

# Effect of Short-Film and Peer-Led Sexual and Reproductive Health Education on Knowledge, Perceptions and Self-Efficacy among Adolescents in Informal Urban Settlements of Lagos State, Nigeria: A Quasi-Experimental Study

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## Abstract

**Introduction:** Adolescents in informal urban settlements face significant sexual and reproductive health challenges, including risky behaviours and limited access to information. Conventional SRH education often fails to engage them effectively. Short film and peer-led strategies may offer more effective alternatives.

**Methods:** This quasi-experimental study involved 60 adolescents aged 13–16 years from two informal communities in Lagos State, Nigeria, equally assigned to an experimental group (short film plus peer-led SRH education) or a control group (no intervention). The 10-week intervention included baseline, midline, and end-line assessments using a validated questionnaire. Data were analysed using descriptive statistics, t tests, and two-way mixed ANOVA ( $\alpha = 0.05$ ).

**Results:** Baseline characteristics were comparable between groups ( $n = 30$  each). The intervention group showed significant improvements in SRH outcomes. Two-way mixed ANOVA revealed significant time–group interactions for knowledge ( $F = 19.68, p < .001$ ), perception ( $F = 17.66, p < .001$ ), and self-efficacy ( $F = 23.43, p < .001$ ). ANCOVA confirmed higher post-intervention knowledge ( $F = 31.84, p < .001$ ) and perception scores ( $F = 26.61, p < .001$ ) in the intervention group. Risky sexual behaviour scores also decreased significantly more in the intervention group (time  $\times$  group interaction:  $F(1,58) = 18.96, p < .001, \text{partial } \eta^2 = .25$ ).

**Conclusion:** The combined short film and peer-led intervention significantly improved knowledge, perceptions, and self-efficacy among sexually active adolescents. These findings support multimedia and peer-led strategies as scalable approaches for improving adolescent SRH outcomes in informal urban settings, though causal inference is limited by the quasi-experimental design.

**Keywords:** Sexual and Reproductive Health; Peer-led education; Short-film intervention; Self-efficacy; Risky sexual behaviour

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## Introduction

Adolescence is a transitional period marked by profound biological, psychological, and social changes that influence health behaviours, including sexuality. Adolescents are often more prone to experimentation and risk-taking compared to adults, which exposes them to unsafe sexual practices and their consequences (1). Risky sexual behaviours, such as

early sexual debut, inconsistent condom use, multiple partners, transactional sex, and sex under the influence of substances, significantly contribute to unplanned pregnancies, unsafe abortions, and sexually transmitted infections (STIs), including HIV (2).

Across the globe, adolescents continue to experience considerable sexual and reproductive health (SRH)



**From the South, for the South, with the World**

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challenges. Evidence indicates that girls who marry or become pregnant before the age of 18 face heightened risks of maternal morbidity and mortality, while boys are more likely to engage in early sexual debut, have multiple sexual partners, and use contraceptives inconsistently (3). In sub-Saharan Africa, adolescent girls and young women are disproportionately affected, with early sexual initiation, high rates of teenage pregnancies, and exposure to HIV remaining persistent challenges (4). National and regional studies have also documented low levels of condom use and limited SRH knowledge among adolescents, underscoring a persistent gap in education and preventive interventions (5).

The situation in Nigeria reflects these global concerns. Adolescents make up nearly 22% of the population, yet they remain inadequately served in terms of access to youth-friendly sexual and reproductive health (SRH) services (6). Evidence shows that risky sexual behaviour is common, with one in four Nigerian adolescents engaging in unsafe practices (7). In Lagos State, especially in slum settlements such as Makoko, Ajegunle, and Ikorodu, the risks are heightened due to poverty, overcrowding, poor infrastructure, and limited health services (8). Akinyemi and Fatusi (2020) reported that 37% of adolescents in Lagos slums initiated sexual activity before age 15, with low contraceptive use. Such trends contribute to Nigeria's high adolescent fertility rate of 106 births per 1,000 girls aged 15–19 years (9) and substantial rates of unsafe abortion and HIV among adolescents (10).

Studies indicate that traditional approaches to sexuality education often fail to meaningfully engage adolescents due to cultural taboos, stigma, and top-down delivery styles (11). Consequently, more innovative and interactive strategies that foster participation, relatability, and behavioural skills are needed. Evidence shows that structured health education improves adolescents' knowledge, attitudes, and preventive practices, especially when delivered using interactive methods and culturally appropriate materials (12). Programmes facilitated by trained youth or near-peers are particularly effective, as adolescents tend to respond better to relatable, non-judgmental communication (13).

In addition, short films have demonstrated strong potential for adolescent health education. It allows adolescents to observe realistic scenarios and consequences of risky sexual behaviours, thereby enhancing emotional engagement, understanding, and retention of information (14). When combined with structured health education sessions, they reinforce learning, improve self-efficacy, and support behaviour change.

Given the persistent sexual and reproductive health (SRH) challenges among adolescents in informal urban settlements in Lagos and the limitations of existing programmes, there is a compelling need to evaluate innovative and context-specific interventions. This study, therefore, assessed the baseline levels of SRH knowledge, perceptions, and self-efficacy among adolescents in Makoko, Ajegunle, and Ikorodu, and examined the effect of a combined short-film and peer-led health education intervention. By integrating

short films with peer-facilitated, structured health education, the study provides empirical evidence on effective strategies for improving adolescents' knowledge, shaping positive perceptions, and strengthening self-efficacy in informal urban communities in Lagos State, Nigeria.

## **Methods**

### *Study design*

This study adopted a quasi-experimental design comprising one experimental and one control group to determine the effectiveness of short-film and health education in sexual and reproductive health (SRH) education interventions in reducing risky sexual behaviours among adolescents in selected urban slum communities in Lagos State, Nigeria. The theoretical foundation of the PRECEDE guided the design of the PROCEED model and Social Cognitive Theory, which provide a framework for developing, implementing, and evaluating health promotion interventions that influence behavioural change.

### *Study setting*

The study was conducted in informal urban communities in Lagos State: Ajegunle Community in Ajeromi-Ifelodun Local Government Area, and Abiodun Agoro Community in Makoko within Lagos Mainland Local Government Area. Each community represented one study arm. The first group (experimental), located in Ajegunle, received a combined intervention consisting of a short film and peer-led sexual and reproductive health (SRH) education. The second group, located in Abiodun Agoro Community in Makoko, served as the control group and did not receive any intervention during the study period.

### *Study population and eligibility*

The study population comprises adolescents aged 13–16 years residing in selected informal urban settlements of Lagos State, Ajegunle and Makoko. Eligible participants include out-of-school boys and girls within this age range who have lived in the selected communities for at least six months, are sexually active, mentally stable, and capable of understanding and engaging with the intervention content. Participants must also be willing to take part in all baseline and follow-up assessments as well as intervention sessions, with informed assent obtained from the adolescents and written consent from their parents or guardians. Adolescents will be excluded if they are outside the specified age range, currently enrolled in school, transient residents likely to relocate during the study period, or not living with a defined caregiver or guardian. In addition, those with mental health conditions or severe cognitive impairments that limit meaningful participation, those who are not sexually active, and those who decline participation or whose parents or guardians do not provide consent will not be included in the study.

### *Sample size and sampling*

The sample size for this study was determined using statistical power analysis to ensure adequate power to detect meaningful differences in sexual and reproductive health outcomes among adolescents exposed to the intervention. The significance level was set at 5% ( $\alpha = 0.05$ ), corresponding to a 95% confidence level, while the statistical power was fixed at 80% ( $\beta = 0.20$ ), which is commonly recommended in behavioural and public health intervention studies (15). Methodological literature recommends that sample sizes of at least 30 participants per group improve the stability of statistical estimates and support the assumption of approximate normal distribution of outcome variables in experimental and quasi-experimental designs (15, 16). Based on these considerations and the feasibility constraints of conducting community-based interventions among adolescents in informal urban settlements, a total of 60 adolescents were recruited, with 30 assigned to the intervention group and 30 to the control group.

$$N = \frac{2(Z_{\alpha} + Z_{\beta})^2 \times P(1-P)}{d^2}$$

Where:

N = required sample size per group

Z $\alpha$  = 1.96, corresponding to a 95% confidence level;

Z $\beta$  = 0.84, representing 80% statistical power;

P = 0.05, the estimated prevalence of risky sexual behaviours; and

d=0.16d = 0.16, the minimum detectable difference between the intervention and control groups.

The calculated minimum sample size was therefore 29 participants per group, but it ended up being 30. Furthermore, methodological literature recommends a sample size of 30 participants per group in experimental and quasi-experimental studies, as this allows the data distribution to approximate normality and improves the reliability of statistical estimates (15, 17). Consequently, 30 participants were included in each study group, resulting in a total sample size of 60 adolescents across the two study arms

(combined short-film and peer-led intervention and control group).

A multi-stage sampling technique was employed to select eligible adolescents from the study communities in a systematic manner. Lagos State was purposively selected as the study location due to its high concentration of informal urban settlements and the vulnerability of adolescents residing in these environments. Two major slum clusters, Makoko and Ajegunle, were subsequently identified based on population density, socio-economic characteristics, and the presence of out-of-school adolescents. The Ajegunle community in Ajeromi-Ifelodun Local Government Area was assigned as the intervention site, while the Abiodun Agoro community in Makoko (Lagos Mainland Local Government Area) served as the control site. These communities were selected due to their comparable socio-economic characteristics and geographical separation, which helped to minimise contamination between study groups.

Within each selected community, mapping activities were conducted in collaboration with community leaders to identify locations where adolescents commonly gathered, such as open spaces, recreational areas, and community centres. This mapping process facilitated the identification of potential participants and provided an understanding of the distribution of eligible adolescents within the communities. Following the mapping exercise, eligible adolescents who met the inclusion criteria were identified through screening conducted at central locations within each community.

A sampling frame consisting of all eligible adolescents identified during the screening process was then developed separately for each community. From this sampling frame, simple random sampling was applied to select participants. Eligible adolescents were assigned identification numbers, and random selection was performed using a ballot method in which numbers were drawn blindly until the required sample size of 30 participants per community was achieved. See Figure 1 for the participants' flow diagram.

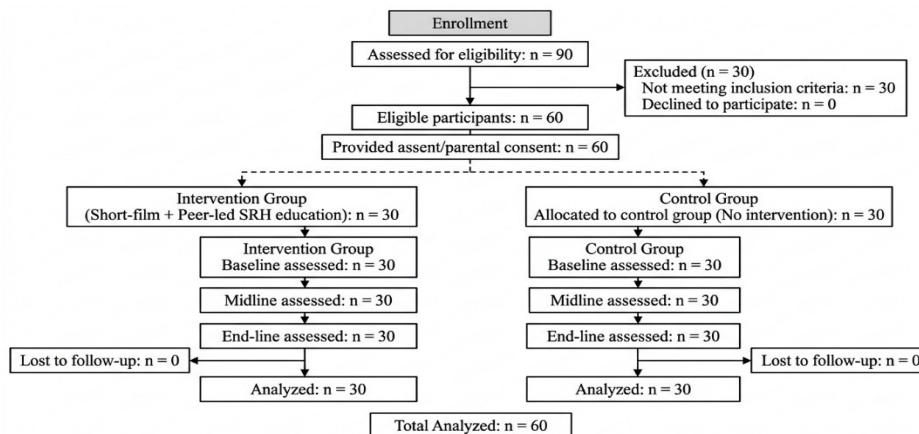


Figure 1: Participant flow diagram

*Study Variables*

The dependent variables in this study are adolescents' sexual and reproductive health (SRH) knowledge, perceptions, and

self-efficacy, as these are the outcomes expected to change following the intervention. The independent variable is the intervention, specifically the combined short-film and peer-

led sexual and reproductive health education delivered to the participants.

#### *Instrumentation*

Data were collected using a structured, interviewer-administered questionnaire developed based on previous sexual and reproductive health (SRH) intervention studies and standardised adolescent SRH assessment tools reported in the literature. The instrument consisted of six sections designed to measure socio-demographic characteristics and key outcome variables.

Section A assessed socio-demographic characteristics, including age, sex, level of education, living arrangement, and duration of residence in the community. Section B assessed sexual and reproductive health knowledge using 10 items covering topics such as puberty, prevention of sexually transmitted infections, contraception awareness, and consequences of risky sexual behaviour. Section C measured perception toward sexual and reproductive health using 10 items addressing beliefs about risk susceptibility, perceived seriousness of unsafe sexual practices, and attitudes toward protective behaviours. Section D assessed self-efficacy using 8 items measuring adolescents' confidence in refusing unwanted sexual advances, negotiating condom use, and making safe sexual decisions. Section E assessed risky sexual behaviours using 8 items covering practices such as multiple sexual partners, inconsistent condom use, transactional sex, and early sexual debut. Section F assessed exposure to sexual and reproductive health information and intervention feedback.

Knowledge items were scored using a binary response format (Correct = 1, Incorrect = 0). Perception and self-efficacy items were measured using a three-point Likert scale (Agree = 2, Not sure = 1, Disagree = 0). Behaviour items were scored using dichotomous responses (Yes = 1, No = 0), with higher scores indicating greater engagement in risky behaviours. Total scores for each construct were computed by summing item responses, with higher scores representing higher knowledge, more positive perceptions, stronger self-efficacy, or higher behavioural risk levels.

#### *Instrument validation and reliability*

The questionnaire used in this study was developed following an extensive review of relevant literature and previously validated sexual and reproductive health (SRH) assessment instruments used among adolescents in similar settings. The instrument was structured to measure socio-demographic characteristics, knowledge, perceptions, self-efficacy, and risky sexual behaviours related to sexual and reproductive health.

Face and content validity of the instrument were established through expert review by three specialists in public health, health education, and behavioural sciences, who evaluated the clarity, relevance, and comprehensiveness of the questionnaire items. Construct validity was ensured by aligning the questionnaire items with the study objectives and

theoretical constructs derived from the Social Cognitive Theory and the PRECEDE–PROCEED Model. Necessary modifications were made based on expert recommendations to enhance clarity, cultural appropriateness, and suitability for adolescent respondents.

Reliability of the instrument was assessed through a pilot study conducted among 30 adolescents in a community with characteristics similar to the study setting but not included in the main study. Internal consistency reliability was determined using Cronbach's alpha coefficient for each domain of the questionnaire. The Cronbach's alpha coefficients obtained were as follows: knowledge domain (10 items),  $\alpha = 0.78$ ; perception domain (10 items),  $\alpha = 0.83$ ; self-efficacy domain (8 items),  $\alpha = 0.86$ ; and risky sexual behaviour domain (8 items),  $\alpha = 0.75$ . These values indicate acceptable to high internal consistency reliability, as coefficients greater than 0.70 are considered adequate for behavioural and public health research.

#### *Data collection procedure*

Before data collection, preliminary visits were conducted to the selected communities to understand their social, cultural, and environmental contexts. Community leaders and relevant stakeholders were consulted to introduce the study and obtain community-level support for the research activities. Community sensitisation meetings were organised to explain the purpose of the study. Data collection was carried out by four trained research assistants who were familiar with the study communities and experienced in administering survey questionnaires. Ethical principles of autonomy, confidentiality, and non-maleficence guided all procedures.

#### *Intervention description*

The intervention consisted of a structured sexual and reproductive health (SRH) education programme combining short-film presentations with peer-led interactive discussions. The intervention content focused on key adolescent sexual and reproductive health topics, including puberty and body changes, prevention of sexually transmitted infections (STIs), contraception awareness, consequences of risky sexual behaviour, decision-making skills, and strategies for resisting peer pressure.

The short-film component involved the use of culturally appropriate educational videos designed to illustrate real-life scenarios related to adolescent sexual health risks and safe behavioural choices. These films were selected to promote visual learning, stimulate reflection, and encourage discussion among participants. Each video presentation was followed by guided peer-led group discussions facilitated by trained adolescent peer educators under the supervision of the research team. The intervention was delivered over a period of 10 weeks, with sessions conducted once per week in each intervention community. Each session lasted approximately 60 to 90 minutes, consisting of a 20–30 minute short-film presentation, followed by a 30–45-minute peer-led

discussion, question-and-answer session, and reinforcement of key learning messages.

Peer educators were trained before the intervention through structured orientation sessions focusing on communication skills, facilitation techniques, and accurate delivery of sexual and reproductive health information. Training sessions were conducted by the research team to ensure consistency and quality of intervention delivery.

Participants in the control group did not receive the intervention during the study period but continued with their routine daily activities. Following completion of the study, selected educational materials were made available to the control group to ensure equitable access to sexual and reproductive health information.

*Outcome measurement and data analysis*

Outcome evaluation occurred in week 10 following the intervention. Changes in adolescents’ sexual and reproductive health knowledge, perceptions, self-efficacy, and risky sexual behaviours were analysed using IBM SPSS version 23. Inferential statistical analyses were conducted using independent sample t-tests to compare baseline mean scores between study groups. Two-way mixed Analysis of Variance (ANOVA) was used to assess the interaction effects of time (baseline and follow-up) and group (intervention and

control) on outcome variables. In addition, Analysis of Covariance (ANCOVA) was conducted to examine post-intervention differences between groups while controlling for baseline scores and selected socio-demographic variables, including age, sex, and educational level. ANCOVA assumptions, including homogeneity of regression slopes and normality of residuals, were assessed and found to be satisfied before analysis.

**Results**

A total of 60 consenting respondents participated in the study, with equal allocation to the control (n = 30) and experimental (n = 30) groups. Socio-demographic characteristics were assessed to establish baseline comparability between the groups. There were no statistically significant differences between the control and experimental groups for most variables, including sex ( $\chi^2 = 0.13, p = 0.94$ ), age ( $\chi^2 = 1.72, p = 0.79$ ), highest level of education ( $\chi^2 = 1.88, p = 0.76$ ), religion ( $\chi^2 = 0.29, p = 0.86$ ), living pattern ( $\chi^2 = 0.55, p = 0.76$ ), decision-making regarding health ( $\chi^2 = 0.44, p = 0.80$ ), and length of stay in the community ( $\chi^2 = 0.37, p = 0.83$ ), indicating that the groups were comparable at baseline.

**Table 1: Socio-demographic characteristics of respondents (N=60)**

Variable	Control (n=30)	Combined (n=30)	$\chi^2$	p-value
<b>Sex</b>			<b>0.13</b>	<b>.94</b>
Male	11	11		
Female	19	19		
<b>Age (years)</b>			<b>1.72</b>	<b>.79</b>
13–14	19	20		
15–16	11	10		
<b>Highest education completed</b>			<b>1.88</b>	<b>.76</b>
Primary	8	8		
Junior secondary	17	17		
Senior secondary	4	3		
<b>Religion</b>			<b>0.29</b>	<b>.86</b>
Christianity	23	23		
Islam	7	6		
<b>Living pattern</b>			<b>0.55</b>	<b>.76</b>
With parents	26	26		
Others	4	4		
<b>Primary health decision-maker</b>			<b>0.44</b>	<b>.80</b>
Parents	24	24		
Self/Others	6	6		
<b>Length of stay in the community</b>			<b>0.37</b>	<b>.83</b>
>6 years	20	20		
≤6 years	10	10		

*N= frequency;  $\chi^2$ = Chi square statistics; P-value= Probability value*

*Baseline knowledge of risky sexual behaviours among adolescents*

The distribution of knowledge levels shows that most adolescents demonstrated a high level of sexual and reproductive health (SRH) knowledge (57.8%), followed by a moderate level (34.4%), while only a small proportion (7.8%) had low knowledge. This indicates an overall good level of SRH knowledge among participants. Comparatively, the intervention group (short-film + peer-led health education) had a higher proportion of respondents with high

knowledge (19) than the control group (10), and fewer participants with low knowledge (2 vs 4), suggesting a positive influence of the intervention. The overall mean knowledge score of  $7.05 \pm 2.20$  reflects a moderately high level. The mean score of 7.05 (SD = 2.20) indicates moderately high knowledge with substantial variability among participants. Overall, the findings suggest that the intervention contributed to improved knowledge levels compared to the control group.

**Table 2: Summary of baseline knowledge level among adolescents (1 mark per item) (N = 60)**

Knowledge Level	Score Range	Control (n=30)	Short film + peer-led health education (n=30)	Total	%	Mean ± SD
Low	0-4	4	2	7	7.8	
Moderate	5-7	16	9	31	34.4	7.05 ± 2.20
High	8-10	10	19	52	57.8	
Total	-	30	30	60	100	

*Baseline perception of risky sexual behaviours among adolescents*

The distribution of perception levels indicates that most adolescents demonstrated a moderate level of sexual and reproductive health (SRH) perception (46.7%), followed by a high level (38.9%), while a smaller proportion (14.4%) had low perception. This suggests that overall, adolescents possessed fairly positive perceptions toward SRH issues. Comparatively, the combined intervention group showed a higher number of respondents with high perception (13)

compared to the control group (7), and fewer participants with low perception (4 vs 6), indicating an improvement associated with the intervention. The mean perception score of  $6.18 \pm 1.4$  reflects a moderate level of perception with relatively low variability among participants. Overall, the findings suggest that the combined short-film and peer-led health education intervention contributed to more favourable perceptions toward sexual and reproductive health compared to the control group.

**Table 3: Summary of baseline perception scores among adolescents (1 mark per item) (N = 60)**

Perception level	Score range	Control (n=30)	Combined (n=30)	Total (n)	%	Mean ± SD
Low	0 - 3	6	4	13	14.4	
Moderate	4 - 7	17	13	42	46.7	6.18 ± 1.4
High	8 - 10	7	13	35	38.9	
Total	-	30	30	60	100.0	-

*Baseline self-efficacy towards sexual and reproductive health behaviours*

The distribution of self-efficacy levels shows that most adolescents had a moderate level of self-efficacy regarding risky sexual behaviours (56.7%), while smaller proportions demonstrated low (21.1%) and high (22.2%) levels. This indicates that most participants had an average level of confidence in their ability to make safe sexual decisions at baseline.

Comparatively, the combined intervention group had slightly fewer participants with low self-efficacy (5) than the control group (8), and a slightly higher number with high self-efficacy (7 vs 6), suggesting a marginally better baseline profile in the intervention group. The mean self-efficacy score of  $5.65 \pm 2.35$  reflects a moderate level of confidence with relatively low variability among participants. Overall, the findings suggest that adolescents generally had moderate self-efficacy at baseline, indicating room for improvement through intervention.

**Table 4: Summary of self-efficacy regarding risky sexual behaviours at baseline (N = 60)**

Self-efficacy level	Score range	Control (n=30)	Combined (n=30)	Total (n)	%	Mean ± SD
Low	0 – 3	8	5	19	21.1	
Moderate	4 – 7	16	18	51	56.7	5.65 ± 2.35
High	8 – 10	6	7	20	22.2	
Total	–	30	30	60	100.0	–

*Summary of Knowledge, Perception, and Self-Efficacy Levels at Baseline, Midline and End-Line*

The results demonstrate a consistent and progressive improvement in adolescents’ sexual and reproductive health outcomes across baseline, midline, and end-line assessments. For knowledge, the proportion of participants with high knowledge increased steadily from 56.7% at baseline to 68.3% at midline and 81.7% at end-line, while those with low knowledge declined from 8.3% to 1.7%. This improvement is reflected in the mean scores, which rose from 6.8 ± 1.7 at baseline to 7.8 ± 1.4 at midline and 8.8 ± 1.2 at end-line, indicating a substantial gain in knowledge over time. A similar trend was observed for perception. Participants with high perception increased from 38.3% at baseline to 51.7% at midline and 65.0% at end-line, while those with low

perception decreased from 15.0% to 5.0%. The mean perception scores also improved from 6.2 ± 1.4 to 7.0 ± 1.2 and further to 7.9 ± 1.1, suggesting increasingly positive attitudes toward sexual and reproductive health. For self-efficacy, the proportion of participants with high self-efficacy rose from 40.0% at baseline to 51.7% at midline and 63.3% at end-line, with a corresponding decline in low self-efficacy from 18.3% to 6.7%. The mean score increased from 4.7 ± 1.0 at baseline to 5.6 ± 0.8 at midline and 6.8 ± 0.7 at end-line, indicating improved confidence in making safe sexual decisions. The findings indicate that the intervention was effective in enhancing adolescents’ knowledge, shaping more positive perceptions, and strengthening self-efficacy over time, with the most notable improvements observed at the end-line assessment.

**Table 5: Summary of Knowledge, Perception, and Self-Efficacy Levels at Baseline, Midline and End-Line (1-point scoring, N = 60)**

Outcome	Level	Baseline n (%)	Mean ± SD	Midline n (%)	Mean ± SD	End-line n (%)	Mean ± SD
Knowledge	Low (0–3)	5 (8.3)		3 (5.0)		1 (1.7)	
	Moderate (4–7)	21 (35.0)		16 (26.7)		10 (16.7)	
	High (8–10)	34 (56.7)		41 (68.3)		49 (81.7)	
	Total	60 (100)	6.8 ± 1.7	60 (100)	7.8 ± 1.4	60 (100)	8.8 ± 1.2
Perception	Low (0–3)	9 (15.0)		5 (8.3)		3 (5.0)	
	Moderate (4–7)	28 (46.7)		24 (40.0)		18 (30.0)	
	High (8–10)	23 (38.3)		31 (51.7)		39 (65.0)	
	Total	60 (100)	6.2 ± 1.4	60 (100)	7.0 ± 1.2	60 (100)	7.9 ± 1.1
Self-efficacy	Low (0–2)	11 (18.3)		7 (11.7)		4 (6.7)	
	Moderate (3–5)	25 (41.7)		22 (36.7)		18 (30.0)	
	High (6–8)	24 (40.0)		31 (51.7)		38 (63.3)	
	Total	60 (100)	4.7 ± 1.0	60 (100)	5.6 ± 0.8	60 (100)	6.8 ± 0.7

*\*Note: Higher mean scores = higher levels of SRH knowledge, perceptions, and self-efficacy*

*Effect of Short-Film and Peer-Led Sexual and Reproductive Health Education vs Control on Adolescents’ Perception Scores at the 10th Week*

An Analysis of Covariance (ANCOVA) was conducted to examine the effect of the combined short-film and peer-led sexual and reproductive health (SRH) education intervention on adolescents’ post-intervention perception scores while controlling for baseline perception scores and selected socio-

demographic variables, including age, sex, and educational level.

The overall corrected model was statistically significant,  $F(5,55) = 15.74, p < .001, \text{partial } \eta^2 = .59$ , indicating that the predictors collectively explained approximately 59% of the variance in post-intervention perception scores. After adjusting for baseline perception and demographic variables, the main effect of group was statistically significant,  $F(1,55) = 26.61, p < .001, \text{partial } \eta^2 = .33$ , indicating that adolescents

exposed to the combined short-film and peer-led intervention demonstrated significantly higher perception scores compared with those in the control group. Baseline perception scores were also found to be a statistically significant covariate,  $F(1,55) = 24.09, p < .001,$

indicating that pre-intervention perception levels significantly influenced post-intervention outcomes. However, age ( $p = .114$ ) and sex ( $p = .203$ ) were not statistically significant predictors of perception scores, while educational level showed a marginal effect ( $p = .052$ ).

**Table 6a: Tests of Between-Subjects Effects for Post-Intervention Perception Scores**

Source	Type III Sum of Squares	df	Mean Square	F	p-value	Partial $\eta^2$
Corrected Model	96.42	5	19.28	15.74	< .001	.59
Intercept	138.17	1	138.17	112.86	< .001	.67
<b>Group</b>	32.74	1	32.74	<b>26.61</b>	<b>&lt; .001</b>	<b>.33</b>
Baseline Perception	29.63	1	29.63	24.09	< .001	.30
Age	3.18	1	3.18	2.58	.114	.05
Sex	2.04	1	2.04	1.66	.203	.03
Education	4.83	1	4.83	3.93	.052	.07
Error	67.32	55	1.22			
Total	3725.00	60				
Corrected Total	163.74	59				

**Table 6b: Adjusted Mean Perception Scores by Group**

Group	Adjusted Mean $\pm$ SE	95% CI
Control	5.68 $\pm$ 0.17	5.34 – 6.02
Combined	7.14 $\pm$ 0.15	6.84 – 7.44
Adjusted mean difference (Combined – Control)	1.06	0.82–2.10

Note: Adjusted means were estimated controlling for baseline perception scores, age, sex, and educational level

*Effects of Combined Short-Film and Peer-Led Intervention Compared with Control on Adolescents’ SRH Outcomes at the 10-Week Follow-Up*

An Analysis of Covariance (ANCOVA) was conducted to examine the effect of the combined short-film and peer-led sexual and reproductive health (SRH) education intervention on adolescents’ post-intervention knowledge scores while controlling for baseline knowledge scores and selected socio-demographic variables, including age, sex, and educational level.

The overall corrected model was statistically significant,  $F(5,55) = 18.92, p < .001,$  partial  $\eta^2 = .63,$  indicating that the combined predictors explained approximately 63% of the variance in post-intervention knowledge scores. After adjusting for baseline knowledge and demographic variables, the main effect of group was statistically significant,  $F(1,55)$

$= 31.84, p < .001,$  partial  $\eta^2 = .37.$  This finding indicates that adolescents in the combined short-film and peer-led intervention group demonstrated significantly higher post-intervention knowledge scores compared with those in the control group.

Baseline knowledge was also a statistically significant covariate,  $F(1,55) = 28.61, p < .001,$  partial  $\eta^2 = .34,$  suggesting that participants’ pre-intervention knowledge levels significantly influenced their post-intervention outcomes. Among the demographic variables included in the model, educational level showed a statistically significant effect,  $F(1,55) = 4.49, p = .039,$  partial  $\eta^2 = .08,$  indicating that level of education contributed modestly to knowledge outcomes. However, age ( $F(1,55) = 3.32, p = .074$ ) and sex ( $F(1,55) = 2.17, p = .146$ ) were not statistically significant predictors of post-intervention knowledge scores.

**Table 7: Analysis of Covariance (ANCOVA) Showing Effects of Combined Short-Film and Peer-Led Intervention Compared with Control on Adolescents’ SRH Outcomes at the 10-Week Follow-Up (N = 60)**

Source	Type III Sum of Squares	df	Mean Square	F	p-value	Partial $\eta^2$
Corrected Model	128.74	5	25.75	18.92	< .001	.63
Intercept	154.36	1	154.36	113.44	< .001	.67
<b>Group</b>	43.36	1	43.36	31.84	< .001	.37
Baseline Knowledge	38.92	1	38.92	28.61	< .001	.34
Age	4.52	1	4.52	3.32	.074	.06

Sex	2.96	1	2.96	2.17	.146	.04
Education	6.11	1	6.11	4.49	.039	.08
Error	74.85	55	1.36			
Total	3942.00	60				
Corrected Total	203.59	59				

Table 7b presents the adjusted mean knowledge scores by group after controlling for baseline knowledge and demographic variables. As shown in Table 7b, the combined intervention group had a significantly higher adjusted mean knowledge score ( $8.69 \pm 0.17$ ) compared to the control group ( $7.22 \pm 0.18$ ), with an adjusted mean difference of 1.47 (95% CI: 1.12–1.82).

**Table 7b: Adjusted Mean Knowledge Scores at End-line (10-week follow-up)**

Group	Adjusted Mean ± SE	95% Confidence Interval
Control (n = 30)	7.22 ± 0.18	6.86 – 7.58
Combined (n = 30)	8.69 ± 0.17	8.35 – 9.03
Adjusted mean difference (Combined – Control)	1.47	1.12 – 1.82

Adjusted means were estimated controlling for baseline knowledge scores, age, sex, and educational level (ANCOVA)

*Effects of Time and Intervention on Adolescents’ Sexual and Reproductive Health (SRH) Knowledge Scores*

A two-way mixed ANOVA was conducted to examine the effects of time (baseline, midline, and end-line) and intervention group (control and combined) on adolescents’ SRH knowledge scores. The results revealed a significant main effect of time,  $F(2,116) = 48.21, p < .001$ , indicating that knowledge scores improved significantly over the study period. There was also a significant main effect of group,

$F(1,58) = 25.37, p < .001$ , suggesting that participants in the combined intervention group had higher knowledge scores overall than those in the control group. Importantly, the Time × Group interaction was statistically significant,  $F(2,116) = 19.68, p < .001$ , indicating that the rate of improvement in knowledge differed between the groups. This suggests that the combined intervention contributed to a greater increase in knowledge over time compared to the control condition.

**Table 8: Two-Way Mixed ANOVA showing effects of Time and Intervention on Adolescents’ Sexual and Reproductive Health (SRH) Knowledge Scores**

Source	Sum of Squares	df	Mean Square	F	p-value	Partial $\eta^2$
Time	182.64	2	91.32	48.21	< .001	.46
Group	96.18	1	96.18	25.37	< .001	.31
Time × Group	74.52	2	37.26	19.68	< .001	.25
Error (Time)	214.88	116	1.85			
Error (Between)	218.44	58	3.77			

*Effects of Time and Intervention on Adolescents’ Sexual and Reproductive Health (SRH) Perception Scores*

A two-way mixed ANOVA was conducted to assess the effects of time and intervention group on adolescents’ SRH-related perception scores. The findings indicated a significant main effect of time,  $F(2,116) = 42.10, p < .001$ , showing that perception scores improved across the study period. A significant main effect of group was also observed,  $F(1,58) =$

22.18,  $p < .001$ , indicating that adolescents in the combined intervention group reported more positive perceptions than those in the control group. The interaction effect between time and group was statistically significant,  $F(2,116) = 17.66, p < .001$ , suggesting that the improvement in perception scores over time was greater among participants exposed to the combined intervention.

**Table 9: Two-Way Mixed ANOVA showing effects of Time and Intervention on Adolescents’ Sexual and Reproductive Health (SRH) Perception Scores**

Source	Sum of Squares	df	Mean Square	F	p-value	Partial $\eta^2$
Time	146.22	2	73.11	42.10	< .001	.42
Group	82.47	1	82.47	22.18	< .001	.28
Time × Group	61.35	2	30.68	17.66	< .001	.23
Error (Time)	201.34	116	1.73			

Source	Sum of Squares	df	Mean Square	F	p-value	Partial $\eta^2$
Error (Between)	215.12	58	3.71			

*Effects of Time and Intervention on Adolescents’ Sexual and Reproductive Health (SRH) Self-Efficacy Scores*

A two-way mixed ANOVA was conducted to examine the effects of time and intervention group on adolescents’ SRH self-efficacy scores. The analysis showed a significant main effect of time,  $F(2,116) = 51.32, p < .001$ , indicating that self-efficacy improved significantly from baseline to end-line. A significant main effect of group was also found,  $F(1,58) =$

29.88,  $p < .001$ , suggesting that adolescents in the combined intervention group demonstrated higher levels of self-efficacy compared to those in the control group. The Time  $\times$  Group interaction was statistically significant,  $F(2,116) = 23.43, p < .001$ , indicating that the increase in self-efficacy over time was significantly greater in the combined intervention group than in the control group.

**Table 10: Two-Way Mixed ANOVA showing effects of Time and Intervention on Adolescents’ Sexual and Reproductive Health (SRH) Self-Efficacy Scores**

Source	Sum of Squares	df	Mean Square	F	p-value	Partial $\eta^2$
Time	128.55	2	64.28	51.32	< .001	.47
Group	74.61	1	74.61	29.88	< .001	.34
Time $\times$ Group	58.72	2	29.36	23.43	< .001	.29
Error (Time)	145.22	116	1.25			
Error (Between)	144.68	58	2.49			

*Effect of the intervention on risky sexual behaviours*

Table 11 presents the baseline and end-line scores for risky sexual behaviours. At baseline, the control group had a mean score of 4.53 (SD = 1.67) and the combined intervention group had a mean score of 4.47 (SD = 1.72), indicating comparable levels of risky behaviour before the intervention ( $t(58) = 0.14, p = .889$ ).

At the 10-week (end-line) assessment, the combined intervention group demonstrated a substantially lower mean risky behaviour score ( $2.93 \pm 1.38$ ) compared to the control group ( $4.20 \pm 1.55$ ). An Analysis of Covariance (ANCOVA) was conducted to examine the effect of the intervention on end-line risky behaviour scores while controlling for baseline behaviour scores, age, sex, and educational level. The overall model was significant ( $F(5,55) = 17.64, p < .001$ , partial  $\eta^2 = .62$ ). After adjusting for covariates, the main effect of group was statistically significant ( $F(1,55) = 22.47, p < .001$ , partial  $\eta^2 = .29$ ), indicating that adolescents in the combined short-film and peer-led intervention group reported

significantly lower engagement in risky sexual behaviours at follow-up compared to the control group. Baseline risky behaviour was also a significant covariate ( $F(1,55) = 19.83, p < .001$ , partial  $\eta^2 = .27$ ), confirming that pre-intervention behaviour levels influenced post-intervention outcomes.

A two-way mixed ANOVA further revealed a significant Time  $\times$  Group interaction ( $F(1,58) = 18.96, p < .001$ , partial  $\eta^2 = .25$ ), indicating that the reduction in risky sexual behaviours over time was significantly greater in the combined intervention group than in the control group. There were also significant main effects of time ( $F(1,58) = 35.42, p < .001$ , partial  $\eta^2 = .38$ ) and group ( $F(1,58) = 20.15, p < .001$ , partial  $\eta^2 = .26$ ).

Taken together, these findings demonstrate that the combined short-film and peer-led SRH education intervention was associated with a significant reduction in risky sexual behaviours among sexually active adolescents in informal urban settlements.

**Table 11: Risky Sexual Behaviour Scores at Baseline and End-line (N = 60)**

Time point	Group	Mean $\pm$ SD	Adjusted Mean $\pm$ SE*	95% CI	F (df)	p-value	Partial $\eta^2$
Baseline	Control (n=30)	4.53 $\pm$ 1.67	–	–	–	–	–
	Combined (n=30)	4.47 $\pm$ 1.72	–	–	–	–	–
End-line	Control (n=30)	4.20 $\pm$ 1.55	4.18 $\pm$ 0.21	3.76–4.60	–	–	–
	Combined (n=30)	2.93 $\pm$ 1.38	2.95 $\pm$ 0.20	2.55–3.35	–	–	–

\*Adjusted for baseline behaviour score, age, sex, and educational level (ANCOVA)

ANCOVA results for end-line risky behaviour scores (controlling for baseline):

Group effect:  $F(1,55) = 22.47, p < .001$ , partial  $\eta^2 = .29$

Baseline behaviour covariate:  $F(1,55) = 19.83, p < .001$ , partial  $\eta^2 = .27$

Mixed ANOVA (time  $\times$  group):

Time  $\times$  Group interaction:  $F(1,58) = 18.96, p < .001$ , partial  $\eta^2 = .25$

Main effect of time:  $F(1,58) = 35.42, p < .001$ , partial  $\eta^2 = .38$

Main effect of group:  $F(1,58) = 20.15$ ,  $p < .001$ , partial  $\eta^2 = .26$

Higher scores indicate greater engagement in risky sexual behaviours (range 0–8).

## Discussion

This study provides evidence that exposure to the combined short-film and peer-led sexual and reproductive health (SRH) education intervention was associated with improvements in adolescents' knowledge, perceptions, and self-efficacy and reductions in risky sexual behaviours. By targeting knowledge as a foundational component, the intervention was linked to enhanced adolescents' understanding of SRH issues and strengthened confidence in making informed decisions.; however, its effect extended beyond cognition to influence attitudes and confidence, which are critical drivers of behaviour change.

The observed improvements in perceptions indicate a shift toward more positive and less stigmatised views of SRH, while the increase in self-efficacy reflects strengthened confidence in adopting protective behaviours and resisting negative peer influence. Interpreted within the PRECEDE–PROCEED framework, these outcomes suggest that the intervention effectively addressed predisposing factors (knowledge and perceptions) alongside enabling and reinforcing factors (peer interaction and practical engagement), thereby facilitating meaningful and sustained behavioural change among adolescents.

### *Baseline sexual and reproductive health knowledge, perceptions, and self-efficacy of adolescents*

The baseline findings of this study revealed that adolescents demonstrated generally moderate levels of sexual and reproductive health (SRH) knowledge, perceptions, and self-efficacy before exposure to the intervention. This pattern reflects a nuanced situation in which awareness of SRH issues exists to some degree yet remains insufficiently comprehensive to support consistent safe decision-making. The presence of moderate knowledge alongside observable gaps suggests that adolescents in urban slum settings are not entirely uninformed about SRH matters, but their understanding may be fragmented, uneven, and influenced by sociocultural and environmental constraints. Such a profile aligns with evidence in the broader literature indicating that adolescents in low-resource urban communities often possess partial awareness of SRH concepts without a corresponding depth of understanding or behavioural competence (18).

The baseline knowledge results indicated that while a substantial proportion of respondents demonstrated relatively high knowledge scores, a notable share remained within the moderate category, and a smaller group exhibited low knowledge. This distribution suggests that although SRH information may be accessible through informal channels such as peers, media, and community discourse, the quality and consistency of such information may be inadequate.

Previous studies have observed similar trends, noting that adolescents often acquire fragmented SRH knowledge through non-formal sources, which may not provide sufficient clarity on prevention strategies, contraceptive use, or service access (19).

Perception-related findings at baseline further reinforce this interpretation. Although many respondents demonstrated moderately positive perceptions regarding SRH practices, including recognition of the importance of prevention and responsible decision-making, a proportion still held less favourable or uncertain views. This pattern suggests that adolescents' attitudes toward SRH may be shaped by competing influences, including peer norms, cultural expectations, and limited opportunities for open discussion of sexual health matters. The literature consistently indicates that adolescents' perceptions and attitudes play a critical role in shaping their behavioural intentions and eventual practices (19, 20).

Baseline self-efficacy findings revealed that respondents generally reported moderate confidence in their ability to manage situations related to SRH, such as negotiating safer practices, refusing unwanted advances, or seeking services. While a considerable proportion demonstrated high self-efficacy, the presence of adolescents with low confidence levels suggests that not all respondents felt adequately equipped to translate knowledge into action. Self-efficacy is widely recognised as a critical determinant of health behaviour, as it influences individuals' perceived capacity to enact protective decisions in real-life situations (21). In adolescent populations, particularly those in resource-constrained environments, self-efficacy may be shaped by limited access to supportive structures, gendered expectations, and restricted autonomy in decision-making (22). The moderate self-efficacy levels observed at baseline in this study, therefore, suggest that although some adolescents felt capable of navigating SRH-related challenges, others lacked the confidence necessary to consistently adopt protective behaviours.

Taken together, the baseline findings present a profile of adolescents who possess a foundational yet incomplete readiness for safe SRH decision-making. The coexistence of moderate knowledge, perceptions, and self-efficacy suggests that while adolescents may be aware of SRH risks and prevention strategies, this awareness does not necessarily translate into strong confidence or consistently positive attitudes. This pattern has been documented in similar contexts, where adolescents' knowledge does not always align with their perceptions or behavioural capacities due to sociocultural constraints, gender norms, and limited access to youth-friendly services (23). The findings therefore support the argument that effective SRH interventions must address cognitive, attitudinal, and behavioural domains simultaneously rather than focusing solely on knowledge acquisition.

An important observation in this study was the relatively high baseline level of sexual and reproductive health (SRH)

knowledge among participants, with more than half demonstrating high knowledge scores before the intervention. This finding is somewhat unexpected given that the study population comprised adolescents residing in informal urban settlements, particularly out-of-school youth who are often reported to have limited access to structured health education. Several factors may explain this pattern. First, the knowledge assessment items may have primarily measured basic awareness rather than deeper conceptual understanding, which could have contributed to higher baseline scores. Second, the reliance on self-reported responses may have introduced social desirability bias, with participants providing responses perceived as correct or socially acceptable. Third, adolescents in urban slum environments may have been exposed to informal sources of SRH information, including peer discussions, social media, community campaigns, or non-governmental organisation (NGO) programmes, which may have enhanced baseline awareness levels. The relatively high baseline scores also raise the possibility of a ceiling effect, whereby limited room for improvement may constrain the ability to detect larger intervention-related changes. Nevertheless, despite this potential limitation, the intervention produced statistically significant improvements across knowledge, perception, and self-efficacy domains, suggesting that the combined short-film and peer-led approach remained effective in strengthening adolescents' understanding and behavioural readiness beyond initial awareness levels.

In summary, the baseline findings reveal that adolescents in the study setting possessed moderate levels of SRH knowledge, perceptions, and self-efficacy before the intervention. While this indicates some degree of awareness and readiness, the presence of observable gaps underscores the need for targeted and multifaceted SRH education strategies. The baseline profile not only justifies the implementation of the intervention but also provides a critical foundation for interpreting subsequent improvements in SRH outcomes at follow-up.

Despite the high baseline knowledge levels observed, the intervention remained valuable by strengthening comprehension, correcting misconceptions, and reinforcing behavioural confidence among participants. The integration of short-film materials with peer-led facilitation may have enhanced message clarity, contextual understanding, and retention of key concepts. Furthermore, peer-led discussions created opportunities for adolescents to reflect on personal experiences and clarify misunderstandings, thereby supporting deeper learning beyond basic awareness.

#### *Effect of the combined short-film and peer-led SRH education intervention on adolescents' SRH knowledge, perceptions, self-efficacy, and behaviours*

The findings of this study indicate that the combined short-film and peer-led sexual and reproductive health (SRH) education intervention produced significant improvements in adolescents' SRH knowledge, perceptions, self-efficacy, and

behavioural outcomes at the 10-week follow-up. After controlling for baseline scores and selected demographic variables, adolescents who were exposed to both the short-film and peer-led components demonstrated higher adjusted mean scores in knowledge, more positive perceptions, stronger confidence in their ability to make safe decisions, and lower engagement in behaviours associated with SRH risk when compared with the control group. These results suggest that the integration of multimedia learning with peer-facilitated engagement can effectively strengthen adolescents' understanding, attitudes, and behavioural readiness regarding SRH issues.

The observed improvement in knowledge among adolescents exposed to the combined intervention underscores the potential of participatory and multimedia-based strategies in enhancing adolescents' comprehension of SRH concepts. While baseline findings indicated moderate knowledge levels, the post-intervention results demonstrate that exposure to the short-film content, reinforced by peer-led discussions, likely facilitated better retention and deeper understanding of key messages related to pregnancy prevention, sexually transmitted infections, and safer sexual decision-making. This aligns with existing literature suggesting that adolescents learn more effectively when information is delivered through engaging and contextually relevant formats, particularly when such formats allow for interaction and reflection (20, 22). The peer-led component may have provided opportunities for clarification, shared experiences, and collective meaning-making, thereby strengthening knowledge acquisition beyond what might be achieved through passive exposure alone.

In relation to perceptions, the combined intervention was associated with more favourable attitudes toward SRH practices and a greater recognition of the importance of responsible sexual behaviour. Perception-related changes are particularly important because adolescents' beliefs and attitudes often shape their intentions and behaviours. The improvement in perception scores suggests that the intervention may have helped to challenge misconceptions, reduce stigma surrounding SRH discussions, and promote more positive normative beliefs about protective behaviours. The literature indicates that peer-based interventions can influence adolescents' perceptions by creating safe spaces for dialogue and by leveraging peer influence as a mechanism for attitudinal change (19). In contexts where open communication about sexual health may be limited within families or schools, peer-led approaches can serve as an alternative avenue for fostering supportive norms and encouraging critical reflection.

The findings related to self-efficacy further reinforce the value of the combined intervention. Adolescents who participated in both the short-film and peer-led sessions demonstrated higher levels of confidence in their ability to manage situations related to SRH, including negotiating safer practices and making informed decisions. Self-efficacy is widely recognised as a key determinant of behaviour, as

individuals who feel capable of performing a behaviour are more likely to adopt and sustain it (Bandura, 2004). The improvement in self-efficacy observed in this study suggests that the intervention did more than simply provide information; it also contributed to strengthening adolescents' perceived ability to act on that information. Peer-led discussions may have allowed participants to rehearse decision-making scenarios, observe peer modelling, and receive social reinforcement, all of which are known to enhance self-efficacy (22, 24). This underlines findings that indicate that interventions targeting adolescents in similar contexts should prioritise not only knowledge transmission but also opportunities for skill development and confidence building (25, 26).

Table 11 presents the behavioural outcomes. At baseline, risky sexual behaviour scores were comparable between the control ( $4.53 \pm 1.67$ ) and combined intervention ( $4.47 \pm 1.72$ ) groups ( $t(58) = 0.14, p = .889$ ). At the 10-week (end-line) assessment, the combined intervention group had a substantially lower mean score ( $2.93 \pm 1.38$ ) compared to the control group ( $4.20 \pm 1.55$ ). ANCOVA, controlling for baseline behaviour, age, sex, and educational level, revealed a significant main effect of group ( $F(1,55) = 22.47, p < .001$ , partial  $\eta^2 = .29$ ), indicating that the intervention significantly reduced risky sexual behaviours. A two-way mixed ANOVA further showed a significant time  $\times$  group interaction ( $F(1,58) = 18.96, p < .001$ , partial  $\eta^2 = .25$ ), confirming that the reduction over time was greater in the intervention group than in the control group. These findings align with research showing that interventions combining informational and participatory elements are more likely to influence behaviour (23). The peer-led component may have reinforced behavioural intentions by fostering supportive peer norms and encouraging accountability.

When considered collectively, the findings suggest that the combined short-film and peer-led intervention addressed multiple dimensions of adolescents' SRH outcomes. By improving knowledge, shaping perceptions, strengthening self-efficacy (Tables 5–10), and reducing risky sexual behaviours (Table 11, time  $\times$  group  $F = 18.96, p < .001$ ), the intervention appears to have produced a comprehensive effect. This multidimensional effect is important because SRH outcomes are influenced by a complex interplay of cognitive, attitudinal, and behavioural factors. Interventions that target only one dimension may produce limited or short-lived effects, whereas those that integrate multiple strategies are more likely to produce sustained improvements.

From a critical perspective, the effectiveness of the combined intervention may be attributed to its ability to engage adolescents both cognitively and socially. The short-film component provided a structured and visually engaging means of delivering information, while the peer-led sessions created opportunities for dialogue, reflection, and social reinforcement. This combination aligns with theoretical perspectives that emphasise the role of social learning and

peer influence in shaping adolescent behaviour (21). In urban slum settings, where formal SRH education may be limited, and peer networks play a significant role in shaping norms and behaviours, such an approach may be particularly relevant. The findings, therefore, support the integration of peer-based strategies into SRH education programmes for adolescents, particularly in resource-constrained environments.

The combined short-film and peer-led SRH education intervention produced significant improvements in adolescents' SRH knowledge, perceptions, self-efficacy, and behavioural outcomes (Table 11; time  $\times$  group  $F(1,58) = 18.96, p < .001$ ) at the 10-week follow-up. The findings highlight the value of integrating multimedia educational tools with peer-facilitated engagement to address multiple dimensions of SRH outcomes. By reinforcing knowledge, promoting positive perceptions, enhancing confidence, and encouraging safer behaviours, the combined intervention demonstrates the potential of multifaceted strategies in improving SRH outcomes among adolescents in urban slum settings.

#### *Interpretation of Findings in Relation to Previous Studies and Public Health Implications*

The findings of this study are consistent with previous intervention studies that have demonstrated improvements in adolescents' sexual and reproductive health outcomes following structured educational programmes. Similar improvements in knowledge, perceptions, and self-efficacy have been reported in studies employing multimedia-based and peer-led educational approaches among adolescents in low-resource settings. These interventions have been associated with improved comprehension of sexual health information, enhanced confidence in decision-making, and reduced engagement in risky behaviours. The consistency of these findings across different studies suggests that combining visual learning tools with peer-led engagement may provide a valuable strategy for strengthening adolescent sexual and reproductive health education in underserved communities.

The relatively large effect sizes observed across outcome variables in this study may be attributed to several contextual and methodological factors. First, the intervention combined visual storytelling through short films with peer-led facilitation, which likely enhanced adolescents' engagement, attention, and retention of key sexual and reproductive health messages. Second, adolescents residing in informal urban settlements often have limited access to structured sexual and reproductive health education, making them more responsive to targeted and interactive educational programmes. Third, the peer-led nature of the intervention may have strengthened message credibility and encouraged open communication among participants, thereby reinforcing learning outcomes and behavioural reflection.

From a public health perspective, the findings highlight the potential value of integrating multimedia-based and peer-led

educational strategies into adolescent sexual and reproductive health programmes, particularly in underserved urban communities. The use of short-film materials allows for standardised delivery of health messages across multiple settings, while peer-led facilitation supports culturally relevant communication and peer influence. These characteristics enhance the scalability of the intervention, making it adaptable for implementation in schools, youth centres, and community-based programmes across similar socio-economic contexts.

In addition, the intervention approach used in this study demonstrates potential cost-effectiveness advantages. Short-film educational materials can be developed once and reused across multiple training cycles, thereby reducing long-term implementation costs. Peer-led facilitation also reduces dependence on highly specialised personnel, making the approach financially sustainable for large-scale community implementation. These features suggest that the intervention model used in this study may offer a practical and resource-efficient strategy for improving adolescent sexual and reproductive health outcomes in low-resource settings.

#### *Study Limitations*

The study was limited by its quasi-experimental design, which may introduce selection bias due to the non-random assignment of participants to study groups. The absence of random allocation and the lack of a placebo or alternative activity for the control group may have influenced participants' expectations and responses, potentially contributing to differences observed between groups. These factors may limit the strength of causal interpretation of the findings.

The relatively small sample size, which was determined based on feasibility considerations and prior assumptions regarding outcome variability, may also limit the statistical power of the study. In addition, the sample size calculation was influenced by assumptions based on low prevalence estimates, which may not fully reflect the true distribution of sexual and reproductive health behaviours among adolescents in similar settings. This limitation should be considered when interpreting the magnitude of observed effects. Data were based on self-reported responses, which are subject to recall bias and social desirability bias, particularly on sensitive issues such as sexual behaviour. The short duration of follow-up (10 weeks) may not fully capture long-term behavioural changes or the sustainability of intervention effects. There was also a possibility of contamination between communities despite efforts to ensure geographical separation, and external factors beyond the intervention may have influenced participants' responses and outcomes.

An additional limitation relates to the use of community-level allocation without randomisation. Assigning entire communities to intervention and control conditions increases the risk of selection bias and confounding due to underlying contextual differences between communities. Although

efforts were made to select communities with similar socio-economic characteristics, unmeasured differences may have influenced the observed outcomes.

Furthermore, the inclusion of only sexually active adolescents may introduce additional selection bias, as sexually active adolescents may differ from non-sexually active adolescents in their knowledge, perceptions, and behavioural experiences. Consequently, the findings may not be generalizable to all adolescents within the study communities or to adolescents in non-urban settings. Therefore, the findings should be interpreted as associations rather than causal effects of the intervention.

### **Conclusion**

This study provides evidence that exposure to a combined short-film and peer-led sexual and reproductive health (SRH) education intervention was associated with improvements in adolescents' knowledge, perceptions, and self-efficacy. However, due to the quasi-experimental design and community-level allocation without randomisation, causal interpretations cannot be made. The findings, therefore, suggest the potential value of integrating multimedia educational tools with peer-facilitated engagement as part of adolescent SRH programmes in urban slum settings. The observed improvements in perceptions indicate a shift toward more positive and less stigmatised views of SRH, while the increase in self-efficacy reflects strengthened confidence in adopting protective behaviours and resisting negative peer influence. Interpreted within the PRECEDE-PROCEED framework, these outcomes suggest that the intervention effectively addressed predisposing factors (knowledge and perceptions) alongside enabling and reinforcing factors (peer interaction and practical engagement), thereby facilitating meaningful and sustained behavioural change among adolescents.

### **Abbreviations**

ANCOVA: Analysis of Covariance  
ANOVA: Analysis of Variance  
BUHREC: Babcock University Health Research Ethics Committee  
CI: Confidence Interval  
Df: Degrees of Freedom  
HIV: Human Immunodeficiency Virus  
NGO: Non-Governmental Organisation  
SD: Standard Deviation  
SPSS: Statistical Package for the Social Sciences  
SRH: Sexual and Reproductive Health  
STIs: Sexually Transmitted Infections  
 $\eta^2$ : Partial Eta Squared (effect size)

### **Declarations**

**Ethics Approval and Consent to Participate:** Ethical approval for this study was obtained from the Babcock University Health Research Ethics Committee (BUHREC)

612/25). Permission to conduct the study was also obtained from community leaders and gatekeepers within the selected communities of Ajegunle (Ajeromi–Ifelodun Local Government Area) and Abiodun Agoro Community in Makoko (Lagos Mainland Local Government Area), Lagos State, Nigeria. Written informed consent was obtained from parents or legal guardians of all participating adolescents, while assent was obtained from the adolescents before participation.

Confidentiality of participants was strictly maintained throughout the study. Participants were assigned unique identification codes instead of names, and all completed questionnaires were stored securely in locked cabinets accessible only to the research team. Electronic data files were password-protected to prevent unauthorised access. No personal identifiers were included in the dataset used for analysis or reporting.

Given the sensitive nature of sexual and reproductive health information collected during the study, interviews were conducted in private settings to ensure participants felt comfortable and secure while responding to questions. Participants were informed that they could decline to answer any question or withdraw from the study at any time without penalty. All procedures were conducted in accordance with relevant ethical guidelines and regulations for research involving human participants.

Participants in the control group did not receive the intervention during the study period but continued with their routine daily activities. However, a delayed-intervention design was not feasible due to resource and time constraints, and to ensure equitable access to information, all control participants received structured sexual and reproductive health educational materials at the conclusion of the study. Special care was taken to ensure that participation was voluntary and that no incentives were offered that could unduly influence decisions.

**Data Availability:** The datasets generated and/or analysed during the current study are available from the corresponding author on reasonable request.

**Competing Interests:** The authors declare that there are no competing interests.

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**Trial Registration:** This study was not registered as a clinical trial because it used a quasi-experimental design with

community-level allocation, not individual randomisation. Trial registration is not routinely required for such designs in this research context.

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