern Nigeria, where socio-cultural norms, religious conservatism, gender inequality, early marriage, and restricted parent-adolescent communication further heighten vulnerability.^{9,10} Adolescent girls in this region also face significant menstrual hygiene management (MHM) difficulties due to poor water, sanitation and hygiene (WASH) infrastructure in schools, limited access to sanitary materials, and menstrual-related stigma.^{11,12}

School-based peer-led interventions have emerged as a promising strategy to address these gaps. Peers often enjoy greater credibility and relatability than adult facilitators, fostering open dialogue on sensitive SRHR topics and promoting positive health behaviours.¹³

When delivered in schools, such interventions can reach large numbers of adolescents efficiently while bridging education and health sectors.¹⁴ Previous studies in sub-Saharan Africa, including Nigeria, have shown that well-designed peer education programmes can improve SRHR knowledge, reduce misconceptions, and enhance health-seeking intentions.^{15–17}

However, robust evidence on the real-world effectiveness, acceptability, and implementation of large-scale peer-led SRHR interventions in northern Nigeria remains limited. Most existing studies have been small-scale, community-based rather than school-based, or lacked mixed-methods evaluation of both outcomes and implementation processes. Few studies have specifically examined integrated approaches addressing HIV, HPV, menstrual hygiene, GBV, and youth-friendly services within the culturally conservative context of northern Nigeria.¹⁸

This study aimed to evaluate the effectiveness, acceptability, and implementation experiences of a peer-led school-based SRHR intervention among in-school adolescents in Kaduna State, northern Nigeria, using a mixed-methods operational research approach.

Methods

Study Design

This was a mixed-methods, non-randomised pre-test/post-test operational research study conducted in Kaduna State, north-western Nigeria, between May and June 2025. The intervention was implemented across eight Local Government Areas (Giwa, Kaduna South, Kagarko, Kudan, Kubau, Igabi, Chikun, and Zaria) in 36 secondary schools comprising public, private, and faith-based institutions.

Study Population

The study population comprised male and female adolescents enrolled in junior and senior secondary schools in the participating Local Government Areas. Participants were eligible if they were enrolled in a participating school, attended the intervention sessions, provided the required consent or assent, and completed the pre-test or post-test questionnaire. Adolescents who declined participation, submitted substantially incomplete questionnaires, or were absent during the intervention were excluded.

Intervention

The intervention was a structured, peer-led school-based sexual and reproductive health and rights education programme delivered over four days. Ninety peer educators and eight supervisors, trained through a UNICEF-supported YouthHubAfrica programme, delivered sessions covering HIV prevention and stigma reduction, human papillomavirus and vaccination, adolescent sexual and reproductive health and rights, menstrual hygiene management, gender-based violence, mental health, healthy relationships, and youth-friendly health services. Sessions combined didactic presentations, interactive discussions, question-and-answer sessions, anonymous written questions, and small-group activities. Female-led breakout sessions were conducted where appropriate to facilitate participation in sensitive discussions. Each session lasted 40–90 minutes. Adolescents identified as requiring further support were referred to nearby youth-friendly health services and primary healthcare facilities. The programme was implemented through collaboration among UNICEF, the Kaduna State AIDS Control Agency, the Ministry of Health, Primary Health Care facilities,

Civil Society Organisations, and YouthHubAfrica.

Data Collection

A structured, self-administered questionnaire was used to collect quantitative data before the intervention and immediately after completion of the intervention sessions. The questionnaire contained 28 questions covering HIV knowledge and prevention, human papillomavirus and vaccination, sexual and reproductive health and rights, menstrual health, gender-based violence, and youth-friendly health services. Pre-test and post-test questionnaires were not individually linked because a unique participant identifier was unavailable to match responses across the two assessment points.

The questionnaire was developed in English and translated into Hausa, with back-translation into English to ensure consistency of meaning. It was pretested with 60 adolescents at a non-participating school in Kaduna South Local Government Area, and minor revisions were made to improve clarity and cultural relevance.

Eighteen knowledge items were included in the composite knowledge score. Each item was scored dichotomously, with 1 point assigned for a correct response and 0 points for an incorrect or “don't know” response. The total knowledge score ranged from 0 to 18, with higher scores indicating greater knowledge. Percentage scores were calculated by dividing the total score by 18 and multiplying by 100. Knowledge was categorised as poor (<50%), fair (50–69%), or good (≥70%).

Validity and Reliability

Content validity was assessed through expert review by three public health specialists, two adolescent health researchers, and one reproductive health educator. Internal consistency of the knowledge measure was assessed separately for the pre-test and post-test datasets, yielding Cronbach's alpha coefficients of 0.81 and 0.84, respectively. Item-total correlations exceeded 0.30 for most items. Exploratory factor analysis using principal component analysis with varimax rotation supported the underlying structure of the knowledge measure, with the first component accounting for 42.6% of the total variance.

Outcome Measures

The primary quantitative outcome was the composite sexual and reproductive health and rights knowledge score, based on the 18 scored knowledge items, assessed at pre-test and post-test. Secondary quantitative outcomes were the distribution of participants across the three knowledge categories (poor, fair, and good) and reported willingness to undergo HIV testing. Qualitative outcomes comprised acceptability of the peer-led approach, gender-sensitive participation, misconceptions and stigma, operational challenges, and referral linkage experiences.

Data Analysis

Quantitative data were analysed using IBM SPSS version 27.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarise socio-demographic characteristics and outcome variables. Welch's independent-samples t-test was used to compare mean sexual and reproductive health and rights knowledge scores between the pre-test and post-test groups because the groups were independent and the questionnaires were not individually linked. The mean difference was reported with its 95% confidence interval, and Cohen's d was used to

estimate the standardised effect size. Pearson's chi-square test was used to compare the distribution of knowledge categories and willingness to undergo HIV testing between the pre-test and post-test groups.

Multivariable linear regression analysis was performed to assess the independent association between assessment status (post-test versus pre-test) and sexual and reproductive health and rights knowledge score, adjusting for age, sex, and class level. Pre-test was the reference category for assessment status, female sex for sex, and JSS1 for class level. School-clustered robust standard errors were used to account for clustering of observations within schools. Regression coefficients were reported with 95% confidence intervals. Statistical significance was assessed using two-sided tests with a threshold of $p < 0.05$.

Qualitative data were obtained from eight implementation reports, with one report prepared by the designated lead Local Government Area supervisor for each participating Local Government Area, and from the post-intervention meeting involving KADSACA. The reports documented implementation experiences across the participating schools, including intervention acceptability, participant engagement, gender-sensitive facilitation, misconceptions and stigma, operational challenges, and referral processes.

The qualitative materials were reviewed systematically and coded inductively. Relevant observations and experiences were identified and grouped into categories based on recurring patterns across the reports and post-intervention meeting. Emerging themes were subsequently reviewed and refined through discussion among members of the research team to enhance the credibility and trustworthiness of the qualitative findings.

Ethical Considerations

Ethical approval for the study was obtained from the Kaduna State Ministry of Health Research Ethics Committee (NHREC/17/03/2018). Administrative approvals were also secured from the Kaduna State Ministry of Education and the authorities of all participating schools. Participation was entirely voluntary. Written informed consent was obtained from participants aged 18 years and above, while written or verbal assent was obtained from younger adolescents, in line with national guidelines and the ethical principles of the Declaration of Helsinki. Parental consent was waived for in-school adolescents where permissible under local regulations, following approval from school authorities and the ethics committee. Participants were informed that they could withdraw from the study at any time without any negative consequences. To ensure confidentiality and anonymity, no personal identifiers were collected on the questionnaires. Data were stored securely in password-protected files accessible only to the research team. All study procedures adhered to ethical standards for research involving minors in educational settings.

Results
Participant Characteristics

Table 1. Socio-demographic Characteristics of Adolescents at Pre-test and Post-test

Characteristic	Pre-test, n (%)	Post-test, n (%)	χ^2	p value
Sex				
Female	909 (63.1)	776 (62.3)	0.131	0.717
Male	532 (36.9)	469 (37.7)		
Class level				
JSS1	192 (13.3)	158 (12.7)	1.396	0.925
JSS2	261 (18.1)	240 (19.3)		
JSS3	377 (26.2)	325 (26.1)		
SS1	302 (21.0)	270 (21.7)		
SS2	173 (12.0)	144 (11.6)		
SS3	136 (9.4)	108 (8.7)		

Note: Pre-test n = 1,441; post-test n = 1,245. Pearson's chi-square test. Percentages may not total exactly 100% because of rounding.

The pre-test included 1,441 adolescents, while the post-test included 1,245 adolescents. Females constituted 63.1% of the pre-test sample and 62.3% of the post-test sample, while males accounted for 36.9% and 37.7%, respectively. The distribution by sex did not differ significantly between the pre-test and post-test groups ($\chi^2 = 0.131$, $p = 0.717$). Similarly, the distribution of participants across class levels was comparable between the two groups ($\chi^2 = 1.396$, $p = 0.925$) (Table 1).

Table 2. Sexual and Reproductive Health Knowledge Scores Before and After the Intervention

Survey (n)	Mean score $\pm$ SD	Maximum score	Mean percentage	Mean difference 95% CI (post-test-pre-test)	t	df	p value
Pre-test (1,441)	8.10 $\pm$ 5.01	18	44.97%				
Post-test (1,245)	16.54 $\pm$ 2.57	18	91.90%	8.45 (8.15–8.74)	-56.00	2,211.05	<0.001

Note: Welch's independent-samples t-test; Cohen's d = 2.08.

The mean SRHR knowledge score increased from 8.10 $\pm$ 5.01 at pre-test to 16.54 $\pm$ 2.57 at post-test, corresponding to an increase of 8.45 points (95% CI: 8.15–8.74). The difference was statistically significant on Welch's independent-samples t-test ($t = -56.00$, $df = 2,211.05$, $p < 0.001$), with a large standardized effect size (Cohen's d = 2.08) (Table 2). The corresponding mean percentage score increased from 44.97% to 91.90%.

Table 3. Distribution of Adolescents by Sexual and Reproductive Health Knowledge Category Before and After the Intervention

Knowledge category	Pre-test, n (%)	Post-test, n (%)	χ^2	df	p value
Poor (<50%)	736 (51.1)	35 (2.8)	1,287.79	2	<0.001
Fair (50–69%)	351 (24.4)	49 (3.9)			
Good ($\geq 70\%$)	354 (24.6)	1,161 (93.3)			
Total	1,441 (100.0)	1,245 (100.0)			

Note: Pearson's chi-square test.

The proportion of adolescents with good SRHR knowledge increased from 24.6% (354/1,441) at pre-test to 93.3% (1,161/1,245) at post-test. Conversely, the proportion with poor knowledge decreased from 51.1% (736/1,441) to 2.8% (35/1,245), while those with fair knowledge decreased from 24.4% to 3.9%. The distribution of knowledge categories differed significantly between the pre-test and post-test groups ($\chi^2 = 1,287.79$, $df = 2$, $p < 0.001$) (Table 3).

Table 4. Willingness to Undergo HIV Testing Before and After the Intervention

Response	Pre-test, n (%)	Post-test, n (%)	χ^2	df	p value
Yes	909 (63.1)	1,150 (92.4)	326.20	2	<0.001
No	203 (14.1)	54 (4.3)			
Maybe	329 (22.8)	41 (3.3)			
Total	1,441 (100.0)	1,245 (100.0)			

Note: Pearson's chi-square test.
The proportion of adolescents who reported willingness to undergo HIV testing increased from 63.1% (909/1,441) at pre-test to 92.4% (1,150/1,245) at post-test. The proportion responding “No” decreased from 14.1% to 4.3%, while those responding “Maybe” decreased from 22.8% to 3.3%. The distribution of responses differed significantly between the pre-test and post-test groups ($\chi^2 = 326.20$, $df = 2$, $p < 0.001$) (Table 4).

Table 5. Multivariable Linear Regression Analysis of Factors Associated with Sexual and Reproductive Health Knowledge Score

Variable	β coefficient	95% CI	p value
Post-test exposure	8.49	7.52–9.46	<0.001
Age (years)	0.06	–0.00–0.13	0.068
Male sex	–0.14	–0.61–0.33	0.550
JSS2	0.54	–0.80–1.87	0.431
JSS3	0.97	–0.42–2.35	0.172
SS1	1.26	–0.17–2.69	0.085
SS2	0.62	–0.96–2.20	0.444
SS3	1.44	–0.32–3.20	0.109

Note: Reference categories were pre-test exposure, female sex and JSS1. Analytical sample = 2,678. $R^2 = 0.527$; adjusted $R^2 = 0.526$; overall model $p < 0.001$. Standard errors were estimated using school-clustered robust standard errors.

In the multivariable linear regression model, post-test exposure was significantly associated with a higher SRHR knowledge score after adjustment for age, sex, and class level ($\beta = 8.49$, 95% CI: 7.52–9.46, $p < 0.001$). Age was not significantly associated with knowledge score ($\beta = 0.06$, 95% CI: –0.00–0.13, $p = 0.068$), and there was no significant association with sex ($\beta = -0.14$, 95% CI: –0.61–0.33, $p = 0.550$). None of the class-level categories differed significantly from JSS1 (all $p > 0.05$). The model explained 52.7% of the variation in SRHR knowledge scores ($R^2 = 0.527$; adjusted $R^2 = 0.526$; overall $p < 0.001$) (Table 5).

Qualitative Findings

Qualitative analysis identified five themes relating to the implementation of the peer-led SRHR intervention: acceptability of the peer-led approach, gender-sensitive facilitation, misconceptions and stigma, operational challenges, and referral linkage systems. Students actively participated in the peer-led sessions, while smaller and female-led discussions facilitated greater participation among girls. The sessions also identified misconceptions concerning HIV transmission and human papillomavirus vaccination. Implementation was affected by logistical challenges, including poor internet connectivity, transport difficulties, and inadequate public address systems.

Adolescents requiring additional support were referred to youth-friendly health services and primary healthcare facilities (Table 6).

Table 6. Qualitative Themes, Illustrative Findings and Programmatic Implications of the Intervention

Theme	Illustrative finding	Programmatic implication
Acceptability of the peer-led approach	Students actively participated and engaged openly during peer-led sessions.	Peer-led approaches may facilitate adolescent engagement in sexual and reproductive health education.
Gender-sensitive facilitation	Girls participated more during female-led and smaller-group discussions.	Gender-responsive approaches may enhance participation in adolescent sexual and reproductive health sessions.
Misconceptions and stigma	Misconceptions regarding HIV transmission and human papillomavirus vaccination were identified during the sessions.	Continued sexual and reproductive health education may help address persistent misconceptions and stigma.
Operational challenges	Poor internet connectivity, transport difficulties, and inadequate public address systems affected implementation.	Improved logistical planning and communication infrastructure are needed to support programme delivery.
Referral linkage systems	Students requiring additional support were referred to youth-friendly health services and primary healthcare facilities.	Strengthening school-health-service linkages may facilitate access to appropriate adolescent health services.

Discussion

This mixed-methods operational research study demonstrated that a peer-led school-based sexual and reproductive health and rights intervention was associated with substantial improvements in adolescent SRHR knowledge and willingness to undergo HIV testing among secondary school students in Kaduna State, Nigeria. The intervention resulted in statistically significant improvements in mean knowledge scores, substantial reductions in poor knowledge levels, increased proportions of adolescents with good SRHR knowledge, and improved willingness to undergo HIV testing. Mean SRHR knowledge scores increased from 8.10 ± 5.01 at pre-test to 16.54 ± 2.57 at post-test, representing an increase of 8.45 points (95% CI: 8.15–8.74). The difference was statistically significant (Welch's $t = -56.00$, $df = 2,211.05$, $p < 0.001$), with a large standardised effect size (Cohen's $d = 2.08$). The proportion of participants with poor knowledge ($<50\%$) declined from 51.1% to 2.8%, while those with good knowledge ($\geq 70\%$) increased from 24.6% to 93.3%. Willingness to undergo HIV testing increased from 63.1% to 92.4%. Multivariable linear regression analysis further showed that post-test exposure remained independently associated with higher SRHR knowledge scores after adjustment for age, sex, and class level ($\beta = 8.49$; 95% CI: 7.52–9.46; $p < 0.001$). These findings are consistent with previous peer-led adolescent SRHR interventions conducted in Kaduna and Kano States, which similarly reported significant improvements in SRHR knowledge and health-seeking behaviours among adolescents and young people following community-based peer education.¹ Comparable gains were also observed in a study among in-school adolescents in Ebonyi State, Nigeria, where peer education approaches enhanced participation and reproductive health knowledge.¹ The current findings also align with broader evidence that peer-led and structured educational interventions can improve adolescent health knowledge, including sexual and reproductive health and HIV-prevention knowledge.^{1,21} The substantial increase in mean knowledge scores, together with the large standardised effect size and marked shift in knowledge categories, indicates a substantial improvement in SRHR knowledge following the intervention. The proportion of adolescents classified as having good knowledge increased substantially, while poor knowledge declined markedly. In the multivariable model, post-test exposure remained strongly associated with higher knowledge scores after adjustment for age, sex, and class level, while age, sex, and class level were not statistically significant predictors of knowledge in the

adjusted analysis. The generally low level of baseline knowledge observed in this study is consistent with evidence of substantial gaps in adolescent sexual and reproductive health knowledge across sub-Saharan African settings.^{22,23} However, because the study lacked a control group and pre-test and post-test responses could not be individually linked, the observed improvement cannot be attributed exclusively to the intervention.

Qualitative findings further supported the quantitative results by demonstrating high acceptability of the peer-led approach, active adolescent participation, and the identification and clarification of misconceptions concerning HIV transmission and human papillomavirus vaccination. Smaller and female-led discussions appeared to facilitate greater participation among girls, highlighting the potential value of gender-sensitive approaches when addressing sensitive SRHR issues in school settings. These implementation experiences are consistent with evidence emphasising the importance of multisectoral and youth-friendly approaches in adolescent SRHR programming.^{24,25}

The increase in willingness to undergo HIV testing from 63.1% before the intervention to 92.4% after the intervention is also noteworthy. Although this measure represents a behavioural intention rather than actual HIV testing uptake, the finding suggests that the intervention may have reduced informational and attitudinal barriers to HIV testing. This interpretation is consistent with evidence that adolescent-focused educational interventions can improve knowledge, attitudes, and behavioural intentions related to HIV prevention and testing.^{16,20} The large reduction in the proportion responding “No” or “Maybe” further suggests a shift towards greater willingness to consider HIV testing following exposure to the intervention.

The qualitative findings also highlighted important implementation considerations. Peer-led delivery appeared to support open engagement among students, while gender-sensitive facilitation created opportunities for girls to participate more actively in discussions of sensitive subjects. At the same time, supervisors identified persistent misconceptions regarding HIV transmission and human papillomavirus vaccination, indicating that misinformation remained present despite the intervention. Continued, age-appropriate SRHR education may therefore be necessary to reinforce accurate knowledge and address misconceptions over time.

Operational challenges, including poor internet connectivity, transport difficulties, and inadequate public address systems, affected implementation across participating schools. These findings highlight the importance of adequate logistical preparation and school-level coordination when implementing large-scale school-based interventions. Despite these challenges, the intervention was implemented across 36 schools in eight Local Government Areas, suggesting that peer-led SRHR programming can be operationally feasible when supported by coordination among health, education, civil society, and development partners. Multisectoral collaboration is recognised as an important component of coordinated programming for adolescent health and well-being.²³ Referral of adolescents requiring additional support to youth-friendly health services and primary healthcare facilities also demonstrates the potential for school-based education programmes to strengthen linkages between adolescents and existing health

services.²

Strengths and Limitations

Strengths of the study include the large sample size, mixed-methods design, real-world operational setting across public, private, and faith-based schools, and integration of implementation insights with quantitative outcome assessment. The inclusion of schools across eight Local Government Areas also provides experience from diverse implementation settings within Kaduna State.

Several limitations should be considered when interpreting the findings. First, the non-randomised pre-test/post-test design without a control group limits causal inference, as changes in knowledge and willingness to undergo HIV testing cannot be attributed exclusively to the intervention. Second, pre-test and post-test questionnaires were not individually linked, preventing assessment of within-person changes and requiring comparison of independent assessment groups. The difference in sample size between the two assessment points may therefore introduce selection bias, although the two groups had comparable distributions by sex and class level. Third, the post-test assessment was conducted immediately after the intervention and therefore does not establish whether the observed knowledge gains or changes in behavioural intention were sustained over time. Fourth, willingness to undergo HIV testing was self-reported and represents behavioural intention rather than confirmed testing uptake. Finally, the qualitative findings were based on implementation reports and a post-intervention meeting involving programme personnel rather than direct interviews with participating adolescents; therefore, the qualitative findings primarily reflect implementation perspectives and should not be interpreted as direct measures of adolescents' experiences.

Conclusion

This mixed-methods operational research study demonstrated that a peer-led school-based sexual and reproductive health and rights intervention was feasible and associated with substantial improvements in sexual and reproductive health knowledge and willingness to undergo HIV testing among in-school adolescents in Kaduna State, Nigeria. The intervention was associated with a marked increase in mean knowledge scores and a substantial shift from poor and fair to good knowledge, while willingness to undergo HIV testing also increased considerably. Qualitative findings further indicated high acceptability of the peer-led approach, the value of gender-sensitive facilitation, and the importance of addressing persistent misconceptions and operational barriers. These findings support the continued implementation and potential scale-up of peer-led school-based sexual and reproductive health and rights education, alongside strengthened referral linkages to youth-friendly health services. Further controlled and longitudinal studies are needed to establish sustained effects and strengthen causal inference.

Recommendations

Based on these findings, we recommend:

1. Scale-up of peer-led school-based sexual and reproductive health and rights education: Peer-led SRHR programmes should be expanded to additional secondary schools in Kaduna State through collaboration among the Ministries of Health and Education, Kaduna State AIDS Control Agency, development partners, and relevant civil society organisations.

2. Strengthening school–health-service referral linkages: Sustainable referral mechanisms linking schools with youth-friendly health services and primary healthcare facilities should be strengthened to ensure that adolescents requiring additional information, counselling, or health services can access appropriate care.
3. Integration of gender-sensitive approaches: Gender-sensitive facilitation, including female-led small-group discussions and opportunities for anonymous questions, should be incorporated into school-based SRHR programmes to promote participation in discussions of sensitive topics.
4. Strengthening implementation support: Adequate logistical planning, transport arrangements, communication infrastructure, and school-level coordination should be provided to address operational challenges identified during implementation, including poor internet connectivity and inadequate public address systems.
5. Further evaluation of sustained effects: Future studies should use controlled and longitudinal designs, preferably cluster-randomised approaches where feasible, to assess the sustained effects of peer-led school-based SRHR interventions and strengthen causal inference.

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