

Original Research Article

A school-based study of sexual health knowledge among sexually active adolescent girls in Calabar, Nigeria

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ABSTRACT

Background: There is high burden of sexually transmitted infections (STIs) and unwanted pregnancy among young people. In many developing countries including Nigeria, there is paucity of literature on sexual health knowledge among sexually active adolescent girls, as key vulnerable population. This study aimed at assessing level of sexual health knowledge among adolescent secondary school girls in Calabar, Nigeria.

Methods: Cross-sectional study design was used, with recruitment of randomly selected sexually active adolescent girls in three public secondary schools in Calabar. Sexual health knowledge was assessed using structured, pre-tested questionnaire, knowledge scores were converted to percentage, and 50% or greater was considered satisfactory. Factors associated with level of knowledge was assessed using Chi-square test, with p value set at 0.05.

Results: One hundred and eight (180) respondents were studied, with mean age of 17.4 ± 1.2 years (14-19 years). Mean age at sexual debut was 15.0 ± 2.1 years, ranging from 11 to 19 years. Mean knowledge score (out of maximum of 62) was 25.4 ± 4.2 (9-49), corresponding to $41.0 \pm 7.8\%$ (14.5 to 79.0%). Sixty respondents (33.3%) had satisfactory level of knowledge on sexual health. Higher level of paternal and maternal education, married parental status, were associated with satisfactory level of knowledge.

Conclusions: There is suboptimal level of sexual health knowledge among sexually active school girls in Calabar. There is urgent need to provide sexual health educational interventions. The school-based family life HIV education (FLHE) program, should be revived, to mitigate sourcing of false sexual health information from peers.

Keywords: Sexual health, Knowledge, Adolescents, Girls, Calabar, Nigeria

INTRODUCTION

Globally, adolescents are vulnerable to high-risk sexual behavior (HRSB), if they are not appropriately informed and guided on issues of sexual and reproductive health. In most developing countries including Nigeria, the sexual health needs of this vulnerable subpopulation has remained unmet.¹ Social restrictions and norms in typical African settings, limit access to essential information, required for safer sexual behavioral practices.^{2,3} In most of these settings, available sexual health information and services, are insufficient and/or inappropriate for adolescents.³ On

the other hand, high and increasing burden of youth unemployment, peer pressure, access to social media and sexually explicit materials have increased propensity for HRSB.⁴

Unfortunately, though Nigeria has high proportion of young people, there has been little commitment to meeting sexual health needs of this subpopulation, at least with educational interventions.⁵⁻⁷ Neglect of sexual health issues has persisted, despite government's commitment of the 1994 international conference on population and development (ICPD) program of action.^{7,8} Therefore, current sexual behavioral practices among young people

may constitute drawback against attainment of the reproductive health targets of the sustainable development goals (SDGs) in many developing countries including Nigeria.^{7,9}

Assessment of level of sexual health knowledge, which is essential to behavioral practice, is key for successful planning and implementation of educational intervention programs.^{3,7} However, studies on sexual health conducted in sub-Saharan Africa, have mainly focused on behavioral practices, with much neglect of assessment of level of knowledge.^{10,11} Reports from few previous studies among young people in sub-Saharan Africa and other global settings, indicate high prevalence of misconceptions about several sexual health issues, including pubertal changes and sexually transmitted infections (STIs). For instance, previous study among adolescents in Bangladesh, Malaysia, and India, reported 45.2%, 87.6% and 81.3%, not knowing means of STI transmission, respectively.¹²⁻¹⁴ A multicenter study of sexual health knowledge in eight sub-Saharan Africa countries reported poor knowledge of STI, including 44.1% recognizing their means of transmission.¹⁵ In Uganda reported 37% and 8% having knowledge of non-HIV STI and their means of transmission, respectively.¹⁶

In Nigeria, there is paucity of literature on sexual health knowledge among unmarried sexually active in or out-of-school girls. Previous study among adolescent school girls in Ekiti state, South West Nigeria, reported average level of knowledge.¹⁷ The study was however focused on reproductive health, with assessment of knowledge of unsafe abortion, and exclusion of knowledge of STIs. In the Niger-Delta region, a cross-sectional study among adolescents in Uyo, South-South Nigeria, found most female respondents being knowledgeable of HIV (97.6%) and gonorrhea (100%) as common STIs.¹⁸ However, much fewer proportion knew of hepatitis B (0.8%), genital warts (1.6%), human papilloma virus (3.2%) and chlamydia (0.0%) as STIs. Yet, more than half of respondents (56.0%) engage in unprotected sexual intercourse.¹⁸ In particular, adolescents in the region constitutes key vulnerable subpopulation, and have one of the poorest sexual and reproductive health indices in Nigeria.¹⁹ This present study was aimed at assessing level of sexual health knowledge, among in-school adolescents in Calabar, a Metropolitan city in the region.

METHODS

Study design and population

Cross-sectional study was conducted among sexually active adolescent girls in selected senior secondary schools, in Calabar, Cross River State, Nigeria. Data was collected within the four (4) weeks of February 2022. Calabar Municipality is an urban setting with estimated population of 604,546 people.²⁰⁻²² It has 88 and 37 public and private secondary schools, respectively. Of these schools, only seven (7) are single-sex, comprising 2 and 5

boys-only and girls-only schools, respectively. Calabar is noted for having several tourist sites, including the Tinapa Resort and the annual Calabar Christmas Carnival.²³

Sample size

The minimum sample size of 181 secondary school students was determined using the Leslie Kish formula, including assumption of 10% non-response rate.²⁴

$$N = \frac{Z^2 P(1 - P)}{d^2}$$

Where; n is minimum sample size, z is the standard normal deviate for 95% confidence interval which is 1.96, P is proportion in the target population [which is 87.6%, representing proportion that were knowledgeable of abstinence, faithfulness and condom use as key STI prevention measures], and d is degree of accuracy (assuming 5%).

The sample size was rounded off to one hundred and eight (180) students, to ease the process of sampling.¹⁸

Sampling

Multistage sampling method was used to recruit respondents into the study. In the first stage, simple random sampling by balloting, was used to select 3 out of 85 co-educational public secondary schools in Calabar Municipality. In the second stage, simple random sampling by balloting was also used to recruit sixty (60) sexually active adolescent girls from each senior secondary arm in each of the three selected school, totalling sample of one hundred and eighty (180) respondents. If a selected student did not assent or their parents did not consent to participating, then a replacement was done via balloting among remaining sexually active students who were not selected.

Eligibility

Sexually active adolescent girls within 10-14 years in the selected schools were eligible to participate in the study. Status of sexual activity was inferred from responses to probes on period and experiences of sexual debut, as well as last sexual intercourse. Students who provided unclear or doubtful responses to these probes were excluded. Also, students whose sexual experiences only comprised assault or rape, especially during their sexual debut, were also excluded.

Study protocol and data collection

Following ethical approval, permission was sought and obtained from authorities in the selected schools, before conducting the study. With the aid of trained research assistants, the study instrument, which comprised structured questionnaire, was pretested among twenty (20) students in similar setting. Changes were made to finalize

the questionnaire following pre-testing. Recruitment of respondents and interviewer administration of the questionnaire was then carried out. Parents of recruited students were informed about the study and their consent obtained before data collection. Assent was also obtained from the respondents before data collection. There was assurance of voluntary participation and confidentiality of information obtained.

Instrument

Structured questionnaire used in this study, comprised information on sociodemographic characteristics, source of information on sexual health and knowledge of various components of sexual health. Sexual health knowledge was assessed using 62 items, comprising pubertal changes (5), types (10), transmission (15), symptoms (10), complications (6) and prevention (11) of STIs and unwanted pregnancy (5). The instrument was adapted from validated tools for assessment of sexual health knowledge, including the Miller-Fisk sexual knowledge questionnaire and sexual literacy survey.^{25,26} Findings from literature and the sociocultural peculiarities of the study setting were also considered in the questionnaire development and finalization. Pre-testing of the questionnaire was done, with attainment of Cronbach alpha of 0.76 before use for data collection.

Data analysis

Data entry and analysis was done using statistical package for the social sciences (SPSS) version 26.0. Tables, cross-tables and bar chart was used to present data. Each correct response to knowledge items, contributed one unit to total maximum score of 62. Total score was obtained for each respondent and mean score computed. Scores were also converted to percentage, and 50% was considered benchmark for satisfactory level of knowledge on sexual health. Chi-square inferential statistic was used to assess factors associated with satisfactory level of sexual health knowledge. P value was set at 0.05.

RESULTS

Data was obtained from one hundred and eighty (180) respondents, with response rate of 92.3%. Most respondents were younger than 18 years old (58.3%), had parents that were married (58.3%), had father (75.0%) and mother (59.4%) with at least secondary level of education (Table 1). The most common residential status of respondents was living with both parents (47.2%), while Efik (25.0%) and Ejagham (19.4%) were the common ethnic groups.

Table 2 shows mean levels of sexual health knowledge for all items, as well as each of construct assessed. Mean knowledge score was 25.4 ± 4.2 , out of maximum of 62 points. This corresponds to mean percentage score of $41.0 \pm 7.8\%$. Except for knowledge of anatomical/pubertal changes and unintended pregnancy, all other knowledge

constructs had means scores less of less than 50%. Figure 1 shows categories of sexual health knowledge among respondents. Approximately one-third (33%) of respondents, had satisfactory level of knowledge of sexual health.

Table 1: Sociodemographic characteristics of respondents (n=180).

Variable	Frequency (N)	Percentage (%)
Class		
SS1	45	25.0
SS2	65	36.1
SS3	70	38.9
Age group (in years)		
<18	105	58.3
≥18	75	41.7
Father education		
None	20	11.1
Primary	25	13.9
Secondary	75	41.7
Tertiary	60	33.3
Mother education		
None	25	13.9
Primary	50	27.8
Secondary	55	30.6
Tertiary	50	27.8
Parents marital status		
Married	105	58.3
Divorced/separated	45	25.0
Widowed	15	8.3
Cohabiting	15	8.3
Residence		
Live with both parents	85	47.2
Live with mother only	25	13.9
Live with father only	15	8.3
Live with guardian	55	30.6
Ethnic group		
Efik	45	25.0
Ejagham	35	19.4
Yakurr	25	13.9
Annang/Ibibio	30	16.7
Ibo	15	8.3
Others*	30	16.7

*Other ethnic groups include Yoruba, Hausa, Ijaw.

Results on Table 3, show proportion of respondents providing correct responses to questions in the various components of knowledge of sexual health at baseline. Less than half of respondents knew that a teenage boy (below 18 years old) could potentially impregnate a girl (38.9%), and that mid-menstrual period was not the safest period (22.2%) (Table 2). Low level of knowledge of type of STI was reported for hepatitis B (25.0%), genital herpes (19.4%) and chlamydia (13.9%). Only 38.9% of respondents, knew that oral sex was potential means of

transmission of STI. Possible recurrence of STI was known by 27.8%.

Only five respondents (2.8%) knew that STIs may be asymptomatic, while 13.9% did not know that genital ulcer was a sign of STI (Table 3). Less than one-third (30.6%) knew that cervical cancer was potential complication of STI, while one-third (33.3%) thought that contraceptive pills could protect against STI. Availability of human papilloma virus (HPV) and hepatitis B vaccines, was known by 8.3% and 22.2%, respectively. A quarter (25.0%) considered condom to be reusable, while 16.7% thought that condom could protect against all forms of STIs. Only a quarter (25.0%) of respondents knew of correct way to use emergency contraceptive pill, while 44.4% considered that becoming pregnant would not affect a girl child's educational career.

Table 4 shows result of factors associated with satisfactory level of sexual health knowledge. Low level of parental education and widow status of parents were associated with unsatisfactory level of sexual health knowledge

($p < 0.05$). Age and residential location of respondents, were not associated with level of knowledge. There was also no significant difference in mean age, comparing respondents with satisfactory and those with unsatisfactory level of sexual health knowledge (17.25 versus 17.50 years, $p = 0.41$).

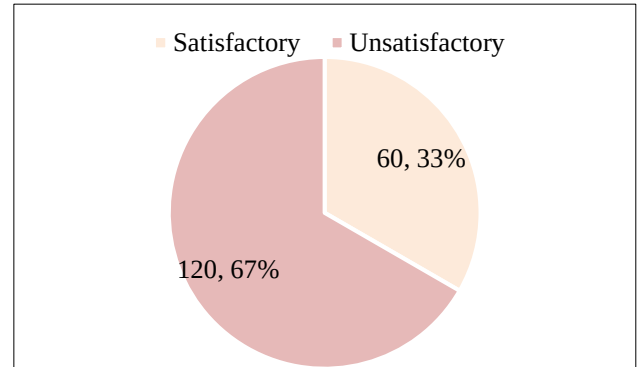


Figure 1: Pie chart showing level of knowledge on sexual health (n=180).

Table 2: Knowledge, attitude and practice of sexual health at baseline (n=180).

Variable	Maximum point scale	Knowledge score	Percent score
		Mean±SD	Mean±SD
Total/all knowledge items	62	25.4±4.2	41.0±7.8
Knowledge of anatomical, physiological and psychological puberty changes	5	2.6±1.1	56.8±6.5
Knowledge of types of STI	10	3.6±1.3	35.6±7.8
Knowledge about transmission of STI	15	7.2±2.4	47.8±7.9
Knowledge of symptoms and signs of STI	10	3.6±1.4	36.4±5.8
Knowledge of complications of STI	6	2.3±1.1	38.4±7.8
Knowledge of prevention of STI	11	3.6±1.6	32.6±8.0
Knowledge of unintended pregnancy and its consequences	5	2.6±1.2	51.1±9.3

Table 3: Sexual health knowledge among respondents (N=180).

S. no.	Knowledge area/item	Correct response
		Frequency (%)
A		
1	A girl cannot become pregnant if she has not started menstruating	165 (91.7)
2	It is normal for adolescent boys to have wet dreams	105 (58.3)
3	Most people have their sexual behaviors formed during adolescence	95 (52.8)
4	A boy cannot impregnate a girl until he is at least 18 years old	70 (38.9)
5	A girl’s safest period is the days around the middle of her menstrual period	40 (22.2)
B	Which are examples of STI?	
6	Malaria	60 (33.3)
7	Gonorrhea	85 (47.2)
8	Hepatitis B	45 (25.0)
9	Leprosy	80 (44.4)
10	Genital herpes	35 (19.4)
11	Vitiligo	20 (11.1)
12	Syphilis	70 (38.9)
13	HIV/AIDS	155 (86.1)
14	Tuberculosis	65 (36.1)
15	Chlamydia	25 (13.9)

Continued.

S. no.	Knowledge area/item	Correct response
		Frequency (%)
C	Which are means of STI transmission?	
16	Poor hygiene	115 (63.9)
17	Blood transfusion	90 (50.0)
18	Vaginal sex	150 (83.3)
19	Hugging an infected person	100 (55.6)
20	Oral sex	70 (38.9)
21	Anal sex	100 (55.6)
22	Mosquito bite	85 (47.2)
23	Not using condom	105 (58.3)
24	Shaking hands with infected persons	95 (52.8)
25	Using public toilet	75 (41.7)
26	Using public swimming pool	75 (41.7)
27	mother-to-child transmission during pregnancy	75 (41.7)
28	Sharing needles and sharp objects	85 (47.2)
29	Sharing clothes with infected person	70 (38.9)
30	A person who has been treated for STI cannot get the infection again	50 (27.8)
D	Which is a symptom or sign of a STI?	
31	Vaginal or urethral discharge	75 (41.7)
32	Penile discharge (for men)	85 (47.2)
33	Headache	65 (36.1)
34	Abdominal pains	85 (47.2)
35	Fever	120 (66.7)
36	Lump in the breast	50 (27.8)
37	Genital ulcer	25 (13.9)
38	Leg swelling	45 (25.0)
39	Pain while passing urine	100 (55.6)
40	There may be no symptom at all	5 (2.8)
E	Which is a complication of STI?	
41	Infertility	115 (63.9)
42	Hypertension	55 (30.6)
43	Abortion	50 (27.8)
44	Cervical cancer	55 (30.6)
45	Diabetes mellitus	40 (22.2)
46	Death	100 (55.6)
F.	Which is a means of preventing STI	
47	STI can be prevented by washing private parts immediately after sex	80 (44.4)
48	Abstaining from sex until marriage is the best form of preventing STI	105 (58.3)
49	Condom protects against all forms of STI	30 (16.7)
50	There is vaccine for prevention of hepatitis B infection	40 (22.2)
51	There is vaccine for prevention of human papilloma virus	15 (8.3)
52	There is vaccine for prevention of hepatitis C infection	10 (5.6)
53	If you are sexually active, you should test for STI regularly	105 (58.3)
54	Contraceptive pills protect against STI	60 (33.3)
55	A condom can be used more than once during same period of sex	45 (25.0)
56	Condom should not be removed when the penis is hard/stiff	40 (22.2)
57	Having many sexual partners increases chance of having STI	115 (63.9)
G	Knowledge of unintended pregnancy and its consequences	
58	Using blood gives more accurate pregnancy test result compared with urine	95 (52.8)
59	Emergency contraception pill taken after 72 hours of sex can prevent pregnancy	45 (25.0)
60	Underage teenagers are more likely to have health problems during pregnancy and child birth, compared with older women	110 (61.1)
61	Becoming pregnant will not affect a girl's chances of finishing school	80 (44.4)
62	Having an abortion may cause difficult in having children in future	130 (72.2)

Table 5: Factors associated with knowledge of sexual health (n=180).

Variable	Knowledge category			P value
	Unsatisfactory, n=120 N (%)	Satisfactory, n=60 N (%)	Total, n=180 N (%)	
Age group (in years)				
<18	65 (54.2)	40 (66.7)	105 (58.3)	0.11
≥18	55 (45.8)	20 (33.3)	75 (41.7)	
Father's educational level				
No formal	15 (12.5)	5 (8.3)	20 (11.1)	0.00
Primary	25 (20.8)	0 (0.0)	25 (13.9)	
Secondary	45 (37.5)	30 (50.0)	75 (41.7)	
Tertiary	35 (29.2)	25 (41.7)	60 (33.3)	
Mother's educational level				
No formal	20 (16.7)	5 (8.3)	25 (13.9)	0.02
Primary	35 (29.2)	15 (25.0)	50 (27.8)	
Secondary	40 (33.3)	15 (25.0)	55 (30.6)	
Tertiary	25 (20.8)	25 (41.7)	50 (27.8)	
Parent marital status				
Married	70 (58.3)	35 (58.3)	105 (58.3)	0.00
Divorced/separated	30 (25.0)	15 (25.0)	45 (25.0)	
Widowed	15 (12.5)	0 (0.0)	15 (8.3)	
Cohabiting	5 (4.2)	10 (16.7)	15 (8.3)	
Residential status				
Living with both parents	55 (45.8)	30 (50.0)	85 (47.2)	0.67
Living with mother only	15 (12.5)	10 (16.7)	25 (13.9)	
Living with father only	10 (8.3)	5 (8.3)	15 (8.3)	
Living with guardian	40 (33.3)	15 (25.0)	55 (30.6)	

DISCUSSION

Adolescence is a critical period for establishment of sexual behavioral practices. Their level of sexual health knowledge is an essential determinant behavioral practice. This is one of few studies which focused on assessing sexual health knowledge among sexually active in-school adolescent girls in a developing country setting. Despite having 50% as simple benchmark criteria, only 41.0% of adolescent school girls had satisfactory level of sexual health knowledge. This low level of knowledge, may be a reflection of decades of lack of sexual educational intervention in the study area. Previous studies in Malaysia, India, Uganda, Ekiti and Uyo, also reported suboptimal levels of sexual health knowledge, with less than half of respondents knowing key means of STI transmission in these studies.¹³⁻¹⁸ Poor knowledge of sexual health may be contributing to HRSB, resulting in high burden of STIs and unwanted pregnancy, with attendant complications including infertility and truncated educational career for the girl child.²⁷

Findings from this study revealed key areas of poor sexual health knowledge among adolescent girls. Concerning anatomical/pubertal changes, poor level of knowledge about safe periods within the menstrual cycle, and that teenage boys could potentially impregnate a girl, could be contributing to unwanted pregnancy and transmission of

STIs among adolescents.²⁸ Lack of knowledge of sexual transmissibility of hepatitis B, genital herpes and chlamydia, may also contribute to poor perception of risk of unprotected sexual intercourse, even if they recognize or suspect their partners to be infected with these infectious diseases. In particular, hepatitis B is currently incurable, while genital herpes may be contracted even with use of condom. Potentially impaired perception of risk of contracting or transmitting these STIs, may contribute to poor or non-uptake of the requisite protective vaccines, in tune with the health belief model (HBM).^{28,29} In other words, low levels of perceived susceptibility and seriousness of these STIs, may mitigate against demonstration of self-efficacy of vaccine uptake for its prevention.²⁹

The possibility of STIs being asymptomatic, as well as recurrence after treatment, was not known by most respondents in this study. These findings suggest that adolescents who get treated for STI, may perceive that they are immune from reinfection. This scenario may potentially drive further HRSB, with potential spread of more resistant strain, increased morbidity and mortality and difficulty in disease control within the region.²⁷ Cervical cancer as long-term complication of sexually transmitted HPV, was not known by most respondents. Though HPV infection is common among sexually active women, knowledge of its cervical cancer causing potential

and infection preventability via vaccination, may have enabled delay in sexual debut and vaccine uptake in tune with HBM.³⁰

This study found that low level of paternal and maternal level of education was associated with unsatisfactory level of sexual health knowledge. This finding suggests that parents with low level of knowledge, may also not be knowledgeable of the potential adverse implications of not supporting provision of sexual health education to their children. Higher level of education (of at least secondary school), may be required for effective synthesis and understanding of sexual health information available via the various media.³¹ Parental level of education as key determinant of sexual health knowledge, was also reported in similar studies in the United States of America (USA).³² Compared with less educated parents, those that were more educated, communicated sexual health information better, amidst trustworthy relationship as guardians to their adolescent children. Information provided by educated parents as role models, may be perceived to be valid, towards potentially establishing safer sexual behavioral practices.³³

Widowhood status of parents of respondents was found to be associated with poor level of sexual health knowledge. Perhaps the widows strive to cope with psychosocial and economic challenges associated with widowhood in many developing country settings, may distract from supporting provision of sexual health education to their children.^{34,35} While widows seek to meet survival or basic family needs as breadwinners in these settings, there may be little time available for more interactive engagement of their adolescent children on sexual health issues.^{34,35}

Limitations

This study has notable limitations. Potential effects of religion, poverty and neighborhood on sexual health knowledge were not explored. Also, due to the sensitive nature this study, some parents did not consent to their children's participation, hence they were excluded. There may have been selection bias, which potentially over or under-estimates overall mean values, especially if these excluded students had much higher or lower level of sexual health knowledge. It is also possible that despite use of interviewer-administration of the questionnaire, there may have been over or under-reporting of sexual health information.

CONCLUSION

Overall, findings from this study, indicate substantially poor level of sexual health knowledge among adolescent school girls. There is urgent need for effective educational programs, aimed at addressing this knowledge gap, towards guiding informed sexual health decisions and leading healthy lives. These programs should be school-based, but may include use of radio, television and other mass media, to improve likelihood and duration of

exposure to sexual health information among adolescents with unmet knowledge needs. In particular, Government of Nigeria, should improve on existing policies and programs on sexual and reproductive health among adolescents. This should include revival of the family life HIV education (FLHE) program, which provides comprehensive sexual health education at secondary schools.

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