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Regional disparities on contraceptive intention and its sociodemographic determinants among reproductive women in Nigeria

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Abstract

Background Despite efforts to improve its uptake, contraceptive use in Nigeria remains low. Understanding regional disparities and sociodemographic determinants of contraceptive intention is crucial for developing effective family planning strategies. This study aimed to investigate these factors in women of reproductive age in Nigeria.

Methods This cross-sectional study analysed data from 36,179 women aged 15–49 participating in the 2018 Nigerian Demographic and Health Survey (NDHS). Bivariate and multivariable logistic regression analyses were conducted to assess the association between sociodemographic factors and contraceptive use intention.

Results The overall prevalence of contraceptive intentions was 39.18%, with significant regional variation. South East had the highest intention at 44.85%, while North East had the lowest intention at 34.76%. Education was a strong predictor, with those with higher education showing 2.657 times greater odds of using contraception (AOR: 2.657, 95% CI: 2.339–3.019, $p < 0.001$). Muslim women and rural residents exhibited lower odds of intention, while women aged 20–24 years had the highest odds (AOR: 1.305, 95% CI: 1.187–1.435, $p < 0.001$).

Conclusion There were significant regional disparities and complex sociodemographic patterns in contraceptive intention among Nigerian women. Tailored interventions addressing educational, religious, economic, and geographical barriers are required to increase contraceptive uptake and improve reproductive health outcomes.

Keywords Contraceptive intention, Regional disparities, Reproductive health, Sociodemographic factors, Nigeria, Family planning

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Introduction

Contraception plays a crucial role in reproductive health, empowering individuals and couples to make informed decisions about family planning, reducing unintended pregnancies, and improving maternal and child health outcomes [1]. In Nigeria, the most populous country in Africa, contraceptive use remains low, despite efforts to improve access and uptake. The country's contraceptive prevalence rate (CPR) for modern methods among married women is estimated to be 17% in 2021, far below the global average of 65% [2, 3]. Understanding the factors that influence contraceptive intentions is crucial for developing effective strategies to increase contraceptive use. Contraceptive intention, defined as the plan to use contraception in the future, is a strong predictor of actual contraceptive use [4]. Various sociodemographic factors have been associated with contraceptive intention and use in different contexts. Age, education, religion, marital status, wealth, employment, place of residence, and geographical region have all been identified as potential determinants of contraceptive behavior [5, 6].

In Nigeria, significant regional disparities exist in health outcomes, including reproductive health indicators [7, 8]. The country is divided into six geopolitical zones, each with distinct cultural, religious, and socioeconomic characteristics that may influence contraceptive attitudes and behaviors [7, 9]. For instance, the predominantly Muslim northern regions have consistently shown lower contraceptive use than the southern regions [10, 11]. Education is widely recognized as a crucial factor in contraceptive use and intention. Higher levels of education are generally associated with increased contraceptive knowledge, more positive attitudes towards family planning, and greater autonomy in reproductive decision-making [12]. In Nigeria, where educational attainment varies significantly across regions and socioeconomic groups, understanding the relationship between education and contraceptive intentions is particularly important [13].

Religion plays a significant role in shaping attitudes towards contraception in Nigeria. The country's population is roughly divided between Christianity and Islam, with a small percentage practicing traditional religion. Religious beliefs and teachings can influence perceptions of family size, attitudes towards contraception, and decision-making regarding family planning [5]. Socioeconomic factors, including wealth index and employment status, have been linked to contraceptive use and intention in various studies. Higher socioeconomic status is often associated with greater access to contraceptive information and services as well as increased autonomy in reproductive decision-making [14].

Urban-rural disparities in contraceptive use have been observed in many developing countries, including Nigeria. Urban areas typically have better access to health services, including family planning, and may be characterized by different social norms regarding family size and contraceptive use compared with rural areas [15]. Despite the importance of understanding contraceptive intention to improve family planning programs, there is limited research on the regional disparities and sociodemographic determinants of contraceptive intention in Nigeria [14]. Most studies have focused on actual contraceptive use rather than intention, and few have examined these factors at a national level while accounting for regional variations [2, 6, 14, 16, 17]. This study aimed to address this gap by investigating the regional disparities in contraceptive intention among reproductive-aged women in Nigeria and identifying the sociodemographic factors associated with this intention. By providing a comprehensive analysis of contraceptive intention across Nigeria's diverse regions and sociodemographic groups, this study can inform targeted interventions and policies aimed at increasing contraceptive uptake and improving reproductive health outcomes in the country.

Methods

Study design and data source

We conducted a cross-sectional analysis using data from the 2018 Nigeria Demographic and Health Survey (NDHS). The NDHS is a nationally representative survey that collects comprehensive health and demographic information from women of reproductive age (15–49 years). We utilized the Individual Recode (IR) dataset, which focuses on women's reproductive health indicators.

Study population and sampling

The study population was comprised of women aged 15–49 years who participated in the 2018 NDHS. We included women who reported their contraceptive use intention as either "intends to use later" or "intends not to use." The final sample comprised 36,179 women. Current contraceptive users were excluded from this analysis to focus specifically on women with unmet needs and those intending to use contraception in the future. This approach ensures that the findings address gaps in contraceptive intention and inform interventions targeted at non-users.

Ethical considerations

The original NDHS protocol was approved by the National Health Research Ethics Committee of Nigeria (NHREC) and Institutional Review Board of the ICF. All participants provided informed consent prior to data collection. For this secondary analysis, we used the de-identified data available in the public domain.

Study variables

The outcome variable was the intention to use contraception, initially categorized into four groups: users of modern methods, users of traditional methods, non-users intending to use contraception in the future, and non-users not intending to use it. For this analysis, only the two categories related to intention were retained, resulting in a binary classification: individuals intending to use contraception in the future were coded as "1," while those not intending to use it were coded as "0." Women currently using any form of contraception were excluded from the analysis. *The independent variables* in this study consisted of various sociodemographic factors, including age, education level, religion, marital status, wealth index, employment status, residence, and region. These variables were analyzed to assess their influence on the intention to use contraception.

Table 1 Sociodemographic characteristics ($N = 36,179$)

Variable	Weighted Frequency	Percent (%)
Age group		
15–19	8,278	22.88
20–24	6,077	16.80
25–29	6,078	16.80
30–34	4,981	13.77
35–39	4,276	11.82
40–44	3,191	8.82
45–49	3,298	9.11
Education		
no education	14,031	38.78
Primary	5,103	14.10
Secondary	13,650	37.73
Higher	3,395	9.39
Religion		
Christianity	15,209	42.04
Islam	20,749	57.35
Others	221	0.61
Marital status		
never in union	9,731	26.9
Married	24,475	67.65
Widowed	984	2.72
Divorced/separated	989	2.73
Wealth index		
Poorest	6,995	19.33
Poorer	7,535	20.83
Middle	7,237	20.00
Richer	7,264	20.08
Richest	7,148	19.76
Employed		
No	13,610	37.62
Yes	22,569	62.38
Residence		
Urban	15,499	42.84
Rural	20,680	57.16
Region		
North central	5,157	14.25
North east	6,140	16.97
North west	11,631	32.15
South east	3,959	10.94
South south	3,881	10.73
South west	5,412	14.96

Statistical analysis

Descriptive statistics were used to summarize the characteristics of the study population. Bivariate and multivariable logistic regression analyses were conducted to assess the association between sociodemographic factors and contraceptive use intention. Crude odds ratios (CORs) and adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were calculated to quantify the strength of the associations. Cases with missing values for key variables were excluded to ensure consistency and robustness, with minimal missing data that did not significantly affect the sample size or representativeness. Sampling weights provided by the DHS were applied to account for the complex survey design, ensuring nationally representative estimates. All statistical analyses were performed using Stata version 17 with a significance level of $p < 0.05$. To illustrate regional disparities in contraceptive use intentions, a map was generated using Geopandas in Python with Natural Earth vector map data for Nigeria. This visualization provides a clear geographical representation of regional differences.

Results

Sociodemographic description

This study included 36, 179 women of reproductive age (15–49 years). Table 1 presents the socio-demographic characteristics of the study population. The largest age group was 15–19 years (22.88%), followed by 20–24 and 25–29 years (both 16.8%). Regarding education, 38.78% had no formal education, whereas 37.73% had secondary education. The majority of the participants were Muslim (57.35%) and married (67.65%). The wealth index is fairly evenly distributed across quintiles. Most of the women were employed (62.38%) and lived in rural areas (57.16%). The Northwest region had the highest representation (32.15%), while the South East and South South had the lowest (10.94% and 10.73%, respectively).

Prevalence and regional disparities of contraceptive intention in Nigeria

The overall prevalence of contraceptive intentions among women in Nigeria was 39.18% (Fig. 1). However, significant regional disparities were also observed (Figs. 1 and 2). The Southeast region showed the highest proportion of women intending to use contraception (44.85%), followed by the Southwest (43.06%) and North Central

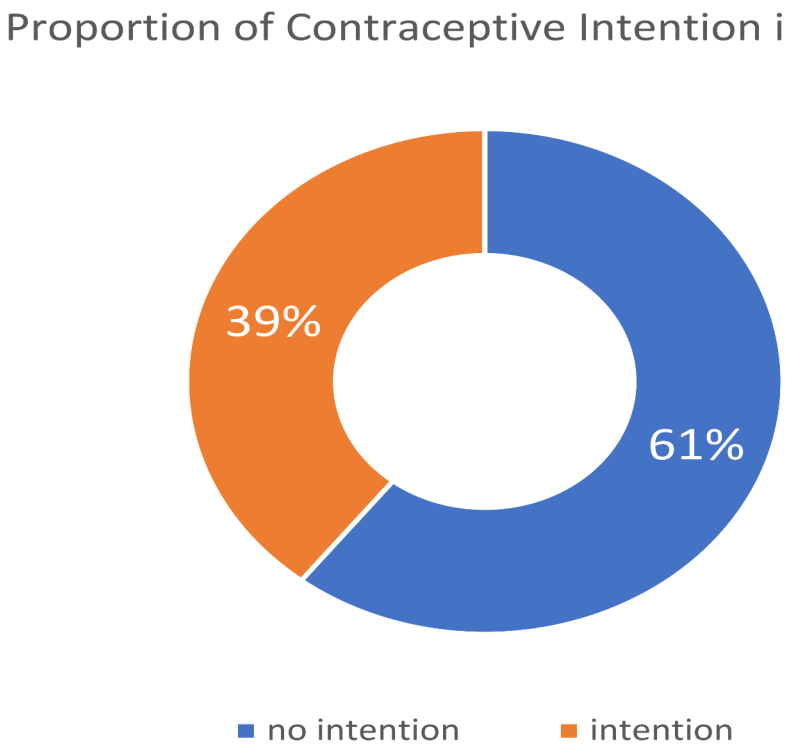

Fig. 1 Proportion of contraceptive intention in Nigeria

(41.31%) regions. The lowest intentions were observed in the Northeast (34.76%) and South south (36.23%) (Fig. 2).

Bivariate analysis of factors associated with contraceptive intention among women in Nigeria

Bivariate analysis identified several factors significantly associated with contraceptive intention among women in Nigeria (Table 2). Age was a notable factor, with women aged 20–34 years demonstrating a higher likelihood of intending to use contraception than those aged 15–19 ($p < 0.001$). Conversely, women aged ≥ 35 years exhibited decreased odds of contraceptive intention. Education level was strongly positively correlated with contraceptive intention; women with higher education had 2.657 times greater odds of intending to use contraception compared to those with no education (95% CI: 2.339–3.019, $p < 0.001$). Additionally, religion played a significant role, as Muslim women (COR: 0.554, 95% CI: 0.506–0.607, $p < 0.001$) and women of other religions (COR: 0.470, 95% CI: 0.340–0.649, $p < 0.001$) were less likely to intend to use contraception than were Christians. Marital status also influenced contraceptive intention, with married, widowed, and divorced/separated women showing lower odds than never-married women ($p < 0.001$ for all categories). Furthermore, a higher wealth index correlated with increased odds of contraceptive intention; the richest quintile had 1.414 times greater odds than the poorest quintile (95% CI: 1.255–1.594, $p < 0.001$). Employed women showed higher odds of using contraception (COR: 1.196, 95% CI: 1.124–1.272, $p < 0.001$) than their unemployed counterparts. Additionally, rural residents had lower odds of contraceptive intentions than those living in urban areas (COR: 0.796, 95% CI: 0.746–0.850, $p < 0.001$). Regional differences were also significant, with the North West exhibiting the highest odds (COR: 1.717, 95% CI: 1.567–1.881, $p < 0.001$) and the South south showing the lowest odds (COR: 0.470, 95% CI: 0.421–0.524, $p < 0.001$) when compared to the North Central region.

Multivariable analysis of factors associated with contraceptive intention

The multivariable analysis, after adjusting for potential confounders (Table 3), showed that many factors remained significantly associated with contraceptive intention, although the strength of the associations varied. Age remained a significant factor, which is consistent with the bivariate analysis. Women aged 20–34 years had higher odds of intending to use contraception, while those aged 35 and older had lower odds than those aged 15–19 years. Education level continued to show a strong positive association with contraceptive intention, with women with higher education displaying the highest adjusted odds ratio (AOR: 2.657, 95% CI: 2.339–3.019, $p < 0.001$) relative to women with no formal education.

Religion level also remained a significant predictor. Muslim women (AOR: 0.554, 95% CI: 0.506–0.607, $p < 0.001$) and women of other religious affiliations (AOR,

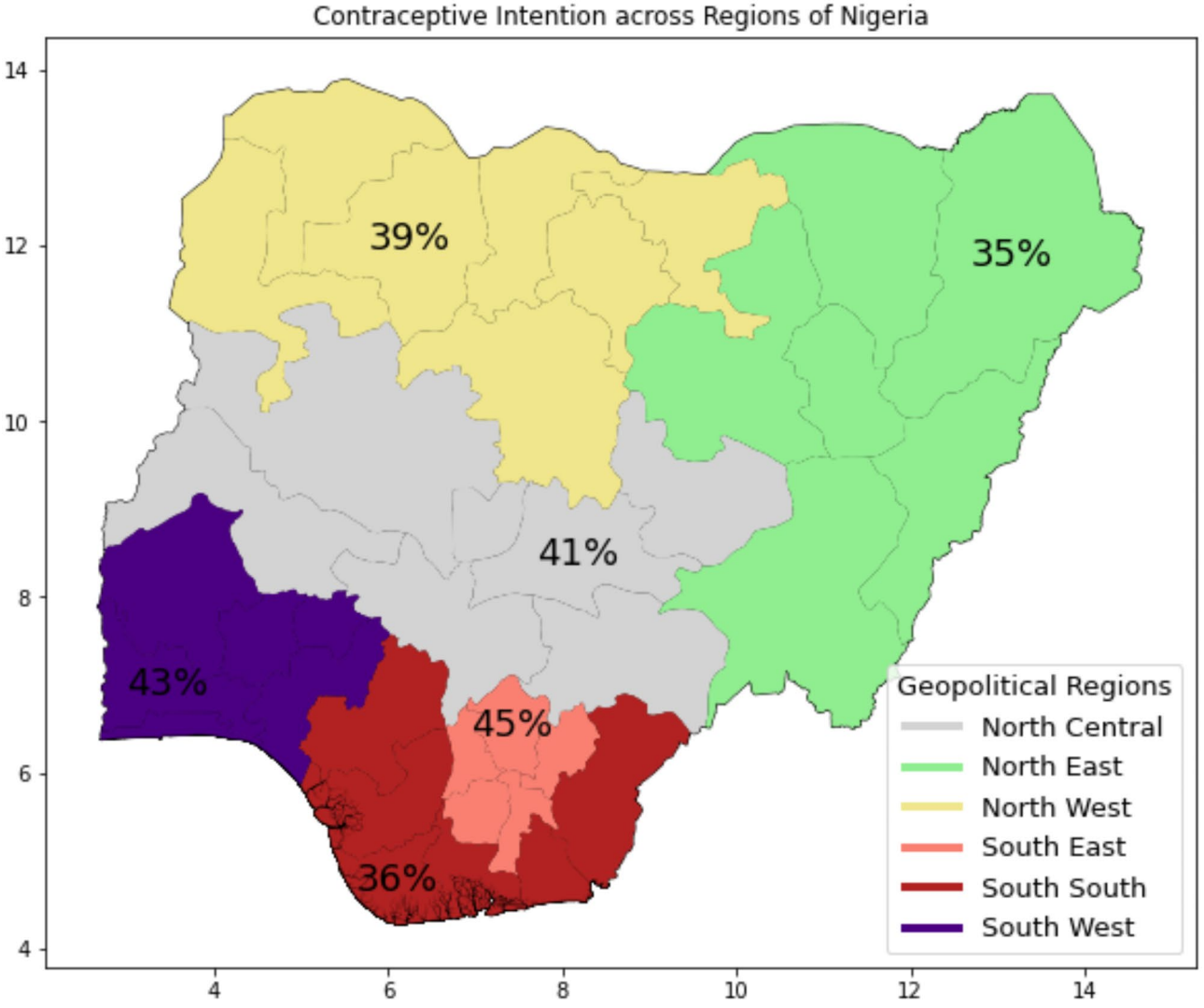

Fig. 2 Map of Nigeria showing regional disparities in contraceptive intention

0.470; 95% CI, 0.340–0.649; $p < 0.001$) were less likely to intend to use contraception than Christian women. Marital status showed similar results to the bivariate analysis, with married, widowed, and divorced/separated women having lower odds of using contraception than those who were never married. The wealth index maintained its positive association with contraceptive intention in the adjusted model, with higher wealth quintiles correlating with increased odds of intention. Employment status remained a significant factor, as employed women were more likely to use contraception (AOR: 1.196, 95% CI: 1.124–1.272, $p < 0.001$). Additionally, rural residents had lower odds of using contraception (AOR: 0.796, 95% CI: 0.746–0.850, $p < 0.001$) than urban residents. Significant regional disparities were observed in the adjusted model, with the northwest region showing the highest odds of contraceptive intention (AOR: 1.717, 95% CI: 1.567–1.881, $p < 0.001$), while the south region had the lowest odds (AOR: 0.470, 95% CI: 0.421–0.524, $p < 0.001$) compared to the North Central region.

Discussion

This study provides valuable insights into regional disparities and sociodemographic determinants of contraceptive intention among women of reproductive age in Nigeria. The findings revealed significant variations in contraceptive intention across regions and highlighted the complex interplay of factors influencing women's plans to use contraception in the future. The overall prevalence of contraceptive intention among women in Nigeria was 39.18%, which is considerably higher than the current contraceptive prevalence rate of 17% for modern methods [2, 3]. This discrepancy between intention and actual use suggests a significant unmet need for contraception and highlights the potential for increased uptake if barriers to access and use are addressed. Regional

Table 2 Bivariate analysis of factors associated with contraceptive intention

Category	Contraceptive Intention		COR [95% CI]	*P*-value
	No Intent	Intent		
Age Group				
15–19 (ref)	4,496 (54.31%)	3,782 (45.69%)	1	
20–24	3,123 (51.38%)	2,955 (48.62%)	1.305 [1.187–1.435]	< 0.001
25–29	3,226 (53.07%)	2,853 (46.93%)	1.333 [1.204–1.477]	< 0.001
30–34	2,769 (55.60%)	2,212 (44.40%)	1.243 [1.111–1.391]	< 0.001
35–39	2,772 (64.83%)	1,504 (35.17%)	0.866 [0.770–0.974]	0.017
40–44	2,505 (78.50%)	686 (21.50%)	0.455 [0.397–0.523]	< 0.001
45–49	3,014 (91.40%)	283 (8.60%)	0.152 [0.129–0.181]	< 0.001
Education				
No education (ref)	10,296 (73.38%)	3,735 (26.62%)	1	
Primary	3,313 (64.93%)	1,789 (35.07%)	1.588 [1.445–1.745]	< 0.001
Secondary	6,777 (49.65%)	6,872 (50.35%)	2.185 [1.996–2.393]	< 0.001
Higher	1,518 (44.71%)	1,877 (55.29%)	2.657 [2.339–3.019]	< 0.001
Religion				
Christianity (ref)	8,258 (54.30%)	6,951 (45.70%)	1	
Islam	13,476 (64.94%)	7,274 (35.06%)	0.554 [0.506–0.607]	< 0.001
Others	171 (77.50%)	50 (22.50%)	0.470 [0.340–0.649]	< 0.001
Marital Status				
Never in union (ref)	4,588 (47.15%)	5,143 (52.85%)	1	
Married	15,849 (64.75%)	8,627 (35.25%)	0.780 [0.716–0.851]	< 0.001
Widowed	826 (83.94%)	158 (16.06%)	0.446 [0.355–0.559]	< 0.001
Divorced/separated	642 (64.92%)	347 (35.08%)	0.684 [0.572–0.819]	< 0.001
Wealth Index				
Poorest (ref)	5,096 (72.86%)	1,899 (27.14%)	1	
Poorer	4,971 (65.98%)	2,564 (34.02%)	1.174 [1.079–1.278]	< 0.001
Middle	4,222 (58.34%)	3,015 (41.66%)	1.413 [1.287–1.552]	< 0.001
Richer	3,963 (54.56%)	3,301 (45.44%)	1.450 [1.306–1.609]	< 0.001
Richest	3,652 (51.09%)	3,496 (48.91%)	1.414 [1.255–1.594]	< 0.001
Employment				
No (ref)	8,111 (59.60%)	5,498 (40.40%)	1	
Yes	13,793 (61.11%)	8,776 (38.89%)	1.196 [1.124–1.272]	< 0.001
Residence				
Urban (ref)	8,296 (53.52%)	7,203 (46.48%)	1	
Rural	13,609 (65.81%)	7,071 (34.19%)	0.796 [0.746–0.850]	< 0.001
Region				
North Central (ref)	3,027 (58.69%)	2,130 (41.31%)	1	
North East	4,005 (65.24%)	2,134 (34.76%)	1.245 [1.133–1.369]	< 0.001
North West	7,133 (61.33%)	4,497 (38.67%)	1.717 [1.567–1.881]	< 0.001
South East	2,183 (55.15%)	1,776 (44.85%)	0.680 [0.613–0.754]	< 0.001
South South	2,475 (63.77%)	1,406 (36.23%)	0.470 [0.421–0.524]	< 0.001
South West	3,081 (56.94%)	2,330 (43.06%)	0.682 [0.609–0.763]	< 0.001

disparities in contraceptive intention were evident, with the Southeast (44.85%) and Southwest (43.06%) regions exhibiting higher proportions compared to the Northeast (34.76%) and South (36.23%). These findings align with previous research demonstrating higher contraceptive use in southern Nigeria [18, 19]. While the North Central region showed a relatively high intention (41.31%), suggesting potential for increased uptake, the lower rates in the Northeast and South South are concerning and may reflect a confluence of factors, including cultural norms, religious beliefs, and access to family planning services [20]. Acknowledging these regional variations necessitates tailored interventions addressing specific barriers and enablers within each geopolitical zone [18]. While this study focused on main effects, exploring interactions between variables, such as education and wealth or religion and region, could provide deeper insights into the complex factors influencing contraceptive use. Furthermore, regional disparities may be influenced by variations in cultural norms, health system capacity,

Table 3 Multivariable analysis of factors associated with contraceptive intention

Variable	Contraceptive Intention		AOR [95% CI]	*P*-value
	No Intent	Intent		
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15–19 (ref)	4,496 (54.31%)	3,782 (45.69%)		
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South West	3,081 (56.94%)	2,330 (43.06%)	0.682 [0.609, 0.763]	< 0.001

and socioeconomic conditions, warranting further investigation.

Education emerged as a strong predictor of contraceptive intention, with women with higher education showing 2.657 times higher odds of using contraception than those with no education. This finding is consistent with numerous studies that have demonstrated a positive impact of education on contraceptive use and intention [21–23]. Education likely influences contraceptive intention through multiple pathways, including increased knowledge of contraceptive methods, greater autonomy in decision-making, and more egalitarian gender attitudes [24, 25]. The strong association between education and contraceptive intention underscores the importance of promoting girls' education as a long-term strategy for improving reproductive health outcomes [23, 26]. The analysis revealed a significant influence of religion on contraceptive intention. Muslim women and those adhering to other religions were less likely to intend to use contraception compared to Christian

women [27]. This finding aligns with previous studies in Nigeria demonstrating lower contraceptive use among Muslim populations [19–29]. Religious beliefs can shape attitudes towards family size, contraception, and spousal communication regarding family planning [30, 31]. Engaging religious leaders in dialogue and developing culturally sensitive family planning messages are crucial for increasing contraceptive acceptance among diverse religious communities [31]. While this study found an overall difference between religious groups, it is important to acknowledge that variations likely exist within religious groups based on sect, level of religious adherence, and individual beliefs. Addressing these nuances requires a nuanced approach that considers the diverse perspectives and beliefs within each religious community.

Marital status was found to be an important factor, with married, widowed, and divorced/separated women having lower odds of contraceptive intention than never-married women. This finding contrasts with those of some studies that have shown higher contraceptive use among married women [6, 32]. The lower intention among married women in this study may reflect desires for children, spousal opposition, or misconceptions about contraceptive use within the marriage. This highlights the need for interventions that target couples and promote joint decision making regarding family planning.

Socioeconomic factors, including the wealth index and employment status, were positively associated with contraceptive intention. This relationship has been observed in numerous studies and may be attributed to greater access to information and services as well as increased autonomy in reproductive decision-making among women of higher socioeconomic status (Adebowale et al., 2014). The persistent effect of wealth on contraceptive intention, even after adjusting for other factors, suggests that the economic barriers to contraceptive use remain significant in Nigeria. The lower odds of contraceptive intention among rural residents compared to urban dwellers reflects the urban-rural divide in access to health services and information. This finding is consistent with previous research in Nigeria and other developing countries [7, 9, 33]. Improving access to family planning services in rural areas and addressing the unique barriers faced by rural women should be a priority for policymakers and program implementers [34]. The age pattern of contraceptive intention, with higher odds among women aged 20–34 years and lower odds among older women, likely reflects the different life stages and reproductive goals. This pattern suggests the need for age-specific family planning messages and services that address women's changing needs and concerns throughout their reproductive years.

Recommendations

To address the identified limitations and enhance family planning strategies, we propose the following recommendations. First, future research should leverage newer datasets, such as the next iteration of the NDHS or similar reproductive health surveys, to assess trends in contraceptive intention post-COVID-19 and following recent policy implementations like the 2021 National Family Planning Blueprint. These studies should also include variables such as spousal communication, attitudes toward family size, and perceived access to family planning services to provide a more nuanced understanding of contraceptive behaviours. Second, tailored interventions are essential to address regional disparities in contraceptive intention. Culturally sensitive strategies, such as engaging religious leaders in predominantly Muslim regions, can help dispel misconceptions and increase contraceptive acceptance. Additionally, integrating family planning services into broader health and social programs can improve accessibility, particularly in rural areas where logistical challenges persist. Community-based approaches should be prioritized to ensure equitable service delivery. Third, educational campaigns targeting women and their partners should be strengthened, emphasizing the health and socioeconomic benefits of contraception. These campaigns should focus on regions with lower contraceptive intention, such as the Northeast and South, to reduce disparities. Lastly, the alignment of national policies with localized implementation must continue to address the economic, religious, and geographical barriers to family planning, ensuring effective outcomes at the grassroots level.

Limitations

This study utilized data from the 2018 Nigeria Demographic and Health Survey (NDHS), which is the most recent nationally representative dataset available at the time of analysis. However, several limitations should be acknowledged. First, the dataset predates significant events such as the COVID-19 pandemic and the introduction of the 2021 National Family Planning Blueprint, both of which likely influenced contraceptive intention and access in Nigeria. These findings, therefore, represent a baseline for understanding contraceptive intention before these events and may not fully reflect current trends. While the study examined sociodemographic determinants of contraceptive intention, it did not include variables such as spousal communication, attitudes toward family size, and perceived access to family planning services, which are critical factors influencing contraceptive behaviors. Incorporating these factors in future studies would provide a more comprehensive understanding of the barriers to contraceptive uptake. Finally, regional disparities in contraceptive intention

were identified, but the analysis did not account for cultural nuances or health system differences within each region, which may have further influenced these disparities.

Conclusion

This study revealed significant regional disparities and complex sociodemographic patterns in contraceptive intentions among Nigerian women. The prevalence of 39.18% indicates the potential for increased uptake; however, variations across regions highlight the need for tailored approaches. Education has emerged as a crucial factor, with higher education being strongly associated with increased intention. Religious beliefs, marital status, wealth, employment, and rural-urban differences also played significant roles. These findings underscore the need for multifaceted interventions that address the educational, religious, economic, and geographical barriers to contraceptive use. Implementing region-specific strategies and considering the unique contexts of different sociodemographic groups are essential for improving reproductive health outcomes in Nigeria.

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Author contributions
JS conceptualized, designed, and conducted the study, including data analysis, visualization, resource gathering, data curation, and writing the original draft. MMA and SH provided oversight, review, and editing. IGW and AOO also contributed to the manuscript review and editing.

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Data availability
No primary data collection was conducted for this research. The data that support the findings of this study are available from the Demographic and Health Surveys (DHS) Program (https://dhsprogram.com/). The 2018 Nigeria Demographic and Health Survey dataset can be accessed upon request and approval from the DHS Program.

Declarations

Ethical approval
This study utilized data from the 2018 Nigeria Demographic and Health Survey (NDHS), which was conducted in accordance with the Helsinki Declaration. Ethical approval was obtained from the National Health Research Ethics Committee of Nigeria (NHREC) and the ICF Institutional Review Board. Informed consent was obtained from all participants prior to data collection. As this is a secondary data analysis, the researchers ensured confidentiality and anonymity in line with ethical guidelines.

Competing interests
The authors declare no competing interests.

Clinical trial number
Not applicable.

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