

Predictors of family size among currently married men in rural Northwestern Nigeria

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Abstract

High fertility remains a major public health and development concern in rural Northern Nigeria, where large family norms persist despite ongoing fertility transitions in other regions. Understanding the socio-demographic and behavioral factors influencing family size among men is essential for designing effective fertility regulation interventions. This study aimed to determine the prevalence and predictors of large family size among married men in rural northwestern Nigeria. A community-based cross-sectional study was conducted among 277 married men in rural northwestern Nigeria using a multistage sampling technique. Data were collected using a structured questionnaire covering socio-demographic characteristics, fertility history, reproductive preferences, and spousal communication. Family size was dichotomized as small (≤ 4 children) and large (≥ 5 children). Data were analyzed using descriptive statistics, chi-square tests for bivariate associations, and multivariable binary logistic regression to identify independent predictors of large family size. Statistical significance was set at $p < 0.05$. The average age of respondents was 47.8 ± 13.3 years, and the average number of children ever fathered was 7.8 ± 5.9 . Nearly two-thirds (65.3%) of respondents had large families. On a multivariable level, men under 45 years old were significantly less likely to have large families compared with those aged 45 and above (Adjusted Odds Ratio, AOR=0.11; 95% Confidence Interval, CI: 0.06-0.22). Men who married between 20 and 29 years of age had higher odds of having a large family than those who married at age 30 or later (AOR=2.26; 95% CI: 1.06-4.80). Notably, men who discussed the desired number of children with their wives were significantly less likely to have large families (AOR=0.28; 95% CI: 0.12-0.66). Educational level, household wealth, and discussions about contraception were not independently linked to family size. Large family size remains prevalent among married men in rural northwestern Nigeria. Age, timing of marriage, and spousal communication regarding desired family size are key determinants of fertility outcomes. Interventions aimed at fertility reduction in similar settings should prioritize male involvement, promote spousal communication, and address deeply rooted pronatalist norms, rather than focusing solely on contraceptive provision.

Key words: family size, high fertility, married men, spousal communication; northern Nigeria.

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Introduction

Fertility levels remain relatively high in Nigeria compared with global averages.¹ Although Nigeria's Total Fertility Rate (TFR) has declined over the decades, it remains substantially above the replacement level of 2.1 children per woman.^{2,3} Fertility is particularly elevated in rural areas, where women have an average of 5.6 children compared with 3.9 children in urban areas.⁴

High fertility, defined as a TFR of 5.0 or higher, is associated with significant public health and socioeconomic challenges, including increased maternal and child health risks, food insecurity, unemployment, slow economic growth, and environmental strain.^{1,5} Evidence from economically advanced countries demonstrates that fertility decline is closely linked to improvements in economic development and social well-being.⁶⁻⁹ In Nigeria, fertility patterns are influenced by proximate determinants such as mar-

ital status, polygyny, age at first marriage, contraceptive use, and postpartum practices, as well as broader socio-demographic factors including education, wealth, and geographic location.^{6,9} Religious beliefs, societal norms, and child mortality rates further shape reproductive behavior and preferences for family size.¹⁰

Family size preference refers to the number of children a couple desires and reflects underlying fertility norms.¹¹ In many Nigerian communities, large families have traditionally been valued for social status, lineage expansion, labor contribution, and economic security.¹² However, large family size may strain household resources and contribute to poverty, malnutrition, limited educational opportunities, and adverse child outcomes.¹³⁻¹⁸ In Northern Nigeria, socio-cultural practices and institutional systems, such as the Almajiri system, illustrate the broader societal implications of high fertility.^{13,14,16-18}

While much fertility research in Nigeria has historically

focused on women, growing attention has been directed toward the role of men in reproductive decision-making.¹⁹ In many African settings, including Northern Nigeria, men are primary decision-makers in matters relating to family size and contraceptive use. Patriarchal norms, religious interpretations, and economic authority reinforce male dominance in reproductive decisions.²⁰ Studies from Ghana and Nigeria have demonstrated that spousal influence over reproductive goals is often asymmetric, with husbands exerting greater control.^{21,22} In some northern Nigerian communities, women may be unable to adopt family planning methods without their husbands' consent.²³ Despite this, male involvement in family planning remains limited, and contraceptive prevalence rates remain low.⁴

International and national policy frameworks recognize the importance of male engagement in fertility regulation. The International Conference on Population and Development (ICPD) recommended increased research into factors inhibiting male participation in family planning,²⁴ while Nigeria's National Population Policy emphasizes the need to reach men with messages about the socio-economic implications of large family size.⁵ Nevertheless, empirical evidence focusing specifically on predictors of achieved family size among married men in rural northern Nigeria remains limited.

Given the persistence of high fertility and the central role of men in reproductive decision-making in this setting, there is a need to better understand the factors associated with large family size among married men. This study was therefore conducted to determine the prevalence and predictors of a large family size among married men in a rural community in Northwestern Nigeria.

Materials and Methods

Study design

This was a community-based analytic cross-sectional study conducted to determine the predictors of large family size among currently married men in Bagwai Local Government Area (LGA), Northwestern Nigeria.

Study population

The study population comprised currently married men residing in the selected households within the LGA. Men who were unmarried, divorced, widowed, or not permanent residents of the area were excluded from the study.

Sample size estimation

The sample size was calculated using the single population proportion formula:

$$N = \frac{Z^2 P(1-P)}{D^2} \quad 25$$

where:

$Z=1.96$ (standard normal deviate at 95% confidence level)

$P=0.71$, representing the proportion of men expressing a preference for a large family size in a previous study conducted in a similar setting²⁶

$D=0.05$ (margin of error)

The proportion was used as a proxy indicator of high fertility norms. After adjusting for a 10% non-response rate, a total of 347 households were targeted.

Sampling technique

A household listing exercise was conducted to establish the sampling frame, yielding 748 households. Systematic random sampling was employed to select eligible households.

The sampling interval (k) was calculated by dividing the total number of households (748) by the desired sample size (347), yielding a sampling interval of approximately 2. A random start was selected from the first two households using simple random sampling. Thereafter, every second household was selected until the required sample size was achieved. Households without eligible respondents or with non-consenting participants were replaced using the next eligible household in sequence.

Data collection

Data were collected using a structured interviewer-administered questionnaire adapted from previously validated instruments, including items from the Nigeria Demographic and Health Survey (NDHS) and relevant published studies on male fertility and family size in sub-Saharan Africa.^{4,22,23,27-30} The questionnaire was adapted to reflect the socio-cultural context of rural northwestern Nigeria, including rewording of some questions and translation into Hausa. Back-translation was conducted to ensure consistency of meaning. The wealth index was constructed using asset ownership indicators and categorized into quintiles using principal component analysis. The instrument was pre-tested among 10% of the calculated sample size in a neighboring community with similar characteristics. Feedback from the pre-test was used to improve clarity, flow, and comprehension of questions. The pre-test data were not included in the final analysis.

Data analysis

Data were entered into Microsoft Excel and analyzed using IBM Statistical Package for Social Sciences (SPSS), version 25. Data cleaning procedures included checking for completeness, consistency, and outliers before analysis.

Outcome variable

The primary outcome variable was family size, defined as the number of living children ever fathered by the respondent. For inferential analysis, family size was dichotomized as: small family size, ≤ 4 children, and large family size, ≥ 5 children.

This categorization was based on commonly used thresholds in fertility research in similar settings.

Independent variables

Independent variables included socio-demographic, marital, and reproductive factors: age of respondent, educational level, occupation, type of marriage (monogamous or polygynous), age at first marriage, wealth index (categorized into quintiles), history of contraceptive use, spousal communication about contraception, spousal discussion regarding the desired number of children, and sex composition of living children.

For analytical purposes, the respondents' age was recategorized into two groups (<45 years and ≥ 45 years) to ensure adequate cell counts and improve the stability of estimates in the regression model.

Descriptive analysis

Categorical variables were summarized using frequencies and percentages. Continuous variables were summarized using means and standard deviations, while medians and interquartile ranges

were reported where appropriate to account for skewed distributions. Results were presented in tables.

Bivariate analysis

The association between independent variables and family size (small vs large) was assessed using the Chi-square test. Variables with p-values <0.05 at the bivariate level were considered statistically significant.

Multivariable analysis

Variables considered clinically relevant and/or statistically significant at the bivariate level were included in a multivariable logistic regression model to identify independent predictors of large family size. Adjusted Odds Ratios (AORs) with 95% Confidence Intervals (CIs) were computed to measure the strength of associations. Statistical significance was set at $p < 0.05$.

Table 1. Socio-demographic and marital characteristics of the respondents (n=277).

Variable	Frequency	Percentage
Age of respondents		
<30	7	2.5
30-39	73	26.4
40-49	74	26.7
≥50	123	44.4
Mean age: 47.8±13.3	Median age: 45 years (IQR: 36-56)	
Educational level		
No formal education	127	45.8
Primary	34	12.3
Secondary	68	24.5
Tertiary	48	17.3
Ethnicity		
Hausa	272	98.2
Fulani	5	1.8
Religion		
Islam	277	100
Occupation		
Farmer	197	71.1
Trader	24	8.7
Artisan	20	7.2
Civil servant	36	13.0
Age at marriage		
<20	28	10.1
20-29	191	69.0
≥30	58	20.9
Mean age: 25.3±5.1		
Type of marriage		
Monogamous	186	67.1
Polygynous	91	32.9
Wealth index		
Lowest	57	20.6
Second	54	19.5
Middle	55	19.9
Fourth	56	20.2
Highest	55	19.9

IQR, Interquartile Range

Ethical considerations

Ethical approval was obtained from the Research and Ethics Committee of the Kano State Ministry of Health (NHREC/17/03/2018). Permission was also obtained from the District Head of Bagwai and the Chairman of the Local Government Area. Written informed consent was obtained from all participants before data collection. Participants were assured of confidentiality, anonymity, and their right to withdraw from the study at any time without penalty.

Results

Of the 347 households approached, 277 eligible married men consented and completed the interview, yielding a response rate of 80%. Households with non-consenting participants were excluded.

The final sample size yielded sufficient outcome events to permit multivariable logistic regression modelling. The results are presented as respondents' descriptive characteristics, followed by bivariate and multivariable analyses examining factors associated with family size.

The mean age of respondents was 47.8±13.3 years, with a median of 45 years (Interquartile Range, IQR: 36-56), suggesting

Table 2. Fertility characteristics and reproductive preferences of respondents (n=277).

Variable	Frequency	Percentage
Number of children ever fathered		
≤2	52	18.8
3-4	44	15.9
≥5	181	65.3
Mean: 7.8±5.9	Median: 7 (IQR: 3-10)	
Category of children		
Male only	9	3.2
Female only	31	11.2
Both	237	85.6
Mean female children:	3.9±3.3	
Mean male children:	4.1±3.4	
Desired more children		
Yes	178	64.3
No	99	35.7
Desired number of sons		
None	101	36.5
1-2	27	9.7
3 or more	149	53.8
Desired number of daughters		
None	100	36.1
1-2	48	17.3
3 or more	129	46.6
Ever used contraceptives		
Yes	49	17.7
No	228	82.3
Discussed contraceptives with wife		
Yes	76	27.4
No	201	72.6
Discuss the number of desired children with wife		
Yes	60	21.7
No	217	78.3

IQR, Interquartile Range

a slightly right-skewed age distribution.

Education levels were generally low, with nearly half having no formal schooling, reflecting the rural environment of the study. Farming was the main occupation, emphasizing the agrarian socioeconomic setting. Most respondents got married between the ages of 20 and 29, and one-third were in polygynous unions. Wealth was evenly distributed across quintiles, indicating limited socioeconomic differences within the study group (Table 1).

Most men (65.3%) had fathered five or more children, with a mean of 7.80 ± 5.96 children.

The median number of children ever fathered was 7 (IQR: 3-10), indicating a right-skewed distribution of family size. Regarding the composition of offspring, 85.6% had both male and female children, 11.2% had only female children, and 3.2% had only male children. The mean number of male children was 4.1 ± 3.4 (median 3, IQR: 2-6), while the mean number of female children was 3.9 ± 3.3 (median 3, IQR: 1-5) (Table 2).

In terms of fertility desire, 64.3% expressed a desire for more children, while 35.7% did not. More than half of the respondents (53.8%) desired three or more sons, and 46.6% desired three or more daughters. Notably, 36.5% and 36.1% reported not desiring any sons or daughters, respectively (Table 2).

The vast majority (82.3%) reported never having used contraceptives. Only 27.4% had discussed contraceptive use with their wives, and even fewer (21.7%) had discussed the number of

desired children (Table 2).

Table 3 presents the bivariate associations between selected socio-demographic, marital, and reproductive characteristics and family size. Type of marriage and age of the respondent were significantly associated with family size, with polygamous men and older respondents more likely to have large families ($p < 0.001$). Sex composition of children was also significantly associated with family size, with respondents having mixed-sex children more likely to report large families ($p < 0.001$).

Spousal communication variables were significantly associated with family size (Table 3). Men who discussed contraceptives with their wives and those who discussed the desired number of children were less likely to have large families compared with those who did not ($p = 0.003$ and $p < 0.001$, respectively). Educational level, age at marriage, and household wealth quintile were not significantly associated with family size in bivariate analyses. In the multivariable logistic regression model (Table 4) age of the respondent and spousal discussion on the desired number of children were significant predictors of large family size. Men aged < 45 years were significantly less likely to have a large family than those aged ≥ 45 years (AOR=0.11; 95% CI: 0.06-0.22; $p < 0.001$).

Men who married between 20-29 years were more likely to have large families compared with those who married at ≥ 30 years (AOR=2.26; 95% CI: 1.06-4.80; $p = 0.034$).

Respondents who discussed the desired number of children

Table 3. Association between socio-demographic characteristics and family size (n=277).

Variable	Small family 4 and below	Large family 5 and above	χ^2	p
Type of marriage				
Monogamous	81 (43.5)	105 (56.5)	19.765	<0.001
Polygynous	15 (16.5)	76 (83.5)		
Age of respondents				
<45	72 (60.0)	48 (40)	60.046	<0.001
≥ 45	24 (15.3)	133 (84.7)		
Age at marriage				
<20	9 (32.1)	19 (67.9)	9.400	0.315
20-29	62 (32.5)	129 (67.5)		
30	25 (43.1)	33 (56.9)		
Category of children				
Males	7 (77.8)	2 (22.2)	70.183	<0.001
Female	30 (96.8)	1 (3.2)		
Mixed	59 (24.9)	178 (75.1)		
Educational level				
None	35 (27.6)	92 (72.4)	6.943	0.074
Primary	12 (35.3)	22 (64.7)		
Secondary	26 (38.2)	42 (61.8)		
Tertiary	23 (47.9)	25 (52.1)		
Wealth quintile				
Lowest	30 (35.1)	37 (64.9)	2.831	0.587
Second	14 (25.9)	40 (74.1)		
Middle	22 (40.0)	33 (60.0)		
Fourth	19 (33.9)	37 (66.1)		
Highest	21 (38.2)	34 (61.8)		
Discuss contraceptives with wife				
Yes	37 (48.7)	39 (51.3)	9.100	0.003
No	59 (29.4)	142 (70.6)		
Discussed desired number of children with wife				
Yes	33 (55.0)	27 (45.0)	13.996	<0.001
No	63 (29.0)	154 (71.0)		

with their wives were significantly less likely to have large families (AOR=0.28; 95% CI: 0.12-0.66; p=0.003).

Educational level, wealth index, age at marriage <20 years, and discussion of contraceptives were not independently associated with large family size.

Discussion

This study examined the socio-demographic and behavioral factors influencing family size and fertility desire among married men in rural Northwestern Nigeria. The findings are consistent with regional and national evidence indicating persistently high fertility in rural Northern Nigeria, where large family norms remain deeply entrenched.

The mean age of respondents observed in this study is comparable to that reported in other Nigerian studies.²¹⁻²³ This is expected, as this age group represents the peak of male reproductive activity. Educational attainment among respondents was generally low, with almost half having no formal education and only a minority attaining tertiary education. This level of educational attainment is substantially lower than the national estimates reported in the 2018 Nigeria Demographic and Health Survey (NDHS), which documented lower proportions of men without formal education and higher proportions with post-secondary education.²⁴⁻²⁶ These disparities reflect persistent educational inequalities between rural northern regions and national averages.

The study population was characterized by high fertility, with nearly two-thirds of respondents having five or more children and a mean family size of almost eight children. Additionally, a substantial proportion of respondents expressed a desire for additional children. These findings align with the NDHS 2018, which reported higher fertility rates in the Northwest region (total fertility rate of 6.6) compared with the national average of 5.3.²⁶ However, the mean number of living children observed in this study is higher than figures reported in other Nigerian studies^{21,27} and in studies from Kenya.²⁸⁻³¹ In West Africa, average family sizes are lowest in Ghana, where the mean number of living children for men is 3.8, while in Egypt it is 3.6.²³ Globally, fertility levels are lowest in high-income regions such as Europe, North America, and Japan, where the mean number of living children for men is generally below two.²³ Pronatalist cultural norms, religious beliefs, and the perceived economic and social value of children - particularly in agrarian communities - likely contribute to the persistence of large family sizes in this setting.

Age of the respondent was strongly associated with family size. Older men were significantly more likely to have larger families than younger men at both the bivariate and multivariable levels. Although the duration of marriage was not directly measured, the age of the respondent may partially reflect cumulative marital exposure, which could explain the strong association observed between older age and larger family size. Similar trends have been reported by Enebe *et al.*¹⁰ and Odu *et al.*,²⁷ who observed increasing family size with age. Comparable findings have also been documented in Kenya, where men aged 50-54 years had an average of 6.8 children.³¹ The tendency for men to continue childbearing into later life may further explain this pattern.^{19,31}

Educational attainment and household wealth were not independently associated with family size in this study. This finding is consistent with the results reported by Enebe *et al.*,¹⁰ who also found no significant association between education and family size. Osili and Long³² similarly suggested that male education may

have a weaker influence on household size than female education. These findings contrast with evidence from urban and socioeconomically diverse settings, where higher education and wealth are often associated with lower fertility.^{8,33,34} In rural northern Nigeria, however, deeply rooted cultural and religious norms may outweigh the influence of formal education and economic status on reproductive behavior. Similar observations have been reported in other rural and agrarian populations.¹² These findings suggest that education alone may be insufficient to drive fertility reduction in such contexts without complementary interventions addressing social norms and male involvement.

Polygynous marriage was significantly associated with large family size at the bivariate level, with a markedly higher proportion of polygynous men having large families compared with those in monogamous unions. Although marital type did not remain an independent predictor in the multivariable model, its strong crude association highlights the role of marital structure in shaping fertility outcomes. Polygyny has been widely documented as a driver of high fertility due to competition among co-wives, social expectations, and the desire to expand lineage size.^{9,10} Previous studies have similarly reported that men in polygynous unions tend to have significantly more children than those in monogamous relationships.³¹

At the bivariate level, the sex composition of children was significantly associated with family size, with men who had children of both sexes being more likely to have large families. This likely reflects son-and-daughter preference dynamics, in which continued childbearing continues until a desired sex composition is achieved.¹¹ However, this association did not persist in the multivariable model, suggesting that its effect may be mediated by other

Table 4. Multivariable binary logistic regression predicting large family size (≥5 children) among currently married men (n=277).

Variable	AOR	95% CI	p
Age of respondents			
≥45 (Ref)	1	-	-
<45	0.11	0.06-0.22	<0.001
Age at marriage			
≥30 (Ref)	1	-	-
<20	2.29	0.70-7.49	0.17
20-29	2.26	1.06-4.80	0.034
Educational level			
Tertiary (Ref)	1	-	-
No formal education	1.43	0.59-3.46	0.429
Primary	1.25	0.40-3.95	0.701
Secondary	1.26	0.51-3.10	0.617
Wealth quintile			
Highest (Ref)	1	-	-
Lowest	0.63	0.23-1.71	0.367
Second	1.3	0.49-3.49	0.597
Middle	0.66	0.25-1.74	0.403
Fourth	0.91	0.35-2.38	0.84
Discussed desired number of children with wife			
No (Ref)	1	-	-
Yes	0.28	0.12-0.66	0.003
Discussed contraceptives with wife			
No (Ref)	1	-	-
Yes	1.16	0.55-2.59	0.724

AOR, Adjusted Odds Ratio; CI, Confidence Interval

factors such as age and spousal communication.

One of the most important findings of this study is the strong association between spousal communication and family size. Men who discussed the desired number of children with their wives were significantly less likely to have large families, even after adjusting for socio-demographic factors. In contrast, discussion of contraception alone was not independently associated with family size, indicating that broader discussions about fertility goals may be more influential than contraceptive awareness in isolation. Previous studies have shown that men who engage in discussions with their spouses about family size and reproductive intentions are more likely to adopt family planning methods.^{20,22,29,30,35,36} Moreover, the quality of spousal communication has been shown to influence agreement on desired family size and is positively associated with modern contraceptive use.^{37,38} In patriarchal settings such as Northern Nigeria, where men often dominate reproductive decision-making, male involvement and open spousal dialogue are critical for effective fertility regulation. Nevertheless, contraceptive discussions remain uncommon in this region,³⁹ with evidence from the Nigerian Urban Reproductive Health Initiative indicating that fewer than one-third of married women in northern Nigeria had discussed family planning with their spouses in the preceding six months.⁴⁰

Limitations

This study has several limitations. First, the cross-sectional design precludes causal inference, and associations observed should not be interpreted as evidence of causality. Second, younger men may not have completed their fertility, potentially underestimating final family size. Third, duration of marriage was not assessed. Because marital duration strongly influences cumulative fertility exposure, its omission may have introduced residual confounding, particularly in the association between age and family size. Future longitudinal studies incorporating marital duration are recommended to better disentangle age effects from exposure time.

Conclusions

This study demonstrates that large family size remains prevalent among married men in rural Northwestern Nigeria and is strongly influenced by age, marital structure, and spousal communication regarding fertility intentions. While educational attainment and household wealth were not independently associated with family size, interpersonal dynamics - particularly discussions about the desired number of children - emerged as critical determinants of fertility outcomes. These findings underscore the importance of engaging men in reproductive health interventions that promote delayed marriage, support spousal communication, and address deeply rooted pronatalist norms. Programs aiming to reduce fertility in similar settings should move beyond contraceptive provision alone and incorporate culturally sensitive strategies that encourage joint decision-making and male involvement in family planning.

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