Original

Modern Contraceptive Use: An Analysis of The Factors Influencing Its Adoption Among Women of Reproductive Age in North-Central Nigeria

[1]Abduljaleel Adejumo, [2]Abdulazeez O. Abdulganiyu, [3]Ibrahim B. Abdullateef, [4]Saheed D. Isiaka

[1]Brooks Insights Limited, Abuja, Nigeria, Africa Institute of Mathematical Sciences, Senegal
[2]Brooks Insights Limited, Abuja, Nigeria. Faculty of the Social Sciences, University of Lagos, Akoka, Nigeria
[3]Department of Sociology and Criminology, Fountain University, Osogbo Nigeria
[4]Sydani Institute for Research and Innovation, Sydani Group, FCT, Abuja, Nigeria. Faculty of the Social Sciences, University of Ibadan, Ibadan, Nigeria

Corresponding author: *Abdulazeez O. Abdulganiyu, Brooks Insights Limited, Abuja, Nigeria. Abdulganiyu.oa@gmail.com: +2348104730940*

Article history: Received 20 November 2024, Reviewed 03 March 2025, Accepted for publication 06 March 2025

Abstract

Background: Despite what is obtainable in existing literature regarding the factors influencing modern contraceptive use in Nigeria, there remains a significant gap in understanding the specific regional factors influencing modern contraceptive adoption in north-central Nigeria**.**

Methods: Using data from the 2021 Nigeria Multiple Indicator Cluster Survey, this study investigated the factors influencing modern contraceptive use among women of reproductive age. The data were analyzed using R studio. Respondents' characteristics were described using frequency and percentage. A logistic regression model was employed to identify factors associated with modern contraceptive usage in the north-central region of Nigeria. Bivariate logistic regression between the explanatory variables (age, marital status, education, ethnicity, wealth index etc.) and the response variable (modern contraceptive usage). This study focused on the north-central zone of Nigeria comprising of Benue, Kogi, Kwara, Nasarawa, Niger, and Plateau state with the Federal Capital Territory (FCT).

Results: Nearly one-third (30.1%) of the respondents are above 35 years of age. 3 out of every 5 (61.2%) respondents are currently married. Over one-tenth (12.8%) of the respondents experienced childbirth delivery through cesarean section. Age, education, childbirth delivery method, number of children, access to media, and state of residence are key drivers of modern contraceptive adoption and utilization among women of reproductive age.

Conclusion: This study finds it plausible to increase the awareness and sensitization of modern contraceptives and contraceptive usage in this region. There is a need for health education on the benefits and relevance of modern contraceptive usage.

Keywords: Modern contraceptive use, Reproductive health, Women of reproductive age

How to cite this article:

Adejumo A, Abdulazeez OA, Abdullateef IB, Isiaka SD. Modern Contraceptive Use: An Analysis of The Factors Influencing Its Adoption Among Women of Reproductive Age in North-Central Nigeria. The Nigerian Health Journal 2025; 25(1):240 – 249.
https://doi.org/10.71637/tnhj.v25i1.963

Introduction

Several contraceptive methods have been introduced into the health milieu over a decade to protect women of reproductive age from unexpected pregnancies and the risk of child delivery.[1] Modern contraceptives are one such contraceptive method discerned as an integral aspect of reproductive health, contributing significantly to reducing maternal mortality, controlling population growth, and enhancing women's empowerment through the ability to make informed decisions about family planning.[2] Globally, the use of modern contraceptives has experienced relative degrees of success, influenced by factors such as socio-economic status, education, cultural beliefs, and accessibility to healthcare services.[3]
In Nigeria, modern contraceptive use remains relatively low despite numerous efforts to increase awareness and accessibility.[4] Consequently, maternal health outcomes in Nigeria remain worrisome, as uptake is still low, with only about 12% of women in the country adopting modern methods of family planning. Additionally, maternal death in Nigeria remains high compared to its counterpart in the global north. In 2020, Nigeria accounted for 800 maternal deaths per 100,000 live births. There is also a high unmet need for family planning in Nigeria, with about 19% among married women.[5] This, in many cases, has led to high fertility rates, rapid population growth, and high maternal mortality and morbidity rates accompanied by poor socio-economic development.[1]

Previous studies have highlighted several factors that could influence modern contraceptive use, including age, marital status, level of education, economic standing, number of children, media, religious belief, and access to healthcare facilities.[6–8] For instance, women with higher educational attainment[9] and those with better economic standing[10] are generally more likely to use modern contraceptives.[8,11] Urban-rural disparities have also been observed in the literature, with urban residents typically having higher adoption rates than their rural counterparts.[12]
Despite what is obtainable in existing literature regarding the factors influencing modern contraceptive use in Nigeria, there remains a significant gap in understanding the specific geo-political regional factors influencing modern contraceptive adoption, particularly in north-central Nigeria. Most studies have focused on national-level data or specific states, thus failing to capture the comprehensive regional dynamics of contraceptive adoption.[13] Furthermore, the reliability of available secondary data from North-central Nigeria is yet to be asserted in previous research.
This study sought to fill the gap in knowledge by examining geopolitical factors influencing modern contraceptive use in North-central Nigeria. Using data from the 2021 Nigeria Multiple Indicator Cluster Survey,[14] this study quantitatively investigated the factors influencing modern contraceptive use among women of reproductive age. The novelty of this study lies in its comprehensive regional focus, which will offer quantitative insights into the barriers and drivers of modern contraceptive use in one of Nigeria's most diverse geo-political zones. This approach contributes to the existing literature and provides actionable data for policymakers and health practitioners aiming to enhance contraceptive uptake and improve reproductive health outcomes in the region.

Methodology

Study design and Study population

The data set used in this study was extracted from the 2021 Multiple indicator Census Survey, a nationally representative cross-sectional survey. The 2021 MICS marks the sixth conducted.

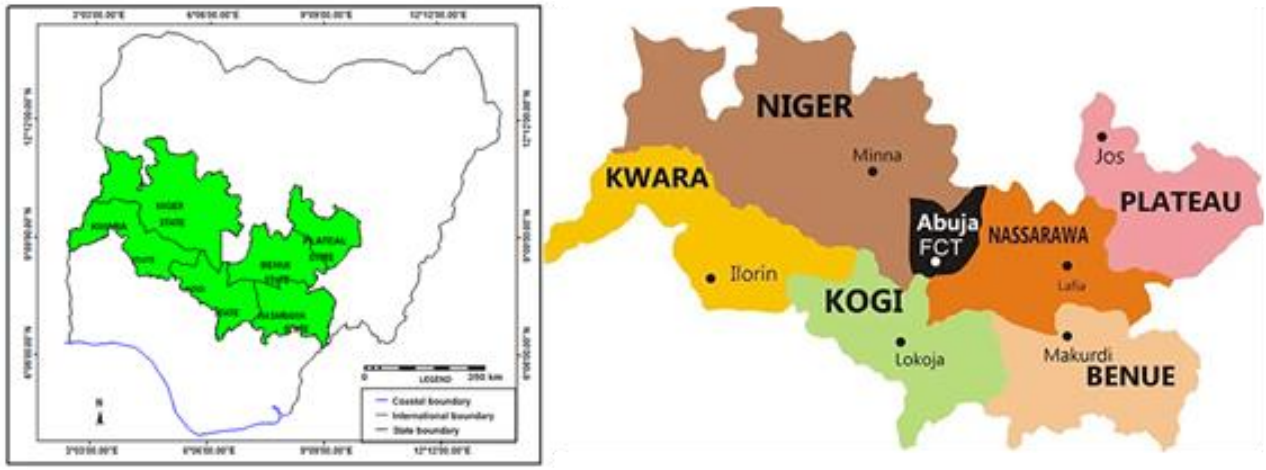
The survey employed a stratified two-stage sampling approach. In the first stage, the 36 states and the Federal Capital Territory (FCT) were stratified into urban and rural areas, from which 1,850 enumeration areas (clusters) were randomly selected. In the second stage, a fixed sample of 20 households per cluster was chosen using an equal probability systematic sampling method, resulting in a total sample of 37,000 households.

Data were collected from 38,806 women aged 15–49 years and 17,347 men aged 15–59 years across all selected households. To account for variations in selection probabilities and response rates, sampling weights were computed separately for each sampling stage and cluster. The survey collected comprehensive data on contraceptive use, with respondents providing detailed accounts of their contraceptive behaviors and methods used for each month within the five years preceding the survey. For this study, the analysis focused on a subset of 5,859 women of reproductive age (15–49 years) residing in the North Central region of Nigeria

Study Area

This study focuses specifically on the north-central zone of Nigeria. This zone is known to be the most diverse zone in the country in terms of religion and ethnicity. The zone is made up of 6 states (Benue, Kogi, Kwara, Nasarawa, Niger, and Plateau state) with the Federal Capital Territory (FCT).

Print ISSN: 0189-9287 Online ISSN: 2992-345X



Source of the data

The study used data from UNICEF 2021 Nigeria Multiple Indicator Cluster Survey/ National Immunization Coverage Survey (MICS/NICS) (https://www.unicef.org/nigeria/media/6316/file/)

Study Variables

Outcome (Response) variable

The outcome variable is the modern contraceptive utilisation rate, which was measured by women of 15-49 years who are using a modern contraceptive method. The women using modern contraceptive methods are coded as Yes, while women who are not using modern contraceptive methods are coded as No.

Explanatory Variables

The explanatory variables that were selected based on the literature are as follows: Respondents' age, Marital status, Education, Ethnicity, Wealth index, Method of last delivery, Number of births in the past two years, Total number of children alive, Desire for more children, Access to media, Residence type, State.

Data Analysis

The data were analyzed using R studio. The characteristics of respondents in this study were described using frequency and percentage. A logistic regression model was employed to identify factors associated with modern contraceptive usage in the north-central region of Nigeria. Bivariate logistic regression was carried out between the explanatory variables and the response variable (modern contraceptive utilisation rate). Those significant explanatory variables (i.e., with a value <0.25) in the bivariate logistic regression were retained in the multivariate logistic regression model. Multiple logistic regression analysis was conducted to assess the adjusted effect of these factors on modern contraceptive usage. The variables with p-values less or equal to 0.05 were considered statistically significant. Also, an adjusted odd ratio was used to determine the likelihood of contraceptive usage. The Variance inflation factor (VIF) was used to determine the collinearity in the model, and a variable with a value greater than 10 was dropped from the multivariate logistics regression.

Results

Out of 5859 respondents, nearly one-third (30.1%) of the respondents are above 35 years of age. 3 out of every 5 (61.2%) respondents are currently married, as almost half (47.1%) of the study population have completed at least secondary school education. Furthermore, 2 out of 5 (42.5%) respondents are from a poor household, and over one-tenth (12.8%) of the respondents experienced childbirth delivery through the cesarean section. Regarding the usage of contraceptives, women with 3-4 children, making up one-third (34.2%) of the study population, had the highest usage rate, followed by over one-quarter (29.9%) of them (those with 4 or more children), and finally nearly one-fifth (18.9%) with 1-2

Print ISSN: 0189-9287 Online ISSN: 2992-345X

children. Also, 3 out of 5 (60.8%) women have access to media, while about two-thirds (65.2%) of the study population live in Rural settlements (Table 1).

Table 1: Descriptive statistics, Women modern Contraceptive usage North Central, Nigeria

Variable	Overall N = 5859 (100.0%)[1]	Not N = 4898 (83.6%)[1]	Yes N = 961 (16.4%)[1]
Respondents age			
15-19	1,249 (21.3%)	1,199 (24.5%)	50 (5.2%)
20-24	1,033 (17.6%)	900 (18.4%)	134 (13.9%)
25-29	1,029 (17.6%)	847 (17.3%)	182 (18.9%)
30-34	785 (13.4%)	616 (12.6%)	168 (17.5%)
35+	1,762 (30.1%)	1,335 (27.3%)	427 (44.4%)
Marital status			
Currently married	3,580 (61.2%)	2,850 (58.3%)	730 (76.0%)
Formerly married	284 (4.9%)	227 (4.6%)	58 (6.0%)
Never married	1,988 (34.0%)	1,816 (37.1%)	172 (17.9%)
Education			
None	1,481 (25.3%)	1,282 (26.2%)	199 (20.7%)
Primary/Junior	1,619 (27.6%)	1,344 (27.4%)	274 (28.6%)
Secondary+	2,759 (47.1%)	2,271 (46.4%)	487 (50.7%)
Ethnicity			
Hausa	713 (12.2%)	618 (12.6%)	96 (9.9%)
Igbo	116 (2.0%)	95 (1.9%)	21 (2.2%)
Yoruba	598 (10.2%)	443 (9.0%)	155 (16.2%)
Fulani	122 (2.1%)	110 (2.2%)	12 (1.3%)
Kanuri	23 (0.4%)	18 (0.4%)	4 (0.5%)
Ijaw	7 (0.1%)	5 (0.1%)	2 (0.2%)
Tiv	827 (14.1%)	685 (14.0%)	142 (14.8%)
Ibibio	8 (0.1%)	7 (0.2%)	1 (0.1%)
Edo	19 (0.3%)	13 (0.3%)	6 (0.6%)
Other	3,426 (58.5%)	2,903 (59.3%)	522 (54.4%)
Wealth index			
Poor	2,489 (42.5%)	2,166 (44.2%)	324 (33.7%)
Middle	1,360 (23.2%)	1,119 (22.8%)	242 (25.1%)
Rich	2,009 (34.3%)	1,613 (32.9%)	396 (41.2%)
Method of last delivery			
CS	748 (12.8%)	582 (11.9%)	166 (17.3%)
No CS	5,110 (87.2%)	4,315 (88.1%)	795 (82.7%)
Number of births in last two years			
No	2,387 (63.7%)	1,811 (61.4%)	576 (72.1%)
Yes	1,360 (36.3%)	1,138 (38.6%)	222 (27.9%)

Print ISSN: 0189-9287 Online ISSN: 2992-345X

Variable	Overall N = 5859 (100.0%)[1]	Not N = 4898 (83.6%)[1]	Yes N = 961 (16.4%)[1]
Total number of children alive			
0	2,111 (36.0%)	1,948 (39.8%)	163 (16.9%)
1-2	1,243 (21.2%)	1,061 (21.7%)	182 (18.9%)
3-4	1,350 (23.0%)	1,021 (20.9%)	329 (34.2%)
4+	1,154 (19.7%)	867 (17.7%)	288 (29.9%)
Want another child?			
No	1,149 (22.2%)	764 (18.0%)	386 (41.0%)
Undecided	673 (13.0%)	593 (14.0%)	80 (8.5%)
Yes	3,358 (64.8%)	2,884 (68.0%)	474 (50.5%)
Access to media			
No	2,294 (39.2%)	2,004 (40.9%)	290 (30.2%)
Yes	3,564 (60.8%)	2,893 (59.1%)	671 (69.8%)
Residence type			
Urban	2,038 (34.8%)	1,663 (34.0%)	375 (39.0%)
Rural	3,821 (65.2%)	3,234 (66.0%)	586 (61.0%)
State			
Benue	1,149 (19.6%)	963 (19.7%)	185 (19.3%)
Kogi	841 (14.3%)	703 (14.4%)	137 (14.3%)
Kwara	620 (10.6%)	463 (9.4%)	158 (16.4%)
Nasarawa	546 (9.3%)	468 (9.5%)	78 (8.2%)
Niger	1,217 (20.8%)	1,091 (22.3%)	126 (13.1%)
Plateau	850 (14.5%)	718 (14.7%)	132 (13.7%)
FCT	636 (10.9%)	492 (10.0%)	145 (15.0%)

Factors associated with Modern Contraceptive usage.

The bivariate logistics regression was used to observe the individual effect of the explanatory variables on the outcome variables. All the explanatory variables were significantly associated with modern contraceptive usage and included in the multivariate logistics regression model. The ethnicity was dropped from the multivariate logistics regression model because of its high correlation with states.

Multivariate logistic regression was adopted to adjust for the effect of other variables. The result shows that women who are 35 years and above are 65% less likely (aOR = 0.35, 95% CI: 0.17, 0.71, p = 0.026) to use modern contraceptives compared to women between the ages of 15 and 19 years old. Furthermore, formerly married women are 37% less likely (aOR = 0.63 95% CI: 0.45, 0.88, p= 0.007) to use modern contraceptives compared to women who are currently married. Compared to women who are not educated, women who had primary/junior, secondary school, and above secondary education are 57% and 82% more likely to use modern contraceptives (aOR = 1.57, 95% CI: 1.22, 2.03, p <0.001) and (aOR = 1.82, 95% CI: 1.41, 2.34, p <0.001) respectively.

Women who did not deliver the last child through cesarean section are 56% less likely (aOR = 0.44, 95% CI: 0.30, 0.64, p <0.001). Women who have 3-4 children are 58% more likely (aOR = 1.58, 95% CI: 1.27, 1.97, p <0.001) to use modern contraceptives compared to women who have 1-2 children. Likewise, women who gave birth to 4 or more are 49% more likely (aOR = 1.49, 95% CI: 1.14, 1.94, p = 0.003) to use modern contraceptives compared to women who have 1 to 2 children. Furthermore, compared to those who do not want to give birth to another child, women who want to give birth to another child are 63% less likely (aOR = 0.37, 95% CI: 0.30, 0.45, p <0.001) to use modern contraceptives (Table 2).

Print ISSN: 0189-9287 Online ISSN: 2992-345X

For media access, women who had access to media were 1.53 times more likely to use modern contraceptives compared to those who did not have access (aOR = 1.53, 95% CI: 1.21, 1.93, p < 0.001). Women residing in rural areas were 48% more likely to use modern contraceptives compared to those in urban areas (aOR = 1.48, 95% CI: 1.11, 1.97, p = 0.007).

State effect on the use of modern contraceptives was also significant. Women from Kwara were significantly more likely to use modern contraceptives compared to those from Benue (aOR = 2.19, 95% CI: 1.37, 3.52, p = 0.001). Women from FCT were also significantly more likely to use modern contraceptives compared to those from Benue (aOR = 1.96, 95% CI: 1.42, 2.71, p < 0.001). However, women from Niger were less likely to use modern contraceptives compared to those from Benue (aOR = 0.87, 95% CI: 0.59, 1.29, p = 0.488), though this result was not statistically significant.

Table 2. Bivariate and multivariable Weighted logistic regression for women Modern Contraceptive Rate (NC)

Variable	Total N (%) N = 5,859[1]	Crude OR			Adjusted OR		
		OR[2]	95% CI[2]	p-value	OR[2]	95% CI[2]	p-value
Respondents age				<0.001			<0.001
15-19	1,249 (21.3%)	—	—		—	—	
20-24	1,033 (17.6%)	3.54	2.42, 5.19	<0.001	0.69	0.34, 1.40	0.304
25-29	1,029 (17.6%)	5.12	3.47, 7.57	<0.001	0.62	0.31, 1.25	0.179
30-34	785 (13.4%)	6.52	4.42, 9.64	<0.001	0.57	0.27, 1.21	0.142
35+	1,762 (30.1%)	7.63	5.25, 11.1	<0.001	0.35	0.17, 0.71	0.004
Marital status				<0.001			0.026
Currently married	3,580 (61.2%)	—	—		—	—	
Formerly married	284 (4.9%)	1.00	0.73, 1.37	0.994	0.63	0.45, 0.88	0.007
Never married	1,988 (34.0%)	0.37	0.28, 0.49	<0.001	0.88	0.47, 1.66	0.700
Education				0.017			<0.001
None	1,481 (25.3%)	—	—		—	—	
Primary/Junior	1,619 (27.6%)	1.32	1.04, 1.66	0.021	1.57	1.22, 2.03	<0.001
Secondary+	2,759 (47.1%)	1.38	1.10, 1.74	0.005	1.82	1.41, 2.34	<0.001
Wealth index				<0.001			0.169
Poor	2,489 (42.5%)	—	—		—	—	
Middle	1,360 (23.2%)	1.45	1.11, 1.88	0.006	1.23	0.93, 1.63	0.153
Rich	2,009 (34.3%)	1.64	1.31, 2.05	<0.001	1.36	0.98, 1.88	0.066
Method of last delivery				<0.001			<0.001
Yes	748 (12.8%)	—	—		—	—	
No	5,110 (87.2%)	0.64	0.52, 0.80	<0.001	0.44	0.30, 0.64	<0.001
Number of births in last two years				<0.001			<0.001
No	2,387 (63.7%)	—	—		—	—	
Yes	1,360 (36.3%)	0.61	0.51, 0.74	<0.001	0.30	0.21, 0.42	<0.001
Total number of child alive				<0.001			<0.001
1-2	1,243 (21.2%)	2.05	1.49, 2.82	<0.001	—	—	
3-4	1,350 (23.0%)	3.85	2.94, 5.06	<0.001	1.58	1.27, 1.97	<0.001
4+	1,154 (19.7%)	3.97	2.91, 5.43	<0.001	1.49	1.14, 1.94	0.003
Want another child?				<0.001			<0.001
No	1,149 (22.2%)	—	—		—	—	
Undecided	673 (13.0%)	0.27	0.19, 0.37	<0.001	0.57	0.42, 0.79	<0.001
Yes	3,358 (64.8%)	0.33	0.28, 0.38	<0.001	0.37	0.30, 0.45	<0.001
Access to media				<0.001			<0.001
No	2,294 (39.2%)	—	—		—	—	
Yes	3,564 (60.8%)	1.60	1.34, 1.93	<0.001	1.53	1.21, 1.93	<0.001
Residence type				0.047			0.007

Print ISSN: 0189-9287 Online ISSN: 2992-345X

Variable	Total N (%)	Crude OR			Adjusted OR		
	N = 5,859[1]	OR[2]	95% CI[2]	p-value	OR[2]	95% CI[2]	p-value
Urban	2,038 (34.8%)	—	—		—	—	
Rural	3,821 (65.2%)	0.80	0.65, 1.00	0.048	1.48	1.11, 1.97	0.007
State				<0.001			<0.001
Benue	1,149 (19.6%)	—	—		—	—	
Kogi	841 (14.3%)	1.01	0.76, 1.35	0.920	0.68	0.45, 1.01	0.056
Kwara	620 (10.6%)	1.77	1.26, 2.50	0.001	2.19	1.37, 3.52	0.001
Nasarawa	546 (9.3%)	0.87	0.63, 1.20	0.395	1.23	0.85, 1.79	0.271
Niger	1,217 (20.8%)	0.60	0.42, 0.86	0.005	0.87	0.59, 1.29	0.488
Plateau	850 (14.5%)	0.96	0.70, 1.31	0.776	1.33	0.94, 1.88	0.109
FCT	636 (10.9%)	1.53	1.22, 1.92	<0.001	1.96	1.42, 2.71	<0.001

[1] n (%)
[2] OR = Odds Ratio, CI = Confidence Interval

Discussion

This study identified the factors affecting modern contraceptive usage among women of reproductive age in the North-central geopolitical zone of Nigeria. Modern contraceptives have been one of the most effective ways and methods of family planning in Nigeria. Several research have focused on other parts of the country. Yet, we are unaware of any study conducted to examine the factors influencing modern contraceptive use in the most diverse geopolitical regions of the country.[8,15–17] This research found that the average modern contraceptive usage among women of reproductive age in the northern part of the country is less than 16.4%, and this corroborates the findings of the study carried out by Durowade et al. in the southwestern part of Nigeria.[16]

The study revealed that the age of a woman influences her usage of contraceptives. Thus, women who are 35 years and above are less likely to use modern contraceptives compared to women between the ages of 15 and 19.[7] Likewise, previously married women are less likely to use modern contraceptives compared to women who are currently married. This alludes to the findings of [18] who reported usage of modern contraceptives as higher among married women compared to unmarried women.[19] Education also plays a significant role in modern contraceptive usage, and educated women were more likely to use modern contraceptives in family planning compared to women without formal education studies. This corroborates the findings of some previous studies, [6,18,20–22,] but disagrees with another study.[23] This may be premised on the possibility that an improved level of education (such as a Master's or PhD) might have been educated about contraception use, options, and the possible benefits of using modern forms of contraception, enhancing their likelihood of using such contraceptives.[24] Another rationalization for this finding could be that the long duration of higher educational attainment may encourage women to use modern contraceptives to delay any unintended pregnancy until completion of education or after gaining employment.[24] Hence, making highly educated women more likely to use modern contraceptives.

Women who deliver their last child through cesarean section would like to give a gap for their stomach to heal before conceiving another child. Similar to the findings of previous studies,[25] this research found that women who delivered their last child through cesarean section are more likely to use modern contraceptives. Similar to the findings of Fadeyibi [7], women who have more than three children are more likely to use modern contraceptives compared to women who have 1-2 children. This finding may be based on the fact that many women will likely desire to stop childbearing when they have more than 3 children due to the economic hardship in the region.[26] This will allow them to focus on giving their current children a better upbringing. The desire for another child also influences women's choice of using modern contraceptives. This research found that women who wished to have another child were less likely to use modern contraceptives than those who did not want to give birth to another child.

Findings from our study also revealed that women who had access to media were more likely to use modern contraceptives compared to those who did not have access. This is similar to what previous studies found.[27,28] This implies that health information through radio, television, and social media should be encouraged. Also, other awareness platforms, such as town hall meetings and community gatherings, should not be overlooked when broadcasting healthcare messages. Women

Print ISSN: 0189-9287 Online ISSN: 2992-345X

residing in rural areas were more likely to use modern contraceptives compared to those in urban areas.[6,29] Finally, women's state of residence had a significant effect on women's usage of modern contraceptives in the north central. In other words, this research found that women from Kwara were more likely to use modern contraceptives compared to those from Benue state. [30] Women from FCT were also more likely to use modern contraceptives compared to those from Benue. However, women from Niger were less likely to use modern contraceptives compared to those from Benue. This is similar to the previous studies [4,30,31]

Available data and our study findings indicate that the utilization of modern contraceptives among women of reproductive age in the North Central region of Nigeria is poor. The current utilization rate is less than one-fifth of the expected users. The study also asserted that the socio-demographic variables of these women were key determinants in their adoption and utilization of modern contraceptives in North Central Nigeria. There is a need for health education on the benefits and relevance of modern contraceptive usage among women of reproductive age in North Central Nigeria.

Declarations

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest concerning this article's research, authorship, and/or publication.

Funding

The author(s) received no financial support for this article's research, authorship, and/or publication.

Ethical approval

This study utilized publicly available data from the MICS database. Access was granted on July 26, 2024, by the UNICEF MICS Team after signing up and providing a description of the study's purpose. Since this was a secondary data analysis with no direct involvement of human subjects, it was exempt from ethics assessment. All data is used solely for research purposes, encrypted, and kept confidential. The findings will inform policy recommendations to enhance women's and public health in Nigeria.

Author contributions

AA conceptualized the study and contributed to the data and results sections. **AOA** supported the methodology and synthesized the discussion section. **AIB** developed the background of the study, while **IS** reviewed and edited the manuscript. All authors read and approved the final version of the manuscript

Availability of data and materials

All data generated and analyzed for the manuscript are available upon reasonable request.

References

1. Abdullateef IB, Abdulganiyu AO, Fanu OO, Atta JA. Knowledge and Perceptions of the Billing's Ovulation Method of Natural Family Planning among Married Women in Lagos, Nigeria. International Journal of Research and Innovation in Social Science. 2024; VIII(I):2548–57.
2. Cahill N, Sonneveldt E, Stover J, Weinberger M, Williamson J, Wei C, et al. Modern contraceptive use, unmet need, and demand satisfied among women of reproductive age who are married or in a union in the focus countries of the Family Planning 2020 initiative: a systematic analysis using the Family Planning Estimation Tool. The Lancet. 2018 Mar;391(10123):870–82.
3. Haakenstad A, Angelino O, Irvine CMS, Bhutta ZA, Bienhoff K, Bintz C, et al. Measuring contraceptive method mix, prevalence, and demand satisfied by age and marital status in 204 countries and territories, 1970–2019: a systematic analysis for the Global Burden of Disease Study 2019. The Lancet. 2022 Jul;400(10348):295–327.
4. Adegboyega LO. Attitude of married women towards contraceptive use in Ilorin Metropolis, Kwara State, Nigeria. Afr Health Sci. 2019 Jun;19(2):1875–80.
5. The Federal Republic of Nigeria Nigeria Demographic and Health Survey 2018 National Population Commission Abuja, Nigeria [Internet]. 2019. Available from: www.DHSprogram.com.
6. Bolarinwa OA, Tessema ZT, Frimpong JB, Seidu AA, Ahinkorah BO. Spatial distribution and factors associated with modern contraceptive use among women of reproductive age in Nigeria: A multilevel analysis. PLoS One. 2021 Dec 8;16(12):e0258844.
7. Fadeyibi O, Alade M, Adebayo S, Erinfolami T, Mustapha F, Yaradua S. Household Structure and Contraceptive Use in Nigeria. Front Glob Womens Health. 2022 May 10;3.
8. Alo OD, Daini BO, Omisile OK, Ubah EJ, Adelusi OE, Idoko-Asuelimhen O. Factors influencing the use of modern contraceptive in Nigeria: a multilevel logistic analysis using linked data from performance monitoring and accountability 2020. BMC Womens Health. 2020 Sep 3;20(1):191.

Print ISSN: 0189-9287 Online ISSN: 2992-345X

9. Ekholuenetale M, Olorunju S, Fowobaje KR, Onikan A, Tudeme G, Barrow A. When Do Nigerian Women of Reproductive Age Initiate and What Factors Influence Their Contraceptive Use? A Contextual Analysis. Open Access J Contracept. 2021 Jul; Volume 12:133–47.
10. Fadeyibi O, Alade M, Adebayo S, Erinfolami T, Mustapha F, Yaradua S. Household Structure and Contraceptive Use in Nigeria. Front Glob Womens Health. 2022 May 10;3.
11. Ononokpono DN, Odimegwu CO, Usoro NA. Contraceptive Use in Nigeria: Does Social Context Matter? Afr J Reprod Health. 2020 Mar;24(1):133–42.
12. Anate B, Balogun M, Olubodun T, Adejimi A. Knowledge and utilization of family planning among rural postpartum women in Southwest Nigeria. J Family Med Prim Care. 2021;10(2):730.
13. Solanke BL. Factors influencing contraceptive use and non-use among women of advanced reproductive age in Nigeria. J Health Popul Nutr. 2017 Dec 7;36(1):1.
14. NBS, UNICEF. 2021 Nigeria Multiple Indicator Cluster Survey (MICS) & National Immunization Coverage Survey (NICS): Statistical Snapshots [Internet]. National Bureau of Statistics and United Nations Children's Fund. 2022. Available from: https://www.unicef.org/nigeria/media/6126/file/2021 MICS Statistical Snapshots Report.pdf
15. Adeniji OI, Adeniji AO. Factors affecting the use of modern contraception among women of reproductive age in Odigbo local government area, Ondo state, Nigeria. Int J Reprod Contracept Obstet Gynecol. 2024 May 29;13(6):1404–8.
16. Durowade KA, Omokanye LO, Elegbede OE, Adetokunbo S, Olomofe CO, Ajiboye AD, et al. Barriers to Contraceptive Uptake among Women of Reproductive Age in a Semi-Urban Community of Ekiti State, Southwest Nigeria. Ethiop J Health Sci. 2017 Mar;27(2):121–8.
17. Solanke BL. Factors influencing contraceptive use and non-use among women of advanced reproductive age in Nigeria. J Health Popul Nutr. 2017 Dec 7;36(1):1.
18. Oluwasanu MM, John-Akinola YO, Desmennu AT, Oladunni O, Adebowale AS. Access to Information on Family Planning and Use of Modern Contraceptives Among Married Igbo Women in Southeast, Nigeria. Int Q Community Health Educ. 2019 Jul;39(4):233–43.
19. Shagaro SS, Gebabo TF, Mulugeta BT. Four out of ten married women utilized modern contraceptive method in Ethiopia: A Multilevel analysis of the 2019 Ethiopia mini demographic and health survey. PLoS One. 2022;17(1):e0262431.
20. Woldeamanuel BT, Gessese GT, Demie TG, Handebo S, Biratu TD. Women's education, contraception use, and high-risk fertility behavior: A cross-sectional analysis of the demographic and health survey in Ethiopia. Front Glob Womens Health. 2023; 4:1071461.
21. Workneh BS, Zegeye AF, Tamir TT, Ali MS, Ayenew T, Mekonen EG. Individual and community level factors associated with discriminatory attitudes against people living with HIV/AIDS among women of reproductive age in three sub-Saharan African countries: evidence from the most recent demographic and health survey (2021/22). BMC Public Health. 2024 Jun 5;24(1):1503.
22. Johnson OE. Determinants of Modern Contraceptive Uptake among Nigerian Women: Evidence from the National Demographic and Health Survey. Afr J Reprod Health. 2017 Sep;21(3):89–95.
23. Kistiana S, Gayatri M, Sari DP. Determinants of Modern Contraceptive Use among Young Married Women (Age 15-24) in Indonesia. Glob J Health Sci. 2020 Oct 31;12(13):37.
24. Nyarko SH. Spatial variations and socioeconomic determinants of modern contraceptive use in Ghana: A Bayesian multilevel analysis. PLoS One. 2020 Mar 10;15(3):e0230139.
25. Coomson JI, Manu A. Determinants of modern contraceptive use among postpartum women in two health facilities in urban Ghana: a cross-sectional study. Contracept Reprod Med. 2019; 4:17.
26. Kidie AA, Aychiluhm SB, Ayal BG, Kodo TK, Fentie EA, Masresha SA, et al. Women's desire to limit child-bearing and its associated factors in rural Ethiopia: A multilevel analysis. Heliyon. 2024 Feb;10(3):e25372.
27. Boah M, Adokiya MN, Hyzam D. Prevalence and factors associated with the utilisation of modern contraceptive methods among married women of childbearing age in Yemen: a secondary analysis of national survey data. BMJ Open. 2023 Jun;13(6):e071936.
28. Negash WD, Eshetu HB, Asmamaw DB. Predictors of modern contraceptive use among reproductive age women in high fertility countries in sub-Saharan Africa: evidence from demographic and health surveys. BMC Womens Health. 2022 Dec 13;22(1):520.

Print ISSN: 0189-9287 Online ISSN: 2992-345X

29. Sserwanja Q, Musaba MW, Mutisya LM, Mukunya D. Rural-urban correlates of modern contraceptives utilization among adolescents in Zambia: a national cross-sectional survey. BMC Womens Health. 2022 Aug 2;22(1):324.
30. Atama CS, Okoye UO, Odo AN, Odii A, Okonkwo UT. Belief System: A Barrier to the Use of Modern Contraceptives among the Idoma of Benue State, North Central Nigeria. J Asian Afr Stud. 2020 Jun 29;55(4):600–16.
31. Akpoti OO, Kareem AJ, Kareem AO, Ogunromo AY, Owoeye-Lawal OT, Ahmed LA, et al. Demand for modern contraceptives and use among women of reproductive age in north central Nigeria. Int J Community Med Public Health. 2023 Feb 28;10(3):958–67.

Print ISSN: 0189-9287 Online ISSN: 2992-345X