

# Predictors of young people's use of sexual and reproductive health services in Nigeria: a mixed-method approach

Amelia Ngozi Odo (✉ [ngozi.odo@unn.edu.ng](mailto:ngozi.odo@unn.edu.ng))

University of Nigeria, Nsukka <https://orcid.org/0000-0002-2028-7112>

Justina Ifeoma OFUEBE

University of Nigeria

Anthony Ifeanyi ANIKE

University of Nigeria

Efiong S Samuel

University of Nigeria


---

## Research article

**Keywords:** Sexual and reproductive health, Use, Predictors, Adolescents

**Posted Date:** August 29th, 2020

**DOI:** <https://doi.org/10.21203/rs.3.rs-30823/v3>

**License:**  This work is licensed under a Creative Commons Attribution 4.0 International License. [Read Full License](#)

---

**Version of Record:** A version of this preprint was published on January 6th, 2021. See the published version at <https://doi.org/10.1186/s12889-020-10022-x>.

# Abstract

**Background** Sexual and Reproductive health Services (SRHS) are essential for prevention and control of SRH problems among young people and the achievement of sustainable development goal 3. These services may be available but certain factors interfere with their access and utilization by the young people. This study sought to determine factors that predict the utilization of SRHS among young people in Enugu State, Nigeria.

**Methods** The study adopted mixed method research employing cross-sectional research design. The population of the study comprised young people within the ages of 12 and 22 years. Multi-stage sampling procedure was used to select 1,447 young people used for the study. Questionnaire, in-depth interview, and focus group discussion were used for data collection. Percentages, Chi-square, and logistic regression were used to analyse quantitative data, while qualitative data were thematically analysed using NVivo software.

**Results** Socio-demographic factors of gender, age, education, income and living status ( $p < .05$ ) were significant predictors of utilization of SRHS. Psycho-cultural and health system factors ( $p < .05$ ) were also significant predictors of utilization of SRHS.

**Conclusion** The study concluded that some socio-demographic factors (of gender, age, level of education, income and living status), psycho-cultural and health system factors can be used to predict young people's utilization of SRHS. These predictors could be addressed through home sex education, regular training of health care providers on youth-friendly services delivery and policy reforms.

## Background

The world population is made up of slightly one quarter of young people (10-24 years) [1]. In developing countries, this group constitutes 32 per cent of the population [1] and are faced with several neglected health problems including sexual and reproductive health problems. In Nigeria, about 26.1% of the population are within 12-24years [2]. Nineteen per cent of the adolescents (15-19) had begun childbearing [3] and are more likely to experience adverse pregnancy outcome than those who delayed childbearing. Moreover, the incidence and prevalence of sexually transmitted infections are high among young people aged 15-24 years [4,5]. In 2018, 510,000 young people between the ages of 10 and 24 were newly infected with HIV, of whom 190,000 were adolescents between the ages of 10 and 19 years [6]. Adolescents are also at risk of other SRH problems such as unsafe abortion, early marriage, and sexual violence. Adolescents are exposed to these problems mainly due to their unhealthy sexual behaviours such as early sexual debut, multiple sexual partners, and unsafe sex [7]. Access to and utilization of Sexual and Reproductive Health Services (SRHS) are essential for the prevention of sexual and reproductive health (SRH) problems and diseases.

Though, availability and accessibility of SRHS are still poor in developing countries [8, 9] including Nigeria, the little services that are available and accessible are underutilized by adolescents [10, 11]. Yet, there are increase in the incidence and prevalence of SRH problems and diseases among adolescents such as teenage pregnancy, unsafe abortion, sexually transmitted infections (STI), HIV and AIDS in sub-Saharan Africa [12]. Adolescents are supposed to make effective use of these services because these services are meant to promote the sexual and reproductive health of every individual. Utilization of health services is measured based on health outcomes and percentage of persons that use the services [13]. The significant impact of SRHS' utilization can be observed in

reproductive health outcomes such as pregnancy and birth, prenatal and neonatal mortality, maternal mortality, Sexually Transmitted Infections (STIs) and HIV and AIDS, and complications of abortion [14]. The World Health Organization stated that nearly 20 per cent of all global maternal deaths happen in Nigeria [15] with the risk higher among adolescent girls [16], suggesting that adolescents' utilization of sexual and reproductive health services is low.

Many factors could determine adolescents' utilization of SRHS in Nigeria, despite efforts to make SRHS available at the primary healthcare facilities. These factors which are referred to as predictors in this study range from social, personal, psychological and health system factors. The level of secrecy accorded to sexuality in Nigeria with its direct and indirect implications, makes it difficult for sexually active adolescents to freely access and use SRHS, exposing a high percent of them to STIs [17]. It is, therefore, important to study the perceived predictors carefully to inform health professionals and policy makers, which would enable them to understand the SRH challenges the young ones are facing and explore possible ways of addressing them. For this study, predictors were studied under the following subcategories: socio-demographic, psycho-cultural, and health system factors, to find out if they predicted adolescents' utilization of SRHS. Socio-demographic factors include age, gender, level of education, religious affiliation, location, living status, marital status, economic status. Research has linked sociodemographic factors and adolescents' utilization of health services [18, 19].

Moreover, one's cultural and personal belief may influence the individual's perception of accessing and using health services. Psycho-cultural refers to the interaction of psychological and cultural factors in the individual's personality or in the characteristics of a group [20]. Psycho-cultural factors in this study refers to those cultural beliefs or values that affect the psychology of the youth in seeking for or using SRHS in Enugu State. Psycho-cultural factors included: belief that discussing sexual issues is a taboo, fear of stigmatization or embarrassment based on cultural beliefs, fear of meeting their parents or people they know in the clinics, fear of being labeled a prostitute by community members, fear of not getting married later in life, fear of being barren, and other cultural beliefs regarding the use of SRHS by youths. For example, in some societies, most people assume that providing SRHS for the youth, like provision of sexuality education and contraceptives, promote promiscuity. These fears and burdens are capable of limiting adolescent's use of SRHS and could result in stigmatizing youths that are bold enough to access and use available SRHS [21].

Furthermore, health system factors such as availability of quality reliable services, proximity of the facility to users, cost of services, lack of privacy and confidentiality, long waiting time, using services with adults, and the attitude of service providers were assessed as predictors of adolescents' utilization of SRHS. The nearer the facility to the users, the higher their level of access and utilization. Geographical access, therefore, influences service utilization [22, 9] The main objective of the present study was to determine if these factors predict the adolescents' utilization of SRHS in Enugu State. This has become necessary because such prediction studies are lacking in the State, while there are observed low utilization of health services among adolescents in Nigeria. We used adolescents and young ones interchangeably in this study.

## **Methods**

### **Study area, design, and sampling techniques**

This study was conducted in Enugu State, Southeast Nigeria between January 2015, and July 2016. The cross-sectional design using the mixed method research approach was adopted for this study. Multi-staged sampling procedure was used to randomly select 1,447 young ones within the ages of 12 and 22 who completed the questionnaire correctly. Twenty-seven interviews and 18 group discussions were conducted. The first phase of this study which is focused on availability and accessibility of SRHS had been published [9]. Details of the study area, design and sampling techniques be found in the study [9].

### **Data collection procedure**

Questionnaire, in-depth interview guide and focus group discussion guide were used to collect data from the respondents on both personal and group contacts. Structured questionnaire was prepared through review of related literature. The questionnaire which contained two parts was used to measure utilization of SRHS. First part contained the socio-demographic characteristics of the respondents while the second part contained utilization of sexual and reproductive health services (sexuality education, family planning services, safe motherhood services, post abortion care and prevention and treatment of STIs and HIV and AIDS). Details of the data collection procedure is described elsewhere (9)

### **Data processing and analysis**

Data collected were cross-checked for completeness. Logical techniques were employed to identify errors during data cleaning. Out of 1620 copies of questionnaire only 1447 copies of questionnaire did not have errors and were used for data analysis. The Statistical Package for the Social Sciences (SPSS) version 20.0 was employed for statistical analysis of quantitative data. Percentages were used to assess the utilization of SRHS to adolescents, while Chi-square statistic and logistic regression were used to test association between the variables at .05 level of significance. Data from the questionnaire are presented in Tables. The responses from focus group discussion and IDI were transcribed in English language while maintaining the contexts of the responses. The NVivo 11 Pro software was used to code and analyze the data thematically. The data are presented alongside the quantitative findings.

Outcome variables (SRHS: sexuality education, family planning, safe motherhood, post abortion care and prevention and management of STIs and HIV/AIDS services) were measured dichotomously. Respondents were asked to indicate "Yes" if they have used or helped another young person use the services, otherwise "No". Explanatory variables include: Socio-demographic, psycho-cultural and health system factors. The variables were categorically measured. Socio-demographic variables were gender, age, level of education, living status, location and income status. Psycho-cultural variable was measured by the cumulative of responses to questions related to cultural beliefs and fear such as belief that discussing sexual issues is a taboo, fear of stigmatization or embarrassment based on cultural beliefs, fear of meeting their parents or people they know in the clinics, fear of being labeled a prostitute by community members, fear of not getting married later in life, and fear of being barren. While health system variable was measured by the cumulative responses to questions relating health facility and service providers such as availability of quality reliable services, proximity of the facility to users, cost of services, lack of privacy and confidentiality, long waiting time, using services with adults, and the attitude of service providers.

## **Results**

Table 1 shows the socio-demographic characteristics of the respondents. One thousand, four hundred and forty-seven (1,447) adolescents within the ages of 12 and 22 years, with a mean age of 16.9 years responded to the questionnaire. More than half (57.1%) of the respondents were females while 42.9% were males. Slightly more than half (54.0%) had secondary education. Majority (56.7%) of the respondents lived in rural area and most of them were living with their parents (62.3%). Majority had a monthly income less than ₦5000.00 (1 USD = 199.3 NGN) [9].

**Table 1: Socio-Demographic Characteristics of Adolescents that Responded to the Questionnaire on Utilization of SRHS (n=1447)**

<b>Characteristics</b>	<b>%</b>
<b>Gender</b>	
Male	42.9
Female	57.1
<b>Total</b>	<b>100.0</b>
<b>Age</b>	
12-16	48.2
17-22	51.8
<b>Total</b>	<b>100.0</b>
<b>Education</b>	
Primary	2.2
Secondary	54.0
Tertiary	42.0
None	1.8
<b>Total</b>	<b>100.0</b>
<b>Location</b>	
Urban	43.3
Rural	56.7
<b>Total</b>	<b>100.0</b>
<b>Living Status</b>	
With parents	62.3
Alone	20.4
With friends/husband	3.2
In school	14.1
<b>Total</b>	<b>100.0</b>
<b>Monthly Income</b>	
Below ₦1,000.00k	46.8
₦1,000.00k-₦4,000.00k	19.8
₦5,000.00k-₦10,000.00k	16.0
₦11,000.00k-₦20,000.00k	8.8
Above ₦20,000.00k	8.6
<b>Total</b>	<b>100.0</b>

Table 2 shows that overall percentage total of 38.2 utilized SRHS. The table shows that more than half (56.6%) of the respondents reported using sexuality education services, 30.9% use family planning information and services, 36.5% use safe motherhood services, 23.6% use post-abortion care services and 40.3% use services for the prevention and treatment of STIs and HIV and AIDS.

**Table 2: Percentage Responses on the Utilization of SRHS for Youth in Enugu State (n = 1447)**

<b>Items</b>	<b>%</b>
<b>Sexuality Education Services</b>	
Human biology	68.6
Puberty and menstrual hygiene education	72.0
Skill to overcome sexual desire	60.7
Healthy relationships	55.6
Dangers of pre-marital and unsafe sex	60.3
Counseling on reproductive health issues	48.6
Information on harmful cultural practices like female circumcision	46.0
Information on prevention of non-infectious conditions of reproductive health such as fistulas and cancers	41.2
<b>Cluster % Total</b>	<b>56.6</b>
<b>Family Planning Information and Services</b>	
Family planning information and counseling	42.2
Condoms	43.4
Oral pills	31.0
Injectable contraceptives	22.8
Intrauterine Contraceptive Devices (IUCDs)	22.0
Other contraceptives	23.8
<b>Cluster % Total</b>	<b>30.9</b>
<b>Safe Motherhood Services</b>	
Antenatal care	35.4
Skilled delivery	30.3
Postnatal care	33.4
Immunization	49.1
Infant feeding information	36.1
Growth monitoring	34.5
<b>Cluster % Total</b>	<b>36.5</b>
<b>Post Abortion Care Services</b>	



Emergency care during bleeding	25.8
Manual removal of retained product of conception	21.4
Information on prevention of unwanted pregnancy and abortion	36.8
Referral	23.6
<b>Cluster % Total</b>	<b>26.9</b>
<b>Services for Prevention and Treatment of STIs and HIV and AIDS</b>	
STIs and HIV and AIDS prevention information	56.5
Voluntary Counseling and Testing (VCT) for STIs and HIV	45.9
Antiretroviral therapy	22.9
Treatment of STIs	32.6
Condoms for prevention of STIs and HIV	43.8
<b>Cluster % Total</b>	<b>40.3</b>
<b>Overall % Total</b>	<b>38.2</b>

---

Table 3 shows that age ( $p \leq .05$ ) and level of education ( $p \leq .05$ ) are significantly associated with the utilization of sexuality education, safe motherhood, and post-abortion care. Younger adolescents (12-16 years) used sexuality education more than the older adolescents. The table also shows that income ( $p \leq .05$ ) is significantly associated with the utilization of sexuality education, post-abortion care services and services for the prevention and management of STIs, HIV and AIDS. While level of education ( $p \leq .05$ ), location ( $p \leq .05$ ) and living status ( $p \leq .05$ ) are significantly associated with the utilization of family planning services. Respondents that had higher education utilized most of the SRHS more than others with lower education. Those who lived in urban areas utilized SRHS slightly more than their counterparts in rural areas. Furthermore, respondents who were living alone utilized family planning services more than adolescents that were living with their parents. The table further shows that utilization of sexuality education, family planning, safe motherhood, post-abortion care and services for prevention and management of STI, HIV and AIDS are significantly associated with psycho-cultural ( $p \leq .05$ ) and health system factors ( $p \leq .05$ ).

**Table 3: Factors Associated with Utilization of SRHS (n=1447)**

Factors	Sexuality education			Family Planning			Safe motherhood			Post abortion care			Prevention and management of STIs, HIV and AIDS			
	%	X <sup>2</sup>	p	%	X <sup>2</sup>	P	%	X <sup>2</sup>	p	%	X <sup>2</sup>	p	%	X <sup>2</sup>	p	
<b>Gender</b>																
Female	67.50	2.16	.14	36.10	3.73	.05	40.90	.02	.88	32.70	1.92	.16	42.20	3.05	.08	
Male	71.10			31.20			41.30			29.30			37.70			
<b>Age</b>																
15-16	74.60	16.39	.00*	33.40	.01	.93	44.00	4.75	.03*	35.30	13.02	.00*	41.90	2.96	.09	
17-22	64.80			33.20			38.40			26.50						
<b>Level of Education</b>																
Primary	40.60	15.50	.00*	40.60	8.04	.05*	21.9	26.68	.00*	21.90	16.01	.00*	28.10	5.97	.11	
Secondary	69.50			32.40			42.10			34.40			40.50			
Tertiary	71.50			33.10			39.00			25.80			38.30			
None	57.70			57.70			84.60			46.20			57.70			
<b>Location</b>																
Urban	70.30	.34	.56	38.30	12.28	.00*	41.50	.06	.81	30.30	.10	.75	41.50	1.61	.20	
Rural	68.90			29.50			40.90			31.10			38.20			
<b>Income</b>																
<1000	72.50	11.03	.03*	36.50	6.90	.14	43.70	4.84	.30	36.30	18.95	.00*	42.70	11.46	.02*	
1000-4000	70.60			32.20			40.20			26.20			39.50			
4000-10000	68.10			28.90			35.80			24.60			34.90			
10000-20000	62.50			28.10			39.80			27.30			28.90			
>20,000	60.50			32.30			40.30			25.80			42.70			
<b>Living status</b>																
With parents	68.50	5.84	.12	31.60	9.17	.03*	39.40	6.59	.09	30.60	2.65	.45	39.40	3.76	.29	
Alone	69.50			40.70			47.10			33.90			43.40			

ith ends	60.70			31.90			46.80			27.70			40.40		
school stel	76.00			30.40			38.70			27.50			34.80		
psycho- ltural	73.20	9.89	.00*	38.90	21.45	.00*	47.40	24.93	.00*	37.70	34.34	.00*	48.20	47.31	.00*
health stem	72.30	11.99	.00*	35.90	10.37	.00*	42.90	4.33	.04*	32.70	5.72	.02*	42.60	12.48	.00*

\*Significant

Table 4 shows that socio-demographic factors of gender (OR = 0.64; CI = 0.43-0.95), age (OR = 0.23; CI = 0.14-0.38), and income (OR = 0.84; CI = 0.72-0.99) were significantly associated with lower odds of SRHS utilization, while education (OR = 2.93; CI = 1.93-4.46) and living status (OR = 1.40; CI = 1.13-1.73), were significantly associated with higher odds of SRHS utilization. The null hypothesis that socio-demographic factors are not significant predictors of utilization of SRHS is therefore, not accepted except for location which is not a significant predictor of utilization of SRHS. Similarly, psycho-cultural (OR = 2.40; CI = 1.50-3.84) and health system factors (OR = 7.47; CI = 4.66-12.01) were significantly associated with higher odds SRHS utilization. These imply that gender, age, education, income, living status, psycho-cultural and health system factors can be used to predict utilization of SRHS among adolescents.

**Table 4: Predictors of Utilization of SRHS.**

Variables	Odds Ratio	p-value	[95% Conf.	Interval]
Utilization				
Gender	.6392293	0.026	.4315432	.9468673
Age	.2338778	0.000	.1428744	.3828455
Level of Education	2.930767	0.000	1.927537	4.456149
Location	1.390854	0.101	.9376491	2.063113
Monthly income	.8449874	0.032	.7244511	.9855789
Living status	1.39663	0.002	1.125347	1.733311
Psycho-cultural	2.401807	0.000	1.501572	3.841759
Health system	7.47935	0.000	4.656598	12.01321

## Qualitative data

Data generated through in-depth interview reveals that only 9 (33.3%) out of 27 interviewees agreed that they have used other SRHS apart from sexuality education which 26 (96.1%) of them use in the schools, churches and at homes. In the words of some interviewees:

*"I have never used any of these services"* (Enugu-North 002). *"I have only used sex education services"* (Nkanu-West 002). *"I don't use them because I don't think I need them"* (Udi 001). *"I did not use any of them.....though last year during youth week in my church, a health provider came and thought us about sex education"* (Udenu 002). *"Yes I used only sexuality education and services for prevention and management of STIs and HIV and AIDS"* (Ezeagu 002). However, many of these interviewees did not want to reveal the particular services being used.

Few participants in the focus group discussions admitted using SRHS apart from sexuality education. Most males were of the view that SRHS are mainly for females except sexuality education and services for prevention and management of STIs and HIV and AIDS. *"I have not used any of these services. They are only for females or married people"* (Udenu Male FGD-P1). *"It is true. P1 is correct"* (other Ps chorused). *"Yes at times we get some during youth week, seminars and school"* (Udenu Female FGD-P7). *"I was tested for HIV last year"* (Nkanu-West Male FGD-P6). This implies that majority of the participants use sexuality education and services for prevention and management of STIs and HIV and AIDS only.

## Discussions

Utilization of sexual and reproductive health services among adolescents is key to reducing in the prevalence of SRH problems in developing countries [23, 24], which is posing a challenge to the actualization of the SDG 3. Determining the factors that make adolescents to use or not to use SRHS is very important in designing interventions to promote adolescents' SRHS utilization. We utilized mixed method research because we have learnt from experience that triangulating multiple methods of data collection is better than using single method especially when collecting sensitive data such as sexuality information. The study aimed at determining predictors of adolescents' utilization of SRHS in Enugu State using quantitative and qualitative methods.

The utilization of SRHS among the adolescents was low. Sexuality education was the only SRHS utilized by slightly more than one-half of the respondents. This finding could be because these services, apart from sexuality education, were normally provided in the general health facilities which are not so comfortable for adolescents. Previous studies in other countries also reported [25, 19] low utilization of reproductive health services among adolescents. Similarly, qualitative data generated through in-depth interview revealed that very few of the participants agreed that they had used other SRHS apart from sexuality education, which majority of them used in the schools, churches and at homes. However, many of these interviewees did not want to reveal the services being used, which was not surprising to us because of the secrecy accorded to sexual issues generally and particularly in the study area. Few participants in IDI and FGD admitted using SRHS apart from sexuality education.

The utilization of sexuality education, safe motherhood, and post-abortion care services was associated with socio-demographic factors of age and level of education. Association also exists between income level and sexuality education, post-abortion care, and services for the prevention and management of STIs, HIV and AIDS while utilization of family planning services was associated with location, level of education and living status.

Younger adolescents utilized sexuality education more than the older adolescents. This could be because younger adolescents are still in schools where sexuality education is taught, as majority of the adolescents revealed in qualitative data that they used sexuality education services only in schools. The finding is consistent with [11] who reported that age is significantly associated with SRHS but the finding differs from Nisar and White [26], who reported no association between age and antenatal care utilization. Surprisingly, adolescents with no formal education used all the SRHS except sexuality education more than adolescents with any formal education. Although some previous studies reported association between level of education and utilization of SRHS [27, 26, 28], the common report has been that those with higher level of education utilize the services more than those with no formal education.

All the SRHS were associated with psycho-cultural factors. Qualitative data revealed that adolescents believed that services under family planning services are taboo for unmarried adolescents. The cultural belief is that family planning services are for married couples only. They also believed that SRHS will make youth become promiscuous and barren later in life. These beliefs make some adolescents feel ashamed and afraid of using SRHS. This finding is consistent with previous research [29] which reported that cultural beliefs and practices affected utilization of maternal health services and the reason adolescents do not use contraceptives include feeling embarrassed or ashamed to use or purchase contraceptives [21]. Similarly, association also exist between all the SRHS and health systems factors. The finding could be because there is lack of youth clinics or units which are expected to have specially trained service providers that provide youth friendly SRHS. Information from the qualitative data revealed that most interviewees and FGD participants said that pattern of service delivery like long waiting hours, lack of privacy, attitude of health providers and not being youth-friendly in services provision were the major health system factors that influence their use of SRHS. The finding is consistent with Cheptum, et al [29] who reported that lack of facilities, inadequate staffing and negative staff attitude were associated with access and use of health services. Anusornteerakul, Khamanarong, Khamanarong, and Thinkhamrop [30] reported that health service system is one of the important factors influencing management of youth reproductive health services.

The finding showed that socio-demographic factors (of age, level of education, income and living status), psycho-cultural, and health system were predictors of adolescents' utilization of SRHS. This implies that an adolescent's personal factor can determine whether he or she would use SRHS. The finding agrees with previous studies that reported some of these demographic factors as predictors of SRHS utilization [26, 31]. Previous studies also reported psychological and cultural factors as significant predictors of utilization of SRHS [32, 29]. The common reason adolescents do not use contraceptives included feeling embarrassed or ashamed to use or purchase condom or any other contraceptives [33]. Additionally, the belief that discussing sexual issue is a taboo prevents parents from rendering age appropriate sex education at home, limiting young ones from getting basic information about sexuality early enough [11]. Health systems factors such as providers' attitude, having good and friendly relationship with the youth, keeping client's information confidential among others, determine youth's access to reproductive health and make youth reproductive health services successful. Proximity of health facility, available services and good reputation of the providers were main predictors for choosing health facilities [34, 35].

## Conclusion

## **Conclusion**

The study concluded that some socio-demographic (of age, level of education, income and living status), psycho-cultural and health system factors are predictors of adolescents' access to and utilization of SRHS. These predictors could be addressed through home sex education, regular training of health care providers on youth-friendly services delivery and policy reforms.

## **Limitations**

The study utilized the cross-sectional design, therefore, cannot assume cause and effect association. The legal age of consent was a challenge because it was difficult to convince the parents of adolescents below the age of 18 years even when the adolescents were ready to participate. On the other hand, some adolescents declined their participation because their parents were to give the consent. Nigeria is a multi-ethnic country and this study was conducted only in one state, therefore, generalization of the findings may not be realistic.

## **Abbreviations**

FGD: Focus Group Discussion

HIV and AIDS: Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome  
IDI: In-depth Interview

LGA: Local Government Area

SPSS: Statistical Package for the Social Sciences

SRH: Sexual and Reproductive Health

SRHS: Sexual and Reproductive Health Services

STIs: Sexually Transmitted Infections

WHO: World Health Organization

## **Declarations**

### **Acknowledgements**

We wish to acknowledge all our research assistants for their cooperation and hard work.

### **Funding**

No financial support was received for this study.

### **Availability of data and materials**

The data that support the findings of this study are from different datasets (e.g. PubMed, Doaj, Google, and Google Scholar) are included in the list of references.

### **Authors' contributions**

AN and ES designed the research work. AN collected data with the help of research assistants. All authors contributed to data analysis and drafting of the manuscript.

### **Authors' information**

Authors are academic staff and researchers at the University of Nigeria, Nsukka.

### **Ethics approval and consent to participate**

Both oral and written consent were obtained from the participants. The parents or guardian of participants below the age of 18 years provided both oral and written consent on their behalf. Participation was total voluntary. The Local Institutional Review Board (Postgraduate Studies Review Board), University of Nigeria, Nsukka approved the study procedure.

### **Consent for publication**

Not Applicable

### **Competing interests**

The authors declare that they have no competing interests.

## **References**

1. State of world population. 2014. Available at [https://www.unfpa.org/sites/default/files/pub-pdf/EN-SWOP14-Report\\_FINAL-web.pdf](https://www.unfpa.org/sites/default/files/pub-pdf/EN-SWOP14-Report_FINAL-web.pdf)
2. United Nations. World Population Prospects. 2019. Available at <https://population.un.org/wpp/DataQuery/>
3. Nigeria Demographic and Health Survey. Fertility. 2018. Available at <https://www.dhsprogram.com/pubs/pdf/FR359/FR359.pdf>
4. Abdul, R., Gerritsen, A.A.M., Mwangome, M., & Geubbels, E. Prevalence of self-reported symptoms of sexually transmitted infections, knowledge and sexual behavior among youth in semi-rural Tanzania in the period of adolescent friendly health services strategy implementation. BMC Infectious Diseases. 2018; 18(229). Available at <https://bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-018-3138-1>
5. Francis, S.C., Mthiyane, T.N., Baisley, K., Mchunu, S.L., Ferguson, J.B, Smit, T., Crucitti, Tania, ....., Shahmanesh, M. Prevalence of sexually transmitted infections among young people in South Africa: a nested survey in a health and demographic surveillance site. PLoS Med. 2018; 15(2). Available at <https://pubmed.ncbi.nlm.nih.gov/29485985-prevalence-of-sexually-transmitted-infections-among-young-people-in-south-africa-a-nested-survey-in-a-health-and-demographic-surveillance-site/>
6. Adolescent HIV prevention. 2019. Available at <https://data.unicef.org/topic/hivaids/adolescents-young-people/>

7. Maternal, newborn, child and adolescent health. 2017. Available at [https://www.who.int/maternal\\_child\\_adolescent/topics/adolescence/development/en/](https://www.who.int/maternal_child_adolescent/topics/adolescence/development/en/)
8. Denno, D. M., Hoopes, A. J., & Chandra-Mouli, V. Effective strategies to provide adolescent sexual and reproductive health services and increase demand and community support. *Journal of Adolescent Health*. 2015; 58(1): 522-541
9. Odo, A.N., Samuel, E.S., Nwagu, E.N., Nnamani, P.O., & Atama, C.S. Sexual and reproductive health services (SRHS) among adolescents in Enugu State, Nigeria: a mixed methods approach. *BMC Health Services Research*. 2018; 18(92). Available at <https://bmchealthservres.biomedcentral.com/track/pdf/10.1186/s12913-017-2779-x?site=bmchealthservres.biomedcentral.com>
10. Obong'o, C.O., & Zani, A.P. Evaluation of the provision of sexual and reproductive health services to young people in Wagari and Karemo divisions, Siaya County, Kenya.. *IOSR Journal of Humanities and Social Sciences*. 2014; 19(8), 89-99. Available at <https://pdfs.semanticscholar.org/8f2d/bb370ed50007a07d27a16092e91342fe888d.pdf>
11. Abajobir, A. A. & Seme, A. Reproductive health knowledge and services utilization among rural adolescents in East Gojjam zone, Ethiopia: A community-based cross-sectional study. *BMC Health Services Research*. 2014; 14(138). Available at <https://bmchealthservres.biomedcentral.com/articles/10.1186/14726963-14-138>
12. Dida, N., Darega, B., & Takele, A. Reproductive health services utilization and its associated factors among Madawalabu University students, Southeast Ethiopia: cross-sectional study. *BMC Research Notes*. 2015; 8(8). Available at <http://www.biomedcentral.com/1756-0500/8/8>
13. Ansah, E.A. & Powell-Jackson, T. Can we trust measures of healthcare utilization from household surveys? *BMC Public Health*. 2013; 13(853). Available at <http://www.biomedcentral.com/1471-2458/13/853>
14. Akinyi, O. P. Determinants of utilization of youth-friendly reproductive health services among school & college youth in Thika West District, Kiambu Country Kenya. 2009. Available at [http://www.ku.ac.ke/school/public\\_health/images/stories/docs/students-research/obonyo-perez.pdf](http://www.ku.ac.ke/school/public_health/images/stories/docs/students-research/obonyo-perez.pdf)
15. Sexual and reproductive health: generating information for action. 2019. Available at <https://www.who.int/reproductivehealth/maternal-health-nigeria/en/>
16. Nove,A., Matthews, Z., Neal, S., & Camacho, A.V. Maternal mortality in adolescents compared with women of other ages: evidence from 144 countries. *The Lancet Global Health*, 2014; 2(3); PE155-E164. Available at [https://doi.org/10.1016/S2214-109X\(13\)70179-7](https://doi.org/10.1016/S2214-109X(13)70179-7)
17. Reproductive health of women. 2015. Available at <http://www.unfpa.org>.
18. Adogu, P., Udigwe, I., Udigwe, G., Nwabueze, A. & Onwasigwe, C. Pattern, types and predictors of contraception among female in-school and out-of-school adolescents in Onisha, Anambra State, Nigeria. *Advances in Sexual Medicine*. 2014; 4, 33-41. Available at <https://pdfs.semanticscholar.org/428e/01b8e71f520b82d01aef2e23bcd6c5c6ce0.pdf>
19. Abebe, M. & Awoke, W. Utilization of youth reproductive health services and associated factors among high school students in Bahir Dar, Amhara Regional State, Ethiopia. *Open Journal of Epidemiology*. 2014; 4, 69-75. Available at <https://pdfs.semanticscholar.org/f9d6/31753b9dca8aa364b09da0b4cd149edd7d31.pdf>



20. Merriam-Webster. Psycho-cultural. 2015. Available at <http://www.merriam-webster.com/thesaurus/psychocultural/>
21. Osaikhuwuomwan, J.A. & Osemwenkha, A.P. Adolescents' perspective regarding adolescent pregnancy, sexuality and contraception. *Asian Pacific Journal of Reproduction*. 2013. 2(1), 58-62. Available at <https://www.sciencedirect.com/science/article/pii/S2305050013601189>
22. Yao, J., Murray, A.T., & Agadjanian, V. A geographical perspective on access to sexual and reproductive health care for women in rural Africa. *Social Science and Medicine*. 2013; 96, 60-68. Available at <https://pubmed.ncbi.nlm.nih.gov/24034952-a-geographical-perspective-on-access-to-sexual-and-reproductive-health-care-for-women-in-rural-africa/>
23. Williamson, L.M., Parkes, A., Wight, D., Petticrew, M., & Hart, G.J. Limits to modern contraceptive use among young women in developing countries: a systematic review of qualitative research. *Reproductive Health*. 2009; 6(3). Available at <https://link.springer.com/article/10.1186/1742-4755-6-3>
24. Bearinger, L.H., Sieving, R.E., Ferguson, J., & Sharma, V. Global perspectives on the sexual and reproductive health of adolescents: patterns, prevention, and potential. *The Lancet*. 2007; 369 (9568). Available at <https://www.sciencedirect.com/science/article/pii/S0140673607603675>
25. Feleke, S.A., Koye, D.N., Demssie, A.F., & Mengesha, Z.B. Reproductive health services utilization and associated factors among adolescents (15-19 years old) in Gondar town, Northwest Ethiopia. *BMC Health Services Research*. 2013; 13(294). Available at <http://www.biomedcentral.com/1472-6963/13/294>
26. Nisar, N. & White. Factors affecting utilization of antenatal care among reproductive age group women (15-49) in an urban squatter settlement of Karachi. *Journal of Pakistan Medical Association*. 2008; 58(1). Available at [http://www.jpma.org.pk/full\\_article\\_text.php?article\\_id=83](http://www.jpma.org.pk/full_article_text.php?article_id=83)
27. Mishra, S. K., Mukhopadhyay, S. M. & Mukhopadhyay, B. Reproductive health and its bio-cultural correlates among Rai and Bhutia women of rural Sikkim: a micro level study. 2012. <http://www.ishib.org/ED/journal/22-2/ethn-22-02-140.pdf>
28. Achana, F.S., Bawah, A.A., Jackson, E.F., Welaga, P., Awine, T., Asuo-Mante, E., Oduro, A., Awoonor-Williams, K. & Phillips, J.F.. Spatial and demographic determinants of contraceptive use in the Upper East region of Ghana. *Reproductive Health*. 2015; 12(29). Available at <https://reproductive-health-journal.biomedcentral.com/articles/10.1186/s12978-015-0017-8>
29. Cheptum, J., Gitonga, M., Mutua, E., Mukui, S., Ndambuki, J., & Koima, W. Barriers to access and utilization of maternal and infant health services in Migori, Kenya. *IISTE Journal*. Available at <http://41.89.227.156:8080/xmlui/handle/123456789/635>
30. Anusornteerakul, S., Khamanarong, K., Khamanarong, S., & Thinkhamrop, J. The influencing factors that affect Thailand's management of youth reproductive health service. *Journal of diversity management*, 2011; 3(4), 27-32.
31. Silal, S., Penn-kekana, L., Harris, B., Birch, S., & McIntyre, D. (). Exploring inequalities in access to and use of maternal health services in South Africa. *BMC Health Services Research*. 2012; 12(120). Available at <http://www.bmchealthservices.biomedcentral.com/articles/10.1186/1472-6963-12-120>
32. Adekye, O., Ebiai, A., & Adeusi, S.O. Psycho-cultural variables predicting attitude of students towards HIV counseling and testing in selected tertiary institutions in Lagos State, Nigeria. *JORIND*. 2011; 9(1), 431-440

33. Biddlecom, A.E., Munthali, A., Singh, S. and Woog, V. Adolescents' views of and preferences for sexual and reproductive health services in Burkina Faso, Ghana, Malawi and Uganda. *Afr J Reprod Health*. 2007; 11(3). Available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2367115/>
34. Azmat, S.K., Ali, M., Ishaque, M., Mustafa, G., Hameed, W., Khan, O.F., Abbas, G., Temmerman, M., & Munroe, E. (). Assessing predictors of contraceptive use and demand for family planning services in underserved areas of Punjab province in Pakistan: results of a cross-sectional baseline survey. *Reproductive Health Journal*. 2015; 12(25). Available at <http://www.reproductive-health-journal.com/content/12/1/25>
35. Sommer, M & Mmari, K. Addressing structural and environmental factors for adolescent sexual and reproductive health in low- and middle-income countries. *Physical Activity & Public Health*. 2015. American Public Health Association. Available at <https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2015.302740>