

Determinants of Age at Sexual Initiation among Nigerian Adolescents: A Study of Secondary Schools Students in a Military Barracks in Nigeria

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Abstract Context: Adolescent sexual behavior is shaped by series of interlinking individual and family related factors. Information on how these factors influence early sexual debut could help in mounting programmatic strategies to modify adolescent sexual behavior. **Objective:** To determine the age at first sexual intercourse and its determinants among senior secondary schools students in Ojo military barracks, Lagos. **Materials and methods:** This was a cross-sectional study of 400 senior secondary schools students in Ojo military barracks, Lagos, selected using multistage sampling technique. Data was collected using pretested, self-administered semi-structured questionnaires and analysed using statistical package for social sciences version 17. Tests of statistical significance were carried out using chi-square and t-tests. A p value of < 0.05 was considered significant. **Results:** The age group at which respondents had their first sexual intercourse ranged from 10 to 19 years, the mean ages are 14.1±1.2 and 13.4±1.5 for males and females, while the modal and median ages at first sexual intercourse for both gender are 11 and 12 years respectively with a cumulative frequency percent of 56.5. The girls initiated sex earlier than the boys (p= 0.001). Those brought up by one parent initiated sex at an earlier age (p= 0.000), while age of sex initiation increased with maternal (p= 0.000) and paternal education (p= 0.001). **Conclusions:** Age at sexual debut was found to be associated with younger age, gender, living with a one parent and parents' educational status. We recommend formal comprehensive sex education programs targeted at delaying age at first sex.

Keywords: adolescents, determinants, sexual initiation, military barracks, Lagos

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1. Introduction

An individual's sexual debut is embedded with multiple personal and social connotations. For adolescents, it is a marker (one of the first) of the transition from adolescence to adulthood. [1]

Globally, considerable decline in the age at which adolescents initiate sexual intercourse is a recurring public health concern. [2,3] Early age at sexual initiation exposes adolescents to serious health consequences such as unwanted pregnancy, sexually transmitted infections (STIs), including Human Immunodeficiency Virus (HIV), increased risk of human papilloma virus infection, cancer of the cervix and delays in maturation toward healthy adult psychosocial adjustment. [4,5,6,7,8] Early age at sexual initiation has also been associated with higher number of lifetime sexual partners, higher rate of school drop-out as well as detrimental social and economic

consequences. [8] Age at first sex is therefore an important indicator of exposure to these aforesaid risks [6].

As adolescents mature, they acquire the knowledge and skills to negotiate for sex. [9] Therefore, delaying adolescent age at sexual initiation has been key in most interventions in sub-Saharan Africa. [10,11,12,13] However, effective interventions in Nigeria have been marred by dearth of information on contextual factors influencing adolescent sexual behavioral patterns. [14,15] In addition, institutionalization in barracks, also underscores the importance of creating a supportive environment that would effectively promote healthy sexual behavior among adolescents living in there. It is thus timely to examine the age at which adolescents initiate sexual activities and describe determinants that guide this behavior. This study therefore aims at describing time to sexual initiation and associated determinants among adolescents in secondary schools in Ojo military barracks, Lagos.

2. Methodology

2.1. Description of Study Setting

Ojo military cantonment is one of the military barracks in Nigeria. It is located in Ojo local government area of Lagos state in south western Nigeria. The barracks has an estimated population of over 30,000 inhabitants comprising military personnel from various army units, their families and dependants.

Three secondary schools are located within the barracks. These include one army- owned co-educational school (Command Day Secondary school) and two Lagos state owned schools, Cantonment Girls' secondary and Cantonment Boys' High schools. The barracks also has located in it, a Medical Centre that offers curative services, immunization and family planning services to the military personnel, their families and dependants.

2.2. Study Design

A cross sectional descriptive survey was done.

2.3. Study Population and Selection Criteria

The study population comprises senior secondary schools (SSS) one to three students of the three secondary schools. The three schools have a total population of 2903 (SSS1-3) students; a breakdown of this population is as follows:-Command Day Secondary School=1512; Army Cantonment Boys' Senior Secondary School=671; Army Cantonment Girls' Senior Secondary School=720. Each class (SSS1-2) is made up of between 5-7 arms in each of the three schools while SSS3 classes have 3-4 arms.

2.3.1 Inclusion criteria: Senior secondary schools students of the three secondary schools who consent to this study.

2.3.2 Exclusion criteria: Students residing outside the barracks and students whom none of the parents is a military personnel are excluded from this study.

2.4. Sample Size Determination

In a previous study in Nigeria among similar population, level of sexual activity (p) was 52.0%. [16] Therefore, $p = 0.52$. The sample size was determined using the formula for the calculation of sample size in populations greater than 10,000, $n = z^2 pq/d^2$, [17] where n = minimum sample size; p = proportion of sexually active respondents; d =desired precision at 5%; z = a constant at 95% confidence interval $z = (1.96)$. Substituting values,

$$n = \frac{(1.96)^2 \times 0.52 \times 0.48}{(0.05)^2} = 383.55.$$

Then a conversion was made using the formula for the calculation of minimum sample size for populations less than 10,000,

$$nf = \frac{n}{1 + n/N}, [17]$$

where N = target population= 2,903

$nf = 340$ students.

Anticipating a response rate of 90%, an adjustment of the sample size estimate to cover for non- response rate

was made by dividing the sample size estimate with a factor f , i.e. n/f , where f is the estimated response rate. [17] Thus the calculated sample size $= 340/0.90 = 378$ students. However, 400 questionnaires were distributed.

2.5. Sampling Technique

A multistage sampling technique was used.

Firstly, simple random sampling technique was used to select three arms from each of the classes (SSS1-2) and 2 arms of the SSS3 classes.

Secondly, stratified sampling technique was used to proportionately allot respondents according to relative school populations.

- Command Day Secondary School (CDSS) = 232 =58.0%
 - Cantonment Girls' High School = 95 =23.8%
 - Cantonment Boys' High School = 73 =18.2%
- Total minimum sample size=400=100%.

Thirdly, the class registers were used as the sampling frame. For the single sex schools, simple random sampling technique by balloting without replacement was used to select eligible and consenting students until the required number allotted to the selected arms in each class (SSS1-3) has been obtained. For CDSS (which is a co-educational school), the class registers were initially stratified by sex into males and females. Then proportionate sample of each sex was taken using simple random sampling technique to select eligible and consenting students until the required number allotted to the selected arms in each class (SSS1-3) has been obtained.

2.6. Data Collection Technique

Data collection in this study employed pre-tested, self-administered structured questionnaires developed from review of relevant literatures and interview of some adolescents. All questions were written in English language and pre-tested in similar schools in Navy Barracks Ojo. This was done, to check for its reliability and validity. Also determined were the appropriateness of format and wording of the questionnaire as well as time needed to carry out interviews. Thereafter the instruments were reviewed by colleagues, necessary adjustments and corrections were effected before administering the questionnaire to the study population. The questionnaire is divided into three sections (A-C) to obtain data on A) the socio- demographic characteristics of the respondents; B) the ever had sex and age at first sexual intercourse and C) socio-demographic characteristics and mean age at first sexual intercourse.

2.7. Data Management and Statistical Analysis

The data were scrutinized and entered into the computer. Data cleaning was done by carrying out range and consistency checks. Data were analyzed in respect to the socio-demographic characteristics of the respondents; the ever had sex, age at first sexual intercourse and the relationships between socio-demographic characteristics and mean age at first sexual intercourse.

Descriptive and analytical statistics of the data were carried out using statistical package for social sciences (SPSS) Windows version 17.0. [18] Tests of statistical significance were carried out using chi square test for

proportions and t-test for means. A p value of < 0.05 was considered significant. Descriptive data were presented as charts as well as simple frequencies, percentages and as summary indices like means cum standard deviations where appropriate.

2.8. Ethical Consideration

Written permission to carry out this study was sought and obtained from the Barracks' Commander and the Principals of the three schools. Consent and co-operation of the respondents was solicited and obtained for the conduct and publication of this research study. All authors hereby declare that the study has been examined and approved by the University of Ibadan and University College Hospital ethics committee, Nigeria and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

3. Results

A total of 400 respondents participated in the study. This was made up of representative samples from the co-educational school and the two single- sex schools. The response rate was 100%. Table 1 shows the socio-demographic distribution of the respondents. The majority of the students 391(97.8%) were in the adolescent age group (10-19 years); all the respondents above 19 years were from the girls' school. The mean age of the respondents was 15±2.4 for males and 15±2.2 for females. A higher proportion of them 258(64.5%) reside in the quarters for the 'non-commissioned' soldiers while 215(54.5%) of them did some form of income earning jobs.

Table 1. Distribution of respondents' socio-demographic characteristics

Characteristics	Male n (%)	Female n (%)	Total n (%)
School			
Co-educational school	148 (67.0)	84 (47.0)	232 (58.0)
Girls' school	0 (0.0)	95 (53.0)	95 (23.7)
Boys' school	73 (33.0)	0 (0.0)	73 (18.3)
Total	221 (100.0)	179 (100.0)	400 (100.0)
Age group (yrs)			
10 – 14	88 (40.0)	63 (35.0)	151(37.8)
15 - 19	133 (60.0)	107 (60.0)	240 (60.0)
20 – 24	0 (0.0)	9 (5.0)	9 (2.2)
Total	221 (100.0)	179 (100.0)	400 (100.0)
Sex	221(55.3)	179(44.7)	400 (100.0)
Religion			
Christian	130 (59.0)	119 (66.0)	249 (62.3)
Moslem	91(41.0)	60 (34.0)	151 (37.7)
Total	221 (100.0)	179 (100.0)	400 (100.0)
Residence			
Officers' Quarters	84 (38.0)	58 (32.0)	142 (35.5)
Other ranks Quarters	137 (62.0)	121 (68.0)	258 (64.5)
Total	221 (100.0)	179 (100.0)	400 (100.0)
Doing income job			
Yes	119 (54.0)	99 (55.0)	215 (54.5)
No	102 (46.0)	80 (45.0)	185 (45.5)
Total	221 (100.0)	179 (100.0)	400 (100.0)

Table 2 shows the ever had sexual intercourse and age group at first sexual intercourse. One hundred and fifty four (38.5%) of the respondents have had penetrative sexual intercourse at one time or the other; 81(52.6%) of them were males and 73(47.4%) were females. However there was no statistically significant association between this practice and gender ($\chi^2=0.713$, $p=0.200$).

Table 2. The ever had sexual intercourse

Ever had sexual intercourse	Male n (%)	Female n (%)	Total n (%)
Yes	81 (52.6)	73 (47.4)	154 (100.0)
No	140 (56.9)	106 (43.1)	246 (100.0)
Total	221 (100.0)	179 (100.0)	400 (100.0)

($\chi^2=0.713$, $df=1$, $p=0.200$).

Table 3 shows the ages and age groups at first sexual intercourse. The modal age is 11 years for both gender with 17 (21.0%) males and 18 (22.4%) females totaling 35 (22.7%) of the ever had sex. The age group at which respondents had their first sexual intercourse ranged between 10-19 years, over 70.0% of these occurring in early adolescent period (10-14years) and mean ages of 14.1±1.2 years for males and 13.4±1.5 for females. This comprised 74.0% males and 67.2% females. However there was no statistically significant difference in this practice between the two gender ($\chi^2=0.817$, $df=1$, $p=0.176$).

Table 3. Age at first sexual intercourse

Age at first sexual intercourse (yrs) n=154	Male n (Cum %)	Female n (Cum %)	Total n (Cum %)
10	10 (12.3)	18 (24.7)	28 (18.2)
11	17 (33.3)	18 (49.4)	35 (40.9)
12	17 (54.3)	7 (59.0)	24 (56.5)
13	7(62.9)	1(60.4)	8 (61.7)
14	9 (74.0)	5(67.2)	14(70.8)
15	2(76.5)	4(72.7)	6(74.8)
16	3(80.2)	0(72.7)	3(76.7)
17	6(86.7)	15(93.2)	21(90.3)
18	9(98.7)	1(97.7)	10(96.8)
19	1(100.0)	4(100.0)	5(100.0)
Total	81 (100.0)	73 (100.0)	154(100.0)
Age group at first Sexual intercourse (yrs) n=154			
10 – 14	60 (74.1)	49 (57.2)	109 (70.8)
15 - 19	21 (25.9)	24 (42.8)	45 (29.2)
Total	81 (100.0)	73 (100.0)	154(100.0)

($\chi^2=0.817$, $df=1$, $p=0.176$).

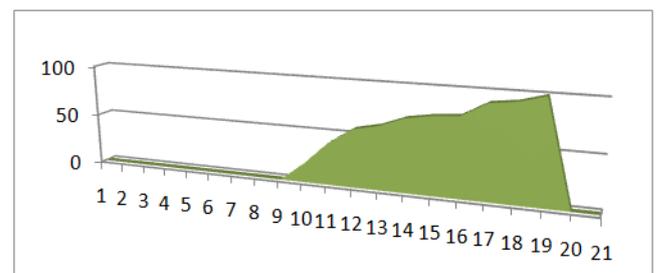


Figure 1a. Cumulative frequency curve showing age at sexual debut for all respondents (KEY: Y-axis = cumulative age %; X axis = age in years)

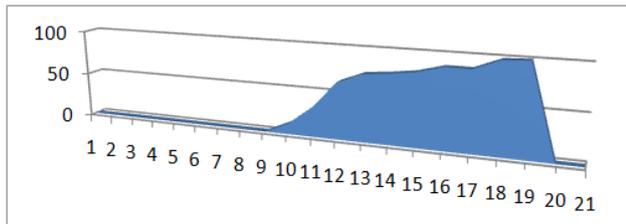


Figure 1b. Cumulative frequency curve showing age at sexual debut for male respondents (**KEY:** Y-axis = cumulative age %; X axis = age in years)

Figures 1a, 1b and 1c show the cumulative frequency percent and median ages at which respondents had their first sexual intercourse for both gender, males and females respectively. The median age at first sexual intercourse for both males and females is 12 years with cumulative

frequency percent of 56.5. The median age at first sexual intercourse for males is 12 years with cumulative frequency percent of 54.3, while the median age at first sexual intercourse for females is 12 years with cumulative frequency% of 59.0.

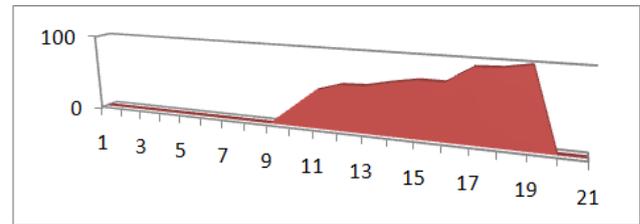


Figure 1c. Cumulative frequency curve showing age at sexual debut for female respondents (**KEY:** Y-axis = cumulative age %; X axis = age in years)

Table 4. Socio-demographic characteristics and mean age at first sexual intercourse

Characteristics intercourse	No	t- test	Mean age at first	SD (I)	Test statistic	P-value
Age Group*						
10-14 yrs	109		11.0	1.0		
15-19 yrs	45		13.9	3.0	4.44, df=152	0.000
TOTAL	154					
SEX*						
Male	81		14.1	1.2		
Female	73		13.4	1.5	3.16 df=152	0.001
TOTAL	154					
SCHOOL*						
Co-educational	67		11.1	1.1		
Male single sex	44		14.8	2.7	9.91 df=152	0.000
Female single sex	43		14.9	3.8		
TOTAL	154					
RELIGION**						
Christian	108		13.0	3.2		
Moslem	46		14.0	3.0	1.85 df=152	0.10
TOTAL	154					
RESIDENCE**						
Officer's quarters	47		13.5	3.1		
Non-commissioned soldier's qrts	107		13.2	2.4	0.595	>0.10
TOTAL	154					
FAMILY TYPE**						
Polygamous	101		12.9	2.8		
Monogamous	53		14.0	3.6	1.93	>0.05
TOTAL	154					
FAMILY SITUATION*						
Living with both parents	50		15.4	3.0		
Living with one parents	97		13.2	6.2	3.68 df=152	0.000
Other arrangements	7		13.1	2.8		
TOTAL	154					
MOTHER'S EDUCATION*						
No formal education	18		11.6	2.7		
Primary	43		12.3	2.4		
Secondary education	56		14.7	3.4	6.38 df=152	0.000
Tertiary education	37		14.9	2.4		
TOTAL	154					
FATHER'S EDUCATION*						
Primary education	54		12.4	3.6		
Secondary education	62		12.7	2.9	3.02 df=152	0.001
Tertiary education	38		14.2	2.8		
TOTAL	154					
SHARING ROOM WITH OPPOSITE SEX*						
Yes	89		11.3	1.7		
No	65		13.8	2.7	6.10 df=152	0.000
TOTAL	154					
DOING INCOME JOB*						
Yes	101		12.4	3.3		
No	53		13.8	2.7	3.02 df=152	0.001
TOTAL	154					

* p<0.05 statistically significant.

Table 4 shows socio-demographic characteristics and mean age at first sexual intercourse. The mean age at sexual debut was shown to increase with the increasing age of the respondents. The mean age at first sexual intercourse for early adolescents was 11.0 ± 1.02 . There was a statistically significant difference in mean age of sexual debut between early and late adolescents ($t=4.44$, $p=0.000$). The girls initiated sex earlier than the boys with a mean age of 13.4 ± 1.5 ($t=3.16$, $p=0.001$). Students from the mixed school initiated sex at an earlier age with a mean age of 11.1 ± 1 than those from single sex schools- 14.9 ± 3.8 for girls and 14.8 ± 2.7 for the males. This finding was statistically significant ($t=9.91$, $p=0.000$). Christians were found to initiate sexual intercourse at an earlier age than the Moslems but the difference in the mean age for the two categories was not statistically significant ($t=1.85$, $p=0.10$). The mean age at sexual debut among students residing in both low and high density quarters were almost the same 13.5 ± 3.1 and 13.2 ± 3.2 ($t=0.595$, $p>0.10$). Those that did income-earning jobs also initiated sex earlier than those that did not. This finding was statistically significant ($t=3.02$, $p=0.001$). Respondents from polygamous families initiated sexual intercourse at an earlier age than those from monogamous families. However, this finding was not statistically significant ($t=1.93$, $p>0.05$). The students brought up by one parent initiated sex at an earlier age ($t=3.68$, $p=0.000$). Age of sex initiation increased as maternal education increased from secondary to tertiary education ($t=6.38$, $p=0.000$). A similar pattern was also observed with the fathers' education, students whose fathers had primary education initiated sex earliest 12.4 ± 3.6 , followed by those whose fathers had secondary education 12.7 ± 2.8 years, ($t=3.02$, $p=0.001$). Respondents sharing room with parents or adult relations of opposite sex were found to have initiated sex earlier with a mean age of 11.3 ± 1.7 years compared to those who did not ($t=6.10$, $p=0.000$).

4. Discussion

Majority of the respondents (97.7%) were aged between 10-19 years. This corresponds to the adolescent age group. [19,20] It is a transition period to adulthood which is linked with series of issues that affect their body, behavior and social interactions. [21,22] Behaviors that are acquired during this period have immense implications for their health and wellbeing. They are likely to have proclivity for sexual experimentation and a great number of them initiate sexual activity during this period. [23]

The findings of this study revealed high magnitude of early sexual debut among adolescents in this population with over seven out of ten of these occurring in early adolescent period (10-14years), at the modal age of 11 years. This finding agrees with the finding of another study that by age 13 years over a quarter of the students studied were sexually active. [14] It corroborates the findings by Upchurch et al., [1] in Los Angeles, Mmbaga et al., [8] and Masatu et al., [9] in Tanzania, that increase in age was associated with lower magnitude of early sexual debut. The authors thence adduced that as adolescents mature, they acquire the knowledge and skills to navigate relationships successfully, such that the rate of sexual escapade is curtailed as adolescents advance in age.

We therefore concur with other authors who earlier posited that delaying age at sexual debut among adolescents is a key intervention strategy in controlling risky sexual behavior in this age group [10,11,12,13].

Age at first intercourse is an indicator and a summary measure of the average age at which adolescents become sexually active. [24] However, information concerning age of sexual initiation can be conveyed in different ways. For example, as: mean age at first intercourse; median age at first intercourse and percent or proportion of adolescents who have ever had intercourse by select reference ages (e.g. 13, 14, etc) or combinations of these. [24] This study examined the trends in associations between socio-demographic characteristics of the respondents and their mean ages at first sexual intercourse.

The mean age at first sexual intercourse was 11.0 ± 1.02 for early adolescents and 13.9 ± 3.0 for late adolescents. This falls below the Nigerian national average figure of 19.7 years. [25] However, Duru et al., [21], Olugbenga-Bello et al., [26] and Imaledo et al., [16] in Nigeria reported mean ages at sexual debut of 15.08 ± 0.2 , 15.2 ± 1 and 17.0 ± 4.5 years respectively. Also a school-based cluster randomized control trial among early adolescents in Dar es Salaam Tanzania reported the mean age at sexual debut of 12 years. [27] Other studies conducted among in school adolescents in Tanzania showed mean ages at sexual debut to be 14.6 and 15.5 years respectively [9,28].

From our study, the mean age at sexual debut was shown to increase with increasing age of the respondents. Slap et al., in Nigeria reported that in the youngest age group, 25.3% of 12 year olds and 30.9% of 14 year olds reported sexual activity, suggesting that sexual initiation is more likely at age ≤ 12 years than it is between 12 and 14 years. [14] Research findings have shown that early adolescent sexual activity was associated with liberal attitudes about negative sexual outcomes while older age was protective [4].

In this study, the mean age at first sexual intercourse suggested that females initiated sex earlier than males. This report is contrary to reports from previous studies in which males initiated sex at earlier ages. [3,4,14] Despite this variation in findings, research has posited that girls who were early starters reported liberal attitude towards negative sexual outcomes and were more likely to have been initiated by partners who were not steady boyfriends. [4] This may have been the same scenario with the female adolescents confined in the barracks.

The findings of this study revealed that students from the mixed school initiated sex at an earlier age than those from single sex schools. Research has identified that the adolescents who have higher levels of externalizing behaviors (acting out), have an increased risk of early sexual initiation. [29,30] It is the view of the authors that the mixed school environment may have encouraged cross gender mingling and acting out.

Christians were found to initiate sexual intercourse at an earlier age than the Moslems but the difference in the mean ages for the two categories was not statistically significant. This finding is consistent with the finding that the proportion of students reporting sexual activity did not differ between Christian and Muslim students. [14] Slap et al., [14] and Manlove et al., [31] in separate studies further

submitted that adolescents who express more religiosity are more likely to delay sexual intercourse.

Military personnel are often known to be separated from their families, because of the rate of transfers and foreign missions among them. From our study, respondents who lived with one parent initiated sex at an earlier age. Studies have shown that adolescents who lived with one parent had significantly initiated sex earlier than those living with biological parents. [1,32,33,34] Several reasons have been adduced for this. Firstly, parental control of adolescents may vary by family structure such that in single-parent families, the absence of a second parent figure may compromise effective monitoring and controlling of adolescents' activities. [32] Also the impact of parental separation on adolescent outcomes showed that those whose parents separated had initiated sex earlier than those whose parents stayed together. [33] This corroborates the report that adolescents who enjoy parental presence, parental relationship, and communicate with their parents about sex are more likely to delay sexual intercourse [8,34,35,36].

In this study, respondents sharing room with parents or adult relatives of opposite sex were found to have initiated sex earlier compared to those who did not. For instance in a large family living in a one or two room apartment, the adolescents share room with parents or older relatives of opposite sex or house-help. They may sometimes observe their parents and older siblings indulge in sexual activity and may thereafter initiate sex earlier than they would have. These sexual debuts often occur as rape or incest with older relatives.

This study showed that adolescents who did income-earning jobs also initiated sex earlier than those that did not. This finding agrees with the finding that adolescents who grow up in stable families with more resources are more likely to delay sexual intercourse. [37] This could be supported by the tendency to focus on socioeconomic disadvantage, positing that poor adolescents' limited opportunities reduce the opportunity costs of sexual activity and attendant consequences [1].

Our study showed that the age of sex initiation increased as educational statuses of the parents increase. This report is consistent with the findings in Nigerian studies that educational level of parents is one of the factors that contributed to the exposure to sexual intercourse. [14,38] This finding agrees with the findings that one of the variables independently associated with sexual activity was lower educational level of parents. [14,39] It is believed that the more educated parents are, the more they are equipped with information on adolescent sexuality and delay in sexual debut to pass on to these adolescents.

5. Limitations and Strengths of the Study

This study is based on self-reports of sexual activity and is subject to social desirability bias due to the sensitive nature of some of the questions. Secondly, sexual behaviors such as age of sexual debut may be affected by recall bias. These biases however, may have been minimized by the self-administered nature of the survey, absence of teachers in the class and the anonymity entrenched in data collection. While the findings may not

be representative of all adolescents from different socio-economic and demographic backgrounds in the country, the findings provide insight into the sexual behavior of adolescents within a sub-set of the Nigerian society. A major strength of our work is the high response rate (100%) achieved. Also there was an assessment of individual and family variables at the same time, thereby reducing the number of unmeasured covariates that could bias our findings.

6. Conclusions

We assessed trends in mean age at sexual debut among the respondents which was found to be associated with younger age, sharing rooms with parents, living with one parent, doing income earning jobs and low socio-economic status of parents. The finding that adolescents are initiating sexual intercourse at an earlier age, underscores the importance of early intervention programs for this group. We therefore recommend that formal comprehensive sex education programs targeted at delaying age at first sex should begin early in primary school before adolescents become sexually active. Efforts should be directed towards increasing the scope of parental communication strategies to reach all adolescents alongside promoting family stability.

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None.

Competing Interests

The authors declare that they have no competing interests.

Authors' Contributions

Author **CCN** was involved in analysis of data, interpretation of results, write up of this study and editing of the main paper, **UCC** was involved in the design and implementation of the study, **CBD** was involved in analysis of data and editing of the main paper while **TOO** and **ALI** were involved in the design and editing of the main paper. All authors read and approved the final manuscript.

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