

# Determinants of Use of Contraceptive Methods Among Sexually Active Married Men in Nigeria

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## Abstract

Using a cross-sectional research design, the men's dataset of the 2018 Nigeria Demographic and Health Survey (NDHS) and a weighted sample size of 7,991 sexually active married men (15–59 years) were used to examine determinants of the use of contraceptive methods. Data were analyzed using frequency tables, proportions, Pearson's chi-square, and multinomial logistic regression. The relative risk of using male-controlled contraception relative to not using any contraception was 3% significantly lower ( $a_{rrr} = 0.7$ , 95% CI [0.5, 1.0],  $p < .05$ ) among polygamous married men than for monogamists. In comparison, the relative risk of using female-controlled contraception relative to not using any contraception was 4% significantly higher ( $a_{rrr} = 1.4$ , 95% CI [1.0, 2.0],  $p < .05$ ) for polygamous married men compared to the corresponding risk for monogamists. Other factors influencing the risk of using male-controlled contraception include tertiary education ( $a_{rrr} = 2.8$ , 95% CI [1.9, 4.0],  $p < .05$ ), Yoruba ( $a_{rrr} = 3.8$ , 95% CI [2.8, 5.2],  $p < .05$ ), richer ( $a_{rrr} = 1.5$ , 95% CI [0.8, 1.7],  $p < .05$ ), and desire for more children ( $a_{rrr} = 0.8$ , 95% CI [0.7, 0.9],  $p < .05$ ), media exposure ( $a_{rrr} = 1.5$ , 95% CI [1.3, 1.7],  $p < .05$ ) and the number of sexual partners in the last 12 months ( $a_{rrr} = 5.7$ , 95% CI [4.6, 7.0],  $p < .05$ ). Findings suggest strengthening male-controlled contraceptive methods by sexually active married men to reduce high fertility levels.

## Keywords

Female-controlled contraceptive; male-controlled contraceptive; married men; Nigeria; sexually active

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## Background

Lowering the fertility level has been a policy objective for years in Nigeria because of the high population growth rate and its adverse effects on national development (Fan & Besong, 2010). According to the United Nations, Nigeria, with an estimated growth rate of 2.5% per annum and over 206 million inhabitants in 2020, is the most populous country in Africa and the seventh in the world (Etokidem et al., 2017; Population Reference Bureau [PRB], 2020). Efforts to control the high fertility rate in Nigeria have not been impressive because of its nexus to underdevelopment (Obinna, 2018; Odusina et al., 2020). The trend in total fertility rates (TFR) in the country indicates either a slow or stalled fertility at a very high level of 5.3 births per woman (Bongaarts, 2017; Moultrie et al., 2008; PRB, 2020; Shapiro & Gebreselassie, 2008; Shapiro & Hinde, 2017). The failure to achieve a lower fertility level, however, has been linked with little attention given to men in sexual and reproductive health decision-making (Adelekan et al., 2014; Amoo et al., 2017; Kabagenyi et al., 2014; Singh & Darroch, 2012). For many years, men were not considered essential partners in sexual and reproductive health issues until after the 1994 International Conference on Population and Development (ICPD) (Amoo et al., 2017; Kabagenyi et al., 2014; MacQuarrie et al., 2015; Ringheim & Feldman-Jacobs, 2009; Ross & Hardee, 2017). For years, fertility, contraceptive use, and family planning have been women's matters through organized family planning programming since the 1960s (Amoo et al., 2017; Kabagenyi et al., 2014; MacQuarrie et al., 2015). Consequently, female-controlled contraceptive methods were heavily relied on to shrink fertility rates in Nigeria. The persistently high and stalled total fertility in Nigeria is now a pointer to the need to consider male-controlled contraceptive methods as one of the pathways to achieving lower fertility levels in the country (Oginni et al., 2015).

Family planning provides opportunities for couples to limit and space the number of children they want (Centers for Disease Control and Prevention [CDC], 1999) and reduce maternal mortality and morbidity by avoiding unwanted pregnancies, unsafe abortions, and high-risk pregnancies (Kavanaugh & Anderson, 2013; Mutombo et al., 2014). Extant literature has shown that these family planning benefits could be achieved entirely by paying more attention to the role of men in fertility decision-making, particularly in the use of male-controlled contraceptive methods (Abbe et al., 2020; Awonuga et al., 2014; Okigbo et al., 2015; Ross & Hardee, 2017). In most sub-Saharan African societies, men are at the apex of the family and societal hierarchy (Oyediran & Isiugo-Abanihe, 2002). Men were vital in family decision-making on sexual and reproductive health matters (Oyediran & Isiugo-Abanihe, 2002). Men's knowledge and attitudes influence the choice and use of contraception (Kabagenyi et al., 2014; Kamal et al., 2013). Like women, men have their attitudes, values, beliefs, and practices of contraception, significantly influencing women's use (MacQuarrie et al., 2015; Moyo et al., 2012). For various reasons, men's opposition to the use of female-controlled contraceptive methods by their wives has been linked to the fear that wives would be promiscuous, undermine their authority in the house, side effects, and that contraception works against their religious teaching (Kabagenyi et al., 2014; Oyediran & Isiugo-Abanihe, 2002).

Globally, the use of male contraception or male-controlled methods of contraception such as periodic abstinence, condoms, vasectomy, and coitus interruptus (withdrawal) is relatively low (Abbe et al., 2020; Cook, 2000; Macquarrie et al., 2015; United Nations, 2014). In developed countries, for instance, male-controlled contraceptive methods form a total of 27%, while that of female-controlled contraceptive methods was 73% (Moyo et al., 2012; United Nations, 2015). A similar wide gap was also observed in developing countries between the male-

controlled and female-controlled methods of contraception (Kabagenyi et al., 2014). The male-controlled contraceptive methods account for 7% compared to 93% of female-controlled contraception methods (United Nations, 2020). In Nigeria, the use of male-controlled methods of contraception is very low (National Population Commission (NPC) [Nigeria] & ICF International, 2014). Coitus interrupts /withdrawal accounted for 2.1%, periodic abstinence (1.2%), condom (2.5%), and vasectomy (0.0%) of contraceptive prevalence (NPC [Nigeria] & ICF, 2019). These existing data undoubtedly confirmed that the use of male-controlled contraceptive methods in Nigeria is very low and, thus, needs a new effort to increase its use.

Extant literature on knowledge of contraception in Nigeria showed a high understanding of contraceptive methods by men and women: 93% for women and 94% for men (NPC [Nigeria] & ICF, 2019). However, in Nigeria, women know the most effective contraceptive methods better than men (Fayehun, 2017). For instance, among women, the most cited method was the pill (82.2%), which has a failure rate of 9%, and among men, the most mentioned method was the male condom (92%), which has a failure rate of 18% (Fayehun, 2017; NPC [Nigeria] & ICF, 2019). Further analysis showed that among the least known methods in the country, only 45% of men and 77.9% of women knew of the implant method, which has a failure rate of 0.1% and can last between three to five years for women who use it (NPC [Nigeria] & ICF, 2019). Nevertheless, high knowledge of contraceptive methods among men does not transform into practice (Blackstone & Iwelunmor, 2017; Moyo et al., 2012; NPC [Nigeria] & ICF, 2019). For instance, a male condom, the most generally used male-controlled contraceptive method, only accounted for 1.6% of all modern contraceptive methods (Ijadunola et al., 2010; NPC [Nigeria] & ICF, 2019).

Promoting men's use of male-controlled contraceptive methods is one of the ways to transform men's contraception knowledge into use (Ijadunola et al., 2010; Pearson & Becker, 2014). For instance, increasing use of a male-controlled method of contraception has been reported when men were involved and made a favorable decision in family planning (Ijadunola et al., 2010; Odimegwu et al., 2005; Samari & Coleman-Minahan, 2018). On the other hand, men's opposition to family planning constitutes a substantial impediment to the use of contraception (Miller et al., 2004; Odimegwu et al., 2005; Ringheim, 2002). Their resistance to family planning has been linked to the low use of contraceptives, mainly in patriarchal societies (Odimegwu et al., 2005). In patriarchal societies, men exercised control over when and how to use family planning methods and seek and use healthcare facilities (Greene & Biddlecom, 2000; Kabagenyi et al., 2014; Odimegwu et al., 2005).

Previous studies (Alo et al., 2020; Blackstone & Iwelunmor, 2017; Ejembi et al., 2015; Ekholuenetale et al., 2021; Hossain et al., 2018) have focused more on factors affecting the use of contraceptive methods using women's data rather than on the use of male-controlled or female-controlled methods using men's data. In Nigeria, little is known about factors affecting the use of male-controlled contraceptive methods using men's data. Studies in other developing countries have shown that the selection of contraceptive methods depends on psychological, social, and cultural factors (Hossain et al., 2018; Kamal et al., 2013). Given the emerging interest, this study compared the factors influencing male or female-controlled contraceptive methods using men's data in Nigeria. These were with the view to providing additional information aimed at increasing the use of contraception and reducing fertility rates in Nigeria.

## Theoretical framework

The theory of Planned Behaviour (TPB) provides the theoretical constructs for this study. The theory provides the basic background of predicting the intention to perform a behavior based on an individual's attitude and belief on a particular phenomenon (Ajzen, 1991). The theory explains the role of approval or disapproval of action for recommended behavior, such as using male-controlled or female-controlled contraceptives. This study adopted the theory to predict individual-level factors for willingness to use male-controlled or female-controlled contraceptives to avoid unwanted pregnancies. According to the theory, the intention to do or not do an action is determined by other direct factors such as beliefs, norms, and attitudes toward the phenomenon (Ajzen, 1991). The theory explains that non-contraceptive users have reasons for not adopting contraception. These include culture, beliefs, norms, and attitudes toward contraception. It could also result from socio-demographic and economic factors (Adelekan et al., 2014; Amoo et al., 2017; Kabagenyi et al., 2014; Singh & Darroch, 2012). Thus, the predictive capacity inherent in the theory of planned behavior may be significant to evaluating future intent of using male-controlled or female-controlled contraceptive methods among men.

## Methods

### Research design

A cross-sectional research design was used for the 2018 NDHS and adopted for this study.

### Data

The data for the study was extracted from the 2018 Nigeria Demographic and Health Survey (NDHS) men's recode (MR) dataset. Of approximately 42,000 households selected throughout Nigeria for the 2018 DHS, only one-third (14,000) were selected for men's surveys nationwide. All men aged 15–59 in the selected households were identified, and only 13,311 households were interviewed, with a response rate of 99%. The NDHS used a two-stage stratified random sampling technique to select the sample population. In the selection, firstly, a multi-stage sampling technique was employed to stratify the country into urban and rural areas and then into the primary sampling units. About 580 clusters in urban areas and 820 clusters in rural areas were selected. The selection of households was done through systematic random sampling.

Details about the sampling procedure are available in the survey report and on the DHS website (<https://dhsprogram.com>). In all, a weighted sample size of 7,991 sexually active married men aged 15–59 years was derived and used for this study. As recommended by Measure DHS, the women's weighting factor (mv005/1000000) was applied to correct over-sampling or under-sampling and for non-response in the dataset. Also, the svy command, the survey command (svyset [pw = wt], psu (mv021) strata (strata), that declared the data a survey data in STATA was applied. Thus, the declared data from a complex survey design was used in the analyses. The data is accessible at <https://dhsprogram.com/data/available-datasets.cfm>.

## **Inclusion and exclusion criteria**

All currently sexually active married or in union men aged 15–59 were included, while those who were not were excluded.

## **Key variables and measurement**

### **Outcome variable**

The outcome variable was generated from the men's questionnaire on responses to the question of whether, at the time of their last sexual intercourse, men or their partner(s) used any method to prevent pregnancy and the type they used. Specifically, the most effective of the reported methods to these questions were captured and used to measure contraceptive use at the last sex. In this study, contraceptive use at the last sex was classified based on the control each partner has over its use. Responses to these questions were regrouped and coded 0 - 'not using,' 1 - 'male-controlled contraceptive methods (male condoms, periodic abstinence, withdrawal, and male sterilization),' and 2 - 'female-controlled contraceptive methods (pill, intra-uterine device, (IUD), injections, diaphragm, female sterilization, other traditional, implants/Norplant, lactation amenorrhea (LAM), female condom, emergency contraception, and standard day's method) (MacQuarrie et al., 2015).

### **Independent variables**

The independent variables considered were informed by what existing literature articulates on factors influencing the use of contraceptives and by whether they are significant at the bivariate level of analysis. The household wealth quintile is grouped into poorest, poorer, middle, richer, and richest. The DHS asked currently married men or men living with a woman whether they have other wives or live with other women as if married?" They were later asked the number of wives or live-in partners. If yes, we generated family type from the number of wives and classified it into polygyny and monogyny. Other independent variables considered and by their categories include respondent's education (no school, primary, secondary, and tertiary); ethnicity (Hausa/Fulani, Igbo/Ibo, Yoruba, and others), number of sexual partners excluding spouse in the last 12 months (0, 1, and 2 partners and above), desire for more children (want more, want no more), media exposure (exposed, and not exposed), place of residence (rural, urban), children ever born (CEB) (less than four children, four children and above), and region of residence (North East, North West, North Central, South East, South-South, & South West).

### **Data analysis**

This study used three statistical analysis levels through Stata SE 14. The background characteristics of the sample were described through a percentage distribution table and charts at the univariate level. In addition, a comparison of the relative risk of the proportion of female-controlled over male-controlled contraceptive methods in each background characteristic was performed. A ratio of female-controlled over male-controlled contraceptive methods (RFM) less than 1 implies that male-controlled contraceptive methods are more prevalent than female-controlled contraceptive methods. If RFM is greater than one (1), female-controlled contraceptive methods are more prevalent than male-controlled

contraceptive methods. Lastly, there is no association when RFM is equal to 1. At the bivariate level, Chi-square was used to establish an association of variables at a 5% significance level.

In the third level (multivariate), the effect of the selected characteristics was examined using the multinomial logistic regression model to measure the adjusted relative risk effects of the selected explanatory variables on the response variable, male-controlled or female-controlled contraceptive methods over not using any method. Multinomial logistic regression fits the maximum likelihood model with a discrete dependent variable when they have more than two outcomes with no natural ordering. For dependent variables with more than two outcomes and  $k-1$  equations, each equation will model the odds of a choice of contraceptive method relative to a baseline (in this case, using or not using any contraceptive method). This regression is denoted as:

$$P(y = i) = \frac{e^{x\beta^1}}{e^{x\beta^1} + e^{x\beta^2} + e^{x\beta^3} + \dots + e^{x\beta^k}}$$

Where  $I = 1, 2, 3 \dots k$  and  $\beta_i$  measure the change in the log odds of  $y = I$  relative to  $y = k$  associated with a one-unit change in  $x$ .

For multinomial probabilities, the remaining  $k$  will measure the change relative to the selected base outcome by subjectively selecting and setting one base outcome to zero. Although the coefficients differ from one selected  $k$  to another, they have different interpretations with the same predicted probabilities for the  $k_s$ . Thus, either parameterization will have a result equal to the primary model. For instance, by setting  $x\beta^{i=1} = 0$ , the equation becomes:

$$P(y = 1) = \frac{1}{1 + e^{x\beta^2} + e^{x\beta^3} + \dots + e^{x\beta^k}}$$

Thus, the relative probability of  $y = 2$  relative to the base outcome  $y = 1$  is the relative risk when  $x$  and  $\beta$  are vectors equal to covariates and their coefficients, respectively. Therefore, the ratio of the risk ratio for a one-unit change in  $x^i$  is the exponential value of a coefficient, which is the relative-risk ratio for a one-unit change in the corresponding variable (Anderson & Rutkowski, 2008).

## Results

### Univariate analyses

Table 1 shows the result of the percentage distributions of sexually active married men by their selected background characteristics. The results revealed that about 86% of the sampled men were not using any contraceptive method, 10.5% used a male-controlled contraceptive method, and 3.5% used a female-controlled contraceptive method. On the type of male-controlled contraceptive methods, the condom was the most used male-controlled contraceptive method (74%), followed by abstinence (3.4%), withdrawal (22.6%), and no respondent had undergone vasectomy (0%). Furthermore, about 85% of the sampled men practiced a monogamous family type, about 57% attained secondary education and above, 24% were from the richest households, and 35% were Hausa or Fulani ethnic groups. Most (92%) of the sampled men had no other sexual partner apart from their spouse, 72% desired

to have more children, and more than half (52%) were exposed to media. More than half of the respondents were rural dwellers (54%). On the number of children ever-born, slightly more than half (52%) of the respondents have had four (4) children and above. A little over one-fifth of the respondents were from the North West (26%) and South West (22%).

**Table 1:** Percentage Distribution of Sexually Active Married Men by Their Background Characteristics

Background Characteristics	Frequency N = 7,991	Percent 100
<b>Contraceptive Method</b>		
Not using	6,873	86.0
Male-controlled contraceptive	839	10.5
Female-controlled contraceptive	279	3.5
<b>Male-Controlled Contraceptive Methods</b>		
Male sterilization	0	0.0
Condom	621	74.0
Withdrawal	189	22.6
Periodic Abstinence	29	3.4
<b>Family Type</b>		
Monogamy	6,796	85.0
Polygamy	1,195	15.0
<b>Education</b>		
No school	2,075	26.0
Primary	1,378	17.2
Secondary	3,079	38.5
Tertiary	1,459	18.3
<b>Wealth Status</b>		
Poorest	1,356	17.0
Poorer	1,436	18.0
Middle	1,579	19.8
Richer	1,693	21.1
Richest	1,927	24.1
<b>Ethnicity</b>		
Hausa/Fulani	2,784	34.8
Igbo/Ibo	1,356	17.0
Yoruba	1,472	18.4
Others	2,379	29.8
<b>Number of Sexual Partners Excluding Spouse in the last 12 Months*</b>		
0	7,363	92.2
1	529	6.6
Two partners and above	99	1.2
<b>The Desire for More Children</b>		
Want no more	2,227	27.9
Want more	5,764	72.1
<b>Media Exposure</b>		
Not Exposed	4,034	51.6
Exposed	3,785	48.4
<b>Place of Residence</b>		
Urban	3,660	45.8
Rural	4,331	54.2
<b>Children Ever Born</b>		
Less than four children	3,799	47.5

Background Characteristics	Frequency N = 7,991	Percent 100
Four children and above	4,192	52.5
<b>Region</b>		
North Central	1,112	13.9
North East	1,232	15.4
North West	2,082	26.1
South East	930	11.6
South-South	905	11.3
South West	1,730	21.7

Note: \* Missing values excluded

## Bivariate analyses

The results in Table 2 show the unadjusted (crude) relative risk ratios ( $crrr$ ) of contraceptive methods and the ratio of a female-controlled contraceptive to a male-controlled contraceptive method (RFM) by the selected socio-demographic variables. The result shows that contraceptive methods are significantly associated with family type, education, wealth quintile, ethnicity, number of partners excluding spouse in the last 12 months, desire for more children, media exposure, place of residence, children ever born, and religion. The result also shows that the proportion of the male-controlled contraceptive methods was more than that of female-controlled contraceptive methods across all the selected socio-demographic variables except for the Hausa/Fulani ethnic group where the proportion of the female-controlled contraceptive methods ( $crrr = 2.8$ , 95% CI [2.3, 3.5],  $p < .05$ ) was more than that of male-controlled contraceptive methods ( $crrr = 2.6$ , 95% CI [2.1, 3.2],  $p < .05$ ). Using a border of 10% to represent a significant weight of female-controlled contraceptive methods or male-controlled contraceptive methods, the categories mostly not affected were the polygamists, Hausa/Fulani, and those in the middle and richer category of wealth quintile. For instance, the relative prevalence of female-controlled contraceptive methods over male-controlled contraceptive methods was higher among the Hausa/Fulani, middle and richer married men, polygamous married men, and men from the North West.

**Table 2:** Unadjusted Relative Risk Ratios ( $crrr$ ) and 95% Confidence Interval (CI) of the Use of Contraceptive Methods, Chi-Square, and the Ratio of Female-Controlled Contraceptive Method to Male-Controlled Contraceptive Method (RFM), by Selected Covariates

Variable	Not using contraception	Female- controlled contraception	Male-controlled contraception	$\chi^2$ , $p$ value, and RFM
	$crrr$ [95% CI]	$crrr$ [95% CI]	$crrr$ [95% CI]	
<b>Family Type</b>				$\chi^2 = 52.9$ , $p = .0000$
Monogamy	85.1 [84.2, 85.9]	3.4 [2.9, 3.8]	11.5 [10.8, 12.3]	0.3
Polygamy	91.1 [89.4, 92.6]	4.3 [3.3, 5.6]	4.6 [3.5, 5.9]	0.9
<b>Education</b>				$\chi^2 = 320.1$ , $p = .0000$
No Education	96.6 [95.7, 97.3]	1.0 [0.7, 5.6]	2.4 [1.8, 3.1]	0.4
Primary	88.4 [86.6, 90.0]	2.5 [1.8, 3.5]	9.0 [7.6, 10.7]	0.3
Secondary	81.3 [79.9, 82.7]	0.4 [3.7, 5.2]	14.3 [13.1, 15.6]	0.0



Variable	Not using contraception	Female- controlled contraception	Male-controlled contraception	$\chi^2$ , <i>p</i> value, and RFM
	<i>crrr</i> [95% CI]	<i>crrr</i> [95% CI]	<i>crrr</i> [95% CI]	
Tertiary	78.6 [76.4, 80.6]	6.0 [4.9, 7.3]	15.4 [13.7, 17.4]	0.4
<b>Wealth Quintile</b>				$\chi^2 = 253.6, p = .0000$
Poorest	95.7 [94.5, 96.7]	0.9 [0.5, 1.6]	3.3 [2.5, 4.4]	0.3
Poorer	91.2 [89.6, 92.5]	2.8 [2.1, 3.8]	6.0 [4.9, 7.4]	0.5
Middle	86.6 [84.8, 88.2]	3.1 [2.4, 4.1]	10.3 [8.9, 11.9]	3.0
Richer	82.2 [80.3, 84.0]	4.3 [3.4, 5.4]	13.5 [12.0, 15.2]	3.2
Richest	78.2 [76.3, 80.0]	5.4 [4.5, 6.5]	16.4 [14.8, 18.1]	0.3
<b>Ethnicity</b>				$\chi^2 = 347.4, p = .0000$
Hausa/Fulani	94.6 [93.7, 95.4]	2.8 [2.3, 3.5]	2.6 [2.1, 3.2]	1.1
Igbo/Ibo	82.7 [80.5, 84.6]	1.6 [1.1, 2.4]	15.8 [13.9, 17.8]	0.1
Yoruba	77.7 [75.5, 79.7]	6.3 [5.2, 7.7]	16.0 [14.2, 18.0]	0.4
Others	83.0 [81.4, 84.5]	3.6 [3.0, 4.5]	13.4 [12.1, 14.8]	0.3
<b>Number of Sexual Partner(s) excluding Spouse in the last 12 Months</b>				$\chi^2 = 568.0, p = .0000$
0	88.5 [87.8, 89.2]	3.4 [3.0, 3.8]	8.1 [7.5, 8.8]	0.4
1	56.2 [51.9, 60.4]	4.7 [3.2, 6.8]	39.2 [35.1, 43.4]	0.1
Two partners and above	59.7 [49.7, 68.9]	5.6 [2.4, 12.3]	34.7 [26.0, 44.7]	0.2
<b>The Desire for More Children</b>				$\chi^2 = 94.8, p = .0000$
Want no more	79.9 [78.2, 81.6]	5.4 [4.6, 6.5]	14.6 [13.2, 16.2]	0.4
Want more	88.4 [87.5, 89.2]	2.7 [2.3, 3.2]	8.9 [8.2, 9.7]	0.3
<b>Media Exposure</b>				$\chi^2 = 89.4, p = .0000$
Not exposed	89.8 [88.8, 90.7]	2.5 [2.0, 3.0]	7.8 [7.0, 8.7]	0.3
Exposed	82.3 [81.1, 83.5]	4.5 [3.9, 5.2]	13.2 [12.2, 14.2]	0.3
<b>Place of Residence</b>				$\chi^2 = 91.8, p = .0000$
Urban	81.9 [80.6, 83.1]	4.6 [4.0, 5.3]	13.5 [12.4, 14.6]	0.3
Rural	89.5 [88.5, 90.3]	2.6 [2.1, 3.1]	8.0 [7.2, 8.8]	0.3
<b>Children Ever Born</b>				$\chi^2 = 24.8, p = .0000$
Less than 4	84.8 [83.6, 85.9]	3.0 [2.5, 3.6]	12.2 [11.2, 13.3]	0.3
Four children and above	87.1 [86.1, 88.1]	3.9 [3.4, 4.5]	9.0 [8.1, 9.9]	0.4
<b>Region</b>				$\chi^2 = 372.7, p = .0000$
North Central	82.6 [80.3, 84.7]	4.2 [3.2, 5.6]	13.2 [11.3, 15.3]	0.3

Variable	Not using contraception	Female- controlled contraception	Male-controlled contraception	$\chi^2$ , <i>p</i> value, and RFM
	<i>a</i> rrr [95% CI]	<i>a</i> rrr [95% CI]	<i>a</i> rrr [95% CI]	
North East	92.6 [90.9, 93.9]	2.9 [2.1, 4.0]	4.5 [3.5, 5.8]	0.6
North West	93.9 [92.8, 94.9]	3.4 [2.7, 4.3]	2.7 [20.8, 3.5]	1.3
South East	82.9 [80.4, 85.2]	1.3 [0.7, 2.2]	15.8 [13.6,18.3]	0.1
South-South	7.0 [74.1, 79.6]	2.5 [1.6, 3.7]	20.6 [18.1, 23.4]	0.1
South West	80.4 [78.5, 82.2]	5.3 [4.3, 6.5]	14.3 [12.7, 16.0]	0.4
<b>Total</b>	86.0 [85.2, 86.8]	3.5 [3.1, 3.9]	1.1 [9.9, 11.2]	3.3

## Multivariate analysis

Table 3 shows the results of the adjusted relative risk ratios (*a*rrr) of the contraceptive method by the selected independent variables. The independent variables in the models include family type, education, wealth quintile, ethnicity, number of sexual partners excluding the spouse, desire for more children, and media exposure. The variables were tested for multicollinearity using the variance inflation factor < 0.5 to include them in the multinomial logistic regression model. The results show that the risk of using male-controlled contraception relative to not using any contraception was 3% (*a*rrr = 0.7, 95% CI [0.5, 1.0], *p* < .05), significantly lower among polygamous married men than for monogamists. The relative risk of using male-controlled contraceptive methods instead of not using any contraceptive method increases monotonically with the level of education. The risk of using male-controlled contraceptive methods was two (2) times (*a*rrr = 2.0, 95% CI [1.4, 2.8], *p* < .05) higher for primary education, 2.4 times (*a*rrr = 2.4, 95% CI [1.7, 3.4], *p* < .05) and 2.8 times (*a*rrr = 2.8, 95% CI [1.9, 4.0], *p* < .05) higher for secondary and tertiary respectively than the risk of respondents with no education.

Regarding the wealth quintile, the risk of using male-controlled contraceptive methods instead of not using any contraceptive method exhibited a concave pattern with an early increase in wealth quintile (up to the richer group) after a decrease in the risk among the richest. Furthermore, the risk of using male-controlled contraceptive methods instead of not using any method was 3.8 times (*a*rrr = 3.8, 95% CI [2.8, 5.2], *p* < .05) statistically significantly higher for the Yoruba ethnic group, 2.7 times (*a*rrr = 2.7, 95% CI [1.9, 3.6], *p* < .05) for Igbo/Ibo, and 2.8 times (*a*rrr = 2.8, 95% CI [2.1, 3.7], *p* < .05) for other ethnic groups. On the number of partners excluding the spouse, the result revealed that the risk of using male-controlled contraceptive methods instead of not using any method was 5.7 times (*a*rrr =5.7, 95% CI [4.6, 7.0], *p* < .05) higher for respondents with one partner excluding the spouse and 3.9 times (*a*rrr =3.9, 95% CI [2.5, 6.1], *p* < .05) higher for those with more than one partner excluding spouse compared to respondents with no other partner excluding spouse. Also, the relative risk of using male-controlled contraceptive methods relative to not using any method was 2% (*a*rrr = 0.8, 95% CI [0.7, 0.9], *p* < .05) lower for respondents who want more children relative to their counterparts with no desire for more children. Finally, the relative risk of using male-controlled contraceptive methods relative to not using any method was 1.5 times (*a*rrr = 1.5, 95% CI [1.2, 1.7], *p* < .05) higher for those who have media exposure than their counterparts without media exposure.

On the other hand, the same covariates linked with the relative risk of using male-controlled contraception were also related to the risk of using female-controlled contraception in this study. The results in Table 3 further revealed that the relative risk of using female-controlled contraception relative to not using any contraception was 4% ( $a_{rrr} = 1.4$ , 95% CI [1.0, 2.0],  $p < .05$ ), significantly higher for polygamous married men compared to the corresponding risk for monogamists. The relationship between education and the wealth quintile also revealed that the relative risk increases monotonically. A statistically significant relationship exists between the risk of using a female-controlled method and not using any contraceptive method with educational level attained and wealth quintile, respectively. As regards ethnicity, the risk of using female-controlled contraceptive methods was 7% ( $a_{rrr} = 0.3$ , 95% CI [0.2, 0.5],  $p < .05$ ), significantly lower for Igbo/Ibo compared to the corresponding risk among the Hausa/Fulani. Other ethnic groups were not significantly associated with ethnicity compared to the corresponding risk among the Hausa/Fulani. Furthermore, the relative risk of using a female-controlled method instead of not using any contraceptive method was 7% ( $a_{rrr} = 1.7$ , 95% CI [1.1, 2.1],  $p < .05$ ), significantly higher among respondents with only one sexual partner apart from their spouse compared to their peers with no sexual partner. The risk was also not significantly associated with respondents with more than one sexual partner. In terms of the desire for more children, the relative risk of using female-controlled contraceptive methods instead of not using any method was 4% ( $a_{rrr} = 0.6$ , 95% CI [0.4, 0.7],  $p < .05$ ) statistically significantly lower than that of respondents who want no more children. Lastly, the relative risk of using female-controlled contraceptive methods instead of not using any method was two times ( $a_{rrr} = 2.0$ , 95% CI [1.5, 2.6],  $p < .05$ ), statistically significantly higher for respondents who have media exposure.

**Table 3:** Multinomial Logit Results Comparing the Adjusted Relative Risk Ratio ( $a_{rrr}$ ) of Using Male-Controlled Contraceptive Methods to Female-Controlled Contraceptive Methods by Selected Covariates

Characteristics	Female-controlled contraception vs. Not using contraception		Male-controlled contraception vs. Not using contraception	
	$a_{rrr}$	95% CI	$a_{rrr}$	95% CI
<b>Family Type</b>				
Monogamy (RC)	1.0		1.0	
Polygamy	1.4*	1.0, 2.0	0.7*	0.5, 1.0
<b>Education</b>				
No Education (RC)	1.0		1.0	
Primary	2.4**	1.3, 4.1	2.0***	1.4, 2.8
Secondary	3.1***	1.8, 5.2	2.4***	1.7, 3.4
Tertiary	3.4***	2.0, 6.0	2.8***	1.9, 4.0
<b>Wealth Quintile</b>				
Poorest (RC)	1.0		1.0	
Poorer	1.7	0.9, 3.0	1.2	0.8, 1.8
Middle	1.6	0.9, 3.0	1.3*	1.0, 1.9
Richer	2.1*	1.1, 3.8	1.5*	0.8, 1.7
Richest	2.1*	1.1, 4.0	1.4*	1.0, 2.2
<b>Ethnicity</b>				
Hausa/Fulani (RC)	1.0		1.0	
Igbo/Ibo	0.3***	0.2, 0.5	2.7***	1.9, 3.6
Yoruba	1.3	0.9, 2.0	3.8***	2.8, 5.2
Others	0.9	0.6, 1.2	2.8***	2.1, 3.7

Characteristics	Female-controlled contraception vs. Not using contraception		Male-controlled contraception vs. Not using contraception	
	a <sub>rrr</sub>	95% CI	a <sub>rrr</sub>	95% CI
<b>Number of partner(s) excluding spouse in the last 12 Months</b>				
0 (RC)	1.0		1.0	
1	1.7*	1.1, 2.7	5.7***	4.6, 7.0
Two partners and above	1.4	0.5, 4.1	3.9***	2.5, 6.1
<b>The Desire for More Children</b>				
Want no more (RC)	1.0		1.0	
Want more	0.6***	0.4, 0.7	0.8***	0.7, 0.9
<b>Media Exposure</b>				
Not Exposed (RC)	1.0		1.0	
Exposed	2.0***	1.5, 2.6	1.5***	1.3, 1.7
<b>Place of Residence</b>				
Urban (RC)	1.0		1.0	
Rural	0.6	0.7, 1.2	0.9	0.8, 1.1
<b>Children Ever Born</b>				
Less than 4 (RC)	1.0		1.0	
Four children and above	1.4	1.0, 1.9	1.0	0.9, 1.2
<b>Region</b>				
North Central (RC)	1.0		1.0	
North East	1.2	0.8, 1.9	0.5	0.4, 0.7
North West	1.3	0.7, 2.1	0.4	0.3, 0.6
South East	0.3	0.1, 0.7	0.7	0.5, 1.0
South-South	0.4	0.2, 0.7	0.8	0.6, 1.1
South West	0.6	0.4, 1.1	0.6	0.5, 0.8
cons	0.0*	0.0, 0.0	0.0**	0.0, 0.0

Note: RC = reference category; level of significance at \* $p < .05$ ; \*\* =  $p < .01$ ; \*\*\* $p < .001$

Model summary: -2 Log Likelihood = -3362.4, model chi-square ( $\chi^2$ ) = 979.1,  $n = 7,819$ ,  $p$  value < .000,  $R^2 = 0.12$

## Discussion

The results revealed that condom is the most widely used male-controlled contraceptive method, followed by abstinence and withdrawal, while no respondent ever underwent a vasectomy. This result shows that vasectomy is not a popular method in Nigeria. Some studies have found evidence that condom is the most used male-controlled contraceptive method of contraception (Kabagenyi et al., 2014; Odimegwu et al., 2005; Okigbo et al., 2015; Oyediran & Isiugo-Abanihe, 2002). The study found that except among the Hausa/Fulani ethnic group, the prevalence of male-controlled contraceptive methods in all the selected background characteristics is more than that of female-controlled contraceptive methods. Even though the overall prevalence shows that female-controlled rather than male-controlled contraceptive methods are more prevalent in Nigeria. This finding does not raise many concerns given that the most widespread use of the contraceptive method is the condom and that the use of the contraceptive method is in the marital relationship. This relationship has been found in some studies that the percentage of men using male-controlled and suitable methods of contraception at the last sex is higher than that of female-controlled methods (Asa et al., 2018; MacQuarrie et al., 2015).

As expected, the study found that education positively affects contraceptive methods. Sexually active married men with a higher level of education were more likely to have used female-controlled and male-controlled contraceptive methods than not using any contraceptive method. This finding is consistent with previous studies that men with higher education were more likely to be involved in reproductive health services (Asa et al., 2018; Kamal et al., 2013; MacQuarrie et al., 2015). This finding might be because men with a higher level of education have proper knowledge that reduces the fear of side effects of contraceptive methods. The study also found that the wealth status of sexually active married men was positively associated with contraceptives. The richest sexually active married men were more likely to have used female-controlled and male-controlled contraceptive methods than not using any contraceptive methods. This finding is consistent with the study by Shahjahan et al. (2013) that men in the lowest quintile are the least likely to use a contraceptive method. Furthermore, ethnicity is found to be associated with the use of contraceptive methods.

Our study found that sexually active married men from the Yoruba ethnic group are likelier to have used female-controlled and male-controlled contraceptive methods than other ethnic groups. This study is consistent with other studies that found that contraceptive use among sexually active men is associated with ethnicity (Okigbo et al., 2015). The Yoruba's educational level and the pronatalist view of other regions might have influenced the Yoruba to use contraception more than other ethnic groups. This study found that the number of sexual partners apart from a spouse is associated with the use of either male-controlled or female-controlled contraceptive methods than not using any method. This finding aligns with other studies (Okigbo et al., 2015) that a higher number of sexual partners apart from a spouse increases the use of contraceptive methods. This finding, however, is not surprising given that the use of contraception is highest when men have sex with a commercial sex worker/casual acquaintance or with a girlfriend/fiancée (Kamal et al., 2013; MacQuarrie et al., 2015; Okigbo et al., 2015).

Lastly, the study found that sexually married men who want more children were less likely to use either female or male-controlled contraceptive methods. This finding corroborates other studies (Kamal et al., 2013; Okigbo et al., 2015) that the desire for additional children negatively impacts contraceptive use. The study also observed different magnitudes but the same direction of the relationship of some variables using female- and male-controlled contraceptive methods. The relative risk of using male- and female-controlled contraceptive methods affects some respondents more than others in Nigeria. For example, the use of female-controlled contraceptive methods exceeds male-controlled contraceptive methods among polygamously married men than for monogamists. This finding aligns with previous studies (Asa et al., 2018; Kabagenyi et al., 2014; Ross & Hardee, 2017).

In addition, the use of female-controlled contraceptive methods exceeds male-controlled contraceptive methods among respondents who have had media exposure to family planning messages compared to those without media exposure. This finding is consistent with previous studies (Blackstone & Iwelunmor, 2017; Das et al., 2021; Moyo et al., 2012; Okigbo et al., 2015) that found media-exposed women more likely to use any contraception method than those who are not exposed. Also, the relative risk of using female-controlled contraceptive methods exceeds male-controlled contraceptive methods among respondents with different levels of education and wealth quintiles. This finding is consistent with other studies (Alo et al., 2020; Blackstone & Iwelunmor, 2017; Hossain et al., 2018; Kamal et al., 2013). On the other hand, the study observed that the use of male-controlled contraceptive methods exceeds female-controlled contraceptive methods among respondents with different levels of number of

partners excluding spouse, desire for more children, and ethnicity. This finding may be attributed to men's sexual infidelity, the socio-cultural and attitudinal norms that make men use condoms, the side effects of female methods, and the fact that female methods are more expensive than male methods.

## Strengths and limitations of the study

The 2018 NDHS is a well-planned and executed survey. The findings can be generalized to the country because it is a nationally representative survey. Some limitations include the dataset employed for this study, which was obtained from a cross-sectional survey. Thus, establishing causality among the variables is limited. Recall that bias could have affected some variables, affecting the study's outcome. Any interpretation in this regard is not an accurate representation of the country's actual situation. Furthermore, some variables were reclassified in the analysis to examine the statistical significance of the association between the variables. Thus, they may shroud the genuine relationship between the variables.

## Conclusion

The study revealed that the desire for more children, the number of sexual partners excluding the spouse, ethnicity, place of residence, wealth status, media exposure, and educational attainment are fundamental in the choice of contraceptive methods by sexually active married men. Thus, this study calls for concerted efforts to encourage men to use male-controlled contraceptives to control their fertility level. Men should be provided with information and programs that could improve their health and well-being and increase their knowledge to reduce barriers to using modern male methods of contraception, particularly vasectomy.

## List of abbreviations

$a_{rrr}$ :	Adjusted Relative Risk Ratio
CEB:	Children Ever Born
CI:	Confidence Interval
$u_{rrr}$ :	Unadjusted Relative Risk Ratio
DHS:	Demographic and Health Survey
RC:	Reference Category
RFM:	Ratio of Female-controlled over Male-controlled contraceptive methods
NDHS:	Nigeria Demographic and Health Survey
TFR:	Total Fertility Rate

## Ethical consideration

The study analyzed secondary data. The original data for this study was authorized from the Measure DHS website (<https://dhsprogram.com>), and ethnic standards are available at <http://goo.gl/ny8T6X> (Zegeye et al., 2021).

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