Sociodemographic and Contextual Determinants of Men's Fertility Desires in Northern Nigeria: An Analysis of the 2018 Demographic and Health Survey

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Abstract

Nigeria has a high fertility rate, averaging 5.1 children per woman. The desire for large families, especially by men from the northern region, is a crucial driver of the country's high total fertility rate. There is, however, a shortage of evidence on the sociodemographic determinants of men's fertility desires despite being essential stakeholders in fertility decisions in the family. This study, therefore, estimates men's desired family sizes and the sociodemographic and contextual factors influencing their desires in the northern region of Nigeria. Data from the men's recoded 2018 Nigeria Demographic and Health Survey dataset were used with a sample of 7,822 men. The chi-square test and ordinal logistic regression analysis were used to test the association and estimate the relationship between the outcome and predictor variables. The findings revealed that 71% of men desired to have at least six children, which was high irrespective of sociodemographic characteristics. However, the desire for six or more children was lower (65%) among the youngest cohort than among the oldest (80%). Being a Muslim (AOR = 4.50, 95% CI [3.86, 5.24], $p < .05$), having two or more wives (AOR = 2.41, 95% CI [1.68, 3.45], $p < .05$), having 3–5 (AOR = 2.28, 95% CI [1.89, 2.76], $p < .05$) and six or more (AOR = 6.03, 95% CI [4.48, 8.13], $p < .05$) living children, and living in the northeast (AOR = 2.03, 95% CI [1.75, 2.37], $p < .05$) and northwest (AOR = 1.44, 95% CI [1.20, 1.72], $p < .05$) zones were the most significant predictors of high fertility desire by men. Policymakers should target these categories of men in fertility and family planning programs to promote lowering and slowing the rate of fertility and population growth.

Keywords

Fertility desires; men; Nigeria; northern region; sociodemographic

Introduction

Globally, fertility rates have declined, and the world's current total fertility rate (TFR) is 2.3 children per woman (Population Reference Bureau, 2022; United Nations Department of Economic and Social Affairs (UNDESA), 2022). The TFRs in developed countries and Asia have also dropped below the replacement level of 2.1 children per woman, currently at 1.5 and 1.9 children per woman, respectively. However, the TFR for Africa is currently at twice the replacement level, with 4.3 children per woman. The TFR for sub-Saharan Africa (SSA) is 4.6 children per woman (Population Reference Bureau, 2022; UNDESA, 2022). The high TFR in SSA, compared with other regions of the world, is driven mainly by high fertility desires (Casterline & Agyei-Mensah, 2017; Church et al., 2023; Yeatman et al., 2020). Nigeria, located in West Africa, is the most populated country in Africa and the sixth most populated country in the world. The country's TFR was 5.1 children per woman in 2021 (Population Reference Bureau, 2022). The population of Nigeria is growing by 2.5% per year, and it is projected to become the fourth most populous country in the world by the year 2050 (UNDESA, 2022). The country's TFR is primarily driven by a strong desire for large families by both men and women, especially from the northern and rural regions (National Population Commission & ICF, 2018).

Fertility desire, otherwise known as desired family size, is an intermediate determinant of fertility (Bongaarts & Hodgson, 2022) and a driver of actual fertility (Muluneh & Moyehodie, 2021; Teshale et al., 2022). The desire for fertility is influenced by demographic and socioeconomic factors, as reported by studies in different parts of the world (Adhikari, 2010; Bongaarts, 2003; Bongaarts & Casterline, 2013; Casterline, 2017; Cleland et al., 2020; Mbacké, 2017; Muluneh & Moyehodie, 2021; Wang & Sun, 2016; Yeboah et al., 2021). Most of the studies on the determinants of fertility desire or preferences among women in Nigeria and elsewhere have reported education, child mortality, urbanization, household income, and cultural norms as prominent determinants, with many of the studies emphasizing the importance of education (Angeles, 2010; Bongaarts, 2003; Bongaarts & Hodgson, 2022; Canning et al., 2015; Cleland, 2009; Murtin, 2013; Piotrowski & Tong, 2016; Reher et al., 2017; van Poppel et al., 2012). The few studies on fertility desire involving men in other countries have also confirmed these determinants (Ahinkorah et al., 2021; Akinyemi & Odimegwu, 2021; Matovu et al., 2017; Yaya & Osanyintupin, 2018). However, this has not been established in the northern region of Nigeria.

There remains a gap in the research on fertility desire in sub-Saharan Africa due to the limited inclusion of men (Church et al., 2023), which is more pronounced in Nigeria. In Nigeria, especially in the traditionally inclined northern region, fertility decisions are mostly made exclusively by men as the heads of households due to the patriarchal setting of families. However, studies on fertility desires and national programs and policies on population control have often neglected men despite their influence on women's fertility desires, especially in the northern region, which has consistently presented high fertility rates in the country over the years. Hence, this study will fill a gap and contribute to the country's efforts toward lowering fertility rates and slowing population growth.

This study has two main objectives. The first is to estimate the fertility desires of men in the northern region of Nigeria, and the second is to identify the factors influencing such desires. Providing this evidence will help policymakers consider involving men in programs to lower fertility in the country. The findings will be relevant for addressing northern Nigeria's

population dynamics and family planning strategies. Men are critical to fertility reduction efforts because, as heads of household, they dominate decision-making and often have a more significant influence on women's fertility choices. Consequently, there is a need to understand men's fertility desires and the factors influencing such desires for an appropriate policy response. Therefore, we hypothesize that sociodemographic and contextual factors affect men's desire for fertility in northern Nigeria.

Theoretical and literature review

Demographers, sociologists, and economists have theorized about the determinants of fertility desires, which can be grouped into demographic transition and economic theories. Bongaarts and Hodgson (2022) argued that in agrarian societies, high fertility was promoted due to the high prevalence of mortality and to ensure the population's survival. The economic value of children is another driver of fertility desires in traditional and non-industrialized societies; parents desire more children as a source of labor and as an investment for security in old age (Cleland & Wilson, 1987). Miro and Potter (1980) wrote that "fertility tends to respond to shifts in the balance of economic benefits and costs that childbearing entails" (p. 96). In the case of non-industrialized societies, fertility is considered more beneficial than costly. However, with the rising cost of raising children, such as schooling, and the declining economic value of childbearing, the demand for children decreased drastically in urbanized and industrial societies as parents adopted measures, such as contraception and abortion, to reduce childbearing (Bongaarts & Hodgson, 2022). Even in SSA, evidence suggests an increasing acceptance and recognition of the burden of larger families due to urbanization and economic conditions, such as increased cost of living and school expenses for children, leading to reduced fertility desires (Church et al., 2023). Cleland and Wilson (1987) challenged the popular economic argument that the demand for children is mainly due to costs and benefits. However, in many SSA countries, children are still valued for their economic contribution to the household and parents' old-age security, which drives the desire for high fertility (Church et al., 2023).

Recent studies in Africa on fertility desires and the relationship between fertility preferences and actual fertility among women have reported the influence of sociodemographic factors (Ahinkorah et al., 2020; Atake & Gnakou Ali, 2019; Kebede et al., 2022; Kodzi et al., 2010; Matovu et al., 2017; Muluneh & Moyehodie, 2021; Ndahindwa et al., 2014; Odusina et al., 2020; Oyefabi et al., 2019; Teshale et al., 2022; Van Lith et al., 2013; S. Yaya et al., 2018; Yeboah et al., 2021). Studies have also shown that socioeconomic status and cultural practices influence the fertility desires of people (Götmark & Andersson, 2020; Wang & Sun, 2016), including the influence of men on women's fertility desires (Bankole, 1995; Yeboah et al., 2021) and emphasize the importance of spousal influence on the understanding of fertility desires (Baynes et al., 2021; Church et al., 2023; Kahansim et al., 2013), especially as religious and traditional systems grant men powers on fertility decisions to their partners and such partners are expected to comply with these practices (Odusina et al., 2020; Oyediran, 2006).

Yeboah et al. (2021) acknowledged that men's fertility preferences can influence women's actual fertility, emphasizing the importance of understanding men's desires. An earlier study argued that the reproductive process in Africa would not be adequately understood if research continues to focus only on women, considering men's influence on fertility decisions and that neglecting men could have severe implications (Bankole, 1995). The few studies conducted among men in SSA countries have identified certain sociodemographic and

contextual factors influencing men's fertility desires. Prominent among these factors are the age of respondents, number of living children, sex preference for sons, education, religious affiliation, cultural norms, access to information, and household factors (Abbani & Usman, 2023; Ahinkorah et al., 2021; Akinyemi & Odimegwu, 2021; Kahansim et al., 2013; Matovu et al., 2017; Odusina et al., 2020; Yaya & Osanyintupin, 2018). It has also been reported that men in Nigeria are more pronatalist than women, as they tend to desire more children (Odusina et al., 2020; Oyediran, 2006), and this desire drives the actual fertility rates of women in the country (Isiugo-Abanihe, 1994, 2003). Even among adolescents and youths (15–24 years) who have yet to start their family formation, fertility desire is greater among young men than young women (Akinyemi & Odimegwu, 2021). These findings reinforce the importance of understanding men's fertility desires in Nigeria to lower the country's fertility rate, especially in the region with the highest fertility rate.

Data and methods

Data source

The data for this study are from the men's recoded dataset of Nigeria's 2018 Demographic and Health Survey (DHS). The Nigerian DHS is a nationally representative sample survey that uses a two-stage stratified cluster sampling technique to collect data on men, women, children, couples, and household characteristics in all six geopolitical zones of Nigeria. The sample for this study included 7,822 men aged 15–59 years who provided both numeric and nonnumeric responses on their ideal number of children from the northcentral, northeast, and northwest geopolitical zones that make up the northern region of the country. The data from the Nigerian DHS are usually weighted to ensure that the sample accurately represents the population by considering sample imbalance and response bias. A detailed description of the 2018 NDHS can be found in the full report (National Population Commission & ICF, 2018).

Outcome variable

The outcome variable was the desired fertility of men, which was generated from the question of the ideal number of children desired by the respondents. The variable, which records individual responses, was recategorized and grouped into three groups: 0–2 children representing replacement level fertility and considered low desire; 3–5 children, which is within the current TFR in the country and considered to be average; and six or more children, which is above the national average and considered to be a high desire. Those who gave nonnumeric responses were added to the category of six or more children because they usually imply a desire for large family size (Olaleye, 1993). The replacement level of fertility was used as the reference category for analysis.

Predictor variables

The predictor variables were selected based on a literature review of studies involving men and women (Abbani & Usman, 2023; Ahinkorah et al., 2021; Akinyemi & Odimegwu, 2021; Matovu et al., 2017; Odusina et al., 2020; Teshale et al., 2022; Yaya & Osanyintupin, 2018), which were found to be relevant to the objectives of this study. The variables were recoded for analysis and classified into sociodemographic and contextual factors. The

sociodemographic factors included age [15–19; 20–29; 30–39; 40–49; 50–59], education [no education; primary; secondary, tertiary], working status [yes; no], religion [Islam; others], ethnicity [Fulani; Hausa; others], number of marital partners [none; one; two or more], number of living children [0–2; 3–5; 6 or more] and the sex of head of household [male; female]. The contextual factors included exposure to media (reading newspapers or magazines, listening to radio, watching television) [yes; no], contraceptive knowledge and contraceptive use [yes; no], household wealth [poor (poorest and poorer); middle; rich (richer and richest)], place of residence [urban; rural], and geopolitical zone [northcentral; northeast; northwest].

Statistical analysis

Descriptive analysis using frequency counts, percentages, and a bar graph was used to present the background characteristics of the respondents and their current fertility situation and desires. The bivariate analysis included cross-tabulation and chi-square tests for the statistical association of variables. Ordinal logistic regression was used at the multivariable level to estimate the influence of the predictor variables on men's fertility desire. Ordinal logistic regression was chosen based on ordering the outcome variables into three groups: replacement level, average level, and high fertility desire. The logistic regression was modeled into three models. The first model controlled for sociodemographic factors, the second model controlled for contextual factors, and model three controlled for all the variables from models one and two that were statistically significant at $p < .05$.

Ethical consideration

The National Population Commission of Nigeria obtained ethical approval for the Nigeria Demographic and Health Survey from the National Health Research Ethics Committee under the Federal Ministry of Health of Nigeria. The dataset is freely available for public use, with approval from the DHS program (https://www.dhsprogram.com/data/dataset_admin/login_main.cfm).

Results

Sample characteristics

The sociodemographic and contextual background of the respondents, as displayed in Table 1, shows that approximately one-fifth were still in the adolescent stage, while approximately one-fourth were in the age groups of 20–29 and 30–39, respectively. Those aged 40–49 and 50–59 constituted 18% and 10%, respectively. Most respondents had some form of education from primary to tertiary levels, while approximately one-third had no education. Almost all the respondents were engaged in one occupation at the time of the survey. Three-quarters of them were Muslims, while other religions constituted 24%. The Hausa ethnic group constituted the most significant proportion (45%), Fulani accounted for 10%, and the other combined ethnic groups comprised 45%. Approximately 40.5% of the respondents were never married, while 58% were currently married or cohabiting. Most had either no partner (42%) or had only one wife (45%), while 13% had two or more wives. Most married or cohabiting respondents had their first marriage at 20–29 years (63%), and the mean age at first marriage was 25 years.

Similarly, most respondents with children had their first child at 20–29 years (69%), with a mean age at first birth of 26 years. More than half of the respondents were from poor (poorest and poorer) households (54%), while most resided in rural areas (69%). Over one-third were from the northwest zone, while equal proportions were from the northcentral and northeast zones.

Table 1: Background Characteristics of the Respondents

Variable	Category	Frequency	%
Age	15–19	1,605	20.52
	20–29	2,087	26.68
	30–39	1,933	24.71
	40–49	1,379	17.63
	50–59	818	10.46
Education	None	2,755	35.22
	Primary	988	12.63
	Secondary	2,856	36.51
	Tertiary	1,223	15.64
Currently working	Yes	7,021	89.76
	No	801	10.24
Religion	Others	1,915	24.48
	Islam	5,907	75.52
Ethnic group	Fulani	800	10.23
	Hausa	3,513	44.91
	Others	3,509	44.86
Marital status	Never married	3,168	40.50
	Married/cohabitation	4,559	58.28
	Widowed/Divorced	95	1.21
Age at first marriage/cohabitation	15–19	779	16.74
(*n* = 4,654)	20–29	2,934	63.04
Mean = 24.99, *SD* = 5.80,	30 or more	941	20.22
Min = 13, Max = 56.			
Number of wives/partners	0	3,263	41.72
	1	3,553	45.42
	2 or more	1,006	12.86
Age at first birth (*n* = 4,368)	15–19	297	6.80
Mean = 26.04, *SD* = 5.40,	20–29	3,011	68.93
Min = 8, Max = 55	30 or more	1,060	24.27
	Poor	4,192	53.59
Household wealth	Middle	1,682	21.50
	Rich	1,948	24.90
	Urban	2,429	31.05
Place of residence	Rural	5,393	68.95
Geopolitical zone	Northcentral	2,415	30.87
	Northeast	2,447	31.28
	Northwest	2,960	37.84

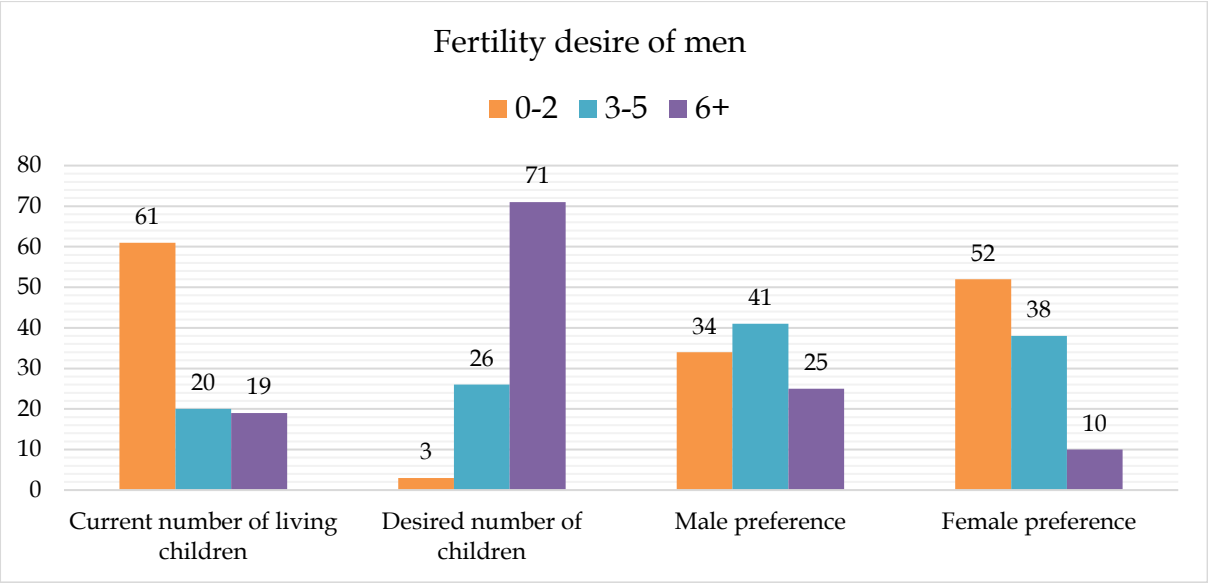
Note: SD: standard deviation, Min: minimum, Max: maximum

Fertility desire of men and associated factors

The fertility situation of the respondents, including their current number of living children, their desired family size, and their sex preference, is shown in Figure 1. At the time of the survey, 61% of the respondents had two or fewer children, meaning they were only starting

their family formation. One-fifth had three to five children, while 19% had six or more children. The mean number of currently living children was 2.75 (*SD* = 3.69, Min = 0, Max = 32). Interestingly, an overwhelming 71% of the respondents desired to have six or more children, and approximately a quarter desired between three and five children. Only 3% desired to have two or fewer children. The mean ideal number of children desired was 5.54 (*SD* = 1.17, Min = 0, Max = 7). The desire for children by sex shows that male preference is more prevalent among those who desire to have three to five children, while female preference is more prevalent among those who desire to have two or fewer children.

Figure 1: Fertility Desire of Men in Northern Nigeria



The associations between men's fertility desire and sociodemographic and contextual factors were tested using chi-square tests and are presented via cross-tabulation (Table 2). The results indicate that all the sociodemographic and contextual determinants had a statistically significant association with men's fertility desire ($p < .05$). The results show that the desire for six or more children was highest among all age groups, irrespective of educational attainment and working status. It is highest among Muslims, among all ethnic groups, regardless of marital status, number of wives or partners, number of living children, and sex of household head. It is also highest irrespective of media exposure, knowledge of contraceptives, and more among those not using any contraceptives. It is also most prevalent irrespective of household wealth, place of residence, and geopolitical zone.

Table 2: Association Between Sociodemographic and Contextual Factors and Men's Fertility Desire

Variable	Number of children desired			*p* value
	0–2	3–5	6+	
Sociodemographic factor				
Age				.000
15–19	92 (5.73)	470 (29.28)	1,043 (64.98)	
20–29	54 (2.59)	657 (31.48)	1,376 (65.93)	
30–39	30 (1.55)	551 (28.50)	1,352 (69.94)	
40–49	28 (2.03)	248 (17.98)	1,103 (79.99)	
50–59	13 (1.59)	109 (13.33)	696 (85.09)	

Variable	Number of children desired			*p* value
	0–2	3–5	6+	
Education				.000
None	59 (2.14)	314 (11.40)	2,382 (86.46)	
Primary	25 (2.53)	225 (22.77)	738 (74.70)	
Secondary	93 (3.26)	985 (34.49)	1,778 (62.25)	
Tertiary	40 (3.27)	511 (41.78)	672 (54.95)	
Currently working				.000
Yes	163 (2.32)	1,772 (25.24)	5,086 (72.44)	
No	54 (6.74)	263 (32.83)	484 (60.42)	
Religion				.000
Others	118 (6.16)	1,026 (53.58)	771 (40.26)	
Islam	99 (1.68)	1,009 (17.08)	4,799 (81.24)	
Ethnic group				.000
Fulani	13 (1.63)	110 (13.75)	677 (84.63)	
Hausa	68 (1.94)	582 (16.57)	2,863 (81.50)	
Others	136 (3.88)	1,343 (38.27)	2,030 (57.85)	
Marital status				.000
Never married	148 (4.67)	1,014 (32.01)	2,006 (63.32)	
Married/cohabitation	66 (1.45)	990 (21.72)	3,503 (76.84)	
Widowed/Divorced	3 (3.16)	31 (32.63)	61 (64.21)	
Number of wives/partners				.000
0	151 (4.63)	1,045 (32.03)	2,067 (63.35)	
1	55 (1.55)	950 (26.74)	2,548 (71.71)	
2 or more	11 (1.09)	40 (3.98)	955 (94.93)	
Number of living children				.000
0–2	177 (3.73)	1,594 (33.62)	2,970 (62.65)	
3–5	23 (1.47)	358 (22.89)	1,183 (75.64)	
6+	17 (1.12)	83 (5.47)	1,417 (93.41)	
Sex of household head				.000
Male	196 (2.62)	1,896 (25.32)	5,397 (72.07)	
Female	21 (6.31)	139 (41.74)	173 (51.95)	
Contextual factor				
Reading newspaper/magazine				.000
Yes	54 (3.14)	679 (39.45)	988 (57.41)	
No	163 (2.67)	1,356 (22.23)	4,582 (75.10)	
Listening to radio				.000
Yes	95 (2.27)	1,159 (27.75)	2,922 (69.97)	
No	122 (3.35)	876 (24.03)	2,648 (72.63)	
Watching television				.000
Yes	91 (2.76)	1,098 (33.33)	2,105 (63.90)	
No	126 (2.78)	937 (20.69)	3,465 (76.52)	
Contraceptive knowledge				.000
Any method	190 (2.63)	1,924 (26.65)	5,106 (70.72)	
No method	27 (4.49)	111 (18.44)	464 (77.08)	
Contraceptive use				.000
Used	23 (2.80)	390 (47.45)	409 (49.76)	
Never used	194 (2.77)	1,645 (23.50)	5,161 (73.73)	
Household wealth				.000
Poor	93 (2.22)	753 (17.96)	3,346 (79.82)	
Middle	46 (2.73)	483 (28.72)	1,153 (68.55)	

Variable	Number of children desired			*p* value
	0–2	3–5	6+	
Rich	78 (4.00)	799 (41.02)	1,071 (54.98)	
Place of residence				.000
Urban	74 (3.05)	830 (34.17)	1,525 (62.78)	
Rural	143 (2.65)	1,205 (22.34)	4,045 (75.00)	
Geopolitical zone				.000
Northcentral	104 (4.31)	1,077 (44.60)	1,234 (51.10)	
Northeast	48 (1.96)	426 (17.41)	1,973 (80.63)	
Northwest	65 (2.20)	532 (17.97)	2,363 (79.83)	

Sociodemographic and contextual determinants of men's fertility desire in northern Nigeria

Three ordinal logistic regression models were fit to estimate the influence of sociodemographic and contextual factors on men's fertility desire in northern Nigeria. Model One controlled for sociodemographic factors, Model Two controlled for contextual factors, while Model Three, the full model, controlled for all the statistically significant factors from Models One and Two.

In Model One, all the sociodemographic factors, including age, educational attainment, working status, religion, ethnicity, number of marital partners, number of living children, and sex of the household head, were statistically significant predictors of men's desire for more children. After controlling for sociodemographic factors, the odds of desiring more children were 1.20 times greater for those aged 20–29 years than for those aged 15–19. Education has a negative correlation with fertility desire, as all those with education were less likely to desire more children than those with no education, with the odds declining as the level of education increased: 37% less likely for those with primary education, 40% less likely for those with secondary education and 61% less likely for those with tertiary education. Compared with those who were working, those who were not working were 23% less likely to desire more children. The results further show that Muslims were 4.44 times more likely to desire more children than other religious practitioners. Respondents from the Fulani and Hausa ethnic groups were 1.28 and 1.34 times more likely to desire more children, respectively, than were those from other ethnic groups. Compared with respondents with no partners, those with two or more wives/partners were 2.45 times more likely to desire more children. Additionally, those with 3–5 children were 2.25 times more likely to desire more children, and those with six or more children were 6.60 times more likely to desire more children than those with 0–2 children. Those in female-headed households were 33% less likely to desire more children than those in male-headed households.

In Model Two, controlling for contextual factors, the results show that media exposure, contraceptive use, household wealth, and geopolitical zone were statistically significant predictors of fertility desire among men, while contraceptive knowledge and place of residence were not statistically significant predictors. The detailed results show that compared with those who read newspapers or magazines, those who did not read newspapers or magazines were 1.54 times more likely to desire more children. However, those who did not listen to the radio were 31% less likely to desire more children than those who did. Those who did not watch television were 1.24 times more likely to desire more children than those who did. Nonusers of contraceptives were 1.63 times more likely to desire more children than users were. Household wealth was inversely correlated with fertility

desire, as those from middle and rich households were 24% and 44%, respectively, less likely to desire more children than those from poor households. Furthermore, respondents living in the northeast and northwest zones were 3.10 and 2.84 times more likely to desire more children than those from the northcentral zone.

In the full model, controlling for statistically significant determinants from models one and two, the results show that being aged 30 years and older, having secondary education, working status, ethnicity, having one wife/partner, sex of household head, listening to the radio and watching television were not statistically significant. For sociodemographic factors, the estimation shows that, compared to the youngest age cohort (15–19 years), the odds of desiring more children were 1.25 times greater for those in the age cohort of 20–29. Education has a negative relationship with fertility desire; those with primary education were 23% less likely, and those with tertiary education were 28% less likely to desire more children than those without education. Respondents who were practicing the Islamic religion were 4.50 times more likely than those practicing other religions to desire more children. Respondents with two or more wives or partners were 2.41 times more likely to desire more children than those without wives. Those with 3–5 living children and those with six or more living children were 2.28 and 6.03 times more likely to desire more children, respectively, than those with 0–2 children.

For contextual factors, respondents who did not read newspapers or magazines were 1.20 times more likely to desire to have more children than those who read at least once a week. Respondents who were not using any contraceptives were 1.29 times more likely to desire more children than those who were using contraceptives. Household wealth was negatively correlated with the desire for more children, with increasing wealth leading to decreasing odds of desiring more children; those within the middle index were 24% less likely, and those within rich households were 49% less likely to desire to have more children than those from poor households. Residing in the northeast and northwest zones increases the likelihood of desiring more children by 2.03 and 1.44 times, respectively, than residing in the northcentral zone of northern Nigeria.

Table 3: Ordinal Logistic Regression Models of Determinants of Men's Fertility Desires

Determinant	Model 1 AOR [95% CI]	Model 2 AOR [95% CI]	Model 3 AOR [95% CI]
Age			
15–19 (ref)			
20–29	1.20 [1.02, 1.41] *		1.25 [1.06, 1.48] **
30–39	1.00 [0.80, 1.24]		1.16 [0.93, 1.45]
40–49	0.88 [0.67, 1.16]		1.09 [0.82, 1.44]
50–59	0.89 [0.64, 1.25]		1.11 [0.79, 1.57]
Education			
None (ref)			
Primary	0.63 [0.52, 0.77] ***		0.77 [0.62, 0.94] **
Secondary	0.60 [0.51, 0.69] ***		0.87 [0.73, 1.03]
Tertiary	0.39 [0.33, 0.47] ***		0.72 [0.58, 0.90] **
Currently working			
Yes (ref)			
No	0.77 [0.64, 0.91] **		0.86 [0.74, 1.06]
Religion			
Others (ref)			

Determinant	Model 1 AOR [95% CI]	Model 2 AOR [95% CI]	Model 3 AOR [95% CI]
Islam	4.44 [3.84, 5.14] ***		4.50 [3.86, 5.24] ***
Ethnic group			
Others (ref)			
Fulani	1.28 [1.02, 1.62] *		0.96 [0.75, 1.23]
Hausa	1.34 [1.16, 1.54] ***		1.12 [0.93, 1.35]
Number of wives/partners			
None (ref)			
1	1.02 [0.86, 1.21]		1.00 [0.84, 1.19]
2+	2.45 [1.72, 3.49] ***		2.41 [1.68, 3.45] ***
Number of living children			
0–2 (ref)			
3–5	2.25 [1.86, 2.71] ***		2.28 [1.89, 2.76] ***
6+	6.60 [4.92, 8.86] ***		6.03 [4.48, 8.13] ***
Sex of household head			
Male			
Female	0.77 [0.61, 0.98] *		0.80 [0.63, 1.02]
Reading newspaper/magazine			
Yes (ref)			
No		1.54 [1.33, 1.77] ***	1.20 [1.02, 1.41] *
Listening to radio			
Yes (ref)			
No		0.69 [0.61, 0.79] ***	0.90 [0.78, 1.04]
Watching television			
Yes (ref)			
No		1.24 [1.08, 1.43] **	1.00 [0.85, 1.15]
Contraceptive knowledge			
Any (ref)			
None		0.90 [0.73, 1.11]	
Contraceptive use			
Used (ref)			
Never used		1.63 [1.39, 1.89] ***	1.29 [1.09, 1.53] **
Household wealth			
Poor (ref)			
Middle		0.76 [0.66, 0.87] ***	0.76 [0.65, 0.88] ***
Rich		0.56 [0.48, 0.66] ***	0.51 [0.43, 0.60] ***
Place of residence			
Urban (ref)			
Rural		1.05 [0.92, 1.19]	
Geopolitical zone			
Northcentral (ref)			
Northeast		3.10 [2.71, 3.54] ***	2.03 [1.75, 2.37] ***
Northwest		2.84 [2.51, 3.22] ***	1.44 [1.20, 1.72] ***

*Note: AOR: adjusted odds ratio, CI: confidence interval, *p < .05, **p < .01, ***p < .001*

Discussion

This study was undertaken to estimate the fertility desires of men and the determining factors of such desires in the northern region of Nigeria. The northern region has always presented higher fertility rates than the national average, and a strong desire for large families promotes this due to religious and traditional norms in which men dominate decision-making in family matters. The findings reveal a high desire for children by men in the region, with an

overwhelming majority desiring to have six or more children. Studies and findings from national surveys in Nigeria have reported that men have greater fertility desire than women, including young men who have yet to start childbearing (Akinyemi & Odimegwu, 2021; Izugbara et al., 2009; National Population Commission Nigeria & ICF, 2018). A plausible explanation for the high desire for large family size by men may be a combination of religious beliefs, traditions, and the value placed on children due to their economic contribution to households and as a source of security in parents' old age as established by demographic and other theories of fertility behavior and empirical studies (Bongaarts and Hodgson, 2022; Church et al., 2023; Cleland & Wilson, 1987; Miro & Potter, 1980). Consequently, men's desire for a large family will have implications for Nigeria's efforts toward lowering the population growth rate and improving the population's well-being, considering that men's preferences usually influence women's fertility choices, as confirmed by Yeboah et al. (2021). Hence, policymakers should not overlook men in their efforts to lower fertility rates in the country.

All the sociodemographic and contextual factors tested using chi-square tests were significantly associated with men's desire for a high number of children (p value = .000). The bivariate analysis revealed that the desire to have six or more children was most prevalent among all age groups, irrespective of educational attainment, and mostly among Muslims and all ethnic groups. It was also most prevalent irrespective of respondents' marital status, number of wives, number of living children, and sex of the head of household. Additionally, the desire was high irrespective of exposure to media, knowledge of contraceptives, household wealth, rural-urban residence, and geopolitical zone. These findings are similar to what other studies have reported regarding the factors associated with fertility desire among men in Nigeria (Abbani & Usman, 2023; Akinyemi & Odimegwu, 2021).

The findings from the full model of the multivariable analysis, which incorporated all significant sociodemographic and contextual determinants from the two individual models, revealed that age, education, religion, number of wives/partners, number of living children, reading of newspapers or magazines, use of contraceptives, household wealth and geopolitical zone were statistically significant predictors of men's fertility desire in northern Nigeria. In detail, the findings show greater fertility desire among those in the 20–29-year-old cohort than those in the 15–19-year-old cohort. This may imply a transition toward a desire for fewer children by the upcoming generation who have not started childbearing. Akinyemi and Odimegwu (2021) reported a similar pattern among the younger generation of unmarried males, with those aged 20–24 desiring more children than those aged 15–19. Therefore, there must be a deliberate effort to ensure that the youngest generation does not desire a large family size if the country wants to reduce population growth. This can be done by involving these young men in family planning programs and other behavior change interventions to lower the country's fertility rate.

The findings further indicate that education plays a significant role in shaping men's fertility desires. This shows that education has a negative relationship with the desire for more children, with increasing educational attainment diminishing the odds of desiring more children. Previous studies have established an inverse relationship between education and fertility in different countries around the world (Ahinkorah et al., 2021; Akinyemi & Odimegwu, 2021; Bongaarts & Hodgson, 2022; Canning et al., 2015; Church et al., 2023; Cleland, 2009; Kırdar et al., 2018; Monstad et al., 2008). The fact that educated men have a lesser desire for large family sizes than uneducated men could be due to the increased awareness that education provides of the benefits of smaller family sizes, such as better educational opportunities for children and greater economic stability for the entire family, as well as increasing knowledge and adoption of family planning. Additionally, educated

persons are less likely to see children as a source of labor or security during old age, unlike uneducated people who rely on their children's economic contribution and as a future source of security in old age. Consequently, promoting educational attainment could lead to lowering the fertility desires of men in the northern region of Nigeria.

Religion is one of the principal promoters of men's fertility desires found in this study, with Muslim men having almost five times more desire for children than other religious believers. Previous studies in Nigeria and other countries have reported similar outcomes with Muslims desiring more children than others (Akinyemi & Odimegwu, 2021; Heaton, 2011; Mberu & Reed, 2014; Odusina, 2017; Odusina et al., 2020). Religion plays a significant role in shaping men's fertility desires in northern Nigeria largely because Islam, the predominant religion in the region, can be viewed as a pronatalist religion (Hasna, 2003; Lehrer, 2004; Riddell, 2016) as it gives "strong and unequivocal emphasis to high fertility" (Al-Bar & Chamsi-Pasha, 2015, p. 174). Hence, a more significant proportion of Nigerian Muslims tend to desire more children because they believe that childbearing is the will of Allah and a form of spiritual blessing that no attempt should be made to override (Izugbara & Ezeh, 2010), trying to control fertility can thus be seen as sacrilegious (Renne, 1996).

Furthermore, the desire for larger family size among Muslim men can be linked to the teachings of the Prophet of Islam. The Prophet of Islam was reported to have said he would be proud of Muslims in the hereafter for procreating to increase his followership in a Hadith by Sahih Abi Dawood, number 2050, which says, "Marry the kind and fertile women who will give birth to many children for I shall take pride in the great numbers of my ummah (nation)" (Al-Bar & Chamsi-Pasha, 2015, p. 174). Although this is a subject of debate as to whether it is an absolute command irrespective of any condition, the saying greatly influences the perceptions of the majority of Muslims in northern Nigeria, who believe that having more children is a religious obligation and will bring blessings in line with religious teachings, thereby encouraging the desire for large families as seen from this study. Consequently, involving religious scholars could help clarify any misunderstandings and misinterpretations, if they exist, thereby reducing the extent of such influence. Further studies can also investigate the influence of Islamic religious teachings on high fertility desires in northern Nigeria.

The number of marital partners also influences men's fertility desires in northern Nigeria. Men with two or more wives were highly desirable to have more children. The practice of polygyny is common in northern Nigeria and could be linked to religious beliefs, especially among Muslims. Additionally, the findings reveal that the more children men have, the more they desire to have more children. Those who already had 3–5 children were twice as likely to desire more children, while those with six or more children were six times more likely to desire more. Policymakers may need to target those with fewer children and attempt to disrupt the pattern by promoting family planning adoption among them to lower the fertility rate. It may also not be too late to engage those with more children to prevent this desire from becoming a reality.

The findings also showed that men who did not read newspapers or magazines had greater odds of desiring to have more children than those who did. The benefit of reading newspapers or magazines is that they can expose men to relevant information on the challenges of having larger family sizes and about family planning, unlike those who do not have access to such information. Previous studies have reported that access to information is associated with lower fertility desires (Church et al., 2023; Oyediran & Isiugo-Abanihe, 2002; Westoff & Bietsch, 2015). Contraceptive use was also a significant determinant of men's fertility desire. Men who were not using any contraceptives were more likely to desire more children than

those who were using them. The use of contraceptives facilitates fertility reduction as those who want to limit childbearing mostly use contraceptives. A study by Odusina (2017) revealed that the demand for children was lower among couples in which one partner was using contraception. Commonly, contraception is seen only as something for women, but even at that, women need the support of their husbands/partners to use contraceptives. Hence, policymakers should ensure the promotion of contraceptive use by men by making them realize that it is not only a woman's affair.

Household wealth was negatively related to the desire for more children. The odds of desiring more children decrease as the household wealth index increases. Those within the middle and rich households had less desire than those within poor households. Several studies from Nigeria and elsewhere have reported similar findings showing that household wealth and income significantly predict fertility desires among men and women (Adhikari, 2010; Akinyemi & Odimegwu, 2021; Church et al., 2023). The findings also reveal that men who reside in the northeast and northwest geopolitical zones tend to desire more children than those who reside in the northcentral geopolitical zone of the northern region. Previous studies have also reported that the northeastern and northwestern zones have consistently higher fertility rates than any other geopolitical zone of Nigeria (Akinyemi & Odimegwu, 2021; Odusina, 2017; Odusina et al., 2020). Studies elsewhere have also shown that the region of residence is a significant predictor of fertility desire (Ahinkorah et al., 2021). By implication, the northeastern and northwestern zones of Nigeria should be targeted by policymakers to lower fertility desires and reduce the fertility rate.

Strengths and limitations of the study

One of the strengths of this study is that the data used is from a nationally representative sample survey; hence, the findings can be generalized and used for policy reforms aimed at lowering the high fertility rate in the northern region of Nigeria. Another strength is the focus on the fertility desires of men, who are critical stakeholders in the family where reproductive decisions are made and are very influential in such decisions. Targeting men could make it easier to address solid barriers that hinder efforts toward lowering fertility rates by including them in fertility and family planning programs. Notwithstanding, this study has some limitations. One limitation is that it is a cross-sectional and quantitative survey, meaning causal relationships cannot be established.

Additionally, fertility desire is strongly related to religious and traditional norms, which can best be understood through qualitative interviews and focus group discussions to understand deep-rooted underlying desires that quantitative data cannot capture. Hence, future studies should engage men in discussions on religious and traditional beliefs and motivations to unravel the cultural basis of fertility desires. Likewise, future studies should consider women's household characteristics, such as education, employment, and spousal communication regarding family size, which could influence men's fertility desires.

Conclusion

The northern region of Nigeria has consistently presented higher fertility rates. Men in the region strongly influence decisions on family size as they are the heads of families.

Understanding men's fertility desires is essential for policies and programs to lower fertility rates and slow population growth in Nigeria. This study contributes to that effort. There is a need for policymakers in the region to include men in fertility and family planning programs to promote lowering and slowing the rate of fertility and population growth. Including men in fertility and family planning programs will expose them to relevant, educative content that could lead to decreased fertility desire and actual fertility, especially by addressing the identified predictors of higher fertility desire.

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