adolescents

MDPI

Article

Age at Sexual Debut and Multiple Sexual Partnerships among Adolescents in Nigeria: An Assessment of the Mediating Role of the Knowledge of Sexually Transmitted Infections

Oluwatobi Abel Alawode [1,*], Hassan Ogunwemimo [2], Miracle-Eunice Bolorunduro [3] and Abayomi Folorunsho Awoleye [2]

[1] Department of Sociology and Criminology & Law, University of Florida, Gainesville, FL 32611, USA
[2] Department of Demography & Social Statistics, Obafemi Awolowo University, Ile-Ife 220282, Osun State, Nigeria; ogunwemimohassanseun@gmail.com (H.O.); awoleyeabayomi@gmail.com (A.F.A.)
[3] Department of Sociology, Criminology and Security Studies, Adekunle Ajasin University, Akungba-Akoko 342111, Ondo State, Nigeria; miracleeunicebolorunduro@gmail.com
* Correspondence: alawodeoluwatobi@ufl.edu

Abstract: Adolescents in Nigeria are at risk of plethora of ills arising from risky sexual behavior in the form of multiple sexual partnerships (MSP). Despite evidence linking MSPs to age at sexual debut, there is a dearth of research among adolescents and the mediating role of the knowledge of STIs has been ignored. Hence, we examined the association between age at sexual debut and MSP and the mediating role of the knowledge of STIs in the relationship among adolescents. We utilized data from the 2018 Nigeria Demographic and Health Survey (n = 3215), employing Chi square test of association and binary logistic regression to address the study objectives. We established strong inverse relationship between age at sexual debut and MSP among adolescents in Nigeria and additionally, found that its interaction with knowledge of HIV and STIs significantly reduced adolescents' engagement in MSP, i.e., adolescents who first had sex in later years (15+ years) were significantly less likely to have multiple sexual partners compared to adolescents who had early sexual debut (≤14 years). Early, age-appropriate, continuous, and improved awareness campaigns and reproductive health services and interventions for this population subgroup are recommended.

Keywords: adolescents; age at sexual debut; multiple sexual partnership; HIV & STIs

Citation: Alawode, O.A.; Ogunwemimo, H.; Bolorunduro, M.-E.; Awoleye, A.F. Age at Sexual Debut and Multiple Sexual Partnerships among Adolescents in Nigeria: An Assessment of the Mediating Role of the Knowledge of Sexually Transmitted Infections. *Adolescents* **2021**, *1*, 421–432. https://doi.org/10.3390/adolescents1040032

Academic Editor: Emma Sorbring

Received: 27 July 2021
Accepted: 24 September 2021
Published: 12 October 2021

1. Introduction

Nigeria has a large population of young people, with one in every four persons being an adolescent between the age of 10–19 years [1–3]. This young population constitutes a large and important proportion of the Nigerian population, but are faced with various sexual and reproductive health issues [4]. Adolescence is a stage of life characterized by changes in preferences, experience, desires, behavior, and sexuality, which greatly determines anticipation for first sexual experience and all these are fueled by the fact that young people are growing up in times totally different from the ones in which their parents grew up, whereby exposure to internet and all sorts of information shape their views about sexuality—the interplay of all these factors directly or indirectly impact the decisions and health of these young ones [5,6]. Sexual activities among adolescents is undergoing changes in recent times as evidenced by the state of age at sexual debut with many young people experiencing early physical maturity and engaging in early sexual debuts as evidenced by data from various countries including Nigeria [7–10]. These transitions also impact the sexual behaviors of adolescents in ways such as engaging in risky sexual behaviors such as having multiple sexual partners (MSPs), which exposes adolescents to negative sexual and reproductive health outcomes, including unwanted pregnancies and STIs, especially when

they lack access to knowledge about HIV/AIDS, other STIs, or lack contraceptives needed for protection [5,11–13].

Multiple sexual partnerships (MSP) have been defined as an overlap of sexual partners within a given time, and it lies at the root of the generalized epidemic of HIV and sexually transmitted infections in sub-Saharan Africa because it exposes sexual partners in people's sexual networks to HIV and other STIs [14–18]. Research has documented that having MSP is a common practice among young people in many parts of the world including Nigeria, a multi-country analysis of risky sexual behavior among male youths in some developing countries even reported that the proportion of high-risk sex including multiple sexual partnership is as high as 90% [14,17,19–28]. Given the deleterious outcomes associated with multiple sexual partnerships, understanding why adolescents have multiple sexual partners is vital to efforts aimed at changing such behavior and tackling its outcome [18]. In this regard, research has consistently documented several factors associated with multiple sexual partnerships, but the relationship between age at sexual debut and multiple sexual partnership especially among adolescents has not received the much-needed attention in the study context. A review of literature reveals that there appears to be some consensus that relationship exists between age at sexual debut and risky sexual behavior especially multiple sexual partnership. A recent study in Nigeria, but among the general female population, submitted that early sexual debut is a significant predictor of multiple sexual partnership, and that women who had sexual debut before the age of 18 were found to significantly have between two to three and more than three lifetime sexual partners [29]. Not many studies on this relationship exists in the study context, but in other climes among adolescents and young people, studies have found relationships. For instance in South Africa, a study found that multiple sexual partnership is significantly more common among those who had early sexual debut and those aged 15–19 years were found to be 1.4 times more likely to report multiple partners compared to those age 20–24 years with another study in South Africa also reporting that young women who first had sex at 19 or younger were over five times more likely to have MSPs [30,31].

Further evidence also exists supporting the relationship between age at sexual debut and multiple sexual partnerships and the submissions from these studies shows that younger age at sexual debut predicts a higher likelihood of multiple sexual partnerships [32–35]. However, not many studies have attempted to understand the mediating role of the knowledge of HIV/AIDS and other STIs in the nexus between age at sexual debut and MSP, but a few have explored the association between knowledge of HIV and other STIs and risky sexual behavior. One common theme amongst the findings of these series of studies is that an association exists between both, and that having such knowledge reduces the risk of engaging in risky sexual behaviors, while a few have also refuted this submission by saying knowledge of HIV/AIDS or STIs is not associated with risky sexual behaviors [36–40]. In view of the paucity of research and evidence on the links between age at sexual debut and multiple sexual partnership among adolescents in Nigeria and the mediating role that knowledge of STIs play in this relationship, we designed this study to fill this gap in literature and also provide evidence to inform adolescents' sexual and reproductive health interventions, since no known study in this context has leveraged on population-based nationally representative data to understand this association and the role that HIV/STI knowledge and information has in the relationship. This is because many of the studies on risky sexual behavior among adolescents have been found wanting in the fact that they have either focused on the general population or group of adolescents in institutionalized settings like school, which does not meet the needs of ever-increasing adolescents' sexual and reproductive health interventions [25,26,29,37,38,41,42]. This study hopes to provide the needed nationally representative research evidence to inform these programs and interventions that wish to conscientize adolescents who have had early sexual debut with information on the deleterious effect of risky sexual behavior, especially MSPs, to help them avoid the dangers associated with MSPs. We hypothesized that adolescents who had early sexual debut will significantly have a larger chance of having multiple

sexual partners. In addition, we expect the knowledge of HIV/AIDS and other STIs to significantly mediate the relationship between age at sexual debut and multiple sexual partnerships. The findings of this research are expected to provide program managers and adolescent sexual and reproductive health stakeholders with the evidence required to design innovative interventions to combat the practice of MSPs and its consequences such as the spread of STIs including HIV/AIDS and avert unintended pregnancy among female adolescents. Hence, the aim of this study is to establish the relationship between the age of sexual initiation and multiple sexual relationships among adolescents in Nigeria and examine the mediating role of knowledge of HIV/AIDS and other STIs in the nexus.

2. Materials and Methods

This study is a cross-sectional study that utilized secondary data from the last installment of the Nigeria Demographic and Health Survey for the year 2018. We merged the male (men recode) and female (individual recode) data set for use in this current study. The Nigeria Demographic and Health Survey (NDHS) is a survey conducted by the National Population Commission in Nigeria with technical assistance from the Demographic Health Survey (DHS) Program through ICF International to provide demographic and health data for planning, research, and policymaking. The survey employed a multistage (two-stage) sample design based on the sampling frame of the 2006 Nigerian population census. The two-stage sampling procedure involved a random selection of clusters during the first stage and systematically sampling households from the clusters in the second stage [7,8,43]. The data was obtained from the DHS program with permission from the DHS program team through their website: The DHS Program-Data.

2.1. Inclusion Criteria

Main inclusion criteria in this study was to be an adolescent. The age classification for being an adolescent is 10–19, but the data used in this study only interviewed adolescents aged 15–19 years of both sexes regardless of current marital status. Based on this, we were able to arrive at a total sample size of 3215 adolescents used in this current study.

2.2. Variables and Measurements

The variables in this study were informed by the literature [16,29,35]. The outcome variable in the study is multiple sexual partnership defined as the number of lifetime sexual partners that an adolescent has ever had. That is, a count of the number of people that an adolescent has ever had sexual intercourse with. It was measured based on the response to a question in the survey that asked about the total number of lifetime sexual partners. For the analysis in this study, which utilized binary logistic regression, the responses were coded as: 1 (0) and 2 + (1). The key explanatory variable in this study is age at sexual debut measured based on the response in the survey to the question that asked respondent about their age at first sexual intercourse. Based on past literature, we categorized the age at sexual debut as; less than or at 14 (0) and sex at 15 years or older (1) [29]. For the control, there are two main control variables in this study that we were interested in assessing their role in the relationship between age at sexual debut and multiple sexual partnerships among adolescents in Nigeria. First of the two variables is knowledge of HIV/AIDS, which refers to a question in the survey that asked if the adolescents have ever heard about AIDS and the responses was coded as No (0) and Yes (1). The other one asked if adolescents have heard about other STIs to which the response was coded as No (0) and Yes (1). Other variables used in this study are the socioeconomic and demographic characteristics of the respondents. Age of the adolescents was coded as 15–17 (0) and 18–19 (1), this study also considered their current marital status which was coded as Never married (1), Married/Cohabiting (2), and Not currently married (3). For region of residence, we considered all the 6 geopolitical zones in Nigeria coded as North Central (1), North East (2), North West (3), South East (4), South South (5), and South West (6); Highest level of education coded as No education (0), Primary (1), Secondary (2), and Higher (4);

Ethnicity coded as Others (1), Hausa/Fulani (2), Igbo (3), Yoruba (4); Religion [Catholic (1), Protestants (2), Islam (3), Traditionalist/Others (4)]; Type of place of residence [Urban (1) and Rural (2)]; and lastly, sex of the adolescents [Female (1) and Male (2)]

2.3. Analytical Procedure

The data was analyzed using Stata 16 at three levels of analyses. The first level involved univariate analysis, which involved presenting the frequency of all variables in the study, including the outcome and key explanatory variables. In the second level, we presented a bivariate analysis to show pattern of MSPs by selected socioeconomic and demographic characteristics with chi-square statistics presented to show association with MSP. In the third level, we fitted two binary logistic regression models with model 1 including just age at first sex, while in model 2, we ascertained the mediating role of the knowledge of sexually transmitted infections.

2.4. Model Description

For the model specification, binary logistic regression was used in this study because an experiment with possible outcomes as either success (1) or failure (0) represents a binary outcome. The rate of change in the outcome of interest with respect to explanatory variable(s) can be achieved by examining its log odds as shown in the binary logistic model below:

$$\text{In } \frac{\rho}{1-\rho}\ \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \ldots + \beta nXn \quad (1)$$

where, In $\frac{\rho}{1-\rho}$ represents the log odds of multiple sexual partnership, $\beta 0$ represents the exposed risk of multiple sexual partners (MSP) without interplay with any explanatory variable, and $\beta 1X1 + \beta 2X2 + \ldots + \beta 3X3$ represents the fraction by which the risk of MSP is altered by a unit change in the respective key explanatory variables and covariates X1, X2 ... X3, which in this case includes the age at sexual debut, knowledge of HIV/AIDS, knowledge of STIs.

2.5. Ethical Considerations

The data was obtained from the DHS program with permission from the DHS program through the website—The DHS Program-Data

3. Results

3.1. Sample Characteristics

Table 1 reveals the prevalence of multiple sexual partnerships among adolescents in Nigeria as 19%, with this 19% having two or more sexual partners in their lifetime. The socioeconomic and demographic characteristics of the respondents have also been presented in Table 1. For age at first sex, it was found that 24% of the adolescents had early sexual debut, that is sex before or at the age of 14, while the majority (76%) first had sex when they were ages older than 14 years. The mean age of first having sex is 15 years. The majority of the adolescents reported knowing about HIV/AIDS, while a little over half reported that they have knowledge about other sexually transmitted infections (55%). The mean age of the respondents in the study is 18 years, and when categorized, we found that more than 60% were between the age of 18 and 19, while about 40% were between the age group of 15–17. A total of 60% were either married or cohabiting, 39% have never been married, and just 2% were not currently married. Regional distribution looks almost even, but the majority were from the North West geopolitical zone of the country (36%). It was also found that more than a quarter were from poorer households (28%), about 23% and 22% were from poorest and middle households, respectively. For the level of education, more than 40% have no formal education and 43% only completed secondary education, 11 and 2% have primary and higher education, respectively. It was found that more than 40% are of the Hausa/Fulani ethnic descent, while 34% are from other minor ethnic groups in the country, 10% are Igbo, while about 9% are Yoruba. More than

two-thirds of the adolescents were Muslims, 29% were Christians, while 9% were Catholic. Most respondents resided in the rural areas (70%). Finally, most of the respondents are female (93%).

Table 1. Sample distribution of number of lifetime sexual partners, early sexual debut, and respondents' socioeconomic and demographic characteristics.

Variables	Freq. (n = 3215)	Percent (%)
Number of Lifetime sexual partners		
1	2608	81.1
2+	607	18.9
Age at first sex/Early sexual debut (Mean age at first sex = 15)		
≤14	770	24.0
15+	2445	76.0
Current age		
15–17	1277	39.7
18–19	1938	60.3
Marital status		
Never Married	1237	38.5
Married/Cohabiting	1927	59.9
Not currently married	52	1.6
Region		
North Central	472	14.7
North East	605	18.8
North West	1169	36.4
South East	270	8.4
South South	375	11.7
South West	323	10.1
Household wealth index		
Poorest	727	22.6
Poorer	883	27.5
Middle	704	21.9
Richer	563	17.5
Richest	337	10.5
Highest level of education		
No Education	1392	43.3
Primary	354	11.0
Secondary	1401	43.6
Higher	69	2.1
Ethnicity		
Others	1078	33.5
Hausa/Fulani	1504	46.8
Igbo	335	10.4
Yoruba	298	9.3
Knowledge of HIV/AIDS		
No	252	7.8
Yes	2963	92.2
Knowledge of other STIs		
No	1462	45.5
Yes	1753	54.5
Religion		
Catholic	300	9.3
Christians/Protestants	940	29.2
Islam	1965	61.1
Traditionalist/Others	10	0.3
Type of place of residence		
Urban	972	30.3
Rural	2243	69.8
Sex of respondents		
Female	2979	92.7
Male	236	7.3

3.2. Bivariate Analysis of Age at First Sex, Respondents' Socioeconomic and Demographic Characteristics, and Multiple Sexual Partnerships

Table 2 presents the chi square test of association between multiple sexual partnerships and age at first sex, which is the key explanatory variable, as well as other variables included in the study. Regarding patterns, we found that 24% of the adolescents who had early sexual debut (that is, less than or at age 14) have had two or more lifetime sexual partners, while for those who had their sexual debut at age 15 or higher, it was found that 17% of them have had more than one lifetime sexual partner. Fourteen percent of those aged 15–17 years have had two or more lifetime sexual partners and the percentage is 22% for those aged 18–19. Adolescents who have never been married have the highest percentage of people who have had two or more lifetime sexual partners (36%). Highest percentage of adolescents with multiple sexual partners can be found in the South-South region of the country with 48%, followed by South West (34%) and South East (28%). Adolescents from the middle (23%), richer (31%), and richest (29%) households have the higher percentage of those with lifetime multiple sexual partners. With respect to level of education, the pattern shows that multiple sexual partnership is higher among the adolescents who are more educated, 33% among adolescents with secondary education, and 27% for those with higher education. For ethnicity, we found that multiple sexual partnerships were higher among Yoruba (35%), Igbo (30%), and Other ethnic groups (32%), but least among Hausa/Fulani at 4%.

Table 2. Bivariate analysis of the proportions of multiple sexual partnerships by age at first sex and other characteristics of the respondents.

	Number of Lifetime Sexual Partner			
	***n* (%)**	***n* (%)**	***n* (%)**	
Age at first sex	1	2+	Total	$p < 0.001$
≤14	585 (75.9)	185 (24.1)	770 (100.0)	
15+	2023 (82.7)	422 (17.3)	2445 (100.0)	
Current age				$p < 0.001$
15–17	1095 (88.8)	182 (14.2)	1277 (100.0)	
18–19	1512 (78.0)	425.8 (22.0)	1938 (100.0)	
Marital status				$p < 0.001$
Never married	794 (64.2)	442 (35.8)	1237 (100.0)	
Married/Cohabiting	1770 (91.9)	157 (8.1)	1927 (100.0)	
Formerly married	44 (84.6)	8 (15.4)	52 (100.0)	
Region of residence				$p < 0.001$
North Central	355 (75.1)	117 (24.9)	472 (100.0)	
North East	511 (84.3)	95 (15.7)	605 (100.0)	
North West	1127 (96.4)	42 (3.6)	1169 (100.0)	
South East	194 (71.8)	76 (28.2)	270 (100.0)	
South South	207 (55.2)	168 (44.8)	375 (100.0)	
South West	214 (66.3)	109 (33.7)	324 (100.0)	
Household wealth index				$p < 0.001$
Poorest	663 (91.1)	65 (8.9)	727 (100.0)	
Poorer	771 (87.3)	113 (12.7)	883 (100.0)	
Middle	546 (77.5)	159 (22.5)	705 (100.0)	
Richer	391 (69.4)	172 (30.6)	563 (100.0)	
Richest	238 (70.6)	99 (29.4)	337 (100.0)	
Highest level of education				$p < 0.001$
No Education	1325 (95.2)	67 (4.8)	1392 (100.0)	
Primary	293 (82.8)	61 (17.3)	354 (100.0)	
Secondary	940 (67.1)	461 (32.9)	1401 (100.0)	
Higher	50 (73.1)	19 (26.9)	69 (100.0)	
Ethnicity				$p < 0.001$
Others	734 (68.1)	344 (31.9)	1078 (100.0)	

Table 2. *Cont.*

	Number of Lifetime Sexual Partner			
	n **(%)**	***n*** **(%)**	***n*** **(%)**	
Hausa/Fulani	1447 (96.2)	57 (3.8)	1504 (100.0)	
Igbo	234 (69.9)	101 (30.1)	335 (100.0)	
Yoruba	193 (64.7)	105 (35.3)	298 (100.0)	
Knowledge of HIV/AIDS				$p < 0.001$
No	225 (89.5)	27 (10.5)	252 (100.0)	
Yes	2383 (80.4)	581 (19.6)	2963 (100.0)	
Knowledge of other STIs				$p < 0.001$
No	1292 (88.4)	170 (11.6)	1462 (100.0)	
Yes	1316 (75.1)	437 (24.9)	1753 (100.0)	
Religion				$p < 0.001$
Catholic	207 (69.1)	93 (30.9)	300 (100.0)	
Other Christians/Protestants	582 (61.9)	358 (38.1)	939.7 (100.0)	
Islam	1809 (92.1)	156 (7.9)	1965 (100.0)	
Traditional/Others	9 (89.7)	1 (10.3)	10 (100.0)	
Type of place of residence				$p < 0.001$
Urban	708 (72.8)	264 (27.2)	973 (100.0)	
Rural	1899 (84.7)	343 (15.3)	2243 (100.0)	
Sex of adolescent				$p < 0.001$
Female	2488 (83.5)	491 (16.5)	2979 (100.0)	
Male	120 (50.8)	116 (49.2)	236 (100.0)	

As regards to knowledge of HIV/ADIS, it has been found that 12% of adolescents who reported to be not aware of HIV/AIDS have had more than one lifetime sexual partner, while 20% of those who claim to have knowledge of HIV/AIDS have multiple sexual partners. Twelve percent (12%) of adolescents who reported knowledge of other STIs have multiple sexual partners, while 25% of adolescents who reported knowledge of other STIs have multiple sexual partners. In addition, we found that multiple sexual partnership are highest among adolescents who are Protestants and other Christians (38%) and Catholics (38%), as compared to Muslim adolescents (8%). The percentage of adolescents with multiple sexual partners in urban areas is 27% as compared to 15% in rural areas of the country. More male adolescents (49%) than females (17%) had multiple sexual partners according to this present study. The three key variables including age at first sex, which is the main explanatory variable, and both knowledge of HIV and other STIs that are covariates were included in the logistic regression models.

3.3. Binary Logistic Regression Analysis of the Relationship between Age at Sexual Debut, Knowledge of Sexually Transmitted Infections, and Multiple Sexual Partnerships

Table 3 presents the results of the multivariable regression analysis of multiple sexual partnerships among adolescents in Nigeria. It was found that adolescents who first had sex later than 14 years were significantly, 0.66 times, less likely to have multiple sexual partners (OR = 0.66;95% CI: 0.53–0.83) compared to adolescents who had early sexual debut. After adjusting for knowledge of HIV/AIDS and other STIs, the result still showed that adolescents who first had sex later than 14 years were significantly, 0.59 times, less likely to have multiple sexual partners (OR = 0.59;95% CI: 0.47–0.75) compared to adolescents who had early sexual debut. For knowledge of HIV/AIDS, it was found that adolescents who have knowledge of HIV/AIDS are 1.33 times more likely to have multiple sexual partners (OR = 1.33; 95% CI: 0.82–2.16) compared to those who do not have such knowledge, but it is important to state that this relationship was not found to be statistically significant. Lastly, adolescents who have knowledge of other STIs are significantly, 2.55 times, more likely to have multiple sexual partners (OR = 2.55; 95% CI: 2.04–3.18) compared to those who have no knowledge of other STIs.

Table 3. Binary logistic regression of the relationship between age at first sex and multiple sexual partnership.

	Model 1		Model II	
MSP	OR	[95% CI]	aOR	[95% CI]
Age at first sex (ref: ≤14)				
15+	0.66 **	[0.53–0.83]	0.59 **	[0.47–0.75]
Knowledge of HIV/AIDS (ref: No)				
Yes			1.33	[0.82–2.16]
Knowledge of other STIs (ref: No)				
Yes			2.55 **	[2.04–3.18]

** = $p < 0.05$; OR = Odds Ratio, aOR = Adjusted Odds Ratio, CI = Confidence Interval, ref = Reference Category.

4. Discussion

This study examined the relationship between age at first sex and MSPs among adolescents in Nigeria. This relationship was assessed with a view to exploring the role of adolescents' knowledge of HIV and other STIs. In corroboration with findings in the literature [31,33], this study observed a strong inverse relationship between age at sexual debut and MSP among adolescents in Nigeria, and additionally found that its interaction with knowledge of HIV and STIs appeared to reduce adolescents' engagement in MSP. However, younger adolescents seemed to be more enmeshed in this risky sexual behavior. Despite Nigeria's socio-cultural diversities, including exposure to reproductive health information, it appeared having multiple sexual partners is cross-cultural and it suggests the need for proper sexual relationship communication at early ages in Nigeria.

Social and economic statuses have been identified as plausible explanations for having multiple partners [18], and these may explain the reason for the pattern of MSPs among adolescents in Nigeria being similar to those observed in other developing countries, particularly those characterized by poor socio-demographic and economic backgrounds. Virtually all examined background characteristics, which include, age, marital status, region and place of residence, household wealth, religion, and ethnicity, were significantly associated with practice of MSPs. Some of these covariates were in tandem with literature findings. For instance, it was reported in Jamaica (Jarrett et al., 2018) and found in South Africa that male adolescents are more likely to engage in MSPs than female, this study confirmed this outcome with nearly half of male and 16% of female respondents [30]. In a study conducted in Vietnam, never married and formerly married respondents were found to be more likely to have multiple sexual partners [44], as against 8% of married or cohabiting respondents, their proportions in this study were 36 and 15%, respectively. Perhaps, the male adventurous tendencies and their inherent higher sexual urges could explain the gender disparities in engaging in MSPs. Also, Nigerian girls are traditionally raised to be reserved and conservative unlike their male counterparts who enjoy more freedom of association and movements. Besides, fathers are often protective of their daughters and it has been reported that being a resident of a household with a biological father reduces the tendency to have multiple sexual partners [27].

Knowledge of HIV/AIDS is very high among adolescents in Nigeria, which is expected because of the huge resources and investments that have gone into creating awareness. Apparently, the Nigerian government understands how deleterious and dangerous the spread of HIV/AIDS can be on a population, therefore in attempts to control its spread, the government embarked on a number of interventions, among which are the tracking of HIV among pregnant women age 15–49 using sentinel surveillance system; setting up of the National Action Committee on AIDS and its subsequent transformation into the National Agency for the Control of AIDS (NACA) [43]. These efforts, among others, seemed to be yielding results in terms of awareness creation. This study found high level of awareness of HIV and other STIs among adolescents in Nigeria. However, findings in this study showed

adolescents with knowledge of HIV and knowledge of other STIs having higher number of multiple sexual partners compared to those without knowledge of these concepts. Clearly, there is need to assess what is being understood about HIV and other STIs among this naïve and young sexually active group. Provision of further information services with particular focus on the content including framing of messages, and contexts is required to address possible myths and misconceptions that make adolescents in Nigeria to perceive themselves as being immune to ills of risky sexual behavior. This attempt will help to translate adolescents' knowledge of HIV and other STIs into their sexual behavior. It is, however, important to point out that this relationship between knowledge of HIV and other STIs and risky sexual behavior, including having multiple sexual partners especially among adolescents, has been well documented. Studies have alluded to how, among adolescents, knowledge of HIV and other STIs [36,37] and knowledge of risky sexual behavior [15,44] are not strongly associated with adolescents' actual behavior, further prompting the need for early creation of age-appropriate sexual and reproductive health knowledge.

It was found that early age at sexual debut is significantly associated with multiple sexual partnerships [29,45–47]. We also found that adolescents who had an early sexual debut have a higher likelihood of having multiple sexual partners compared to adolescents who had their first sexual experience at a later age. Some studies have shown gender variations in the relationship between age at first sex and MSP. Unlike the female age at sexual debut, male age at sexual debut in Jamaica was not connected to having multiple sexual partners [45]. Taking findings from this study together, adolescents in Nigeria with lower age at sexual debut (<14 years) are more vulnerable and susceptible to risky sexual behavior given that they are more prone to having multiple sexual partners. It is unlikely that such first sexual experiences were done with peers of the same age group because older persons feed on adolescents' vulnerabilities and insecurities and initiate them into sexual relationships early in life [48,49]. With lack and/or poor utilization of condoms and in situations where people have partners whose infection status and fidelity are unknown, not only are Nigerian adolescents exposed to higher risks of HIV and other STIs than other population subgroups, but they can also serve as the spreaders for sexually transmitted infection across the board [49]. Meanwhile, in the preceding year before the survey adopted for this study, a little below two-fifths of young women and about three-fifths of young men in Nigeria used a condom during non-marital sexual encounters [43]. The challenge in addition to this low condom use among the young population is the inconsistency of condom use, particularly for prevention of HIV/AIDs and other STIs. Therefore, while the awareness campaign for HIV and other STIs should be encouraged and intensified to persuade the next generations of adolescents to delay their sexual debut, practical steps should be employed to address the challenges faced by current sexually active adolescents.

5. Conclusion and Recommendations

The main conjecture in this study is that age at sexual debut can predict multiple sexual partnerships among adolescents in Nigeria, and specifically, we hypothesized that adolescents who had early sexual debut will significantly have a higher chance of having multiple sexual partners. We can hereby conclude from the findings of this present study that MSP was significantly predicted by age at sexual debut and knowledge of HIV and other STIs improved this relationship. In addition, younger adolescents with earlier age at sexual debut are more likely to have multiple sexual partners than their older counterparts and knowledge of HIV and other STIs reduced having multiple sexual partners further among other adolescents. We recommend that the efforts of the key stakeholders in adolescent sexual and reproductive health should be directed towards guarding against adolescents' engagement in risky sexual behaviors particularly through awareness campaign on the dangers of engaging in risky sexual behaviors, especially having multiple or concurrent sexual partners. However, there is need to further examine the content of messages of awareness campaigns to rid possible ambiguity, myths, and misconceptions or include more specific context-focused information to avoid the mismatch

between knowledge of HIV and other STIs and actual adolescent sexual behavior. Therefore, in attempts to improve adolescents' sexual and reproductive health, program managers should not only continue the intervention campaigns, improve the content of information, and consider the supply of age-appropriate reproductive health services particularly for younger adolescents, they should also consider engaging in age-appropriate sexual and reproductive health education for the next generation of adolescents, particularly to delay their ages of sexual debut. In the review of the literature, we did not find a recent study that has utilized nationally representative data for a similar study amongst adolescents. Hence, the strength of the study comes from the fact that it utilized nationally representative data to study risky sexual behavior such as MSPs among adolescents, because many identified similar studies have mostly been limited to a certain group in a locality or area of the country, which might not be well suitable for ever increasing demands of adolescents' sexual and reproductive health interventions in Nigeria. Despite the strength of this study, it is not devoid of limitations, one limitation being that in the study the lifetime number of sexual partners was self-reported by the respondents who are adolescents in the DHS survey. In addition, a causal relationship cannot be established between the variables and multiple sexual partnership due to the cross-sectional nature of the available demographic and health survey data.

Author Contributions: Conception and design of the study, O.A.A.; Analysis and/or interpretation, O.A.A. and H.O.; Drafting and revising of the manuscript, O.A.A., H.O., A.F.A. and M.-E.B. All authors have read and agreed to the published version of the manuscript.

Funding: The authors did not receive any funding for this research.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The Nigeran demographic and health survey data analyzed in this study is available via the DHS Program website at The DHS Program—Available Datasets.

Conflicts of Interest: The authors declare no conflicts of Interest.

References

1. PMA2020. Adolescents and Young Adults Health Brief. 2017. Available online: https://www.pmadata.org/technical-areas/adolescent-young-adults (accessed on 5 May 2021).
2. Ritchie, H.; Roser, M. Age Structure. Our World Data. 2019. Available online: https://ourworldindata.org/age-structure (accessed on 4 July 2021).
3. UNICEF. The State of World Population 2014. The Power of 1.8 Billion. Adolescents, Youths and the Transformation of the Future. 2014, p. 136. Available online: https://www.unfpa.org/sites/default/files/pub-pdf/EN-SWOP14-Report_FINAL-web.pdf (accessed on 5 July 2021).
4. Envuladu, E.A.; de Kwaak, A.V.; Zwanikken, P.; Zoakah, A.I. Exploring the Factors Influencing Adolescent Sexual Behavior in Plateau State Nigeria. *Am. J. Med. Med. Sci.* **2017**, *7*, 1–6.
5. Hindin, M.J.; Fatusi, A.O. Adolescent Sexual and Reproductive Health in Developing Countries: An Overview of Trends and Interventions. *Int. Perspect. Sex. Reprod. Health* **2009**, *35*, 58–62. [CrossRef] [PubMed]
6. Lenz, B. The Transition from Adolescence to Young Adulthood: A Theoretical Perspective. *J. Sch. Nurs.* **2001**, *17*, 300–306. [CrossRef] [PubMed]
7. National Population Commission-NPC/Nigeria. *ICF International Nigeria Demographic and Health Survey 2008*; NPC/Nigeria and ICF International: Abuja, Nigeria, 2009.
8. National Population Commission-NPC/Nigeria. *ICF International Nigeria Demographic and Health Survey 2013*; NPC/Nigeria and ICF International: Abuja, Nigeria, 2014.
9. Stryhn, J.G.; Graugaard, C. The age at first intercourse has been stable since the 1960s, and early coital debut is linked to sexual risk situations. *Ugeskr. Laeger* **2014**, *176*.
10. Tulloch, T.; Kaufman, M. Adolescent Sexuality. *Pediatr. Rev.* **2013**, *34*, 29–38. [CrossRef] [PubMed]
11. Harrison, A.; Cleland, J.; Gouws, E.; Frohlich, J. Early sexual debut among young men in rural South Africa: Heightened vulnerability to sexual risk? *Sex. Transm. Infect.* **2005**, *81*, 259–261. [CrossRef] [PubMed]
12. Kabiru, C.W.; Beguy, N.; Undie, C.-C.; Zulu, E.M.; Ezeh, A.C. Transition into first sex among adolescents in slum and non-slum communities in Nairobi, Kenya. *J. Youth Stud.* **2010**, *13*, 453–471. [CrossRef]

13. White, R.; Cleland, J.; Caraël, M. Links between premarital sexual behaviour and extramarital intercourse: A multi-site analysis. *AIDS* **2000**, *14*, 2323–2331. [CrossRef]
14. Morris, M.; Kretzschmar, M. Concurrent partnerships and the spread of HIV. *AIDS* **1997**, *11*, 641–648. [CrossRef]
15. Nalukwago, J.; Alaii, J.; Borne, B.V.D.; Bukuluki, P.M.; Crutzen, R. Application of Core Processes for Understanding Multiple Concurrent Sexual Partnerships among Adolescents in Uganda. *Front. Public Health* **2018**, *6*, 371. [CrossRef]
16. Santelli, J.S.; Brener, N.D.; Lowry, R.; Bhatt, A.; Zabin, L.S. Multiple Sexual Partners among U.S. Adolescents and Young Adults. *Fam. Plan. Perspect.* **1998**, *30*, 271–275. [CrossRef]
17. Sawers, L.; Stillwaggon, E. Concurrent sexual partnerships do not explain the HIV epidemics in Africa: A systematic review of the evidence. *J. Int. AIDS Soc.* **2010**, *13*, 34. [CrossRef]
18. Shelton, J.D. Why multiple sexual partners? *Lancet* **2009**, *374*, 367–369. [CrossRef]
19. Berhan, Y.; Berhan, A. A Meta-Analysis of Risky Sexual Behaviour among Male Youth in Developing Countries. *AIDS Res. Treat.* **2015**, *2015*, 580961. [CrossRef] [PubMed]
20. Sathiyasusuman, A. Associated Risk Factors of STIs and Multiple Sexual Relationships among Youths in Malawi. *PLoS ONE* **2015**, *10*, e0134286. [CrossRef]
21. Exavery, A.; Lutambi, A.M.; Mubyazi, G.M.; Kweka, K.; Mbaruku, G.; Masanja, H. Multiple sexual partners and condom use among 10–19 year-olds in four districts in Tanzania: What do we learn? *BMC Public Health* **2011**, *11*, 490. [CrossRef]
22. Kozhimannil, K.B.; Enns, E.; Blauer-Peterson, C.; Farris, J.; Kahn, J.; Kulasingam, S. Behavioral and community correlates of adolescent pregnancy and Chlamydia rates in rural counties in Minnesota. *J. Community Health* **2014**, *40*, 493–500. [CrossRef]
23. Mah, T.L.; Halperin, D.T. Concurrent Sexual Partnerships and the HIV Epidemics in Africa: Evidence to Move Forward. *AIDS Behav.* **2008**, *14*, 11–16. [CrossRef] [PubMed]
24. Manjengwa, P.G.; Mangold, K.; Musekiwa, A.; Kuonza, L.R. Cognitive and behavioural determinants of multiple sexual partnerships and condom use in South Africa: Results of a national survey. *South. Afr. J. HIV Med.* **2019**, *20*, 868. [CrossRef] [PubMed]
25. Odimegwu, C.; Somefun, O.D. Ethnicity, gender and risky sexual behaviour among Nigerian youth: An alternative explanation. *Reprod. Health* **2017**, *14*, 1–15. [CrossRef]
26. Okunlola, D.; Alawode, O.A.; Bolarinwa, O.A.; Agbeja, I.O.; Awoyele, A.F. Socio-Demographic, Economic and Psychological Correlates of Risky Sexual Behaviour Among Sexually Active Young People in Nigeria. *Glob. J. Health Sci.* **2020**, *12*. [CrossRef]
27. Pilgrim, N.A.; Ahmed, S.; Gray, R.H.; Sekasanvu, J.; Lutalo, T.; Nalugoda, F.; Serwadda, D.; Wawer, M.J. Multiple sexual partnerships among female adolescents in rural Uganda: The effects of family structure and school attendance. *Int. J. Adolesc. Med. Health* **2014**, *27*, 319–328. [CrossRef]
28. Rosenberg, M.D.; Gurvey, J.E.; Adler, N.; Dunlop, M.B.V.; Ellen, J.M. Concurrent Sex Partners and Risk for Sexually Transmitted Diseases among Adolescents. *Sex. Transm. Dis.* **1999**, *26*, 208–212. [CrossRef] [PubMed]
29. Yaya, S.; Bishwajit, G. Age at First Sexual Intercourse and Multiple Sexual Partnerships among Women in Nigeria: A Cross-Sectional Analysis. *Front. Med.* **2018**, *5*, 171. [CrossRef]
30. Khangelani, Z.; Geofrey, S.; Thabile, K.; Thembile, M.; Thomas, R.; Ntombizodwa, M. Age at Sexual Debut: A Determinant of Multiple Partnership among South African Youth. *Afr. J. Reprod. Health Rev. Afr. Santé Reprod.* **2010**, *14*, 47–54.
31. Onoya, D.; Zuma, K.; Zungu, N.; Shisana, O.; Mehlomakhulu, V. Determinants of multiple sexual partnerships in South Africa. *J. Public Health* **2014**, *37*, 97–106. [CrossRef] [PubMed]
32. Agajie, M.; Belachew, T.; Tilahun, T.; Amentie, M. Risky Sexual Behavior and Associated Factors among High School Youth in Pawe Woreda Benishangul Gumuz Region. *Sci. J. Clin. Med.* **2015**, *4*, 67. [CrossRef]
33. Jarrett, S.B.; Udell, W.; Sutherland, S.; McFarland, W.; Scott, M.; Skyers, N. Age at Sexual Initiation and Sexual and Health Risk Behaviors among Jamaican Adolescents and Young Adults. *AIDS Behav.* **2018**, *22*, 57–64. [CrossRef]
34. Kassa, G.M.; Degu, G.; Yitayew, M.; Misganaw, W.; Muche, M.; Demelash, T.; Mesele, M.; Ayehu, M. Risky Sexual Behaviors and Associated Factors among Jiga High School and Preparatory School Students, Amhara Region, Ethiopia. *Int. Sch. Res. Not.* **2016**, *2016*, 4315729. [CrossRef]
35. Son, D.T.; Oh, J.; Heo, J.; Van Huy, N.; Van Minh, H.; Choi, S.; Hoat, L.N. Early sexual initiation and multiple sexual partners among Vietnamese women: Analysis from the Multiple Indicator Cluster Survey, 2011. *Glob. Health Action* **2016**, *9*, 29575. [CrossRef] [PubMed]
36. Anderson, J.E.; Kann, L.; Holtzman, D.; Arday, S.; Truman, B.; Kolbe, L. HIV/AIDS Knowledge and Sexual Behavior Among High School Students. *Fam. Plan. Perspect.* **1990**, *22*, 252. [CrossRef]
37. Odu, B.K.; Akanle, F.F. Knowledge of HIV/AIDS and Sexual Behaviour among. *Humanit. Soc. Sci. J.* **2008**, *3*, 81–88.
38. Ola, T.M.; Oludare, B. Sexual practices and knowledge about Hiv/aids among Nigerian secondary school students. *Int. J. Health Res.* **2010**, *1*. [CrossRef]
39. Oliveira-Campos, M.; Giatti, L.; Malta, D.C.; Barreto, S. Contextual factors associated with sexual behavior among Brazilian adolescents. *Ann. Epidemiol.* **2013**, *23*, 629–635. [CrossRef] [PubMed]
40. Rugigana, E.; Birungi, F.; Nzayirambaho, M. HIV knowledge and risky sexual behavior among men in Rwanda. *Pan Afr. Med. J.* **2015**, *22*, 380. [CrossRef] [PubMed]
41. Ali, M.M.; Merdad, L.; Bellizzi, S. Socioeconomic variations in risky sexual behavior among adolescents in 14 sub-Saharan Africa countries who report ever having had sex. *Int. J. Equity Health* **2021**, *20*, 1–7. [CrossRef] [PubMed]

42. Durowade, K.A.; Babatunde, O.A.; Omokanye, L.O.; Elegbede, O.E.; Ayodele, L.M.; Adewoye, K.R.; Adetokunbo, S.; Olomofe, C.O.; Fawole, A.A.; Adebola, O.E.; et al. Early sexual debut: Prevalence and risk factors among secondary school students in Ido-ekiti, Ekiti state, South-West Nigeria. *Afr. Health Sci.* **2017**, *17*, 614–622. [CrossRef]
43. National Population Commission-NPC. *ICF Nigeria Demographic and Health Survey 2018—Final Report*; NPC and ICF: Abuja, Nigeria, 2019.
44. Luke, N. Age and Economic Asymmetries in the Sexual Relationships of Adolescent Girls in Sub-Saharan Africa. *Stud. Fam. Plan.* **2003**, *34*, 67–86. [CrossRef]
45. Hardee, K.; Gay, J.; Croce-Galis, M.; Afari-Dwamena, N.A. What HIV Programs Work for Adolescent Girls? *JAIDS J. Acquir. Immune Defic. Syndr.* **2014**, *66*, S176–S185. [CrossRef]
46. Dana, L.M.; Adinew, Y.M.; Sisay, M.M. Transactional Sex and HIV Risk among Adolescent School Girls in Ethiopia: Mixed Method Study. *BioMed. Res. Int.* **2019**, *2019*, 4523475. [CrossRef] [PubMed]
47. Moore, A.M.; Awusabo-Asare, K.; Madise, N.; John-Langba, J.; Kumi-Kyereme, A. Coerced First Sex among Adolescent Girls in Sub-Saharan Africa: Prevalence and Context. *Afr. J. Reprod. Health* **2007**, *11*, 62–82. [CrossRef]
48. Machira, K.; Maonga, B.; Chirwa, T. Determinants of Risky Sexual Behavioral Practices among Teen-girls in Malawi. *Open Public Health J.* **2020**, *13*, 839–849. [CrossRef]
49. Nnebue, C.C.; Chimah, U.C.; Duru, C.B.; Ilika, A.L.; Lawoyin, T.O. Determinants of Age at Sexual Initiation among Nigerian Adolescents: A Study of Secondary Schools Students in a Military Barracks in Nigeria. *Am. J. Med. Sci. Med.* **2016**, *4*, 1–7. [CrossRef]