ORIGINAL RESEARCH ARTICLE

Susceptibility of Nigerian adolescents to pregnancy and use of modern contraceptives

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Abstract

Nearly half of pregnancies amongst adolescent girls between ages 15 and 19 are unplanned, one outcome of this is unsafe abortion. Nigerian adolescents aged 15-19 have higher proportion of unmet needs for contraception than those aged 20-24, raising pertinent questions on their perceived susceptibility to pregnancy. Using the Health Belief Model, this article examined the effect of perceived susceptibility to pregnancy on modern contraceptive use among adolescents in Nigeria. Weighted data for 983 sexually active unmarried adolescents aged 15-19 years was extracted from the 2018 Nigerian Demographic and Health Survey. Binomial logistic regression was modelled to test for this relationship. Results showed that there is no significant association between perceived susceptibility and modern contraceptive use. However, adolescents who make use of the internet (AOR=1.659, CI 1.046-2.630), and those who had a sexual partner (AOR=4.051, CI 1.960-8.639), more than one partner in the last 12 months (AOR=6.037, CI 2.292-15.902) were more likely to use modern contraceptive. Young adolescents in Nigeria needs to be sensitized about reproductive health and the importance of the use of contraceptive. *(Afr J Reprod Health 2022; 26[2]: 106-117).*

Keywords: Modern contraceptive, never married, ovulation, adolescents, NDHS, Nigeria

Résumé

Près de la moitié des grossesses chez les adolescentes âgées de 15 à 19 ans ne sont pas planifiées, l'une des conséquences étant l'avortement à risque. Les adolescents nigérians âgés de 15 à 19 ans ont une proportion plus élevée de besoins non satisfaits en matière de contraception que ceux âgés de 20 à 24 ans, ce qui soulève des questions pertinentes sur leur sensibilité perçue à la grossesse. À l'aide du modèle de croyances en matière de santé, cet article a examiné l'effet de la susceptibilité perçue à la grossesse sur l'utilisation de contraceptifs modernes chez les adolescents au Nigeria. Les données pondérées de 983 adolescents célibataires sexuellement actifs âgés de 15 à 19 ans ont été extraites de l'enquête démographique et sanitaire nigériane de 2018. La régression logistique binomiale a été modélisée pour tester cette relation. Les résultats ont montré qu'il n'y a pas d'association significative entre la sensibilité perçue et l'utilisation de contraceptifs modernes. Cependant, les adolescents qui utilisent Internet (AOR = 1,659, IC 1,046-2,630) et ceux qui ont eu un partenaire sexuel (AOR = 4,051, IC 1,960-8,639), plus d'un partenaire au cours des 12 derniers mois (AOR = 6,037, IC 2,292-15,902) étaient plus susceptibles d'utiliser un contraceptif moderne. Les jeunes adolescents nigérians doivent être sensibilisés à la santé reproductive et à l'importance de l'utilisation des contraceptifs. *(Afr J Reprod Health 2022; 26[2]: 106-117).*

Mots-clés: Contraceptif moderne, jamais marié, ovulation, adolescents, NDHS, Nigeria

Introduction

A significant fraction of the world population increase arises from marginally advanced regions of the world, especially sub-Saharan Africa[1]. Adolescents make up nearly 20% of the global population, a population expected to keep increasing across the next 15 years, with the highest growth in sub-Saharan Africa[2]. The aspiration of improving on the uptake of modern contraceptives in most of the countries in sub-Saharan Africa is unsteady, and programs have been funded in the continent with the aim of tackling high levels of unmet needs for contraceptive. Even with these efforts, the use of contraceptives in Africa has remained comparatively low[3]. Nonetheless, there are high levels of unfulfilled necessity for contraception and unintended pregnancies among adolescents aged 15-19 in the developing countries, about half of pregnancies among this age group is

unintended[4]. Among adolescents below age 20 who get pregnant in Latin America and Caribbean, half of them did not plan it while in many parts of sub-Saharan Africa it is more than 40% [5]. Unmet need for contraception reported among adolescents in the developing regions ranges from 34%-67% among the unmarried[6]. This may be an indication of contraceptive service bias against non-marital union. Nigeria being one of the largest populations in Africa is a hub for promoting contraceptive use. By 2050, Nigeria's population is forecasted to reach 400 million, making top five of most populous countries in the world[7]. The triggers for rapid population growth are high birth rates, low contraceptive use and early marriages[8]. Adolescents in Nigeria contribute significantly to these factors. Fertility rates at this age group is 118 births per 1000 girls aged 15-19 years[9]. In Nigeria, unmet needs for contraception among adolescent is 35.3%, this value is high compared to the value for older women[10]. Many reproductive health and contraceptive study on adolescents are more likely to miss the significance of knowledge of the fertility window with prevention of unintended pregnancy through contraception. Fertility awareness is the ability to understand the time of susceptibility to pregnancy during the menstrual cycle[11]. This knowledge method has been recommended as a possible means of family planning[12]. The lack of knowledge of this period could lead to unprotected sex with diverse health and social outcomes among sexually active unmarried adolescents. Adolescents may be deficient in understanding when they are likely to get pregnant and may not practice contraception if they are not familiar with the make-up of the reproductive system.

Therefore, a possible approach to increase contraception among adolescents may be to understand their knowledge on the risk of conception. Studies has suggested a connection between young people's reproductive health apprehension and outcomes in developing countries[13,14]. The prevention of poor reproductive health outcomes in this population therefore may necessitate adequate information about fertility awareness among sexually active unmarried adolescents in Nigeria. Adequate knowledge of the ovulatory period may assist in increasing modern contraceptive use which in turn will affect sexual

and reproductive health outcomes among adolescents in Nigeria. This article presumes that modern contraceptive use may be associated with knowledge of ovulation days as proxy for perceived susceptibility to pregnancy among adolescents aged 15-19 years in Nigeria. The objective of this article is to assess the relationship between perceived susceptibility and current contraceptive use among adolescents.

Issues in context

This article is premised on the health belief model. From this model, pregnancy perception is regarded as potential antecedents of contraceptive behaviour. It posits that individual perception of an outcome can guide preventive measures against it. However, this perception is modified by some characteristics of the individual. According to the model, perceived susceptibility is individual's awareness and belief of risk of pregnant. A study in the US among women aged 20-45 years revealed a lower probability of using contraceptives at last sex among women who thought they can't get pregnant compared to women, who thought they are at risk of getting pregnant[15]. However, another study carried out among low-income women aged 16-24 years in the U.S showed that perceived susceptibility to pregnancy is not associated with use of contraceptive or the practice of safer sex[16]. A quantitative cross-sectional study analysed the interrelationship between ovulation awareness, contraception, and unintended pregnancy among young women between ages 15 and 24 years in 29 African countries using data from the Demographic and Health Survey. Although inaccurate description of ovulation was prevalent among users and non-users of contraceptives, respondents who had accurate information about ovulation had higher probability of using contraception compared to those who did not[17].

Communities link the use of contraceptive to promiscuity and prostitution as a result, young women are ashamed to buy or carry contraceptive. Hagan and Buxton provided the evidence that adolescents are embarrassed to acquire contraceptive[18]. Adolescents feel that acquiring contraceptives will make them subjects of mockery and gossip[18]. Different factors like individual perceptions, behaviour, and environments have

been found to be factors that limit adolescents to seek and use contraceptives. Nalwadda *et al* opined that misconceptions and fear of contraception are obstacles to contraception[19]. Young people believes that contraceptives interfere with fertility and are frightened to use something that hinder them from giving birth later in life. In addition, Kinaro and Colleagues' study among adolescents in Kenya support this finding by establishing that unfavourable perceptions among adolescents contribute to low contraceptive use[20]. Similarly, Renjhen *et al* found that adolescents perceive contraceptive to cause weakness and that it may also lead to obesity[21]. Aside misconceptions, Nalwadda *et al* also found that the fear of stigmatisation prevent adolescents from using contraceptives[19].

Makola *et al* wrote that area of residence is a significant determinant of contraceptive use. Rural settlement is associated with low use of contraceptives[22]. In contrast, Osakinle *et al* argued that place of residence has no effect on contraceptive use[23]. Another predictor of contraceptive use is number of sexual partners. Essiben found that having only one partner is associated with non-use of contraceptives likewise, Anyangu in a study among people aged 15-24 years in Kenya argued that consistent condom use is associated with having multiple sexual partners[24,25]. Founmane *et al* in Cameroun also found that lower rate of use is found where there is infrequent sexual activity. Kelcikova threw weight to this argument having found that one of the reasons for not using contraceptive is having sex rarely[26]. Contributing to the debate on partner's characteristics and contraceptive use, Makola *et al* study among young women in South Africa reveals that using some form of contraceptive is associated with sexual partner age difference[22]. Having a sexual partner who is not more than 5 years older promotes use. Supporting this argument, Guleria also found that having a sexual partner 20 years or older is associated with non-use of contraceptive[27]. As earlier pointed out unravelling the determining factor of modern contraception among unmarried adolescents in the developing countries is precedence for policymakers and the populace because of its implications. Though many studies have established various determinants of adolescents' contraceptive use, nevertheless the factors propelling the event has not been fully explored especially with regards to awareness of susceptibility to pregnancy among unmarried adolescents in Nigeria.

Methods

We used a cross-sectional method to answer the research question-*what is the association between perceived susceptibility to pregnancy and modern contraceptive use among unmarried adolescents in Nigeria?* Data was collected from the 2018 Nigeria Demographic and Health Survey (NDHS) dataset. The study population comprises of sexually active unmarried adolescent aged 15-19 years. The survey is five-year periodic population-based, and it is the sixth of its kind in Nigeria. The 2006 population and housing census sampling frame was used for the survey. The Enumeration areas from the sampling frame was used to define the clusters, which is the primary sampling unit (PSU). The survey covers 1389 clusters and 42000 households randomly selected from the 36 states and the Federal Capital Territory (FCT)[28].

Sample size and variables

For this study, data for only 983 adolescents (weighted) between ages 15-19 years who were never married, not pregnant and ever had sex at the time of the survey were used. Use of modern method is the outcome variable for this study, measured as a dichotomous variable. During the survey women were asked the method they were using with the options *"No method, Folkloric method, Traditional, and Modern method"*. For this study, the responses were categorized into two- *not using and using a modern method*. The primary explanatory variable of interest is perceived susceptibility to pregnancy, which is measured as knowledge of ovulation. Study Participants were asked a question to test their knowledge on ovulation, and the responses were -: "*1 = During her period, 2 = After the period ended, 3 = middle of the cycle, 4 =Before period begins, 5 = at any time, 6 = others, 8 = Don't know*". Responses "1,2,4,5,6, and 8" indicate incorrect knowledge and was recoded as "0" while "3" which is correct knowledge was recoded as "1" for this study[17]. The

predictor variables (modifying and enabling factors) in the study include the background characteristics of the respondents and which have been found to influence contraceptive use directly or indirectly in the literature and part of Health Belief Model (HBM). These variables are current age in single years, education, living arrangement, place of residence, religion, region, age at first sex, nature of first sex, number of sexual partners, fertility history.

Data analysis

Weight was applied to the data to control for sampling errors and to make the sample a good representative of the entire population. Data analysis was done using the Statistical Package STATA version 14. The profile of the study sample was described using frequency and percentages distribution. The outcome variable was tabulated against the predictors to display prevalence of use across groups. A p-value less than 0.05 was considered significant for all the statistical analysis. Binary logistic regression model the odds of modern contraceptive use. Binomial Logistic regression is appropriate when the predicted outcome is binary in this case- use and non-use of modern contraceptive. Binomial logistic regression tests the probability of independent variable(s) being statistically significant in a specific category, compared to the baseline outcome category of a binary outcome variable. The analysis commences with logit transformation of the outcome variable using maximum likelihood estimation. This is done using odds ratio which is described below-

$Odds_i = [P_x/1-P_x]$

$Log [odds ratio] = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \ldots + \beta_n x_n$

$Odds_i = [P_x/1-P_x] = e^{\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \ldots + \beta_n x_n}$

It is assumed that there is a linear relationship between the predictors and the log-odds of the event that Y=1
Where,
P_x is the probability of use
$1-P_x$ is the probability of non-use
β_0 = coefficient for intercept
β_1 = coefficient for predictor 1
X_1 = predictor 1
This test is used when there is no assumption of normality, linearity or homoscedacity[29].

Results

The first part of this section shows the distribution of the respondents by their background characteristics, and reproductive characteristics. An awareness of the background characteristics of the study population enhances a clear understanding of the findings. The descriptive analysis is divided into three sub-sections: demographic and socio-economic characteristics, reproductive characteristics, and knowledge and contraceptive behaviour. This is done using frequency and percentage distribution tables and pictorial chart as shown below.

Table 1 and 2 depict the frequency and percentage distributions of respondents' characteristics as well as the prevalence of modern contraceptive use across the groups, while Table 3 shows the unadjusted and adjusted odd- ratio of the relationship between respondents' characteristics and modern contraceptive use.

Description of respondents

Table 1 shows the weighted frequencies and percentages of the respondents' demographic and socio-economic characteristics. The mean age of respondents is 17.6±1.2 years. Seventy-nine percent of the respondents have secondary school education while 5.5% have no formal education. Majority of the adolescents live with their parent (68.1%). One-quarter of the respondents (25.6%) are residents in the South-south region, while 22.5% reside in the North central region, 22.2% are in the South-west, 16.3% reside in the South-east, 9.9% North-eastern region, and 3.6% in the North-west. Respondents are almost evenly split between the two areas 50.6% in urban areas and 49.4% in rural areas. Most of the respondents are Christians (61.1%) and 18.5% are Catholics. More than one-quarter of the sample are from the richer household (28.5%) while, 7.4% are from the poorest household. Of the whole sample, 71% have never use internet only about 24.8% used internet in the last 12 months before the survey.

Most of the respondents 81.7% had their first sex at age 15 or after, 96.8% report their first sex to be consensual, 72% report having only one sexual partner in the last 12 months before the survey. More than one-quarter of the respondents

Table 1: Frequency and Percentage distribution of unmarried adolescents aged 15-19 years background characteristics and prevalence of use in Nigeria

VARIABLE	FREQUENCY (%)	MODERN CONTRACEPTIVE USE. N (%)
AGE	Mean=17.62 SD=1.22	
15	63(6.4)	4(6.9%)
16	121(12.3)	16(12.9%)
17	185(18.8)	15(8.1%)
18	326(33.1)	65(19.9%)
19	289(29.4)	55(19.1%)
PLACE OF RESIDENCE		
Urban	498(50.6)	79(16%)
Rural	486(49.4)	75(15.6%)
HIGHEST EDUCATIONAL LEVEL		
No Education	54(5.5)	7(12.1%)
Primary	89(9.1)	9(10.1%)
Secondary	781(79.5)	126(16.2%)
Higher	59(6.0)	13(21.9%)
LIVING ARRANGEMENT		
With Parent	670(68.1)	98(14.6%)
Other Relative	179(18.2)	34(18.8%)
Non-Relative or Alone	135(13.7)	23(17.5%)
REGION OF RESIDENCE		
North Central	221(22.5)	23(10.2%)
North East	98(9.9)	27(28.1%)
North West	35(3.6)	4(11.4%)
South East	160(16.3)	26(16.5%)
South South	252(25.6)	50(19.8%)
South West	218(22.2)	25(11.3%)
RELIGION		
Catholic	181(18.5)	25(13.9%)
Other Christians	601(61.1)	106(17.6%)
Islamic &Others	201(20.4)	24(11.8%)
HOUSEHOLD WEALTH		
Poorest	72(7.4)	5(6.4%)
Poorer	154(15.7)	29(18.8%)
Middle	254(25.8)	41(16.3%)
Richer	280(28.5)	43(15.4%)
Richest	223(22.6)	37(16.5%)
USE OF INTERNET		
Never	698(71.0)	96(13.7)
Yes, last 12 months	244(24.8)	49(20.3%)
Yes, before last 12 months	41(4.2)	10(23.8%)
TOTAL	983(100.0)	155(16.0%)

WEIGHTED FREQUENCY AND PERCENTAGES

(29.8%) reported having sex in the last four weeks before the survey. Most of the respondents (90.4%) has never given birth.

Male condom is the most used type of modern contraceptive (75.7%), followed by periodic abstinence (6.5%). The least used methods are injection (1.2%) and implants/Norplant (1.8%).

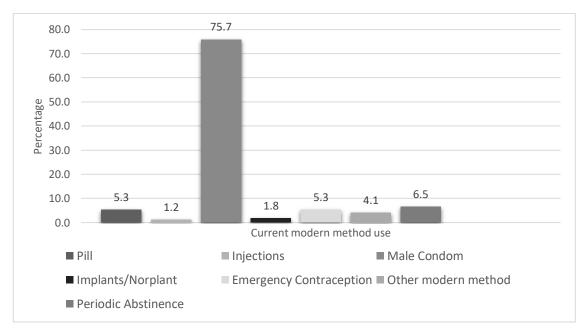About 5% uses the pill and emergency contraception.

From the figure below, the majority (65.8%) of respondents who use modern contraceptives get them from chemists, patent medicine store or shops. Only 6.3% reported to be getting from clinics and hospitals.
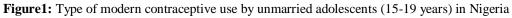
Table 2: Frequency and Percentage distribution of unmarried adolescents' reproductive characteristics by prevalence of use in Nigeria

VARIABLE	FREQUENCY (%)	MODERN CONTRACEPTIVE USE. N (%)
AGE AT FIRST SEX		
Before age 15	194(18.3)	27(15.5%)
15-19	866(81.7)	128(15.8%)
NATURE OF FIRST SEX		
Forced	32(3.2)	4(13.7%)
Not forced	952(96.8)	151(15.8%)
NUMBER OF SEX PARTNERS LAST 12 MONTHS		
None	219(22.3)	10(4.5%)
One	708(72.0)	126(17.8%)
More than one	56(5.7)	19(33.8%)
LAST SEXUAL ACTIVITY		
Active in last 4 weeks	293(29.8)	66(22.6%)
Not active-Postpartum	49(4.9)	1(1.1%)
Not active -not postpartum	642(65.3)	88(13.8%)
FERTILITY HISTORY		
None	888(90.4)	144(16.3%)
Yes	95(9.7)	10(11%)
KNOWLEDGE OF OVULATION		
Incorrect	792(81.0)	119(15%)
Correct	191(19.0)	36(19%)
FECUNDITY		
Fecund	945(96.1)	154(16.3%)
Infecund	39(3.9)	0.5(1.4%)

WEIGHTED FREQUENCY AND PERCENTAGES

Figure1: Type of modern contraceptive use by unmarried adolescents (15-19 years) in Nigeria

Prevalence of modern contraceptive use

Of the sexually active unmarried adolescents in Nigeria, approximately 16% are currently using a modern method of contraception while 84% are not using. From Table 1, one-fifth of respondents who are 18 years old are currently using a modern method while only 6.9% of respondents who are 15
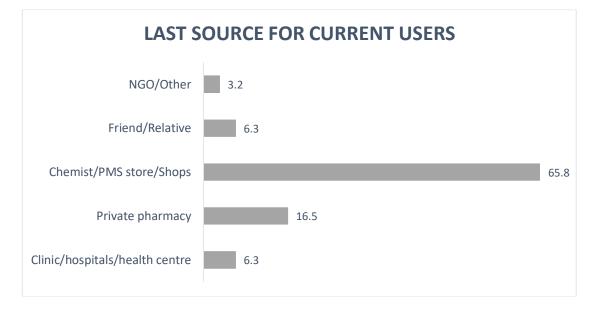
LAST SOURCE FOR CURRENT USERS

- NGO/Other — 3.2
- Friend/Relative — 6.3
- Chemist/PMS store/Shops — 65.8
- Private pharmacy — 16.5
- Clinic/hospitals/health centre — 6.3

Figure 2: Percentage distribution of source of modern contraceptives for current users

years old are using. The prevalence of use in the two areas of place of residence are almost the same. The prevalence of modern method of contraception increases with educational attainment, (10.1%) for primary education and 21.9% for tertiary education category respectively.

One-tenth of respondents in North Central are using a modern method, 28.1% of respondents in Northeast are using a method. Contraceptive use is highest among other Christians (17.6%) and lowest amongst Islamists and others (11.8%). The Poorest households reported the least prevalence of use (6.4%), while the poorer households reported the highest prevalence (18.8%). Adolescents who live with other relation reported the highest use (18.8%) while adolescents who live with parent reported the least prevalence (14.6%). Adolescents are exposed to the use of internet recorded higher prevalence of use (20.3%, 23.8%).

From Table 2 above the prevalence of modern contraceptive use is higher in the group of adolescents who have correct knowledge of ovulation. The use of modern contraceptives is more among adolescents who reported fecundity (16.3%). Of those who had their first sex at age 15 and older, 15.8% are using a modern method while 15.5% of those who had their first sex under age 15- reported use. Further, 13.7% of respondents, who experienced coerced first sex are currently using a modern method, while 33.8% of the respondents

with multiple sexual partners in the last 12 months before the survey, are using a modern method while only 17.8% of those with only one sexual partner within the same period uses a modern method. More than one-fifth (22.6%) of those who had sex in the last four weeks are using a modern method. More than one-tenth of (11%) of those who has given birth are using a modern method.

Knowledge of ovulation is not statistically associated with the use of modern contraceptive at 0.05 level of significance [AOR=1.021, CI 0.660-1.580]. Fecundability is independently associated with the use of modern contraceptive. The likelihood of modern contraception is 90% lower among respondents who reported infecundity in relation to those who are fecund [OR=0.100, CI 0.137-0.728]. There is an association between number of sexual partners and modern contraceptive use. Respondents who had one sexual partner are more likely to be using a modern method compared to those with no sexual partner in the last 12 months [OR=5.388, CI 2.698-10.761]. Controlling for other variables, adolescents with one sexual partner are four times as likely as those with no sexual partner in the last 12 months before the survey to be using a method (AOR=4.051, CI=1.960-8.693). Those with multiple sexual partners in the last 12 months were eight times as likely as those with no sexual partner to be using a modern method of contraceptive [OR=8.636, CI

Table 3: Demographic and socio-economic risk factors of modern contraception among unmarried adolescents in Nigeria

VARIABLE	UNADJUSTED ODD-RATIO	95% CONFIDENCE INTERVAL	ADJUSTED ODD-RATIO	95% CONFIDENCE INTERVAL
KNOWLEDGE OF OVULATION				
INCORRECT	*RC*		RC	
CORRECT	1.235	0.825-1.848	1.021	0.660-1.580
FECUNDITY				
FECUND	*RC*			
INFECUND	0.1000*	0.137-0.728	0.209	0.025-1.736
AGE AT FIRST SEX				
Before age 15	RC		RC	
At age 15 or above	1.226	0.775-1.941	0.733	0.429-1.252
LIVING ARRANGEMENT				
With Parent	RC		RC	
Other Relation	1.2978	0.859-1.960	1.214	0.780-1.888
Non-Relation or alone	1.147	0.681-1.933	0.864	0.491-1.520
NUMBER OF SEX PARTNERS LAST 12 MONTHS				
None	RC			
One	5.388	2.698-10.761	4.051*	1.960-8.639
More than one	8.636	3.557-20.971	6.037*	2.292-15.902
LAST SEXUAL ACTIVITY				
Active in last 4 weeks	RC		RC	
Not active-Postpartum	0.056*	0.007-0.408	0.209	0.022-1.934
Not active -not postpartum	0.531*	0.375-0.753	0.721	0.487-1.065
BIRTH HISTORY				
None	RC		RC	
Yes	0.517*	0.272-0.984	0.982	0.459-2.104
AGE				
15	RC		RC	
16	1.566	0.589-4.159	1.448	0.514-4.078
17	1.223	0.469-3.193	1.231	0.439-3.452
18	2.527*	1.051-6.078	2.32	0.977-6.141
19	2.376	0.979-5.767	2.083	0.774-5.607
PLACE OF RESIDENCE				
Urban	RC		RC	
Rural	0.822	0.586-1.155	0.994	0.653-1.913
HIGHEST EDUCATIONAL LEVEL				
No Education	RC		RC	
Primary	1.663	0.510-5.424	1.984	0.554-7.107
Secondary	2.312	0.821-6.508	1.912	0.612-5.973
Higher	3.643*	1.094-12.131	1.952	0.506-7.529
REGION OF RESIDENCE				
North Central	RC		RC	
North East	2.046	1.130-3.706	1.826	0.928-3.597
North West	1.423	0.463-4.376	1.283	0.394-4.180
South East	1.801*	1.050-3.092	1.628	0.869-3.049
South South	1.754	1.057-2.912	1.331	0.761-2.328
South West	1.683	0.964-2.938	1.365	0.738-2.525
RELIGION				
Catholic	RC		RC	
Other Christians	1.149	0.728-1.812	1.169	0.690-1.980

Islamic &Others	0.677	0.365-1.254	0.802	0.387-1.661
HOUSEHOLD WEALTH				
Poorest	RC		RC	
Poorer	2.632*	1.049-6.603	3.146*	1.164-8.505
Middle	2.605*	1.076-6.308	2.912*	1.097-7.729
Richer	2.656*	1.094-6.448	2.523	0.916-6.969
Richest	3.196*	1.291-7.912	2.856	0.990-8.36
USE OF INTERNET				
Never	RC		RC	
Yes, last 12 months	1.953*	1.339-2.848	1.659*	1.046-2.630
Yes, before last 12 months	3.03*	1.349-6.803	2.348	0.963-5.622

3.557-20.971]. Adjusting for other variables, they were six times as likely [AOR=6.037, CI 2.292-15.902]. Sexual activity is independently associated with current use. Adolescents who reported no sexual activity in the last 4 weeks before the survey due to postpartum abstinence have lower odds of using a modern method compared to those who had sexual activity (OR= 0.056, CI=0.007-0.408). Adolescents non postpartum who had no sex in the last 4 weeks before the survey are less likely to be using a modern method compared to those who had sex in the last 4 weeks before the survey (OR=0.531, CI=0.375- 0.753).

Adolescents who were already mothers were less likely to be using a method compared to those who had never given birth (OR=0.517, CI=0.272- 0.984). However, this association became insignificant after controlling for other variables. Adolescents who are 18 years old have higher odds of modern method of contraceptive compared to adolescents who are 15 years old [OR=2.527, CI 1.051-6.078]. Adolescents with higher education were three times as likely as those with no education to be using modern contraceptive (OR=3.643, CI=1.094-12.131). Adolescents in southeast Nigeria were 80% more likely to be using modern contraceptive compared to adolescents in North central Nigeria (OR=1.801, CI=1.050-3.092).

Adolescents in poorer household are more likely to be using modern contraceptive compared to adolescents in poorest household at p-value<0.05 even after controlling for other variables in the model (OR=2.632, CI=1.049-6.603; AOR=3.146, CI=1.164-8.505). Adolescents in middle wealth household and those in richer household are more likely to be using a modern method compared to the adolescents in poorest household at p-value<0.05 (OR=2.605, CI=1.076-6.308, OR=2.656,

CI=1.094-6.448 respectively). Controlling for other variables, adolescent in middle wealth household were more likely to be using modern contraceptive (AOR=2.912, CI=1.097-7.729). Adolescents in Richest household are three times as likely as adolescents in poorest household to be using a method (OR=3.916, CI=1.291-7.912). Adolescents who used internet within the last 12 months before the survey were 95% more likely to be using a modern method compared to adolescents who has never used internet (OR=1.953, CI=1.339-2.848). Adjusting for other variables in the model, they are more likely to be using a modern method of contraceptive compared to those who had never used internet (AOR=1.659, Cl=1.046-2.630). Adolescents who used internet before the last 12 months before the survey are more likely to use a modern contraceptive compared to those who has never used the internet (OR=3.030, CI=1.349-6.803).

Discussion

This article has examined the relationship between perceived susceptibility and the use of modern method of contraceptives among sexually active unmarried adolescents in Nigeria. In this article, the average age of sexually active unmarried adolescent in Nigeria is 17.6 years most of which have not completed secondary school. Most of them had their first sex at age 15 or above, had one sexual partner and had limited sexual activity. This reflects the infrequent nature of sexual activity among unmarried adolescent in Nigeria. One-tenth of these adolescents are already mothers. This study found that 15.8% of sexually active unmarried adolescents between ages 15 and 19 currently use a modern method of contraceptive. This is low compared to the overall average in the continent; 30.5% in West

and Central Africa, 34.6% in Eastern and Southern Africa and to be specific 48.7% in Tanzania[30,31]. Despite these, Ghana a close country recorded only 6% among the same population[32]. The most prevalent type of modern method among these adolescents is male condom; this result is conformable to a study conducted among adolescents in Kenya, which discovered that condom is the predominantly used type[33]. This could be because of easier access to it as majority of users get method from chemists. This may also be the reflection of the nature of sexual activity among this age group, which encourages short term method and more importantly the dual protection against unwanted pregnancy and sexually transmitted diseases provided by male condom.

Majority of the adolescents using a modern method get them from chemist, patent medicine shops and shops this is in contrast with some studies where it was found that health facilities is the major source[33,34]. This could be because of the judgmental attitude of healthcare providers towards unmarried adolescents seeking contraceptives in Nigeria. Majority of healthcare providers perceives the permission of contraception for unmarried adolescents as a way of promoting sexual promiscuity[35]. Although prevalence of use of at least one modern method of contraceptive is high among adolescents who have correct knowledge of ovulation, it is not associated with modern contraceptive use among sexually active adolescents in Nigeria. Higher prevalence of use was also found among those with knowledge of ovulation period in a studying involving 29 African studies[17]. On the flip side, a study among low-income women aged 16-24 years in the U.S on the association between perceived susceptibility and use of a modern contraceptives revealed no association between the two[16]. The author argued that certain events engaged in regularly may have less impact on a health behaviour. Expectedly, age has a positive influence on modern contraceptive use among sexually active unmarried adolescents in Nigeria. Adolescents who are 18 years old are more likely to use modern contraceptive than those who are younger. The probable explanation is that older adolescents may have easier access to methods considering that they are no longer Minors.

Younger adolescents meet several obstacles in accessing modern contraceptives such as providers' bias because sexual activity is unacceptable among young girls in many settings including Nigeria. In addition to these, adolescents with higher education tends to use more than those with little or no education. This result agrees with previous findings. People who are highly educated are better informed of the importance, and also they may need to practice contraception to ensure that their educational pursuit are not affected by unwanted pregnancy[31,36]. Additionally, higher education has the capability to dissolve erroneous belief about modern contraception. In addition, increased wealth index from poorer to richer household is associated with increased use of modern contraceptive use among unmarried adolescents in Nigeria. A good explanation could be to maintain a continued better quality of life. This finding supports findings from earlier studies. High socioeconomic status of household is associated with higher uptake of contraceptives in the country[36].

Interestingly, it was also found from this study that exposure to internet is promotes modern contraception. Adolescents who used internet in the last 12 months before the survey were more probable to use modern contraceptives as opposed adolescents who has never used the internet. It could be that adolescent who uses internet get expose to more and effective information on contraceptives on the internet. As it has been found that negative attitudes towards contraception can be changed by access to family planning messages. Having a sexual partner in the last 12 months before the survey and having sexual intercourse within the last 4weeks before the survey are associated with modern contraceptive use. This shows that sexual intercourse and mode of sexual relations among unmarried adolescents are not frequent.

Limitation

Dataset used for this study was not primarily collected for this study as a result some of the variables were not measured the exact way they are needed for this study. However, the variables needed were collected in the dataset and the dataset allows for national generalisation.

Conclusion

This article contributes to the global discourse on the determinants of adolescents' contraceptive use. It focuses on the association between perceived susceptibility to pregnancy and modern contraceptive use among sexually active unmarried adolescent aged 15-19 years in Nigeria. The use of modern contraceptive is low among unmarried adolescent in Nigeria. Long-acting method are the least used method among current users. Higher level of education, access to internet, household wealth has strong influence on the acceptance of contraceptive. Knowledge of ovulation period is not related with use. Having multiple sexual partners, frequent sexual activity and use of internet are positively associated with the use of a modern method of contraceptive use. The findings of this paper suggest a need for targeted interventions to improve modern contraceptive among unmarried girls in the country especially those who are young, uneducated or with low education, and those who do not have access to the in internet.

Contribution of authors

OO conceived and designed the study. OO, KO and NS downloaded the data. OO analysed the data and prepared the initial manuscript. KO and NS reviewed the initial manuscript and analysis. All authors read and approved the final manuscript.

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