Effectiveness of school-based health education programs on health behaviours among adolescents in Irrua, Edo State, Nigeria

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Abstract

Background**:** Adolescence is a critical period for shaping lifelong health behaviours. School-based health education programs aim to equip adolescents with the knowledge and attitudes needed to make informed health choices. In Nigeria, limited data exist on the effectiveness of such programs, particularly in semi-urban areas. Objective**:** To assess the knowledge, attitudes, and perceived behavioural outcomes of school-based health education among adolescents in Irrua, Edo State. Methods**:** A descriptive cross-sectional study was conducted among 110 adolescents selected using multistage sampling from two secondary schools in Irrua. Data were collected using structured interviewer-administered questionnaires and analysed with SPSS version 21. Descriptive statistics were used to summarise responses. Results**:** Most respondents had participated in school-based health education (90.9%). Good knowledge was observed in 73.6%, and a positive attitude in 89.1%. Key reported outcomes included improved hygiene (81.8%), increased physical activity (81.8%), healthier eating (84.5%), and better decision-making on sexual health (73.6%). Main sources of information were school programs (66.4%) and healthcare professionals (60.0%). Conclusion**:** School-based health education programs positively influence adolescent health behaviours in Irrua. Strengthening implementation and delivery methods can further improve outcomes and reduce risky behaviours.

Keywords: Adolescents, School-based health education, Health behaviour, Knowledge, Attitude, Nigeria, Preventive health, Irrua.

Introduction

Adolescence, spanning roughly from ages 10 to 19, represents a critical window in the human life course during which individuals undergo rapid physical, emotional, cognitive, and social changes.[1] Globally, adolescents constitute over 1.2 billion people—about 16% of the world's population—with over 80% living in low- and middle-income countries (LMICs).[2] The World Health Organization (WHO) has repeatedly emphasized that investments in adolescent health—particularly in preventive health education—can yield a triple dividend: improved health now, enhanced well-being in adulthood, and better health outcomes for the next generation.[3]

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Despite increased attention to adolescent health in recent years, risky health behaviours remain a major cause of morbidity and mortality in this age group. Globally, the leading causes of adolescent death include road traffic injuries, lower respiratory infections, suicide, and diarrhoeal diseases—all of which are linked in part to poor health literacy and preventable behaviours.[4,5] School-based health education programs have emerged as a strategic response to these challenges. These programs aim to empower adolescents with accurate knowledge, improve their health literacy, shape positive attitudes, and foster lifelong healthy behaviours. They are particularly effective because schools serve as controlled environments with sustained access to young people and opportunities for structured, curriculum-based interventions.[6] Internationally, studies from countries like the United States and Australia have shown that

comprehensive school-based health programs can reduce tobacco use, delay sexual initiation, improve nutrition, and increase physical activity among adolescents.[7,8] These successes are often tied to well-integrated health curricula, teacher training, parental involvement, and policy support.

In sub-Saharan Africa, the epidemiological transition has brought a dual burden of disease, with infectious diseases remaining high while non-communicable conditions and risky behaviours are on the rise among adolescents.[9] Reports from countries like South Africa and Ghana have highlighted alarming trends in early sexual activity, drug use, school dropout, and exposure to violence—all influenced by limited access to structured health education.[10,11] While several African governments have adopted adolescent health strategies, implementation remains fragmented, and monitoring of school-based interventions is often weak.

In Nigeria, adolescents make up about 22% of the national population—over 45 million individuals—yet their health outcomes remain suboptimal. The 2018 Nigeria Demographic and Health Survey (NDHS) revealed low levels of comprehensive knowledge of HIV among adolescents, high rates of teenage pregnancy, and insufficient awareness of contraception, hygiene, and nutrition.[12] Many young people initiate risky behaviours without adequate understanding of their health consequences. Although the National School Health Policy advocates for the inclusion of health education in school curricula, practical implementation varies widely across states and is hampered by resource constraints, teacher training gaps, and low prioritization of adolescent health.[13]

This study, therefore, aimed to evaluate the effectiveness of school-based health education programs on adolescent health behaviours in Irrua, Edo State. Specifically, it sought to determine adolescents' knowledge of school-based health education programs, assess their attitudes toward such initiatives, and evaluate the programs' impact on their health behaviours. Findings from this study are expected to inform policy, guide local educational strategies, and contribute to the national dialogue on adolescent health promotion in Nigeria.

Materials and Method

Study Area

This study was conducted in Irrua, the administrative headquarters of Esan Central Local Government Area in Edo State, Nigeria. Strategically located along the Benin–Auchi highway, Irrua is a key educational and cultural hub for the Esan people. It hosts several secondary schools, both public and private, including Irrua Girls' Secondary School and Ikekato Secondary School. The town is also home to the Irrua Specialist Teaching Hospital (ISTH), a major tertiary health institution in Nigeria.

Study Design

A descriptive cross-sectional study design was employed to assess knowledge, attitudes, and behavioural outcomes related to school-based health education among adolescents. A multistage sampling technique was used. First, two schools were selected from a list of secondary schools in Irrua using simple random sampling. Within the selected schools, eligible adolescents were randomly chosen from the student register using generated random numbers. Data were collected through structured interviewer-administered questionnaires divided into three sections: demographic data, knowledge of school-based health education, and behavioural impact. The questionnaire was developed after a comprehensive literature review and distributed to participants who met the inclusion criteria. Pretesting was conducted among ten students in a nearby school, and necessary adjustments were made prior to data collection.

Study Population

The study population comprised adolescents aged 10 to 19 years enrolled in secondary schools in Irrua. Inclusion criteria were enrollment in selected schools, age within the specified range, and provision of informed consent or assent. Exclusion criteria included inability to communicate effectively, cognitive impairment, and refusal to participate or return a complete questionnaire. The minimum sample size was calculated using Cochran's formula with a prevalence estimate of 93%, a 5% margin of error, and a 95% confidence interval, yielding a sample size of 100. After adjusting for a 10% non-response rate, the final sample size was 110.

Data Analysis

Data were entered and analyzed using IBM SPSS version 21. Descriptive statistics including frequencies and percentages were used to summarize relevant variables, and findings were presented in tables and charts.

Ethical Considerations

The study received departmental clearance from the Department of Community Medicine, ISTH.

Participation was voluntary, and informed consent was obtained from participants or their guardians. Anonymity and confidentiality were assured by omitting personal identifiers and conducting interviews in private settings. Findings will be shared with school authorities and relevant stakeholders to guide health education policy.

Limitations

The study's limited sample size and focus on only two schools may restrict the generalizability of findings. Self-reported data may be subject to bias, and the cross-sectional nature of the study limits the ability to assess long-term behavioural outcomes.

Results

Sociodemographic Characteristics of Respondents

The majority of respondents were aged 13–15 years (63; 57.3%), followed by those aged 16–18 years (27; 24.5%), while the least were aged 10–12 years (20; 18.2%). More than half were female (64; 58.2%) and the rest male (46; 41.8%). Christianity was the predominant religion among participants (103; 93.6%), with only a few identifying as Muslim (7; 6.4%). Most respondents were of Esan ethnicity (66; 60.0%), followed by Bini (17; 15.5%), Igbo (10; 9.1%), Yoruba (7; 6.4%), Etsako (7; 6.4%), and Hausa (3; 2.7%). Over half of the respondents were in senior secondary school (57; 51.8%), 31 (28.2%) were in junior secondary, while 22 (20.0%) were not currently in school.

Sources of Information on Health Education

School-based education programs were the most commonly reported source of health information, cited by 73 respondents (66.4%). This was followed by healthcare professionals (66; 60.0%) and parents or guardians (57; 51.8%). Friends and peers served as a source for 49 respondents (44.5%), while 43 (39.1%) obtained information through social media or the internet.

Knowledge of School-Based Health Education

Most respondents (100; 90.9%) reported having participated in a school-based health education program, while only 10 (9.1%) had not. When asked about the main purpose of such programs, the majority (60; 54.5%) believed it was to educate on health and well-being. Others thought it was to improve academic performance (21; 19.1%) or to provide medical treatment (20; 18.2%), while 9 (8.2%) were unsure.

In terms of who delivers health education in schools, nearly half identified teachers (53; 48.2%), followed by health professionals (27; 24.5%) and school nurses (19; 17.3%), whereas 11 (10.0%) did not know. A large proportion (96; 87.3%) agreed that personal hygiene is important for disease prevention, while 10 (9.1%) disagreed and 4 (3.6%) were not sure. Regarding knowledge of drug abuse risk factors, peer pressure was most commonly identified (87; 79.1%), followed by lack of supervision (79; 71.8%) and stress or mental health issues (68; 61.8%). For sexually transmitted infection (STI) prevention, abstinence was the most recognized method (103; 93.6%), followed by use of protection (86; 78.2%) and regular medical check-ups (25; 22.7%).

Based on overall responses, 81 respondents (73.6%) demonstrated good knowledge, while 29 (26.4%) had poor knowledge of school-based health education.

Table 1: Socio-demographic Characteristics of Respondents

Variables	Frequency	Percentage (%)
Age group (years)		
10–12	20	18.2
13–15	63	57.3
16–18	27	24.5
Gender		
Male	46	41.8
Female	64	58.2
Religion		
Christianity	103	93.6
Islam	7	6.4
Ethnicity		
Esan	66	60.0
Bini	17	15.5
Yoruba	7	6.4
Igbo	10	9.1
Hausa	3	2.7
Etsako	7	6.4
Class level		
Junior Secondary	31	28.2
Senior Secondary	57	51.8
Not currently in school	22	20.0

Table 2: Knowledge of School-Based Health Education (n = 110)

Variables	Frequency (n=110)	Percentage (%)
Participated in a school-based health education program		
Yes	100	90.9
No	10	9.1
Main purpose of school-based education		
To improve academic performance	21	19.1
To educate on health and well-being	60	54.5
To provide medical treatment	20	18.2
Don't know	9	8.2
Who teaches health education in school		
Teachers	53	48.2
School nurses	19	17.3
Health professionals	27	24.5
Don't know	11	10.0
Personal hygiene is important for preventing disease		
Yes	96	87.3
No	10	9.1
Not sure	4	3.6
Risk factors for drug abuse*		
Peer pressure	87	79.1
Lack of supervision	79	71.8
Stress/mental issues	68	61.8
Ways to prevent STIs*		
Abstinence	103	93.6
Use of protection	86	78.2
Regular check-ups	25	22.7

Attitudes Toward School-Based Health Education

Respondents generally expressed positive attitudes toward school-based health education. The strongest agreement was with the inclusion of health education in the school curriculum (mean = 3.28; SD = 0.86), followed by the relevance of topics to daily life (mean = 3.15; SD = 0.95) and the perceived usefulness of the program (mean = 3.14; SD = 1.00). Similarly, the belief that the program effectively improves student health behaviours scored a mean of 3.14 (SD = 0.94). Enjoyment of sessions (mean = 3.01; SD = 1.05) and motivation to apply lessons learned (mean = 2.99; SD = 1.09) were moderately rated. The impact on adopting healthier habits (mean = 2.98; SD = 1.06) and improvement in knowledge of personal hygiene (mean = 2.95; SD = 1.12) were also acknowledged. However, ratings were lower for the teaching methods being interesting (mean = 2.80; SD = 1.23) and feeling comfortable asking questions during sessions (mean = 2.64; SD = 1.23), indicating potential areas for program improvement.

Overall, 98 respondents (89.1%) demonstrated a good attitude, while 12 (10.9%) had a poor attitude toward school-based health education.

Table 3: Attitudes Toward School-Based Health Education

Statement	Mean	Standard Deviation
School-based health education should be included in the school curriculum	3.28	0.86
The topics covered in school-based health education are relevant to daily life	3.15	0.95
School-based health education is useful	3.14	1.00
School-based health education effectively improves students' health behaviours	3.14	0.94
I enjoy participating in school-based health education sessions	3.01	1.05
I feel motivated to apply what I learn from health education sessions	2.99	1.09
The program has helped me adopt healthier habits	2.98	1.06
Health education sessions have improved my knowledge of personal hygiene	2.95	1.12
The teaching methods used in health education are interesting	2.80	1.23
I feel comfortable asking questions during health education sessions	2.64	1.23

Perceived Outcomes of School-Based Health Education

A large proportion of respondents (90; 81.8%) reported improved personal hygiene since participating in the program, while 13 (11.8%) were unsure and 7 (6.4%) reported no improvement. Over half (56; 50.9%) experienced a strong increase in understanding of health behaviours, with 38 (34.5%) indicating a moderate increase and only 6 (5.5%) reporting no improvement.

Half of the participants (55; 50.0%) felt very confident in making healthy decisions, while 35 (31.8%) were somewhat confident. Only 8 (7.3%) reported not being confident at all. Healthier eating habits since the program were reported by 93 (84.5%) respondents, while 10 (9.1%) reported no change.

Similarly, 90 (81.8%) reported increased physical activity, and 74 (67.3%) indicated they were actively avoiding risky behaviours. Regarding sexual health, 81 (73.6%) felt better informed to make decisions, though 18 (16.4%) remained unsure.

An overall improvement in well-being was reported by 86 (78.2%), and the same number (86; 78.2%) reported improved water and sanitation practices. Additionally, awareness of the dangers of drug and substance abuse was high (96; 87.3%), with only 4 (3.6%) stating otherwise.

Table 4: Perceived Outcomes of School-Based Health Education

Variables	Frequency (n=110)	Percentage (%)
Improved Personal Hygiene Since Participation		
Yes	90	81.8
Not sure	13	11.8
No	7	6.4
Increase in Understanding of Health Behaviours		
Strongly increased	56	50.9
Moderately increased	38	34.5
Slightly increased	10	9.1
Not increased	6	5.5
Confidence in Making Healthy Decisions		
Very confident	55	50.0
Somewhat confident	35	31.8
Not very confident	12	10.9
Not confident at all	8	7.3
Healthier Eating Habits Since Program		
Yes	93	84.5
Not sure	7	6.4
No	10	9.1
Increased Physical Activity Since Program		
Yes	90	81.8
Not sure	11	10.0
No	9	8.2
Avoidance of Risky Behaviours		
Yes	74	67.3
Not sure	20	18.2
No	16	14.5
Informed Sexual Health Decisions		
Yes	81	73.6
Not sure	18	16.4
No	11	10.0
Improved Overall Well-being		
Yes	86	78.2
Not sure	18	16.4
No	6	5.5
Improved Water and Sanitation Practices		
Yes	86	78.2
Not sure	15	13.6
No	9	8.2
Awareness of Dangers of Drug and Substance Abuse		
Yes	96	87.3
Not sure	10	9.1
No	4	3.6

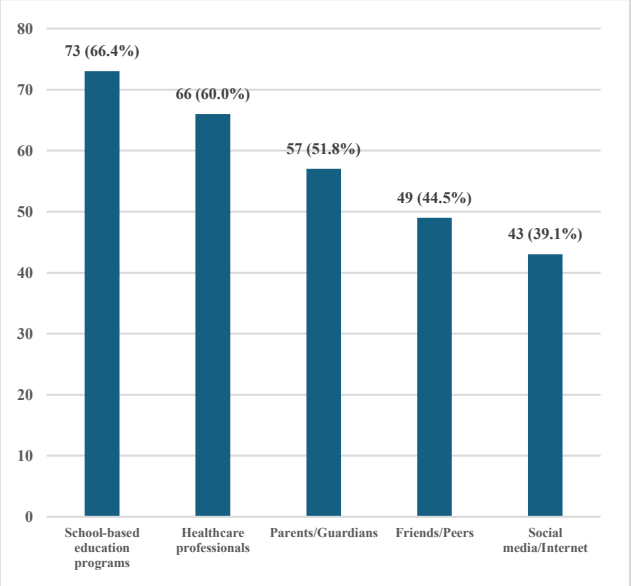

Figure 1: Main source of information among students

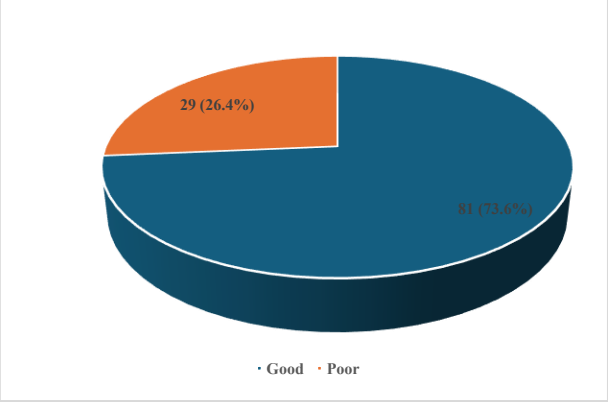

Figure 2: Knowledge of School-Based Health Education among respondents.

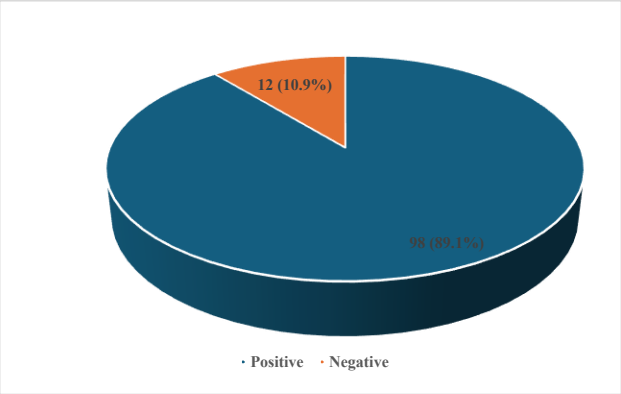

Figure 3: Attitude of respondents towards school-based health education program.

Discussion

The majority of adolescents in this study demonstrated good knowledge and a positive attitude toward school-based health education, emphasizing the relevance of structured health programs in shaping adolescent health literacy and behaviour. This aligns with findings from a study in Ghana by Aninanya et al.[14] (2015), where school-based interventions significantly improved students' understanding and usage of hygiene, reproductive health, and substance abuse. A likely explanation is the consistent integration of health topics into the school curriculum and the use of relatable delivery methods. These findings reinforce the role of early health education in building foundational awareness that can reduce preventable adolescent morbidity. It is recommended that local education authorities strengthen health education content in school curricula and ensure its consistent implementation across schools.

The study revealed that almost all respondents had participated in school-based health education programs, and most correctly identified their core purpose as promoting health and well-being. This is consistent with reports from Kenya by Akiyama et al.[15] (2020), where students exposed to school health programs were more likely to engage in preventive practices. The high participation rate observed in Irrua may be attributed to school-level initiatives and awareness campaigns, though the reach outside formal school settings remains limited. Given that 20% of the adolescents surveyed were not currently enrolled in school, integrating out-of-school youth into community-based health initiatives is essential.

Notably, the most frequently reported sources of health information were school programs, healthcare professionals, and parents. Similar patterns were observed in a study by Ilori et al.[16] (2019) in Oyo, Nigeria, which highlighted the role of schools and caregivers as primary health educators for adolescents. This accentuates the importance of multi-sectoral collaboration, especially involving parents and trained professionals, in reinforcing accurate health messaging. To maximize impact, future programs should adopt a holistic approach that includes school, family, and community involvement.

Attitudes toward health education were largely favourable, with the highest agreement for its inclusion in the curriculum and the relevance of topics to daily life. These findings are in line with research from Austria by Rizvi[17] (2022), which demonstrated that health education programs lead to improved attitudes and practices in relation to health as a whole. However, lower mean scores were reported for teaching method appeal and comfort in asking questions, indicating a potential weakness in delivery style. To address this, health education sessions should be redesigned to be more interactive and youth-friendly, using participatory teaching methods that encourage engagement and dialogue.

Behavioural outcomes further support the effectiveness of school-based interventions. Over four-fifths of participants reported improvements in personal hygiene and physical activity, while almost all adopted healthier eating habits. Additionally, about three-quarters reported informed decision-making on sexual health as well as demonstrated awareness of substance abuse risks. These figures are comparable to outcomes reported in a study by Shapu et al.[18] (2022) in Maiduguri, Nigeria and Tamiru et al.[19] (2017) in Ethiopia, where school health programs led to marked improvements in hygiene and dietary practices among adolescents. A possible explanation is the structured nature of the interventions, coupled with repeated exposure to health messages. Such outcomes suggest that school-based health education can significantly influence adolescent choices when delivered consistently. Stakeholders should ensure that these programs are institutionalized and sustained through supportive policies, teacher training, and funding.

Despite these promising results, challenges remain. About one-third of respondents had poor knowledge or less than optimal behavioural change. Furthermore, about a tenth of respondents reported poor attitudes, which could be due to differences in program exposure, delivery methods, or personal interest. This is concerning, as incomplete or passive participation may undermine the long-term goals of school health programs. Continuous

evaluation, feedback mechanisms, and targeted support for less-engaged students are needed to close this gap.

Conclusion

School-based health education in Irrua has positively influenced adolescents' knowledge, attitudes, and health behaviours, with most showing improved hygiene, healthier lifestyles, and informed decision-making. While the programs are effective, gaps in delivery and engagement remain. Strengthening implementation and adopting more interactive approaches will enhance impact. Continued investment in adolescent health education is essential for long-term health benefits.

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