Article

Analysis of Unmarried Adolescents and Modern Contraceptives Initiation in Nigeria: Evidence from 2018 NDHS

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Abstract: Nigeria is one of Africa's most populous countries. Nigeria's population is expected to exceed 400 million by 2050, putting it among the top five most populous countries in the world. High birth rates, limited contraception use, and early marriage are the main causes of this rapid increase. In Nigeria, adolescents play a substantial role in these issues, with 117 births per 1000 girls aged 15–19 years. Data for this article comes from the 2018 Nigerian Demographic and Health Survey (NDHS). Our sample consisted of 1014 sexually active unmarried adolescents aged 15–19 years. Kaplan Meier's curve, Log Rank Test, and Cox proportional hazards model were modeled to estimate the parameters at $p > 0.05$. Findings show that the average time to the first use of modern contraceptives after sexual initiation is two years. Initiating sex at age 15 or later, belonging to the richest household wealth quintile, and use of the internet is associated with the early initiation of modern contraceptive methods, while residing in the northwest region and being older are associated with a low incidence of modern contraceptive use. Results indicate a deferred initiation of modern contraceptives after first sexual encounter. It has become imperative for tailored interventions to improve the time of initiation of contraceptives, so as to reduce the associated burdens and consequences.

Keywords: unmarried adolescents; contraceptive; Nigeria NDHS

1. Introduction

In 2016, there were 252 million young women in developing nations between the ages of 15 and 19. These young women account for roughly 17% of all women aged 15–49 years in developing nations around the world, and 20% of all women of reproductive age in Africa, which has the world's youngest population (Darroch et al. 2016). During adolescence, a high number of these young people report sexual initiation (Inchley and Currie 2016). This leads to risky sexual behaviors, such as multiple sexual interactions and inappropriate condom use. As a result, sexually transmitted diseases (STIs), such as HIV/AIDS, unwanted pregnancy, and psychosocial difficulties, are becoming more prevalent among young people. These challenges endanger teenage women's health and well-being (Mensch et al. 2006; Taylor-Seehafer and Rew 2000). Using a modern contraceptive method is the most effective option to avoid these issues for unmarried teens who have sex.

Nonetheless, in developing countries, 60% of young women aged 15 to 19 who require contraception do not use a modern method (Darroch et al. 2016). Unmarried adolescent women in Sub-Saharan Africa account for 15% of sexually active adolescent women who wish to avoid pregnancy. Traditional procedures are used by 17% of these girls, while no method is used by 42% (Singh and Darroch 2012). Almost half of all pregnancies in young women are considered unplanned, resulting in 3.9 million unsafe abortions each year (Bearak et al. 2018). Available statistics show that Nigerian adolescents aged 15–19 have a larger proportion of unmet contraceptive needs than those aged 20–24 (17.4% vs.

16.5%). (Oginni et al. 2015). Thus, meeting the current contraceptive needs of teenagers would reduce unintended pregnancies by 6 million per year, ensuing in almost 2 million fewer unintended births, 3.2 million fewer abortions, and 5600 fewer maternal deaths.

In 2017, 107 births per 1000 [15–19-year-old] girls were recorded (UNFPA 2013). In addition to being the primary driver of large family sizes and high population growth rates, adolescent pregnancy has substantial social, economic, and health effects. Furthermore, early motherhood has been observed to damage young women's employment opportunities, resulting in lifetime economic dependency (Urdinola and Ospino 2015). The implication is that adolescent fertility has the potential to lower an economy's potential human capital, which has a negative impact on long-term economic growth. Understanding the timing of adolescents' initial use of a modern contraceptive technique after first sex, as well as the factors that influence it, will disclose how long they are exposed to the repercussions of not using effective methods. The information could be used to pinpoint the optimal period (age) for intervention programs focused at lowering the negative consequences of non-use among adolescents who are not ready to have a child but are having sex. Even when an adolescent is utilizing a method, she may have been exposed to the repercussions of non-use for a long time prior to the method's implementation. As a result, important questions arise, such as: (1) When do unmarried teenagers begin using contraception? (2) What socio-demographic factors increase the risk of poor contraceptive uptake?

As a result, this study looked at how soon they start using contemporary contraception and the socio-demographic risk variables. This study focused on unmarried adolescent girls aged 15–19, a group that is underrepresented in most contraceptive behavior research.

Studies have shown diverse socio-demographic factors, which include individual, family, and societal influences, to be determinants of current contraceptive use among young women. These studies confirm that younger age at first sex is a strong determinant of contraceptive use with a significantly higher percentage of use among those below age 15 at first sexual experience. Also, Lara and Abdo (2016) in a review lent credence to this fact. Their findings showed that girls who initiate sex at age 14 and below are unlikely to use contraceptives at first sex and may postpone initiation. In contrast, Casey et al. (2020) observed that for each year increase in women's age at sexual debut, there is a 10% less chance of using a modern contraceptive. Aside from older age at first sex as a positive determinant of modern contraceptive use, Ahinkorah (2020) also found that the use of mass media increased the likelihood of contraceptive use among young women. Appiah et al. (2020), in their study on female adolescents' contraception in Ghana, also reported that young women, who read newspapers and watch television at least once a week, are more likely to use modern contraceptives. Again, Abebe et al. (2020), in a study in Ethiopia, pointed out the importance of mass media on contraceptive use amongst adolescent girls.

The effect of knowledge [internet use] on modern contraceptive use has been examined and it has been found that it significantly influences contraceptive use. However, Casey et al. (2020) established that lack of knowledge is not related to non-use of modern contraceptives amongst young women. In addition, Agyemang et al. (2019) found high knowledge, derived from the internet about contraceptives, among female adolescents in Ghana, but the knowledge did not translate to use. However, ignorance regarding injectable contraceptive methods limits the request for modern contraception among adolescents. Again, Cheedalla et al. (2020) pointed out the importance of knowledge on contraceptive use and acceptance. There is a higher likelihood of use at first sex but not related with current use. Nsanya et al. (2019) support this argument that higher knowledge of contraception increases use.

Also, high levels of education promote a higher likelihood of contraceptive use. Hounton et al. (2015), in a study covering Ethiopia, Burkina Faso and Nigeria, supported this argument by establishing that there is significant inequality among adolescents' contraceptive use based on education. Contributing to the debate on educational level and

contraceptive use, Chola et al. (2020) analysed data from 1996, 2001/2, 2007 and 2013/14 for Zambia and found that contraceptive use was significantly associated with level of education.

Evidence from 200 female teenagers aged 16–19 years in a Ghanaian district demonstrated that living arrangement is linked to contraceptive use. Adolescents who lived with both parents were more likely to use birth control. (Agyemang et al. 2019). While in Cameroun, Essiben et al. (2018) found that living with both parents, or one of the parents, prevented adolescents from using contraceptives. Similarly, Ramathuba et al. (2012) found that fear of parental reaction negatively affected the use of modern contraceptives among adolescents in the Limpopo province of South Africa. Tabane and Peu (2015) also noticed the effect of the approval or disapproval of friends or important figures on contraceptive use among teenagers. Nalwadda et al. (2010) recorded the fear of parents' reaction as an obstacle to contraceptive use among unmarried adolescents aged 15–19 years in Uganda. In contrast, a study by Olajide and others found that living arrangement was not related to contraceptive usage amongst disabled adolescents in Osun state, Nigeria.

Aside from personal and familial considerations, social factors have been linked to the use of contraception among young women. In a community-level study in Zimbabwe, Ngome and Odimegwu (2014) discovered that girls aged 15–19 years who lived in communities with a higher mean number of children born are less likely to utilize contraception. In addition, Mutumba et al. (2018) investigated the impact of residing in communities with a higher optimum number of children on young women's low usage of contemporary contraception. Both studies indicated that living in a community with a higher mean year of education among women is linked to a higher likelihood of young women using contemporary contraception. Ahinkorah (2020) and Olaide et al. (2022) supports this evidence in a study among adolescent girls and young women in sub-Saharan Africa. He found that AGYW in communities with low literacy levels have lower odds of using modern contraceptives. Further, religion and customs play a major factor in contraceptive use in Sub-Saharan Africa because of its level of development. Adedini et al. (2018) also supported this evidence. About two in five women reported being exposed to family planning messages from religious leaders in their studies. Nonetheless, in developing countries, there are major gaps in contraceptive initiation among adolescents. First, the bulk of studies on contraceptive use among young women have included young adults and focused on married young women. In the few occasions where unmarried adolescents are included in studies, the studies usually focus on current or past contraceptive use and may not be nationally representative. Hence, this study examined the effect of socio-economic factors on modern contraceptive initiation among unmarried adolescents in Nigeria.

Theoretical Framework

While studies have looked at the prevalence and usage of contraceptives in developing countries (Fagbamigbe 2021), the timing of contraceptive use after first intercourse has received less attention. As a result, there is a lack of knowledge about the timing and socio-demographic characteristics related to the use of current methods among Nigerian sexually active unmarried adolescents aged 15–19 years. This study used the Health Belief Model (HBM) as a theoretical framework. This is a widely used model for health behaviour, based on a rational approach. It explains health-related behaviour as a product of certain belief patterns. An individual's rationale for taking on a health behaviour can be divided into three categories: individual perceptions, modifying factors (socio-demographic), and the likelihood of action. The model assumes that people will take action (behaviour) to prevent an undesired outcome if they believe they are susceptible, if the consequences of the outcome are severe and if the benefit of action outweighs the cost (Janz et al. 2002). All these perceptions are modified by socio-demographic factors. The use of modern contraceptives can be seen as health behaviour for the prevention of pregnancy. Pregnancy is mostly unwanted when the woman is young and not in a marital union (Exavery et al. 2014). As a result, the HBM paradigm is adopted in this study, to investigate the influence

of background factors of never-married adolescents on the timing of starting modern contraception after first sex.

2. Data and Method

The data set used for this study originated from the 2018 Nigeria Demographic and Health Survey (NDHS) conducted from August 2018 to December 2018. The dataset is accessible online on the MEASURE DHS website at https://dhsprogram.com/data/available-datasets.cfm (accessed on 20 July 2017). The Demographic and Health Survey (DHS) is a five-year periodic worldwide survey programme designed by USAID with support from other international donors. It is carried out in several developing countries in Africa, Latin America, Caribbean, Asia, Eastern Europe, and the Middle East. The 2018 NDHS is a cross-sectional study, nationally representative, and it is the sixth conducted in Nigeria. The ICF Macro International provides technical support with the Nation Population Commission (NPC) to collect data on fertility, contraception, maternal and child health, violence against women, gender, immunization, nutrition, breastfeeding and other relevant indicators of Sustainable Development Goals. The sample for the survey (NDHS) was a stratified sample selected in two stages. This was done by separating each of the 36 states and the Federal Capital Territory (FCT) into urban and rural areas. In the first stage, 1400 clusters were selected randomly, corresponding in size to Enumeration area. In the second stage, a fixed number of 30 households were selected in every cluster through equal probability systematic sampling, totalling 42,000 households. Data were gathered from 40,567 women aged 15–49 years and 12,056 men aged 15–59 years in all selected households. Sample weights were calculated due to differences in probability selection of the sample and response rates. The sampling weights were calculated, based on sampling probabilities, separately for each sampling stage and for each cluster and were added to the data file. During the survey, comprehensive contraceptive reports were gathered. Respondents were told to give accounts of their contraceptive activities and methods used during each of the months in five years preceding the survey (Croft et al. 2018). For this analysis, data for only 1013 (weighted) female adolescents between ages 15–19, who were not married but had had sex, were used (See Figure 1 below).
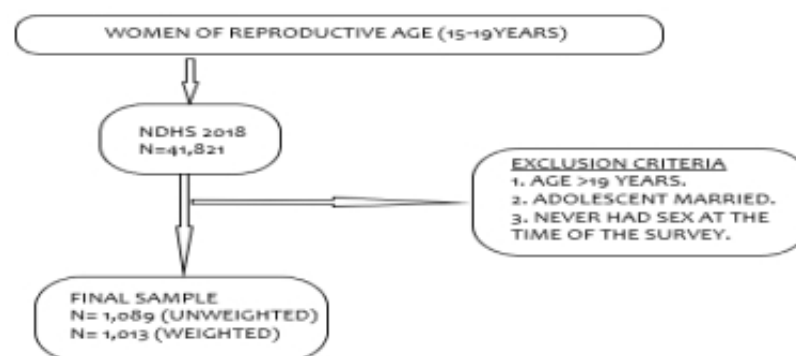

Figure 1. The exclusion procedures to identify the final sample size in NDHS 2018. SOURCE: 2018 NDHS.

2.1. Study Variables

The dependent variable for this study was timing of modern contraceptive initiation among unmarried adolescents between ages 15–19 years who had ever had sex. This was measured in years and assessed by the difference between age at first sex and age at first use of a modern method. To assess the timing to the initiation, a status variable was first created as an initiation of whether an adolescent had ever used a modern method or not. Combining information on the age at first sex and year of first use, adolescents who had never used a modern method at the time of the survey were coded '0', while adolescents who had ever used a modern method were coded '1'. The explanatory variables included socio-demographic characteristics, specifically, age at first sex, current age, residence,

educational attainment, region of residence, religion, nature of first sex, internet use, and sex of head of the household.

2.2. Data Management and Analysis

Data analysis was done using the statistical package STATA version 14. Frequency and percentage distributions were used to describe the key socio-demographic characteristics of the adolescents. Data from the contraceptive histories (calendar) were used to determine the rate at which sexually active unmarried adolescents initiated modern contraceptives. The Kaplan Meiers curve was used to compare the survival function of the modern contraceptive method across certain characteristics. The Log-rank test was used to evaluate whether the Kaplan-Myers curves of time to first use after sexual initiation, for the socio-economic groups, were statistically different. The Cox proportional hazards model was used to estimate the risk of initiating modern contraceptives and the associated socio-demographic factors. The interpretation of the result was made using a hazard ratio and 95% confidence interval. Weight was applied to the data to control for sampling errors and to make the sample representative of the entire population. The time between when a woman had her first sex and the time when she first used a modern method was assumed to be the survival time. The survival time was right-censored for adolescents who did not initiate a modern method during the duration of the study.

3. Findings

3.1. Description of the Respondents:

From Table 1 below, the mean age of the study respondents was 17.6 years. On average, they had their first sex at the age of 15.7 years old but used modern contraceptives at the mean age of 18.2 years. Very few of them reported their first sexual experience as coerced (3.1%). At the time of the survey, of most of the respondents (79.5%) had secondary education, while 5.3% had no formal education at all. About a quarter of the respondents was from the southern region of the country and almost equally distributed in the urban and rural place of residence. More than a quarter (28.4%) of the respondents were from households in the richer quintile. Most of the respondents were Christians (79.3%).

Table 1. Frequency and Percentage Distribution of Respondents' Characteristics.

Variable	Frequency N = 1014	Percentage %
CURRENT AGE	Mean = 17.6, SD = 1.2, RANGE = 15–19	
AGE AT FIRST SEX	Mean = 15.7, SD = 1.6, RANGE = 8–19	
AGE AT FIRST USE	Mean = 18.2, SD = 1.3, RANGE = 10–19	
EDUCATION		
No Education	54	5.3
Primary Education	95	9.3
Secondary Education	807	79.5
Tertiary	58	5.8
PLACE OF RESIDENCE		
Urban	518	51.0
Rural	495	49.0
REGION		
North Central	224	22.1
North East	99	9.8
North West	36	3.6
South East	165	16.3
South South	262	25.8
South West	227	22.4
RELIGION		
Catholic	187	18.4
Other Christians	617	60.9

Table 1. *Cont.*

Variable	Frequency N = 1014	Percentage %
Islam and Other	210	20.7
HOUSEHOLD WEALTH QUINTILE		
Poorest	74	7.3
Poorer	159	15.7
Middle	263	25.9
Richer	288	28.4
Richest	231	22.8
SEX OF HOUSEHOLD HEAD		
Male	656	66.7
Female	328	33.3
LIVING ARRANGEMENT		
Living with Parent	665	67.6
Not living with parent	318	32.4
BIRTH HISTORY		
No	888	90.4
Yes	94	9.6
NATURE OF FIRST SEX		
Forced	31	3.1
Not forced	982	96.9

3.2. Timing of Initiation of a Modern Method of Contraception by Socio-Demographic Characteristics of Respondents

The survival curves were estimated for each category of the variables separately using the Kaplan Meier method while the Log rank test was for statistical comparison.

From Figure 2 above, the survival curves were not all that parallel, and there were times when the curves were close. Time to initiating modern contraceptive use among adolescents in urban areas was different from the time for adolescents in rural areas. Adolescents in rural areas initiated modern contraceptive use earlier than those in urban areas. Figure 3 shows that adolescents in different regions of residence initiated modern contraception at different times. Adolescents in the southwest initiated modern contraceptive use earlier than other adolescents, while adolescents in the northwest initiated modern contraceptive use at later times than all other regions. Figure 4 shows that time to initiate modern contraceptive use was different between the groups. Adolescents who initiated sex after age 15 initiated modern contraceptive use earlier than those who initiated sex before age 15. Figure 5 shows that adolescents who had tertiary education initiated modern contraceptive use earlier than those with no education.
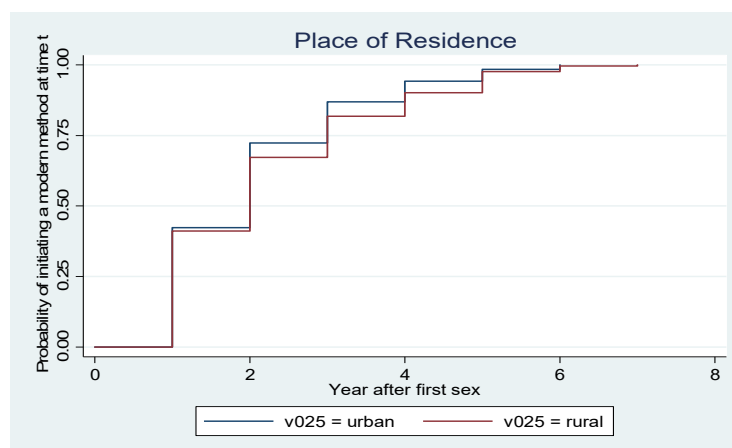

Figure 2. Probability of modern contraceptive initiation among unmarried adolescents by place of residence.
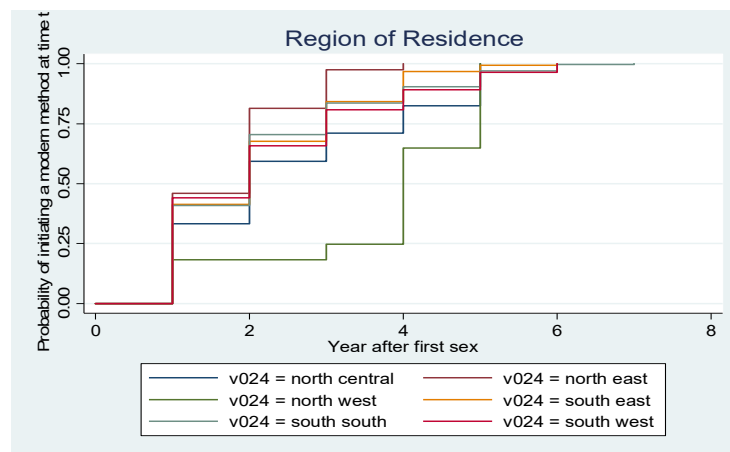
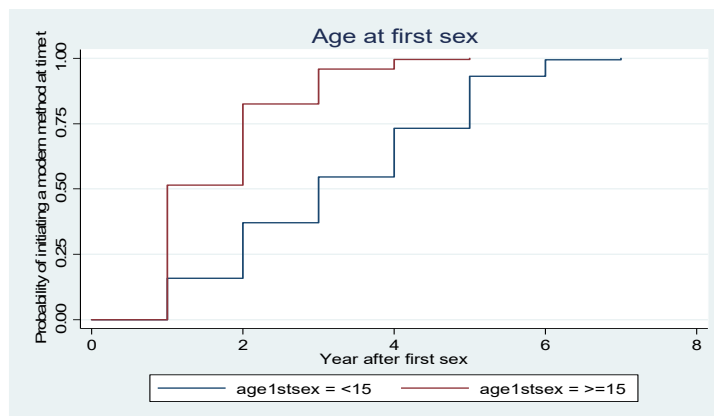**Figure 3.** Probability of modern contraceptive initiation among unmarried adolescents by region of residence.

Figure 4. Probability of modern contraceptive initiation among unmarried adolescents by age at first sex.
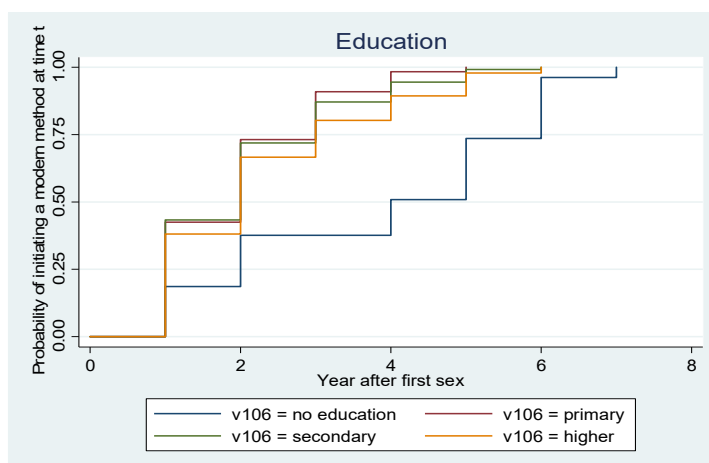

Figure 5. Probability of modern contraceptive initiation among unmarried adolescents by level of education.

From Table 2 it can be seen that the log-rank test of equality across the categories shows that the survival functions for the categories (Urban and Rural) of place of residence were different (*p*-value ≤ 0.000) i.e., time to initiating modern contraceptive use among adolescents in urban areas was different from the time for adolescents in rural areas. The

table shows that the survivor function for regions was statistically different at *p*-value > 0.05. Adolescents in the regions initiated modern contraception at different times. The time to initiate modern contraceptive use was statistically different between the groups at p-value less than 0.05. The time to initiate modern contraceptive use was statistically different between the groups regarding educational attainment at *p*-value less than 0.05.

Table 2. Survivor Test for Place of Residence/Region/Age at First Sex/Education.

Log-Rank Test for Equality of Survivor Functions for Place of Residence		
Place of Residence	Event observed	Event expected
Urban	1299	1244
Rural	975	1030
Total	2274	2274
Chi2(1) = 10.29 Pr > chi2 = 0.001		
Log-Rank Test for Equality of Survivor Functions for Region		
Region	Events observed	Events expected
North central	143	174
North east	437	342
North west	17	32
South east	400	389
South south	893	926
South west	384	411
Total	2275	2275
Chi2(5) = 81.35 Pr > chi2 = 0.000		
Log-Rank Test for Equality of Survivor Functions for Age at First Sex		
Age at First Sex	Events observed	Events expected
Less than 15 years old	618	1010
15 years old or above	1657	1264
Total	2275	2275
Chi2(1) = 630.23, Pr >chi2 = 0.000		
Log-Rank Test for Equality of Survivor Functions for Level of Education		
Level of Education	Events observed	Events expected
No education	85	177
Primary education	130	115
Secondary education	1812	1714
At least Secondary education	247	267
Total	2275	2275
Chi2(3) = 138.01 Pr > 0.000		

The log rank test in Table 3 above reveals that there was no statistical difference in the time of initiation of modern contraceptive use across the religious groups at *p*-value < 0.05. There was no statistical difference in the time of initiation between two groups regarding first sexual experience, at *p*-value < 0.05. However, there was statistical difference in the time of initiation across household wealth groups. In addition, there was statistical difference in the function of wealth quintile across the groups, at *p*-value < 0.05. The log rank test revealed statistical difference in the function of internet use across the groups, at *p*-value < 0.05.

From Figure 6 it can be seen that, the survival curves are nearly overlapping; hence, it depicts no difference in time of initiation across the religious groups. From Figure 7 it appears that adolescents who experienced coerced first sex were initiated earlier than those who did not. Figure 8 depicts differences in times of initiation across household wealth quintile. Adolescents from the richest household wealth quintile, initiated contraceptives use earlier than any group of wealth quintiles. Figure 9 shows that the probability of initiating modern contraceptive use was higher for adolescents who had ever used the internet than it was for those who had never used the internet. Furthermore, Figures 10–12 shows initiation by internet, sex and birth.

Table 3. Survivor Test for Religion/Sexual Experience/Wealth/Internet Use.

| Log-Rank Test for Equality of Survivor Functions of Modern Contraception by Religion		
Religion	Events observed	Events observed
Catholic	343	335
Other Christian	1729	1755
Islam and others	202	184
Total	2275	2275
chi2(2) = 4.48 Pr > chi2 = 0.106		
Log-Rank Test for Equality of Survivor Functions for First Sexual Experience		
First Sex coerced	Event observed	Events expected
No	2245	2242
Yes	29	32
Total	2275	2275
Chi2(1) = 0.56 Pr > chi2 = 0.4558		
Log-Rank Test for Equality of Survivor Functions for sex of household head		
Male	1375	1439
Female	899	836
Total	2275	2275
Chi2(1) = 14.48 Pr > chi2 = 0.0001		
Log-Rank Test for Equality of Survivor Functions across Wealth Quintile		
Wealth quintile	Events observed	Events expected
Poorest	120	218
Poorer	298	330
Middle	517	504
Richer	830	745
Richest	509	478
Total	2275	2275
chi2(4) = 134.68 Pr > chi2 = 0.000		
Birth History		
No	2108	1983
Yes	166	291
Total	2275	2275
chi2(4) = 138.61 Pr > chi2 = 0.000		
Log-Rank Test for Equality of Survivor Functions for Internet Use Groups		
Internet	Events observed	Events expected
Never	1367	1463
Ever	907	811
Total	2275	2275
chi2(1) = 33.81 Pr > chi2 = 0.000		
Log-Rank Test for Equality of Survivor Functions for Internet Use Groups		
Live with parent	1379	1294
Live other relative	895	980
Total	2275	2275
chi2(1) = 33.81 Pr > chi2 = 0.000		
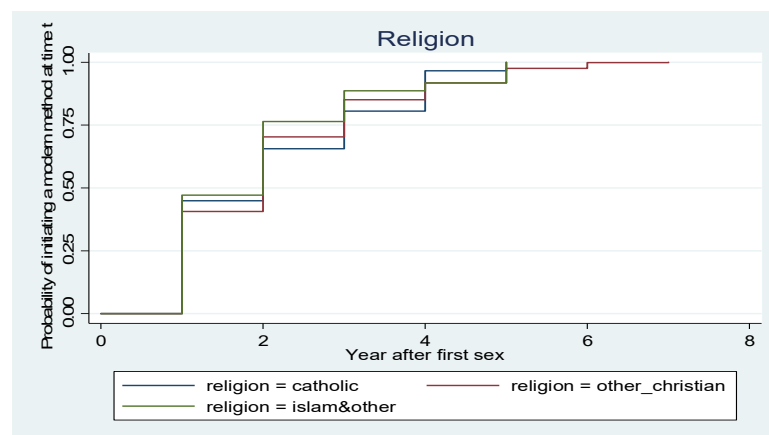
Figure 6. Probability of modern contraceptive initiation among unmarried adolescents by religion.
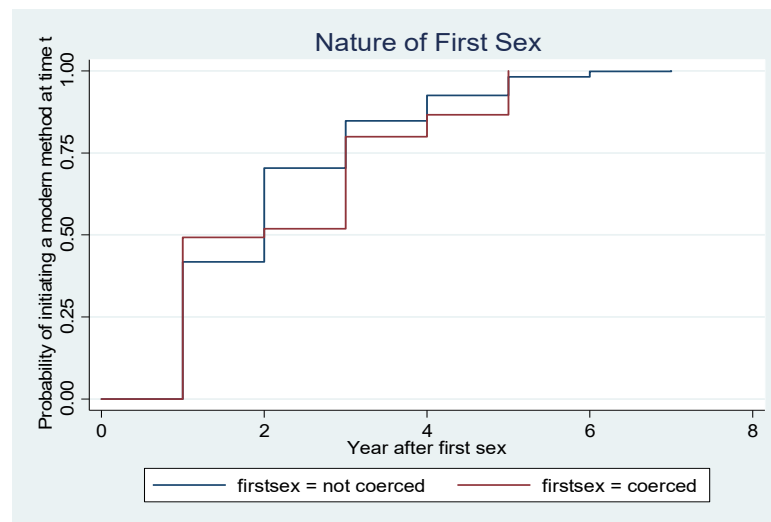
Figure 7. Probability of modern contraceptive initiation among unmarried adolescents by nature of first sexual experience.
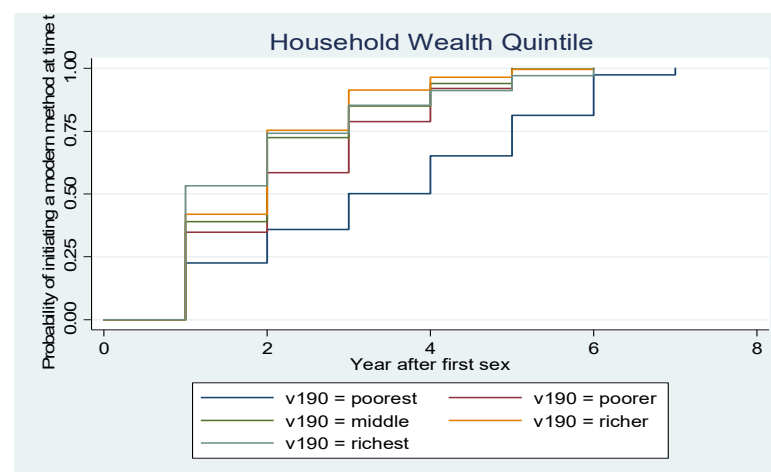

Figure 8. Probability of modern contraceptive initiation among unmarried adolescents by household wealth quintile.
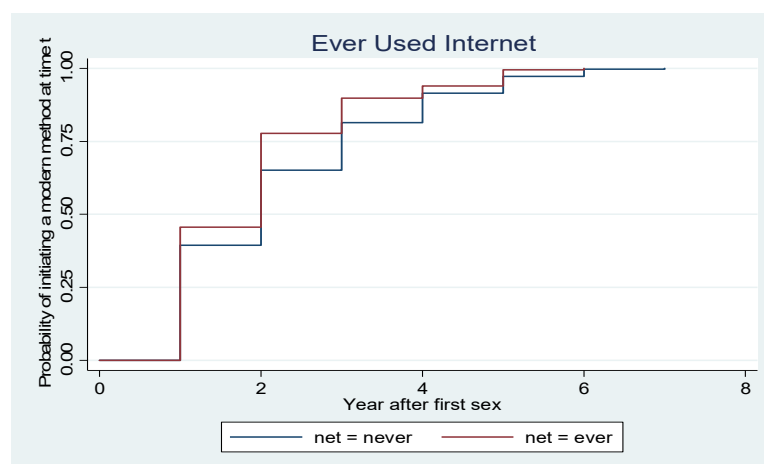

Figure 9. Probability of modern contraceptive initiation among unmarried adolescents by internet use.
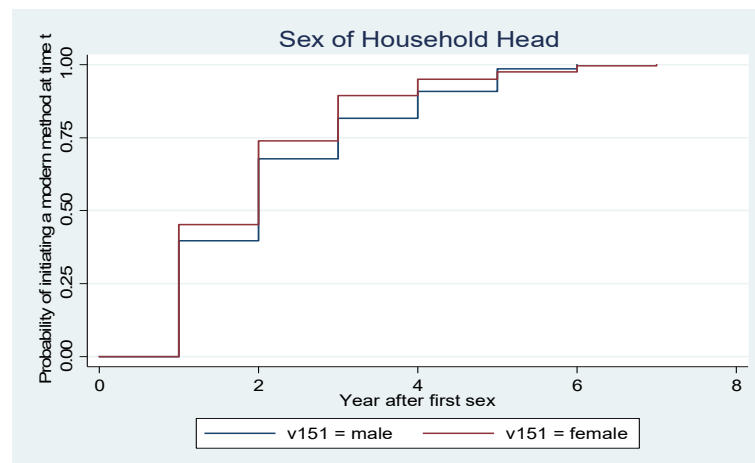
Figure 10. Probability of modern contraceptive initiation among unmarried adolescents by sex of household head.
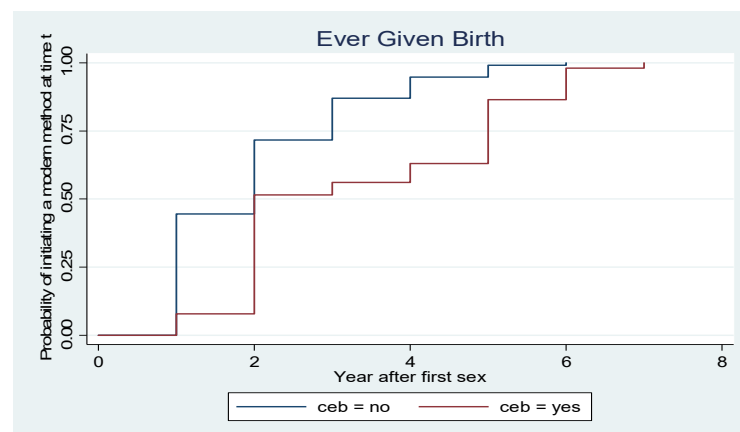

Figure 11. Probability of modern contraceptive initiation among unmarried adolescents by birth history.
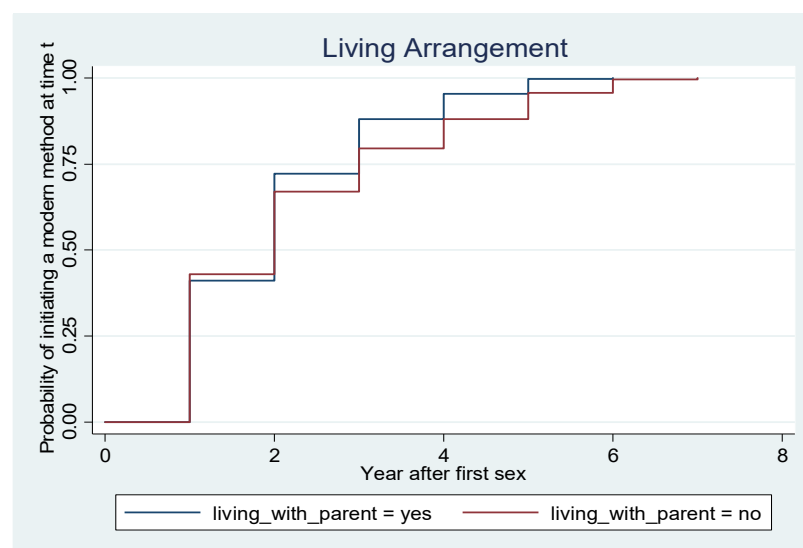

Figure 12. Probability of modern contraceptive initiation among unmarried adolescents by living arrangement.

3.3. Incidence Rate and Risk Factors of Modern Contraceptive Uptake among Sexually Active Unmarried Adolescents Aged 15–19 Years in Nigeria

Table 4 below indicates the incidence of modern contraceptives in Nigeria. The incidence rate of modern contraception among sexually active unmarried adolescents aged 15–19 years was 0.4699 per year. The probability of initiating modern methods of contraceptives use after first sex within a year was 0.4699. At first year after sexual initiation only 25% of sexually active unmarried adolescents who had ever used a modern method had initiated contraceptives use. At year two after first sex, half of the adolescents who had ever used a modern method of contraceptive had initiated use. At year three after first sex, 75% had already initiated use. Table 5 below shows the hazard ratio and intervals of incidence of contraceptives.

Table 4. Incidence Rate of MC.

				Survival Time		
Using MC	Time @ Risk	Incidence Rate	No. of Subjects	25%	50%	75%
	4840.62	0.4699	2274	1	2	3
Total	4840.62	0.4699	2274	1	2	3

Table 5. Hazard ratio and 95% confidence intervals of incidence of modern contraception by socio-demographic characteristics.

Variables	Adjusted Hazard Ratio	95% Confidence Interval
AGE AT FIRST SEX		
Less than 15 years old	RC	
15 years old or older	2.964 *	2.606–3.372
CURRENT AGE	0.696 *	0.659–0.736
REGION		
North Central	RC	
North East	1.164	0.939–1.443
North West	0.484 *	0.283–0.825
South East	0.905	0.712–1.150
South South	0.957	0.784–1.168
South West	1.142	0.920–1.416
PLACE OF RESIDENCE		
Urban	RC	
Rural	1.078	0.965–1.205
LEVEL OF EDUCATION		
No Education	RC	
Primary Education	1.354	0.937–1.956
Secondary Education	1.148	0.820–1.606
Tertiary	1.029	0.707–1.497
RELIGION		
Catholic	RC	
Other Christians	0.968	0.822–1.140
Islam and others	0.858	0.673–1.094
EVER GIVEN BIRTH		
No	RC	
Yes	0.832	0.677–1.035
SEX OF HOUSEHOLD HEAD		
Male	RC	
Female	1.108	0.997–1.231
HOUSEHOLD WEALTH QUINTILE		
Poorest	RC	
Poorer	0.962	0.718–1.290
Middle	1.290	0.971–1.715
Richer	1.292	0.957–1.743
Richest	1.353 *	1.005–1.821
LIVING ARRANGEMENT		
Living with parent	RC	
Not living with parent	1.014	0.919–1.120
INTERNET USE		
Never	RC	
Ever	1.190 *	1.063–1.332
FIRST SEXUAL EXPERIENCE		
Not Coerced	RC	
Coerced	1.078	0.724–1.604

Note: * significant at $p > 0.05$, RC reference category.

Controlling for other variables in the model, adolescents who initiated sex at age 15 years or older were three times as likely as those who had first sex under age 15 to initiate modern contraceptive use [aHR = 2.964, 95% CI 2.606–3.372]. For a unit increase in current age, the incidence of initiating modern contraceptives decreased by 30% [HR = 0.696, 95% 95% CI 0.659–0.736]. The incidence of modern contraceptives initiation was lower among adolescents in the northwest, compared to adolescents in north central [HR = 0.484, 95% CI 0.283–0.825]. The incidence of modern contraceptives initiation was 35% higher for adolescents in the richest household quintile, compared to adolescents from the poorest household [aHR = 1.353, 95% CI 1.005–1.821]. The incidence of modern contraceptives initiation was 19% higher for adolescents who had ever used the internet, compared to adolescents who had never used the internet [aHR = 1.190, 95% CI 1.063–1.332].

4. Discussions

Effective and efficient modern contraception is key to averting unintended pregnancies, sexually transmitted infections, and other health and social consequences (Fagbamigbe et al. 2018). The level of modern contraceptive use reflects the chances of unintended pregnancy and risky sexual behaviour. The timing of the use of modern contraceptives is important in understanding modern contraceptive use. This study examined how soon unmarried adolescents aged 15–19 years in Nigeria started modern contraception after their first sexual experience and the socio-economic factors associated with it. Factors such as age at first sex, current age, household wealth quintile, region of residence, and use of the internet were associated with the timing of the first use of modern contraceptives.

On average, the time when unmarried adolescents initiated the use of modern contraceptives was two years after first sex. The probability of initiating a method of modern contraceptives was lower with an older age. This is in line with the result in Tanzania where age increased with modern contraceptive use among adolescents aged 15–19 years (Nsanya et al. 2019). It could be that the older cohort initiate sex earlier than the younger cohort. As a result, this shows that age at first sex is associated with modern contraceptive initiation. Adolescents who initiate sex at age 15 or later initiate modern contraceptive use sooner after first sex than those who initiate sex before age 15. This is in line with several findings where sexual debut before age 15 years has been found to be associated with sexual risk behaviours, including unprotected sex and taking longer to begin using contraception (Olaide et al. 2022; Cavazos-Rehg et al. 2010; Finer and Philbin 2013).

Regional variation exists in contraceptive initiation. Adolescents in the northwest are significantly less likely to initiate modern contraceptive use early compared to those in north central. Low contraceptive use has been reported in the northwest among all women in the reproductive age group ((Johnson 2017; Wang and Cao 2019; Koenig et al. 2004; Mardi et al. 2018). This may be due to differences in socio-demographic indices in the regions. Wealth quintile is associated with modern contraceptive uptake and the likelihood of use increases along with the wealth quintile. It was found that the incidence of modern contraceptive uptake was highest among adolescents from households in the richest wealth quintile compared to the poorest households. This is similar to what was found among all women in Nigeria (Johnson 2017). It could be that adolescents from these households can afford to buy modern contraceptives, while those from poor households cannot. Affordability could be one of the barriers to early initiation of modern contraceptive use among unmarried adolescents in Nigeria.

The use of the internet has been linked to the use of contraception for the first time. Adolescents who have ever used the internet are more likely to use contemporary contraception than those who have never used it. This backs up findings that internet use has increased the use of modern contraception among women in Sub-Saharan Africa, crossing the educational divide (Toffolutti et al. 2020). It is possible that internet access exposes them to information about modern contraception and reproductive health, prompting them to utilize contraception. Although greater education, rural residency, female-headed house-

holds, not living with a parent, being a Catholic, and being nulliparous are associated with a higher likelihood of starting contemporary contraception, the risks are not significant.

5. Conclusions

This is one of the few studies in Nigeria that looks at how soon contemporary contraceptives are used after sexual debut among sexually active unmarried teenagers aged 15 to 19 years. There has been no attempt to anticipate the rate at which this group will begin using contemporary contraception. The rate of contemporary contraceptive initiation was investigated in this paper. In addition, socio-economic risk factors for this group's use of contemporary contraception were discovered. Unmarried adolescents in Nigeria delay modern contraceptive use until two years after their first sex. It was shown that modern contraceptive initiation is not early in adolescent girls. In Nigeria there are differences in time of initiation due to age at first sex, current age, region, wealth quintile, and internet use. Adolescents who experience sexual debut before age 15 do not initiate contraceptives early. This indicates that young people should be better informed about the benefits of modern contraceptives earlier. This would allow them to recognize the need for modern contraception, and would, thus, increase the chances of early initiation of use. Also, the internet would be very effective in educating young women about sexual and reproductive health. Program managers and health care providers should focus on older adolescents, as well as those in north-western Nigeria, and explore using the internet to reach out to adolescents with contraception and sexual and reproductive health programs. This article outlines a paradigm for effective intervention that is crucial to achieving the Sustainable Development Goals (SDGs), enhancing adolescent health and well-being, and strengthening family and community health.

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