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Article

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

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Abstract: Objectives: In Nigeria, modern contraceptive use remains relatively low despite numerous efforts to increase awareness and accessibility. This study examined the geopolitical factors influencing modern contraceptive use in North-central Nigeria. Design: Using data from the 2021 Nigeria Multiple Indicator Cluster Survey, this study quantitatively 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 was carried out between the explanatory and response variables. Settings: This study focused specifically on the north-central zone of Nigeria comprising 6 states, namely, Benue, Kogi, Kwara, Nasarawa, Niger, and Plateau states 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. This study found that the average modern contraceptive usage among women of reproductive age in north Central Nigeria is less than 15%. 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 in north-central Nigeria. 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: reproductive health; women; modern cotraceptive

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

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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]
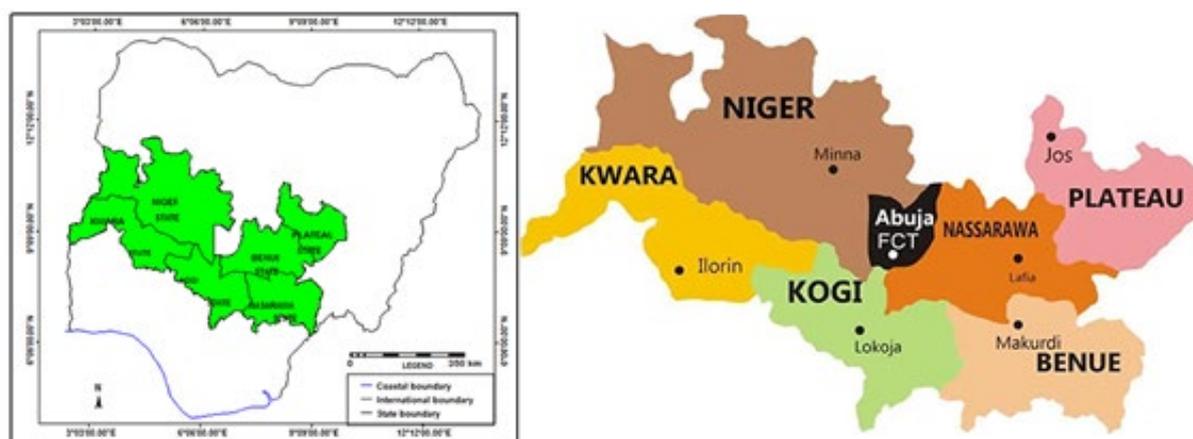
Despite what is obtainable in existing literature regarding the factors influencing modern contraceptive use in Nigeria, there remains a significant gap in understanding the specific geo-political regional factors influencing modern contraceptive adoption, particularly in north-central Nigeria. Most 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.

Methods

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).

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 prevention 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 prevention 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.

Result

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 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 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.

Weighted descriptive statistics, Women modern Contraceptive usage NC.

Variable	Overall N = 5859 (100.0%)[1]	Not N = 4898 (83.6%)[1]	Yes N = 961 (16.4%)[1]	p-value[2]
Respondents age				<0.001
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				<0.001
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				0.015
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				0.009
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				<0.001
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				<0.001
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				<0.001
No	2,387 (63.7%)	1,811 (61.4%)	576 (72.1%)	
Yes	1,360 (36.3%)	1,138 (38.6%)	222 (27.9%)	
Total number of children alive				<0.001
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?				<0.001
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				<0.001
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				0.053
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				<0.001
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%)
[1] n (%)			
[2] Chi-square: adjusted Wald test of independence for complex survey samples			

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.

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.

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

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
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 birth 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
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 15%, 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 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]

Conclusions and Recommendations

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 while also addressing any myths, misconceptions, and rumors associated with the utilization of these contraceptives among women of reproductive age.

Declarations

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

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Ethical approval: This study utilized publicly available data from the MICS database. Access was granted after signing up and describing the study's purpose. All data is used solely for research purposes, encrypted, and kept confidential. The findings will suggest and construct policy recommendations to enhance women's and public health in Nigeria.

Author Contributions: All authors have contributed significantly and agree with the manuscript's content.

Availability of data and materials: All data generated and analyzed for the manuscript are available upon reasonable request.

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