**Contextual determinants of modern contraceptive use among sexually active female adolescents in Nigeria: a multilevel analysis of nationally representative data**

Adolescence, the transition between childhood and adulthood, encompasses individuals aged 10–19 years. Pregnancy during this period, especially in late adolescence, poses significant socio-economic and health challenges, with a disproportionate burden falling on this group. Although there has been a global decline in adolescent birth rates, significant regional variations persist. Latin America, the Caribbean, and sub-Saharan Africa (SSA) experience the highest adolescent pregnancy rates (WHO, 2023). Contraception especially, modern contraceptives (mCP), is a critical intervention for preventing adolescent pregnancies and associated health complications. It provides adolescents with the autonomy to avoid unintended pregnancies and control when they wish to conceive. In view of this, access to comprehensive information and services on contraception is considered a fundamental human right for women of all ages, including adolescents (WHO, 2024). However, the use of contraceptives remains notably low among adolescents in SSA (Ahinkorah et al., 2020).

In low- and middle-income countries, approximately 21 million pregnancies occur annually among adolescents aged 15–19, with half being unintended. In Nigeria, where adolescents make up 32% of the population, issues related to sexual and reproductive health are of critical concern. Pregnancy in adolescence is as high as 67% in some regions of the country (Bolarinwa et al., 2022), yet, Nigeria's contraceptive prevalence rate is generally low, with only 17% of married women using any method (NPC & ICF, 2019). The country’s low contraceptive prevalence rate, especially among adolescents, contributes to high rates of unintended pregnancies, with many leading to unsafe abortions. This failure to access and use contraceptives has severe, long-term consequences, including disrupted education, poverty, and serious health risks for both mothers and infants. Adolescent pregnancy perpetuates intergenerational poverty and gender inequality, while the health risks include maternal mortality and complications such as low birth weight. Cultural stigmas, lack of decision-making power, and limited discussions around contraception further restrict adolescents' access to reproductive health services. Addressing these challenges requires tailored interventions that consider the economic, social, and cultural factors unique to adolescents to ensure they have the resources needed to access and use modern contraceptives effectively.

In 2017, an estimated 214 million women of reproductive age in developing regions had unmet needs for contraception, primarily due to limited access and cultural or religious opposition (WHO, 2024). The variation in cultural and religious norms, both within and between countries, underscores the importance of contextualizing efforts to address early and unintended pregnancies. Lack of empowerment, inadequate support systems, and poor economic resources further impede access to contraceptives for sexually active adolescent girls. Despite the relevance of contextual factors, evidence is sparse on their influence on mCP use among adolescents, and this study aimed to fill this knowledge gap.

## Methods

This study utilized a cross-sectional design based on the latest instalment of the nationally representative Nigeria Demographic and Health Surveys (DHS). The DHS collect key health indicators including family planning and demographic data across low and middle-income countries (Corsi et al., 2012). Preliminary analyses included a weighted sample of 2,052 sexually active adolescents aged 15-19 who were not currently pregnant, The dependent

variable for this study is mCP use, categorized as "Using modern contraceptive" (coded as 1) and "Not using modern contraceptive" (coded as 0). Respondents' characteristics were considered at individual/household and community levels. Statistically, frequencies and percentages were used to describe respondents' contexts, and multilevel binary logistic regression was used to show association between adolescents' contextual factors and mCP use.

**Results**

**Table 1: Use of modern contraceptives (N=2052)**

| Modern contraceptives use | Frequency (N) | Percentage (%) |
|---|---|---|
| Not using | 1853 | 90.7 |
| Using | 199 | 9.3 |

As shown in Table 1, use of mCP was not prevalent (9%) among the late adolescents included in this study. Among the weighted sample, 59 percent were 18-19 years old. While 77 percent of the study sample had their first sexual debut in age range 15-19 years, others had theirs at earlier ages. More than half of the respondents (58%) were currently married and about 44 percent had no education and 57 percent of the sample were not currently working. While the proportion of respondents who had not visited a health facility in the past year was 74 percent, that for those who had no exposure to media was 77 percent. Almost half of the respondents (49%) were in the poor category of wealth status whereas, about 29 percent were in the rich category. Household power relation which explored the extent to which respondents participated in making key decisions, including health, in their households showed that three-quarter of the respondents were not involved in these decision-making process. Furthermore, on community level characteristics, close to 7 in every 10 respondents were rural dwellers. Of the six regions in Nigeria, North West was the most represented (37%), followed by North East (19%). The least represented region was the South East (8%). 42 percent of the respondents were in highly impoverished community with just about a quarter of the sample in lowly impoverished community. In contrast, about a quarter were in highly educated community.

**Table 2: Distribution of respondents by individual/household characteristics (N=2052)**

| Individual/ Household characteristics | Frequency (N) | Percentage (%) | Community characteristics | Frequency (N) | Percentage (%) |
|---|---|---|---|---|---|
| **Age** | | | **Place of residence** | | |
| 15-17 years | 839 | 41.0 | Urban | 567 | 30.6 |
| 18-19 years | 1213 | 59.0 | Rural | 1485 | 69.4 |
| **Age at sexual debut** | | | **Region** | | |
| Less than 15 years | 472 | 22.8 | North Central | 367 | 14.1 |
| 15-19 years | 1580 | 77.2 | North East | 465 | 19.4 |
| **Marital status** | | | North West | 613 | 36.6 |
| Not currently married | 937 | 42.1 | South East | 182 | 7.6 |
| Currently married | 1115 | 57.9 | South South | 247 | 11.7 |
| **Educational attainment** | | | South West | 178 | 10.6 |
| No education | 853 | 43.5 | **Community poverty** | | |
| Primary education | 223 | 10.9 | Low | 547 | 25.6 |
| Secondary/higher education | 976 | 45.6 | Moderate | 624 | 32.3 |

| | | | | | |
|---|---|---|---|---|---|
| **Religion** | | | High | 881 | 42.1 |
| Christian | 891 | 39.1 | **Community education** | | |
| Islam | 1161 | 60.9 | Low | 975 | 50.3 |
| **Current work status** | | | Moderate | 563 | 24.5 |
| Not working | 1182 | 57.3 | High | 514 | 25.2 |
| Working | 870 | 42.7 | | | |
| **Past year health facility visit** | | | | | |
| Did not visit | 1519 | 74.0 | | | |
| Visited | 533 | 26.0 | | | |
| **Family planning messages exposure** | | | | | |
| Not exposed | 1610 | 77.0 | | | |
| Exposed | 442 | 23.0 | | | |
| **Wealth status** | | | | | |
| Poor | 1039 | 49.2 | | | |
| Middle | 461 | 22.0 | | | |
| Rich | 552 | 28.8 | | | |
| **Household power relation** | | | | | |
| Involved | 471 | 25.4 | | | |
| Not involved | 1581 | 74.6 | | | |

**Table 3: Multi-level binary logistic regression models showing individual/household and community determinants of modern contraception among sexually-active adolescents**

| **Individual/ Household characteristics** | **Model 0 (Empty model)** | **Model 1** | **Model 2** | **Model 3** |
|---|---|---|---|---|
| **Age** | | | | |
| 15-17 years | | Ref | | |
| 18-19 years | | 1.81*(1.21-2.71) | | 1.71*(1.14-2.56) |
| **Age at sexual debut** | | | | |
| Less than 15 years | | Ref | | |
| 15-19 years | | 0.67*(0.42-1.06) | | 0.61*(0.38-0.97) |
| **Marital status** | | | | |
| Not currently married | | Ref | | |
| Currently married | | 0.53(0.26-1.06) | | 0.62(0.30-1.25) |
| **Educational attainment** | | | | |
| No education | | Ref | | |
| Primary education | | 2.81*(1.25-6.30) | | 2.26(0.98-5.22) |
| Secondary/higher education | | 3.54*(1.70-7.39) | | 2.58*(1.16-5.75) |
| **Religion** | | | | |
| Christian | | Ref | | |
| Islam | | 0.38*(0.22-0.64) | | 0.47*(0.26-0.85) |
| **Current work status** | | | | |
| Not working | | Ref | | |
| Working | | 0.84(1.69-7.39) | | 0.84(0.58-1.22) |
| **Past year health facility visit** | | | | |

| | | | | |
|---|---|---|---|---|
| Did not visit health facility | | Ref | | |
| Visited health facility | | 1.20(0.77-1.84) | | 1.25(0.81-1.94) |
| **Family planning messages exposure** | | | | |
| Not exposed | | Ref | | |
| Exposed | | 1.20(0.80-1.79) | | 1.16(0.77-1.75) |
| **Wealth status** | | | | |
| Poor | | Ref | | |
| Middle | | 1.18(0.72-1.94) | | 0.87(0.52-1.48) |
| Rich | | 1.56(0.97-2.52) | | 0.72(0.39-1.31) |
| **Household power relation** | | | | |
| Involved | | Ref | | |
| Not involved | | 0.81(0.40-1.63) | | 0.88(0.43-1.81) |
| **Community characteristics** | | | | |
| **Place of residence** | | | | |
| Urban | | | Ref | |
| Rural | | | 0.76(0.46-1.25) | 0.57(0.32-1.00) |
| **Region** | | | | |
| North Central | | | Ref | |
| North East | | | 2.26*(1.15-4.46) | 3.01*(1.51-6.02) |
| North West | | | 0.63(0.28-1.45) | 0.97(0.41-2.29) |
| South East | | | 1.95(1.00-3.83) | 1.66(0.84-3.29) |
| South South | | | 1.45(0.78-2.70) | 1.23(0.66-2.30) |
| South West | | | 1.50(0.76-2.95) | 1.49(0.76-2.91) |
| **Community poverty** | | | | |
| Low | | | Ref | |
| Moderate | | | 0.87(0.54-1.41) | 0.79(0.49-1.28) |
| High | | | 0.31*(0.16-0.58) | 0.25*(0.13-0.50) |
| **Community education** | | | | |
| Low | | | Ref | |
| Moderate | | | 3.71*(1.84-7.48) | 1.44(0.65-3.19) |
| High | | | 6.44*(2.83-14.7) | 2.03(0.79-5.21) |
| **Random Effects** | | | | |
| PSU Variance (95% Conf. Interval) | 3.11(1.76-5.51) | 1.15(0.52-2.53) | 1.19(0.56-2.57) | 1.01(0.43-2.39) |
| ICC | 0.49 | 0.26 | 0.27 | 0.24 |
| LR Test | $\chi^2$=42.9;p<0.05 | $\chi^2$=11.6;p<0.05 | $\chi^2$=12.7;p<0.05 | $\chi^2$=;p<0.05 |
| Wald $\chi$2 | Reference | 96.2* | 89.9* | 102.4* |
| **Model Fitness** | | | | |
| Log-likelihood | -631.9 | -558.8 | -556.7 | -540.0 |
| AIC | 1267.8 | 1145.6 | 1137.5 | 1128.0 |
| BIC | 1279.0 | 1224.3 | 1205.0 | 1263.0 |
| Number of clusters | 962 | 962 | 962 | 962 |

Preliminary results showed that the prevalence of mCP use among adolescents was 9%. Fixed effects, at individual/household level showed age, sexual debut age, education, and religion as mCP use important determinants. Region, community poverty, and community education were also significant predictors of mCP use at community level. Despite the influence of individual, household, and community factors, a significant portion of the variability in mCP use remains unexplained between communities.