Contraceptive use in Nigeria; Prevalence, factors associated with use and policy implications.

BACKGROUND

In 2015, the Sustainable Development Goals, adopted by all member states of the United Nations, were created to end poverty and to promote social and economic development globally.[1] These goals include targets to improve maternal health. Despite progress in many countries, maternal mortality remains unacceptably high; the global maternal mortality ratio was 216 deaths per 100,000 live births in 2015.[2] Almost all maternal deaths (99%) occur in developing countries, with more than half of these deaths occurring in sub-Saharan Africa.[2] In 2015, the maternal mortality ratio in Nigeria was estimated to be 814 deaths per 100,000 live births, accounting for about 14% of the total maternal deaths globally.[3,4.]

Family planning is one of the basic pillars of the Safe Motherhood Initiative, aimed at reducing maternal deaths and improving birth outcomes.[5] A study by Ahmed and colleagues estimated that contraceptive use averted 272,040 maternal deaths, a 44% reduction in the number of expected maternal deaths if contraceptive methods were not used.[5] Family planning prevents unintended pregnancies, therefore reducing the need for unsafe abortions, one of the leading causes of maternal mortality globally.[6] It also delays or prevents pregnancies among high risk women, therefore reducing the risk of maternal deaths.[6]

The use of contraception among reproductive aged women in Nigeria could therefore have implications for poverty reduction, healthcare savings cost, socio-economic development and development of policies. Despite the many benefits of family planning and the various interventions designed to increase contraceptive uptake, the use of contraception in Nigeria has remained very low.[7] In 2018, 24.2% of all women in Nigeria were using any contraceptive method, and only 17.6% were using a modern method.[8] In order to increase the

prevalence of contraceptive methods, it is important to understand the barriers and facilitators to use.

Previous studies done in Nigeria have explored a number of factors associated with contraceptive use. Beyond the well-known associations with socioeconomic and demographic characteristics such as age, parity, and education, previous studies have found that spousal communication and support has been shown to be significantly associated with use.[9] Odimegwu and colleagues showed that respondents who had discussed family planning issues with their partners and those whose partners approved of family planning use were more likely to use contraception.[10]

Similarly, Ezeanolue and colleagues found that in Southeast Nigeria, awareness and support for female contraception among men was significantly associated with the desire to use contraception among their female spouses.[9] In that study, men who gave support to their spouses' use of contraception were more than 5 times as likely to have spouses with a desire to use contraception.[9]

Though these studies have shown the importance of spousal communication and support, they are limited because they were done in specific regions, hence limiting generalizability and extrapolation of findings.[9, 11.] Considering the diversity of culture, religious beliefs, knowledge, attitudes and practices towards family planning, this study aims to determine the association between spousal communication and contraceptive prevalence in Nigeria, using a nationally representative sample.

Additionally, previous studies have shown an association between community level factors and a woman's choice of contraception.[12] A study done by Stephenson and colleagues in Eastern Cape, South Africa showed that several community level factors were associated with a woman's choice of contraceptive method.[12] However, the community level factors

focused on socioeconomic profiles of communities including educational attainment, female empowerment and female autonomy; they were unable to assess community attitudes towards family planning specifically and how individual perceptions of those attitudes affect use.[12] There is thus a dearth of evidence highlighting the association between community perceptions of family planning and use of contraception among women in Nigeria. Additionally, despite the importance of partner dynamics as outlined above, no study was found to have explored the simultaneous effect of community norms and partner support in Nigeria, despite these influences likely exerting influence on women at the same time.

The objective of this study is to identify individual, partner and community factors that are associated with contraceptive use in Nigeria. This study contributes to the literature by exploring the association between an individual's assessment of positive and negative community perceptions of family planning after adjusting for individual characteristics and use of contraception. This study also explores the association between male partner support and use of contraception. This provides a more nuanced understanding of how various personal and social influences impact women's use of contraception.

Finally, studies have shown that the least developed regions of Nigeria have the lowest rate of female literacy levels and modern contraceptive use, with only a small proportion of women utilizing maternal health care services.[13] Therefore, the regional disparities in contraceptive use would magnify the already existent multiple health and socioeconomic disparities in these vulnerable populations.[13] For this study, state level analyses were conducted to explore the differential patterns in contraceptive use by state in Nigeria.

Identifying the factors associated with contraceptive use in Nigeria can inform design and implementation of evidence-based policies to improve contraceptive uptake, and ultimately contribute to reduction of maternal mortality in Nigeria. This study could also enlighten

political stakeholders at the National and State level on the importance of dedicating high level attention to improving family planning quality and access, and also influence resource allocation for family planning.

METHODS

PMA2020 surveys utilized a 3-stage cluster sampling design to select a nationally representative sample of households for the population-based survey.[14] One state from within each zone was selected randomly, with probability proportional to size (PPS). Primary sampling units were then selected randomly through PPS and households selected randomly after completing a listing of the PSU. All women age 15-49 who were regular members of the household or who slept in selected households the night before were eligible for interview. The sample size is sufficient to estimate the modern contraceptive prevalence rate with less than 2% margin of error at the national level and less than 2-3% margin of error at the seven states level.[15]

Resident enumerators conducted face-to-face interviews and responses were entered into a smartphone using Open Data Kit (ODK) software.[16] The data were then submitted to a central secure cloud server to be validated and aggregated.[16] The data for this study are from the Round 5 household and female survey done in seven states in Nigeria (Kaduna, Lagos, Taraba, Kano, Rivers, Nasarawa and Anambra state between April and May 2018.

The outcome of interest was current contraceptive use; defined as whether or not the female respondent or her partner were doing something or using any method to delay or avoid getting pregnant as at the time of the study. This dependent variable was treated as a binary outcome.

The independent variables include a range of socio-economic and demographic variables, including the woman's age (categorized into five year age groups), parity (categorized into "none", "1-4", and "5 and above"), marital status (binary variable categorized as "1" if currently married or living with partner as if married, and "0" if never married, widowed, divorced or separated), highest level of formal education ("Never", "Primary", "Secondary", and "Higher than secondary"), and urban-rural residence.

Independent variables also include community influences which were assessed using two variables measuring respondent's impression of positive and negative perceptions from the community if members of the community were to become aware of their family planning use. For the positive perception variable, women were asked whether they believed that people within their community would praise, encourage, or talk favorably about them if aware of their family planning use. For the negative perception variable, women were asked whether they believed that people within their community would call them bad names or avoid their company if aware of their family planning use. Both perception variables were categorized as "Yes", "No" and "Don't Know".

Finally, the independent variable that assessed partner influence on decision to use contraception based on whether the respondent believed the decision to use or not use contraception belonged to the "Respondent only", "Husband/partner only", "Joint decision", and "Other". The "Other" variable was used for women who said their contraceptive decision was influenced by someone other than themselves or their husbands.

Exploratory data analysis was performed to understand the distribution and pattern of the outcome and independent variables included in the female respondent survey, both nationally and by state. The survey data were weighted and the distributions of the independent

variables were described in a table using simple proportion and the weighted design-based F statistic.

The Variance Inflation Factor (VIF) was used to assess collinearity among the covariates in order to increase precision in the model. The mean "vif" was 1.61 for the analysis, ruling out collinearity. Therefore all pre-selected variables were included in the regression analysis.

Bivariate analyses explored the association between the dependent variable of interest (current contraceptive use) and the independent variables. A weighted logistic regression was fit between each independent variable and the dependent variable to estimate the association between the prevalence odds ratio of contraceptive use in the population and various factors. Subsequently, a weighted multivariable logistic regression model was fit to identify correlates between contraceptive use and all independent variables. Significance was determined as a p-value less than 0.05. All analyses for this paper were conducted using Stata version 15.

Data availability and ethical clearance

A secondary data analysis of PMA2020 data was done in this study. The de-identified datasets are publicly available at www.pma2020.org. The Johns Hopkins School of Public Health Institutional Review Board determined that this project was secondary data analysis and granted approval.

RESULTS

Table 1 below shows the distribution of the independent variables among de facto female respondents. The mean age of study participants was 28.7 years. The majority of respondents (63.7%) were married, and about 82% had received at least some level of formal education. About 47% of respondents had between one and four births and more than half (57.1%) lived in urban areas. Only a third (32.7%) of respondents agreed that members of their community

would encourage them if aware of their family planning use. More than half (about 58.9%) of respondents disagreed that some people within the community would call them bad names or avoid their company if they were aware of their family planning use. About 46% of respondents said the use of contraception was mainly their decision. However a total of 44% reported that contraception decision was mainly influenced by their partner or made as a joint decision. Among women using contraception, about half of them (51.98%) reported making joint decisions with their partners concerning contraception.

Table 1: Percentage distribution of baseline characteristics of participants included in the female respondent survey and those who reported current contraceptive use

	Total No of Respondents	**Current Contraceptive Use**
Variable	N (%)	**n (%)**
Age		
15-19	2,095 (18.86)	136 (6.52)
20-24	1,800 (16.21)	372 (20.70)
25-29	2,087 (18.80)	630 (30.20)
30-34	1,667 (15.01)	490 (29.42)
35-39	1,541 (13.88)	503 (32.70)
40-44	1,162 (10.46)	335 (28.87)
45-49	754 (6.79)	216 (28.72)
Marital status		
Married	7,078 (63.73)	732 (18.22)
Not Married	4,028 (36.27)	1952 (27.58)
Highest level of education		
Never	1,94 (17.54)	184 (9.45)
Primary	1,688 (15.20)	320 (18.98)
Secondary	5,213 (46.94)	1347 (25.83)
Higher	2,256 (20.32)	834 (36.98)
Parity		
None	3,888 (35.07)	613 (15.78)
1 to 4	5,192 (46.83)	1491 (28.72)
5 and above	2,006 (18.10)	579 (28.86)
Residence		
Urban	6,345 (57.13)	847 (17.80)
Rural	4,760 (42.87)	1839 (28.98)
Positive Perception from Community if aware of FP use		
Yes	3,623 (32.76)	685 (16.03)
No	4,279 (38.69)	1377 (38.06)
Don’t Know	3,158 (28.55)	616 (19.56)
Negative Perception from Community if aware of FP use		
Yes	2,168 (19.59)	1757 (26.96)
No	6,518 (58.89)	498 (23.02)
Don’t Know	2,382 (21.52)	429 (18.05)
Main influence on decision to use a contraceptive method		
Mainly Respondent	4,487 (45.68)	564 (12.45)
Mainly Husband/Partner	1,200 (12.22)	433 (35.71)
Joint Decision	3,192 (32.50)	1676 (51.98)
Other	943 (9.60)	5 (0.56)

Table 2 below represents an unadjusted logistic regression model using bivariate analyses for the outcome variable and each independent variable. The age of respondents is statistically significant with the use of contraception at the national level, and in all study states except Taraba State.

At the national level, there was a statistically significant relationship between current use of contraceptives and other sociodemographic variables. The odds of using contraception was 1.7 times higher among married women compared to the non-married women (COR: 1.71 (1.40-2.04), and this was a statistically significant association.

The odds of using contraception were significantly higher among women who had an impression of getting positive perception from their community, if their community members were made aware of their contraceptive use, compared to women who believed otherwise. In addition, women who made contraceptive decisions jointly with their husbands had significantly higher odds of using contraception when compared to women who made sole decisions on contraceptive use [COR: 7.61 (6.23-9.29)]

Table 2: Bivariate analysis of factors associated with current contraceptive use

				Crude OR (95% CI)				
Variable	National	**Kaduna**	**Lagos**	**Taraba**	**Kano**	**Rivers**	**Nasarawa**	**Anambra**
Age	n=11,106	n=1,051	n=2,373	n=1,411	n=1,458	n=1,893	n=1,492	n=1,425
15-19	REF	REF	REF	REF	REF	REF	REF	REF
20-24	**3.74 (2.79-5.02)**	**2.26 (1.38-3.69)**	**5.28 (2.87-9.71)**	1.47 (0.50-4.24)	**20.29 (2.39-172.23)**	**5.58 (2.67-11.65)**	**3.28 (1.68-6.39)**	**4.94 (2.76-8.81)**
25-29	**6.20 (4.47-8.59)**	**4.63 (3.08-6.94)**	**7.59 (3.87-14.86)**	2.41 (0.82-7.06)	**69.58 (8.90-543.59)**	**5.86 (3.11-11.06)**	**8.73 (3.07-24.82)**	**6.23 (3.25-11.92)**
30-34	**5.97 (4.43-8.05)**	**3.51 (2.15-5.73)**	**7.91 (4.08-15.36)**	1.67 (0.71-3.91)	**50.42 (6.32-401.87)**	**5.55 (2.96-10.42)**	**6.72 (3.75-12.06)**	**6.47 (3.63-11.52)**
35-39	**6.96 (5.07-9.56)**	**4.52 (2.93-6.98)**	**8.75 (4.58-16.71)**	2.50 (0.86-7.22)	**59.80 (7.49-477.10)**	**4.95 (2.25-10.88)**	**7.50 (3.94-14.25)**	**11.65 (6.24-21.74)**
40-44	**5.82 (4.10-8.26)**	**6.98 (4.33-11.27)**	**9.13 (4.38-19.02)**	1.62 (0.62-4.21)	**41.15 (4.34-390.01)**	**4.27 (2.01-9.04)**	**8.01 (2.58-24.84)**	**6.94 (3.65-13.20)**
45-49	**5.77 (3.83-8.70)**	**3.59 (2.27-5.68)**	**9.48 (4.26-21.07)**	3.06 (0.43-21.73)	**83.63 (9.11-767.06)**	**3.29 (1.64-6.59)**	**7.73 (3.57-16.73)**	**5.23 (2,67-10.26)**
Marital status								
Not Married	REF	REF	REF	REF	REF	REF	REF	REF
Married	**1.71 (1.40-2.07)**	1.49 (0.74-2.96)	**2.40 (1.75-3.31)**	0.67 (0.31-1.45)	**83.82 (9.93-707.11)**	**1.77 (1.34-2.34)**	**2.92 (1.60-5.32)**	**2.81 (1.78-4.45)**
Highest level of school attended								
Never	REF	REF	REF	REF	REF	REF	REF	REF
Primary	**2.24 (1.49-3.36)**	1.26 (0.56-2.84)	1.98 (0.65-5.95)	1.40 (0.37-5.24)	**2.23 (1.12-4.45)**	3.01 (0.58-15.60)	1.61 (0.85-3.04)	2.32 (0.16-32.57)
Secondary	**3.33 (2.30-4.82)**	**2.17 (1.18-3.99)**	2.51 (0.67-9.37)	3.20 (0.92-11.10)	**2.75 (1.47-5.12)**	3.71 (0.64-21.28)	0.93 (0.49-1.74)	2.51 (0.18-33.49)
Higher	**5.61 (3.87-8.14)**	**3.55 (1.94-6.49)**	**4.35 (1.20-15.78)**	**9.38 (3.09-28.48)**	**5.03 (2.47-10.24)**	4.66 (0.80-27.17)	1.79 (0.94-3.39)	3.41 (0.26-44.59)
Parity								
None	REF	REF	REF	REF	**REF**	REF	REF	REF
1-4	**2.15 (1.77-2.61)**	**2.37 (1.36-4.12)**	**2.80 (2.09-3.75)**	0.65 (0.29-1.48)	**23.83 (6.32-89.80)**	**1.97 (1.46-2.67)**	**3.13 (1.51-6.46)**	**2.73 (1.73-4.33)**
5 and above	**2.16 (1.67-2.79)**	**3.00 (1.57-5..73)**	**3.85 (2.26-6.55)**	1.28 (0.36-4.45)	**23.95 (5.94-96.51)**	**2.37 (1.55-3.62)**	**5.28 (3.11-8.98)**	**6.87 (3.50-13.46)**
Residence								
Rural	REF	REF	REF	REF	**REF**	REF	REF	REF
Urban	**1.88 (1.49-2.38)**	1.00 (0.51-1.96)	N/A	1.94 (0.43-8.77)	**5.29 (2.79-10.05)**	1.17 (0.83-1.63)	0.55 (0.35-0.88)	**1.71 (1.07-2.75)**

Table 2 (continued): Bivariate analysis of factors associated with current contraceptive use

	Crude OR (95% CI)							
Variable	National	**Kaduna**	**Lagos**	**Taraba**	**Kano**	**Rivers**	**Nasarawa**	**Anambra**
Positive Perception from Community if aware of FP use								
No	REF	REF	REF	REF	REF	REF	REF	REF
Yes	**3.21 (2.53-4.08)**	2.00 (0.97-4.12)	**2.34 (1.71-3.21)**	2.59 (0.90-7.39)	**4.59 (2.16-9.79)**	**1.99 (1.25-3.17)**	**4.94 (3.17-7.70)**	**2.97 (1.83-4.82)**
Don't Know	**1.27 (1.03-1.57)**	0.59 (0.29-1.22)	1.02 (0.72-1.44)	0.49 (0.17-1.40)	0.75 (0.28-1.97)	0.96 (0.65-1.41)	*1.98 (1.34-2.92)*	0.83 (0.51-1.35)
Negative Personal Perception from Community								
No	REF	REF	REF	REF	REF	REF	REF	REF
Yes	0.81 (0.64-1.02)	1.16 (0.77-1.73)	**0.43 (0.26-0.73)**	1.74 (0.73-4.15)	0.61 (0.20-1.81)	0.75 (0.56-1.01)	0.79 (0.47-1.35)	1.17 (0.77-1.77)
Don't Know	0.59 (0.49-0.72)	0.79 (0.48-1.32)	**0.43 (0.29-0.63)**	0.37 (0.11-1.16)	0.23 (0.06-0.88)	**0.48 (0.33-0.70)**	0.74 (0.45-1.22)	**0.56 (0.41-0.75)**
Main influence on decision to use a contraceptive method								
Respondent	REF	REF	REF	REF	REF	REF	REF	REF
Husband/Partner	**3.90 (3.00-5.09)**	**2.68 (1.45-4.95)**	**4.95 (3.18-7.71)**	**4.67 (2.34-9.29)**	**3.24 (1.30-8.06)**	**3.58 (2.31-5.56)**	**8.87 (3.92-20.09)**	**6.76 (4.01-11.38)**
Joint Decision	**7.61 (6.23-9.29)**	**8.50 (4.93-14.63)**	**6.94 (5.30-9.08)**	**13.42 (6.31-28.55)**	**4.17 (1.66-10.43)**	**5.97 (3.97-9.00)**	**13.15 (6.39-27.06)**	**10.64 (6.29-18.00)**
Other	0.03 (0.01-0.15)	0.10 (0.02-0.46)	1.00	1.00	1.00	**0.11 (0.01-0.71)**	1.00	**0.07 (0.01-0.61)**

Table 3 below shows a multivariable logistic regression model with analysis of factors associated with current contraceptive use. When compared with the reference age group of 15 to 19 years, the odds of using contraception is highest (almost 3 times higher) among women in the 25-29 age group. In addition, the odds of using contraception are significantly lower among married women compared to non-married women, adjusting for other variables. The odds of using contraception is more than 4 times higher among women who had higher than secondary education when compared with the women who had never had formal education, after adjusting for other explanatory variables included in the model[AOR: 4.74 (3.25-6.91)].

Table 3: Factors associated with current use of contraceptives at National and state level using multivariable analysis

	Adjusted OR (95% CI)							
Variable	**National**	**Kaduna**	**Lagos**	**Taraba**	**Kano**	**Rivers**	**Nasarawa**	**Anambra**
Age	**n=11,106**	**n=1,051**	n=2,373	n=1,411	n=1,458	n=1,893	n=1,492	n=1,425
15-19	REF	REF	REF	REF	REF	REF	REF	REF
20-24	**2.28 (1.76-2.95)**	1.12 (0.74-1.72)	**2.42 (1.35-4.38)**	1.40 (0.85-2.29)	1.99 (0.18-21.29)	**3.36 (1.79-6.31)**	**2.34 (1.16-4.70)**	**2.63 (1.58-4.39)**
25-29	**2.93 (2.17-3.95)**	**2.41 (1.48-3.91)**	**2.98 (1.44-6.17)**	**3.13 (1.68-5.82)**	3.16 (0.32-30.47)	**2.28 (1.22-4.27)**	**3.84 (1.49-9.87)**	**2.77 (1.45-5.29)**
30-34	**2.37 (1.76-3.19)**	1.17 (0.59-2.31)	**2.56 (1.16-5.65)**	**2.72 (1.12-6.66)**	2.52 (0.22-27.88)	1.84 (0.94-3.57)	**2.45 (1.06-5.64)**	1.49 (0.77-2.87)
35-39	**2.67 (1.84-3.86)**	1.55 (0.78-3.06)	**2.69 (1.11-6.51)**	2.40 (0.52-11.01)	2.61 (0.25-26.79)	1.23 (0.54-2.79)	2.85 (0.92-8.86)	**2.57 (1.15-5.73)**
40-44	**2.30 (1.58-3.34)**	**2.76 (1.42-5.35)**	**2.46 (1.09-5.55)**	1.44 (0.35-5.71)	1.85 (0.18-19.28)	1.24 (0.67-2.27)	2.35 (0.67-8.23)	1.43 (0.64-3.16)
45-49	**2.33 (1.52-3.56)**	0.66 (0.24-1.85)	**2.84 (1.15-6.96)**	3.95 (0.72-21.65)	3.26 (0.29-36.05)	1.11 (0.55-2.21)	2.75 (0.84-8.97)	0.82 (0.42-1.63)
Marital status								
Not Married	REF	REF	REF	REF	REF	REF	REF	REF
Married	**0.48 (0.37-0.63)**	0.61 (0.32-1.19)	0.45 (0.27-0.76)	0.26 (0.09-0.79)	16.17 (1.89-138.16	0.58 (0.34-0.97)	0.51 (0.23-1.12)	0.34 (0.14-0.79)
Highest level of school attended								
Never	**REF**	REF	REF	REF	REF	REF	REF	REF
Primary	**2.35 (1.55-3.57)**	1.54 (0.84-2.84)	2.11 (0.61-7.26)	1.30 (0.29-6.01)	1.72 (0.75-3.92)	1.70 (0.39-7.38)	1.58 (0.88-2.84)	0.42 (0.02-8.19)
Secondary	**4.31 (2.98-6.23)**	**3.09 (1.99-4.79)**	3.74 (0.87-16.04)	**2.64 (1.11-6.27)**	**3.57 (1.27-10.01)**	2.20 (0.54-8.88)	1.13 (0.69-1.83)	0.87 (0.04-15.47)
Higher	**4.74 (3.25-6.91)**	**4.01 (2.56-6.27)**	**4.40 (1.10-17.59)**	**5.91 (2.19-15.95)**	**4.12 (1.44-11.76)**	1.96 (0.48-8.05)	1.75 (0.88-3.49)	0.94 (0.05-16.28)
Parity								
None	REF	REF	REF	REF	REF	REF	REF	REF
1-4	**1.59 (1.23-2.05)**	**2.11 (1.15-3.87)**	**2.15 (1.27-3.63)**	0.74 (0.28-6.01)	3.99 (0.66-24.03)	**1.66 (1.07-2.59)**	1.01 (0.60-1.71)	**2.99 (1.34-6.65)**
5 and above	**2.99 (2.14-4.18)**	**3.56 (1.87-6.76)**	**4.31 (2.22-8.37)**	2.40 (0.73-7.92)	6.20 (0.8-47.95)	**3.26 (1.58-6.73)**	**2.61 (1.22-5.58)**	**11.33 (4.53-28.34)**
Residence								
Rural	REF	REF	REF	REF	REF	REF	REF	REF
Urban	1.20 (0.95-1.52)	0.95 (0.55-1.69)	1.00	0.67 (0.26-1.72)	6.20 (0.80-47.95)	1.21 (0.79-1.86)	0.42 (0.24-0.70)	1.57 (0.86-2.85)

Table 3 (continued): Factors associated with current use of contraceptives at National and state level using multivariable analysis

	Adjusted OR (95% CI)							
Variable	**National**	**Kaduna**	**Lagos**	**Taraba**	**Kano**	**Rivers**	**Nasarawa**	**Anambra**
Positive Perception from Community if aware of FP use								
No	REF	REF	REF	REF	REF	REF	REF	REF
Yes	**2.16 (1.75-2.67)**	1.25 (0.74-2.12)	**1.87 (1.33-2.62)**	**2.72 (1.37-5.42)**	**2.46 (1.35-4.49)**	**1.76 (1.09-2.83)**	**3.41 (1.84-6.31)**	**2.28 (1.39-3.75)**
Don't Know	**1.30 (1.04-1.63)**	0.58 (0.30-1.07)	1.11 (0.71-1.75)	**1.77 (0.43-7.37)**	0.79 (0.31-2.02)	1.31 (0.91-1.89)	**2.17 (1.23-3.81)**	0.96 (0.53-1.74)
Negative Personal Perception from Community								
No	REF	REF	REF	REF	REF	REF	REF	REF
Yes	0.90 (0.73-1.13)	1.21 (0.85-1.70)	0.59 (0.33-1.07)	1.07 (0.58-1.99)	0.62 (0.19-1.95)	0.87 (0.59-1.28)	0.68 (0.39-1.19)	1.38 (0.74-2.56)
Don't Know	**0.72 (0.58-0.89)**	1.01 (0.66-1.58)	0.65 (0.39-1.09)	0.43 (0.12-1.54)	0.29 (0.08-1.05)	**0.55 (0.39-0.78)**	0.74 (0.44-1.26)	1.11 (0.68-1.81)
Main influence on decision to use a contraceptive method								
Mainly Responde	REF	REF	REF	REF	REF	REF	REF	REF
Husband/Partne	**4.43 (3.34-5.89)**	**2.83 (1.51-5.29)**	**5.10 (3.14-8.30)**	**8.93 (4.15-19.20**	2.55 (0.69-9.31)	**3.54 (2.16-5.78)**	**9.89 (3.78-25.85)**	**5.85 (2.95-11.61)**
Joint Decision	**7.13 (5.62-9.03)**	**7.55 (3.55-16.05)**	**6.07 (4.37-8.43)**	**18.55 (7.25-47.4**	**4.72 (1.53-14.59)**	**5.73 (3.55-9.25)**	**11.51 (5.20-25.47)**	**10.17 (5.56-18.60)**
Other	**0.04 (0.01-0.19)**	**0.08 (0.01-0.41)**	1.00	1.00	1.00	**0.12 (0.01-0.92)**	1.00	**0.08 (0.01-0.60)**

As shown in Table 3, a significant association was found between respondents' awareness of positive community perception and current use of contraception. At the national level, women who believed that they would get positive perception from the community if aware of their family planning use were about 2 times more likely to use contraception than women who believed otherwise. [AOR: 2.16 (1.75-2.67)]. This is similar to the association in all study states except Kaduna where the association is not statistically significant.

When adjusted for other variables in the multivariable model, women who believed that the community would think poorly of them if aware of their family planning use were less likely to use contraception than women who believed otherwise. However, this association is not significant at the national level [AOR: 0.90 (0.73-1.13)] and at all state levels.

Finally, there was a significant association between use of contraception and the main decision maker for contraceptive use. Table 3 shows that for women whose husbands/partners were the main decision makers for their contraception use, they were about 4 times more likely to use contraception compared to women who made sole decisions. [AOR: 4.43 (3.34-5.89). Women who made their contraceptive decisions jointly with their husbands/partners were more than 7 times as likely to use contraception, compared to women who made sole decisions [AOR: 7.13 (5.62-9.03)], adjusting for all other variables in the model. Similarly, at all seven state levels, there was a significantly higher odds of using contraception among women whose husbands or partner mainly made the contraceptive decision and those who made contraceptive decisions jointly with their husbands/partners.

DISCUSSION

The contraceptive prevalence in Nigeria is low, despite the high unmet need among sexually active women.[17] This population based survey therefore investigated the individual, partner and community factors that influence the utilization of family planning methods among reproductive aged women in Nigeria. While many previous studies have focused mainly on individual factors associated with contraceptive use, this study also explored the association between contraceptive use and the influence of male partners and community perceptions.

About 26% of women in this study were using a form of contraception. This rate is higher than the contraceptive prevalence rate of 24.2% among reproductive aged women in Nigeria in 2018; this indicates that Nigeria is making significant progress towards increasing its contraceptive prevalence rate.[8] Although there is an increase in the contraceptive prevalence, the rate in this study is lower than the 2018 target of 36% set by the Federal Government of Nigeria.[18]

Contraceptive use is lowest among women aged 15-19 years, and the peak of contraceptive use is among women aged 25-29 years. However there is a low rate of use among women who are 40 years and above. These findings are similar to the national trend of contraceptive use by age in Nigeria, as seen in the Nigeria Demographic Health Survey (DHS, 2013).[17] Although women with advanced reproductive age have a higher risk for adverse pregnancy outcomes with unintended pregnancies and childbirth, they had low contraceptive prevalence. Previous studies in Nigeria showed that maternal education, household wealth and geographic region had a significant influence on contraceptive use among women with advanced reproductive age.[19] However, there is paucity of research done in Nigeria to support the reasons for this trend.

This study showed that married women (in the unadjusted model) were 1.7 times more likely

to use contraception than women who were not married. This could be because married women are possibly more likely to be sexually active when compared to the not married group, and hence have a higher need for contraception.[20] However, after adjusting for other variables in the model, married women were 52% less likely to use contraception when compared to the non-married women. This is in keeping with findings from previous studies in Nigeria, which showed that married women had lower odds of using contraceptive when compared to non-married women, after controlling for other variables.[21, 22]

Studies have shown that unmarried women in countries like Nigeria usually have a stronger desire to avoid getting pregnant.[21] However, despite more sporadic sexual activity among unmarried youths in Nigeria, they usually have a higher prevalence of contraceptive use compared with married women.[21,23.] Furthermore, women who are unmarried are more likely to negotiate contraceptive use with their partners, when compared to married women.[24] Formal education among women was significantly associated with the use of contraception in this study. This supports existing evidence, which showed that women with formal education had significantly higher odds of contraceptive use compared to women with no formal education.[25-27.]

In this study, parity was significantly associated with contraceptive use, and women with 5 or more children were about 3 times more likely to use contraception compared to women who had never given birth. The total fertility rate in Nigeria is 5.5, therefore many women are likely to have completed their family after the 5th child, hence the reason for a higher rate of contraceptive use in that period.[28]

Findings from this study also showed that awareness of both positive and negative perceptions of family planning usage from community members were significantly associated with the use of family planning. Women who believed they would receive a positive reaction

from their community were more likely to use family planning, while women who believed they would receive a negative reaction from their community were less likely to use contraception. However, when adjusted for other variables in the multivariable model, the association between contraceptive use and negative community perception is not significant. This could be because the positive and negative perception variables were measuring similar concepts of perceptions from the community with regards to family planning usage.

Previous studies have explored the association of community influences on the use of contraception. A cross-sectional multi-country analysis study done on several countries including Nigeria by Mutumba and colleagues showed that young women who were living in communities with a higher age at first marriage, higher educational attainment of women, greater autonomy in making household decisions, and those living in wealthier communities were more likely to use modern contraceptive methods when compared to women who had contrasting community characteristics.[29] Another study done by Stephenson and colleagues showed that community characteristics were strongly associated with the choice of contraceptive methods among women.[12]

However these studies have focused more on the sociodemographic characteristics of the communities and there is a dearth of research on positive and negative perceptions of the community with regards to family planning in Nigeria. Community perceptions could be associated with cultural beliefs and knowledge on contraception. Therefore, family planning interventions in Nigeria should include community based programs aimed at improving knowledge and awareness of contraception in the community.[9]

Over half of respondents using family planning reported joint decision making with their husbands/partners regarding contraceptive use. This is similar to the findings by Orach et al in a study done in Northern Uganda, where the majority of study participants (71%) also

stated joint decision making for contraceptive use.[30 (32)] The women who made joint decisions with their partners and those whose partners alone mainly made contraceptive decision were more likely to use contraception compared to women who were solely responsible for their contraceptive decision.

These findings are also similar to previous studies done in Nigeria, which found that men's support for contraceptives was significantly associated with the woman's desire for contraceptive use.[9,11, 31] The cultural norms in Nigeria and many other Sub-Saharan African countries support men in having the dominant role in decision making, including fertility decisions.[32] These findings support the need for an emphasis on male partner involvement in the design of interventions to increase family planning utilization in Nigeria.

STRENGTHS AND LIMITATIONS

One of the strengths of this study is that it is drawn from a national sample of women, making it nationally representative. Hence findings from this study could be extrapolated in the design of national family planning policies and programs in Nigeria.

However, this study is not without limitations. A significant percentage of the respondents did not know what the reaction of their community members would be if aware of their family planning use. This could mean that the women truly did not know what their community perception for family planning would be, and it could also be a form of respondent bias. In addition, it could be because the quality of the question was not good enough, and the women did not just understand or have a good conceptualization of the question. Another limitation of this study was the cross-sectional design of the study which would limit the establishment of causality. However these limitations are not sufficient to mitigate the findings of this study.

CONCLUSION & RECOMMENDATIONS

In conclusion, the use of any contraception method is low among women in Nigeria. There are various factors that are associated with contraceptive use. This study found a significant association between use of contraception and socio-demographic factors (Age, Education, Parity, Marital status and Urban/Rural residence). One recommendation is to improve school attendance and educational empowerment of women. Women with higher levels of education are more likely to use family planning.

This study also showed that community factors (positive and negative perception from community members if aware of family planning) were significantly associated with the use of contraception. Community based interventions such as educational and mass media campaigns should be employed to reach out to members of the community. This would help to create awareness and positive perceptions on family planning in the community, which would in turn support increased utilization. However, further research still needs to be done to explore the extent of the association between community perception and family planning use in Nigeria.

Finally, based on the significant association between male partner influence and contraceptive use, male partner involvement should be prioritized in the design of family planning policies and programs in Nigeria. Sensitization of men on the importance of communication and support for contraceptive use with their partners should be done.

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