Maternal Health Care Services Access Index, Family Planning Awareness Programmes and Modern Contraceptive Use among women with no Fertility Intention in Nigeria

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Abstract

Background

Nigeria is among nations experiencing accelerated growth rate world-wide, but its modern contraceptive prevalence rate is low. There are physical barriers to accessing Family Planning (FP) services in Nigeria. We examined the relationship between Maternal Healthcare Services Access Index (MHSAI), FP awareness programmes and modern contraception in Nigeria.

Method

NDHS 2013 data-set was used with focus on weighted sample of women of reproductive age who had no fertility intention *(n=3203)*. Data were analysed using multinomial logit regression models (α=0.05).

Results

Respondents' mean age, number of surviving children and MHSAI was 31.7±7.6, 4.0±7.2 and 7.3±4.0 respectively. MHSAI, FP media exposure, health facility visit and home visit by FP worker were found to be among the important predictors of modern contraceptive use (p<0.05). Others were; age, education, region and number of living children. Lower level of MHSAI inhibits the use of short or long term modern contraceptive method. The likelihood of the use of either long term or short term FP method was higher among women with higher FP media exposure, those that were visited at their homes by FP worker and women who received FP information during their visits to health facility in the last one year (p<0.05).These patterns were persistent when other important factors were used as control.

Conclusion

Access to maternal health care services and FP information increased the use of short or long term modern contraceptive in Nigeria. Therefore, women should optimize the use of maternal health care services as this will promote FP uptake in Nigeria.

Keywords: Maternal health, Modern contraceptive, Fertility intention, Nigeria

Background

Nigeria is the most populous black nation and among countries having high fertility rate world-wide [1]. Its modern contraceptive prevalence rate of 10.0% is considered as low [2]. In any nation, fertility remains one of the key components of population dynamics and socioeconomic development but it is a problem if not controlled. In the absence of effective contraception, coital frequency may have strong influence on the conception probability. Therefore, the consistent reported low level of contraception among women in Nigeria in the past three decades is worrisome despite Government efforts towards ensuring that its accelerated population growth rate is brought down to bearable minimum while some of her reproductive health needs are met. In 2011, the Federal Government of Nigeria in its commitment towards the attainment of the Millennium Development Goals (MDGs) themes mandated Federal Ministry of Health to distribute free contraceptives and other family planning programmes to all states of the federation. Also, previous studies in Nigeria revealed that ability and willingness to pay for contraceptives have influence on contraceptive use and that if cost barriers are removed, access to and use of contraceptives will improve[3,4]. Thus, the Nigeria government intensifies efforts on access to contraceptives and increased its responsibility on reproductive health programmes [5]. Part of the efforts includes creating family planning awareness programmes on media and assigning family health workers to the communities to sensitize families on the need for family planning uptake.

However, differential in access to family planning information and services have been reported by previous studies in Nigeria [2,6,7]. This has led to disparity in the use of modern contraceptives among different categories of women in Nigeria. Unfortunately, there is paucity of information on the relationship between family planning awareness programmes, Maternal Healthcare Services Access Index (MHSAI) and modern contraceptive use among women with no fertility intention in Nigeria. The current study was therefore designed to fill the gap. The focus on women with no fertility intention becomes important as such women either intend to limit or stop or postpone childbearing. Reasons for decision to stop or postpone childbearing are: educational advancement, already had desired family size, employment opportunities and economic harsh condition among others [8,9]. The expectation is that women with no fertility intention should be doing something to prevent unwanted pregnancies. Non-use of modern contraceptive results in unplanned pregnancies and this is one of the major causes of short birth spacing, unsafe abortion, maternal and child death [10, 11]. Studies in Nigeria have shown that about a third of pregnancies are not wanted and half of the women who have unintended pregnancy experience pregnancy related complications, unsafe abortion and one in 176 women dies from pregnancy related cases [2,12]. A woman's ability to space and limit her pregnancies has unswerving impact on her health, well-being, pregnancy's outcome and the family. For instance, [13] found increased risks of uterine rupture in women wanting to have a vaginal delivery after previous caesarean delivery and uteroplacental bleeding disorders are results of short inter-pregnancy intervals. The hazards associated with unwanted pregnancies have become a public health concern in many countries and in Nigeria today.

In Nigeria, there are physical barriers to accessing care within the health system [2]. Studies have found less utilization of health facilities among pregnant women as an important determinant of modern contraceptive use [14,15]. Antenatal care of at least four visits ensures optimal health outcomes for the mother and her baby [16]. If such care is provided by a skilled

health worker, it enables; uptake of tetanus toxoid injections, early detection of complications and timely treatment, disease prevention through immunisation and micronutrient supplementation. It also enhances birth preparedness, utilization of skilled attendant during delivery and counselling for pregnant women. It is known that family planning information are packaged as part of antenatal services in modern health facility but variation often exists in the women access to such services [17]. We therefore combined all the five indices of maternal health care services (antenatal visit, antenatal attendance, tetanus injection during pregnancy, place of delivery, and birth attendance) and generated a composite index which was disaggregated into low, medium and high. Other important independent variables used in this study are family planning media exposure, visit to health facility and home visit by family planning worker. Provision of these information has tendency to override strong cultural believes and practices that are against family planning in Nigeria. More importantly, it also has influence on women decision on choices of contraceptive method whether long acting/permanent (such as tubal ligation, vasectomy, implant, intra uterine devices) or short term method which are injectables, pills, patch, vagina ring, male condoms, female condoms, diaphragm and spermicides [18-20].

The socio-demographic factors such as age, gender preference, region, religion, education, ethnicity e.t.c influencing contraceptive use or choices are well established in the literature [15,21]. Contraceptive use is also a result of ample variety of health and environmental factors [22]. Aside these factors, the percentage of women who are using modern contraceptive can be increased if women adequately utilize modern health facility during pregnancy and also if family planning information are communicated at community level [23]. Against the backdrop of limited research on health care services utilization, family planning information and contraceptive use in Nigeria, we envisaged that the objectives of this study will provide additional contribution to utilization of modern contraceptive strategies in Nigeria. The main questions are: Is there independent and joint relationship between MHSAI, family planning media exposure, visit to health facility and home visit by family planning workers on the use of short and long term modern contraceptive methods? Does the established relationship persist in the midst of demographic and socio-economic factors? Thus, the objectives of this study will provide answers to the above questions.

Method
Study area:
The study was conducted in Nigeria, sub-Saharan Africa. The country is categorized as a developing nation and still regarded as poor with greater proportion of the population living on less than $1 per day [1]. In 2006, Nigeria has a population figure of above 140 million and about 24.9% of the population are women of childbearing age, its population growth rate is 3.0% per annum and the population doubling time is 23 years [24]. The health system in Nigeria consists of three arms which are; primary, secondary and tertiary. Virtually in all these institutions, family planning services are available but the services are poor. The literacy level is low and the cultural and traditional African cultures are persistent among all ethnic groups and social class in the country. Child marriage practice is still common among some parts of Nigeria and the median age at first marriage for women is 18.1 years [2]. The mean age at first sexual intercourse is lower than 18 years and teenage pregnancy is high in Nigeria [2].

Study design:

The cross-sectional 2013 NDHS dataset was used. A stratified three-stage cluster design consisting of 904 clusters (urban=372 and rural=532) was employed during the data collection and representative samples were selected from the six geopolitical zones in Nigeria. The sample was designed in such a way as to provide data that can be analysed on social and health related issues for planning and policy making. The study focused on women of reproductive age (15-49 years); who had life delivery in the last 12 months before the survey, not currently pregnant, sexually active in the last 4 weeks prior the survey, fecund and either want to space or limit childbearing (n=3203 (weighted sample)).

The dependent variable was current use of contraceptive and its indicators are: not using=0, using traditional method=1, using short term modern method=2, using long-acting/permanent method=3. However, the short and long term modern methods were further merged as modern method.

Main independent variables
 a. Maternal healthcare services access index
   This was computed by scoring the responses of individual woman to question on; number of antenatal visits (None=0, 1-3=1, ≥4=2), antenatal attendance (None=0, Traditional birth attendance=1, Unskilled health workers=2, Skilled professionals=3), required number of tetanus injection during pregnancy (No=0, Yes=1), place of delivery (Home=0, Others=1, Modern health facility=2), and birth attendance (None=0, Traditional birth attendance=1, Unskilled health workers=2, Skilled professionals=3), thus, producing maximum and minimum score 11 and 0 respectively. Thereafter, the overall score was disaggregated into three categories based on the percentage x of the total score (Low ($x=0\% \leq x < 50\%$), Medium ($50\% \leq x < 75\%$), High ($75\% \leq x \leq 100\%$)).

 b. Family planning media exposure
   This was generated from the questions on exposure of the respondents to family planning information on one or more of media sources such as; radio, television, newspaper, poster, town-crier, leave-lets and brochure, public announcement. Exposure to each of these forms of family planning exposure attracts 1-point and 0 if otherwise, thus producing the overall score of 7-points. The overall score was further broken into three segments, namely; low (≤3), medium (4-5) and high (6-7).

 c. Health facility visit with family planning information received
   Two questions were used to generate the indicators of this variable. These are; (i) visited health facility in the last 12 months (Yes or No), (ii) at the health facility, were you told of family planning (Yes or No). The two variables were merged as one and recoded as: Not visited health facility in the last 12 months=0, Visited health facility without receiving family planning information=1, Visited health facility and received family planning information=2).

 d. Family planning worker visit
   The questionnaire for the survey elicited information on whether the respondents have been visited by family planning worker at any time in the last 12 months prior the survey. The

response was simply "Yes" for those who have been visited by the family planning worker during the period and "No" if otherwise.

Other independent variables
Other independent variables include; demographic (age, number of living children, sex composition of the living children and partner's age difference) and socio-economic (education, region, religion, residence, ethnicity, women empowerment, wealth index, partner's level of education, family type and number of union).

Analysis Method
Data were analysed using Chi-square and Multinomial Logit Regression Model (MLRM) ($\alpha=0.05$). The MLRM is a series of linked logits and is essentially the discrete-time analogue to situations in which units are at risk for different types of events. For instance, in this study, the dependent variable was coded 0, 1, 2, 3. Where the numbers indicate different types of contraceptive method currently used as illustrated below:

Contraceptive type currently used	Not using=0	Traditional method=1	Short term modern method=2	long term method=3
Not using=0	0,0	0,1	0,2←	0,3←
Traditional method=1	1,0	1,1	1,2←	1,3←
Other modern method=2	2,0	2,1	2,2	2,3←
Long-acting method=3	3,0	3,1	3,2	3,3

Arrows indicate target indicators

Contraceptive type currently used	Not using=0	Traditional method=1	Any modern method=7
Not using=0	0,0	0,1	0,7←
Traditional method=1	1,0	1,1	1,7←
Any Modern method=7	7,0	7,1	7,7

Arrows indicate target indicators

We had to recode the dependent variable in each of these separate logits so that they were 0s or 1s. Nevertheless, these separate logits was able to generate the same results as the MLRM where we do everything all at once. The disparity is that the MLRM is more efficient thus yielding smaller standard errors since the MLRM uses all the observations whereas the separate logits have fewer observations because cases that are not relevant to the relationship were dropped.

The MLRM was motivated using a pure probability model setup. The dependent variable has j=4 nominal events. Let P_{in} be the probability that unit i. experiences event m. Assume that P_{in} is a function of the linear combination, $\alpha_i \xi_n$. The set up for the standard MLRM is $P_{in} = \frac{e^{\alpha_i \xi_n}}{\sum_{j=1}^{J} e^{\alpha_i \xi_j}}$. To put this model in the duration context, we would say that the hazard probability for unit i experiencing event n is given by: $\lambda_{in} = \frac{e^{\alpha_i \xi_n}}{\sum_{k=1}^{n} e^{\alpha_i \xi_k}}$. Where n is once again the set of all possible events and n refers to the nth type of event. In this study, the dependent variable has four categories. Therefore;

$$\lambda_{in} = \frac{e^{\alpha_i \xi_n}}{e^{\alpha_0 \xi_0} + e^{\alpha_1 \xi_1} + e^{\alpha_2 \xi_2} + e^{\alpha_3 \xi_3}}$$

Then, the multinomial logit regression was used to generate models for:
    a. Not using any method against using short term modern methods
    b. Not using any method against using long term modern methods
    c. Not using any method against using any modern methods
    d. Traditional method against using short term modern methods
    e. Traditional method against using long term modern methods
    f. Traditional method against using any modern methods
    g. Short term modern method against using long term modern methods

Results

The data as shown in figure 1 reveals that the percentage of women currently using modern contraceptive method increases with increasing level of Maternal Healthcare Services Access Index (MHSAI). The women in the high MHSAI category constituted the highest proportion of women who are currently using injections (14.7%), pill (9.2%), Condom (9.8%) and IUD (5.1%). Only 1.0% and 0.1% of women in low MHSAI are currently using condom and IUD respectively.

[Figure 1 is here]

The line-graphs in figure 2 show that higher MHSAI scores were observed by women using modern contraceptive method (mean=9.7 (σ=1.6)), while the converse was observed among their counterparts in low MHSAI group. For all the studied women, the mean MHSAI was 7.3 (σ=4.0).

[Figure 2 is here]

Table 1 depicts the percentage distribution of women by contraceptive use type according to demographic and socio-economic characteristics. The mean age of the women was 31.7 (σ=7.6) years and women who are currently using long acting/permanent contraceptive method are older (33.5 (σ=5.9)) than those using either traditional (32.8 (σ=7.4)) or short term (32.1 (σ=6.6)) or not using any (31.1 (σ=8.1)) methods. Majority of women who are using any contraceptive method are currently using short term methods. About 24.1% and 4.1% are currently using short term and long term methods respectively. The use of short and long term methods was more common among women aged 30-34 and 35-39 years than any other age segments. In particular, modern contraceptive use was found to be the least among women at the two extreme age groups 15-24 and 40-49 years. Women who reside in the urban areas showed tendencies of higher use of short term (30.7%) and long term (7.3%) modern contraceptive methods than their counterparts in the rural areas (short term=19.2% and long term=1.8%). The data further showed that the percentage of women who had 3-4 living children at the time of the survey and are using short term (26.5%) and long term (4.1%) method was higher than those with 0-2 and at least 5 living children. It is worrisome that the mean number of surviving children was significantly higher among women who are not using any method than women who are either using traditional, short term and long term method.

Differences also exist in the use of short and long term contraceptive methods across the six geopolitical zones in Nigeria, with highest and least level of use of short term modern method found among women in the South West (43.1%) and North West (10.2%) respectively. However, the use of long term contraceptive method was strikingly lower among women in the North East (0.8%) and South South (0.9%) compared to women in South West (8.8%). The percentage of women who are currently using short term and long term methods increases consistently with increasing level of education. For instance, 6.1% and 31.0% of women with no formal and higher education were using short term methods respectively and for long term, it was 1.1% against 12.2%. Similar pattern was observed for wealth index and partners' level of education. Also, significant higher prevalence of the use of short and long term contraceptive methods was found among Christians than Muslims. Across the three major ethnic groups in Nigeria, the percentage of Yoruba (46.5% and 9.4%) women who are currently using short and long term method was higher than that of Igbo (22.3% and 6.0%) and Hausa (5.2% and 0.8%).

[Table 1 is here]

In Table 2, the data showed that the percentage of women who are currently using modern contraceptive method (both short and long term) increases with increasing level of family planning exposure. For example, 16.7% and 1.8% of women who had low family planning exposure are currently using short and long term contraceptive methods respectively compared with 39.7% (short term) and 10.7% (long term) of women in high family planning exposure group. This pattern was also found for maternal health care services access index. Current use of short and long term modern contraceptive was found to be higher among women who had visited health facility at any time in the last 1 year before the survey, particularly among women who received family planning information at the facility than those who had not visited the facility during the same period. As part of the family planning programmes instituted by government and non-governmental organisations across Nigeria, the community health workers who are family planning workers are employed to visit households and provide family planning information at the community level. Our finding shows that the proportion of women who are currently using either short term or long term methods was higher among women who were visited by family planning worker than those who had not experienced such visits.

[Table2 is here]

Multivariate analysis
The results of the multinomial logit regression analysis were presented on Table 3. The unadjusted logit regression models revealed that the women categorized as having medium and high MHSAI were more likely to currently use any modern, short term and long term contraceptive methods than those in low group. The data also reveal increasing odd ratio of current use of modern contraceptive with increasing level of maternal health care services access index and family planning media exposure. Having visited health facility in the last 1 year with family planning information received was found to promote the use of modern contraceptive method. In addition, across all the models, the likelihood of current use of either short term or long term or any modern method was found to be higher among women visited by family planning worker in the last 1 year than women who were not visited. For instance, in model 1a, women who were visited by family planning worker in the last 1 year prior to the survey had higher odds (4.51 times) of using modern contraceptive methods relative to those

that were not visited by any FP worker. In the adjusted multinomial logit regression model, the patterns observed in all the models were similar to what was obtained in the unadjusted model despite the interactions between all the four key independent variables. However, there was reduction in the risk level across all the models when the variables were introduced jointly into the multinomial logit regression model.

[Table 3 is here]

As presented in Table 4, all the key independent variables were imputed into the logit regression model simultaneously with the socio-economic and demographic variables used as control. The data revealed that maternal healthcare access index and the family planning awareness programmes variables were found to be important determinants of modern contraceptive use (any modern, short term and long term). Using socio-demographic variables as control, a little influence on the pattern of odds ratios was observed for maternal healthcare access index, family planning media exposure, visited health facility in the last 1 year with family planning information received and visited by family planning worker in the last 1 year as shown in the second panel of Table 3. As an example, relative to women who are not using any method, the odds of using any modern method was statistically significantly higher (2.10, $p < 0.001$) and (2.38 $p < 0.001$) among women in the medium and high maternal healthcare access index respectively than those in the low. Also, being in the medium (O.R=4.82, $p < 0.05$) and high (O.R=7.73, $p < 0.01$) MHSAI strikingly promotes the use of long acting method compared to women in low category. It is important to know that when women using short term method were used as reference to those using long acting method, women in high MHSAI group were 4.21($p < 0.05$) times more likely to use long acting contraceptive method than their counterparts in low category.

The identified predictors of current use of any modern contraceptive method and short term method when women who were not using any method were used as reference are: MHSAI, family planning media exposure, visited health facility in the last 1 year with family planning information received, visited by family planning worker in the last 1 year, age, number of living children, region, education, wealth index, religion and ethnicity. However, when women who were using traditional method were used as reference, the predictors of current use of modern contraceptive method are: MHSAI, visited by family planning worker in the last 1 year, age, region and education. As for the use of the long term method when women who were not using any method were used as reference, the predictors are: MHSAI x, family planning media exposure, number of living children, region and ethnicity.

[Table 4 is here]

Discussion
Family planning allows individuals and couples to anticipate and accomplish the number of children they desire to have and the spacing and timing of their births [25]. The knowledge of family planning is almost 100% among men and women of reproductive age in Nigeria but poor utilization has been consistently reported in previous studies [2]. At different times, Nigeria Government has put in place different family planning programmes at the health facility and community aimed at raising the level of contraceptive use in Nigeria.

Unfortunately, many sexually active and fecund women with no fertility intention have unmet need for modern contraceptive [26]. Lack of access to family planning by such women predisposes them to unintended pregnancy particularly in a country where abortion is not legalized. We therefore investigated the relationship between maternal health care services access index, family planning information services and modern contraceptive use. The study is imperative to fill the gap in knowledge on the influence of the independent and interactive effect of these variables on modern contraceptive use among women with no fertility intention in Nigeria.The study's outcome has implication on population growth rate, maternal and child health.

The mean age 31.7 ± 7.6 years reported by the women is expected since the studied women have begun childbearing and some of them have completed their family size. It is a rare situation in Nigeria to see a woman who would not want to bear any children. Also, those who intend to space would have had at least one child before making such decision. This is particularly due to cultural and social demands for children among others and the practice is common to all ethnic groups across Nigeria. In this study, we found that women who are currently using long term contraceptive method are older than their counterparts using short term method. This outcome is consistent with the study conducted in other parts of sub-Saharan Africa countries [7]. The possible reason for our finding is that higher proportion of older women comprises of those who would like to stop other than space childbearing, whereas, the reverse is the case for younger women.

Maternal healthcare services access index was found to be strongly linked with modern contraceptive use. Lower level of MHSAI inhibits the use of either short term or long term modern contraceptive method. This pattern persists when access to family planning information and other socio-demographic variables were used as control. Although, there is dearth of documented information on the relationship between MHSAI and modern contraceptive use, our finding points to the need for incorporating family planning information into the antenatal, delivery and post-natal services at health facility in Nigeria.

Information is the power of knowledge and awareness leads to practice [28]. Constant exposure to family planning information on one or more of radio, television, newspaper, poster, town-crier, leave-lets and brochure, public announcement can discredit the influence of some cultural instincts on the use of modern contraceptive. In this study, the likelihood of the use of either short or long term or any modern method increases as the level of exposure to family planning information on media increases. In addition, having attended health facility in the last one year prior to the survey with family planning information received promotes current use of modern contraceptive methods. Counselling received from family planning workers on the implications of high birth frequency and advantages of child spacing or small family size during such visits can account for the difference [29]. Information received during the visit can override the bad perception and orientation of some women on the use of long term methods. These findings corroborate the outcome of previous studies conducted in United States of America and Italy [30-32].

Home visit by health workers is known to improve attitude and practice of individuals or couples or families on some health issues [33]. It can quash some of cultural believes and norms peculiar to African traditional system. In case of family planning, such visits may provide avenue to reach out to male partners, in-laws, religious leaders and other opinion leaders in the community who have strong influence on the decision to use modern contraceptive particularly the long acting method. Our study revealed that the likelihood of current use of either short or long term contraceptive method was higher among women who had been visited by family planning worker in the last one year before the survey than those not visited. This is in line with the study conducted in Ethiopia where mothers who had frequent household visits by health extension workers were more likely to visit the health posts than mothers who did not get frequent visits [33].

One of the constraints of fertility reduction in developing countries regarding the use of long term contraceptive method is the fear of side effect, in particular, the irreversible nature of some of the methods [23,34-36]. For instance, a young woman who has completed her desired family size would prefer to use the short term method that is reversible and not hormonal [37,38]. The perception and fear that she might not be able to replace her children in case of mortality or bear another child in case of re-marriage will often guide her choice of contraceptive method. In this study, across socio-cultural groups of women, the majority are currently using short term methods. Lower prevalence of modern contraceptive found among women in age groups 15-24 and 40-49 years than those in age range 25-39 years may not be the true likely state in any nation. While majority of married women in age group 15-24 years are expected to be actively involved in childbearing activities which could limit their use of contraceptive, the reason for the finding among those in age group 40-49 years may not be justifiable. This is because majority of such women ordinarily should have completed their family size bearing in mind that menopausal and infecund women were excluded from this study.

Among the studied women, higher use of modern contraceptive method was found among Christians than Muslims, higher than lower level of education, higher than lower wealth quintile, among Yorubas than other ethnic diversities. The patterns of relationship found in all these factors and modern contraceptive use have been earlier established in literature and the direction of association was similar to their findings [39]. However, the multivariate findings showed that women in the rural areas are currently using short term methods than their counterparts in the urban areas when women using traditional method were used as reference. Striking variations existed in the use of modern contraceptive method across the regions in Nigeria. The South West and North West were found to have reported highest and least use of short term contraceptive method respectively. While the proportion of women that reported use of long term method was found to be the highest in the South West the least were reported by their counterparts in South South and North East. The discrepancies in the use of short term and long term methods between the regions can be explained by differentials in the socio-cultural background of the regions in Nigeria [2]. For instance, the Northerners are predominantly Muslims while the Southerners are majorly Christians. Each region in Nigeria has unique ethnic group with similar cultural identities. In South West where the use of modern contraceptive was reported to be the highest, the literacy level and girl-child education are higher in this region than any other regions across Nigeria [24]. There is possibility that the

literacy level in the rural parts of South West may be higher than the level obtainable in the urban areas of some other regions in Nigeria.

The study further shows that aside the main independent variables; maternal healthcare services access index, family planning media exposure, visited health facility in the last 1 year with family planning information received, visited by family planning workers in the last 1 year which were found to be important determinants of the use of modern contraceptive in Nigeria, other identified predictors are; age, number of living children, region, education, wealth index, religion and ethnicity. A major limitation of this study is that the data did not capture the number of times of exposure to family planning information. There is likely to be variation in the number of times of exposure to family planning information on media or through hospital visits or home visits. Some women might not have had access to health facility or family planning information on media more than once while others do, yet they were assigned the same number of score. The reason for remarkable differential in the level of modern contraceptive use between South West and North West is a grey area for further research.

Conclusion

Use of modern contraception either short term or long term method increases as the level of MHSAI increases. Exposure to family planning information services whether in media or at home or health facility also improved the use of modern contraceptive in Nigeria. If women optimize the use of health facility during pregnancy and have access to family planning information and services at home and health facility, modern contraceptive use prevalence rate most especially the long acting/permanent method will improve in Nigeria. The necessary intervention should involve the provision of packages of essential family planning counselling programmes that spans through pregnancy, childbirth and after delivery for women. Increasing provision of contraceptive counselling in primary care may improve modern contraceptive use in Nigeria. The study recommends that efforts should be made towards ensuring that the ongoing family planning information programmes on media and home services should be sustained in Nigeria. The predictors of short term and long term modern contraceptive method found in this study should be taken into consideration while designing strategies for family planning uptake in Nigeria.

Acknowledgement

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Appendix

Figure 1: Maternal Health Care Services Access Index by specific contraceptive type currently using
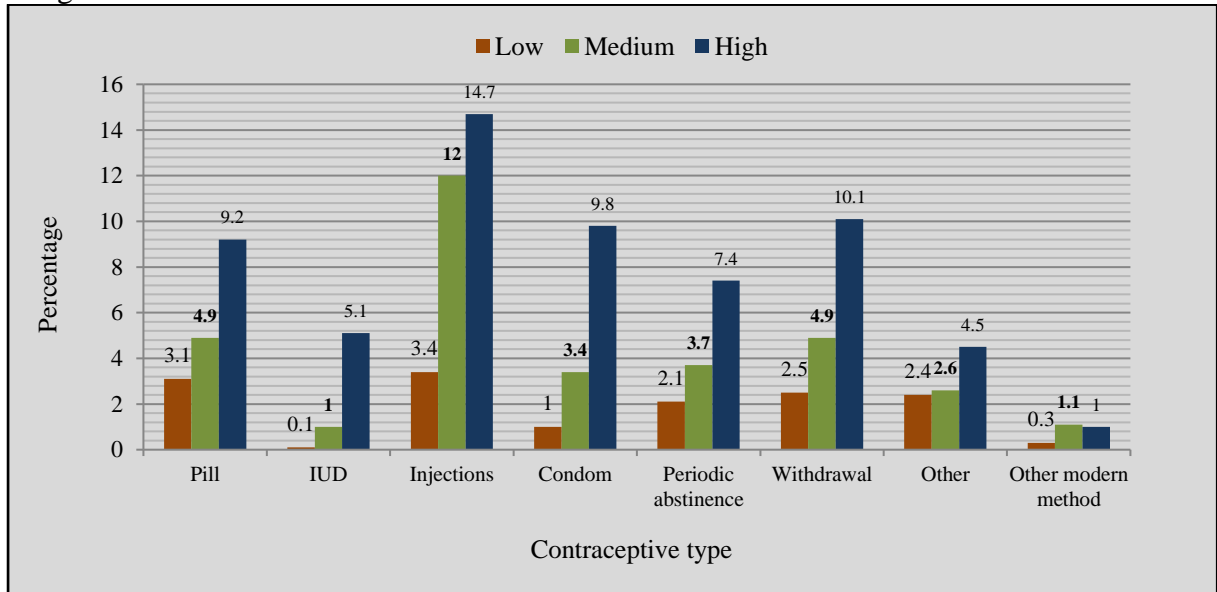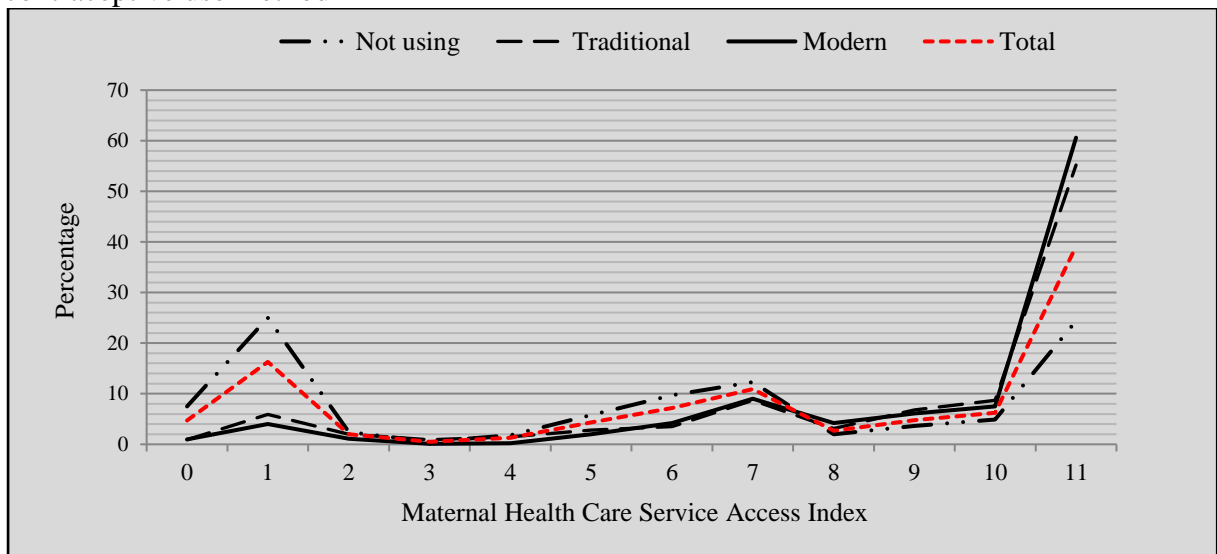

Figure 2: Percentage distribution of Maternal Health Care Services Access Index by contraceptive use method

Mean MHSAI: Not using=5.8±4.1; Traditional method=8.9±3.1; Modern method=9.7±1.6; All women=7.3±4.0

Table 1: Contraceptive use type by socio-demographic characteristics

Characteristics	Contraceptive use type				Total women	χ²-value	p-value
	Not using	Traditional	Short term	Long term			
Total	57.5	14.3	24.1	4.1	3203		
*Age**						*86.899*	*<0.001*
15-24	69.8	10.3	18.7	1.2	582		
25-29	59.3	13.4	23.5	3.9	695		
30-34	51.5	15.7	26.9	6.0	722		
35-39	48.0	16.0	30.9	5.1	625		
40-49	60.6	15.9	19.5	4.0	579		
Mean±σ	*31.1±8.1*	*32.8±7.4*	*32.1±6.6*	*33.5±5.9*	*31.7±7.6*		*<0.001*
*Residence**						*280.162*	*<0.001*
Urban	41.2	20.9	30.7	7.3	1362		
Rural	69.5	9.5	19.2	1.8	1841		
*Number of living children**						*30.062*	*<0.001*
0-2	59.6	13.4	24.1	3.0	898		
3-4	51.4	16.8	26.5	5.2	1110		
5+	61.5	12.6	21.9	3.9	1195		
Mean±σ	*4.1±2.4*	*3.9±2.0*	*3.8±1.9*	*3.9±1.7*	*4.0±7.2*		*0.001*
*Region**						*908.132*	*<0.001*
North Central	51.7	10.3	30.9	7.1	563		
North East	86.4	1.9	10.9	0.8	513		
North West	85.1	2.2	10.2	2.5	683		
South East	35.1	41.1	20.0	3.8	265		
South South	49.7	22.8	26.5	0.9	539		
South West	25.8	22.3	43.1	8.8	640		
*Education**						*700.084*	*<0.001*
No education	88.5	4.3	6.1	1.1	1014		
Primary	53.4	14.3	28.7	3.6	771		
Secondary	40.5	19.1	35.6	4.8	1082		
Higher	28.0	28.9	31.0	12.2	336		
*Wealth Index**						*613.544*	*<0.001*
Poorest	92.3	2.4	5.2	0.2	465		
Poor	78.1	6.5	13.8	1.5	520		
Middle	61.2	12.2	23.5	3.1	639		
Rich	48.6	18.1	29.1	4.2	745		
Richest	30.3	24.0	37.1	8.6	834		
*Religion**						*421.371*	*<0.001*
Christian	41.3	21.1	32.1	5.5	1752		
Islam	77.0	6.0	14.6	2.5	1419		
Others	78.1	9.4	9.4	3.1	32		
*Ethnicity**						*913.245*	*<0.001*
Hausa	91.8	2.2	5.2	0.8	826		
Igbo	33.3	38.3	22.3	6.0	381		
Yoruba	23.2	20.9	46.5	9.4	604		
Others	58.6	12.1	26.1	3.2	1392		
*Family type**						*161.335*	*<0.001*
Single	39.5	23.7	31.6	5.3	38		
Monogamy	51.2	17.1	27.1	4.6	2316		
Polygamy	75.5	6.1	15.7	2.7	849		
*Work status**						*63.872*	*<0.001*
Not working	69.4	9.7	17.6	3.3	808		
Working	53.4	15.9	26.3	4.4	2395		
*Husband/Partner's education**						*508.798*	*<0.001*
None	87.8	3.9	7.1	1.1	813		
Primary	57.6	15.8	23.9	2.6	644		
Secondary	46.1	18.6	31.6	3.7	1163		
Higher	37.7	18.5	32.9	10.8	583		
Number of Unions						*4.878*	*0.181*
Once	56.9	14.5	24.3	4.3	2917		
More than once	63.3	12.2	21.7	2.8	286		

*Significant at 0.1%; **Significant at 1.0%; ***Significant at 5.0%*

Table 2: Contraceptive use type by Maternal Health Care Services Access Index and Family Planning Awareness Programmes

Characteristics	Contraceptive use type				Total women	χ²-value	p-value
	Not using	Traditional	Short term	Long term			
Total	57.5	14.3	24.1	4.1	3203		
*Family planning media exposure**						*342.863*	*<0.001*
Low	71.9	9.6	16.7	1.8	1684		
Medium	44.8	19.0	30.6	5.7	1229		
High	27.9	21.7	39.7	10.7	290		
*Health facility visit in the last 1 year with FP information received**						*269.221*	*<0.001*
Did not visit	65.6	13.5	18.1	2.7	2084		
Visited not receive	55.9	12.8	26.3	5.1	533		
Visited received	29.9	18.4	43.5	8.2	586		
*Home visit by family planning worker in the last 1 year**						*228.249*	*<0.001*
No	63.4	13.5	19.7	3.4	2610		
Yes	31.2	17.7	43.7	7.4	593		
*Maternal health care services access index**						*575.529*	*<0.001*
Low	85.0	6.9	7.8	0.3	932		
Medium	66.0	10.5	21.6	1.9	668		
High	37.9	20.2	34.6	7.2	1603		
Mean±σ	*5.8±4.1*	*8.9±3.1*	*9.2±2.9*	*10.3±1.5*	*7.3±4.0*		*<0.001*

*Significant at 0.1%; **Significant at 1.0%; ***Significant at 5.0%*

Table 3: Odds ratios of current use of family planning methods by Maternal Health Care Services Access Index and Family Planning Awareness Programmes

Health and family planning awareness related Characteristics	Modern	Modern	Short term	Long term	Short term	Long term	Long term
				Reference			
	Not using	Traditional	Not using	Not using	Traditional	Traditional	Short term
	Model 1a	Model 2a	Model 3a	Model 4a	Model 5a	Model 6a	Model 7a
UNADJUSTED MULTINOMIAL LOGIT REGRESSION MODEL							
Maternal Health Care Services Access Index							
Low †	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Medium	3.71*	1.89**	3.54*	7.78**	1.80**	3.96***	2.20
High	11.50*	1.74**	9.90*	9.37*	1.50***	7.64**	5.09**
-2loglikelihood	2973.83	1729.30	2763.40	794.65	1617.00	604.16	732.82
Family Planning Media Exposure							
Low†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Medium	3.15*	0.99	2.94*	4.97*	0.93	1.57	1.69***
High	6.99*	1.20	6.11*	9.9*	1.05	2.57**	2.44**
-2loglikelihood	3209.74	1737.99	2959.86	859.27	1623.47	616.86	740.58
Visited Health Facility in the last 1 year with Family Planning information received							
Did not visit†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Visited not receive	1.77*	1.60**	1.71*	2.17**	1.54***	1.96***	1.28
Visited received	5.46*	1.82*	5.29*	6.58*	1.76*	2.199*	1.25
-2loglikelihood	3224.76	1716.24	2951.32	896.97	1604.68	613.07	750.20
Visited by Family Planning worker in the last 1 year							
No†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	4.51*	1.70*	4.52*	4.48*	1.70*	1.68***	0.99
-2loglikelihood	3263.68	1722.65	2976.14	921.23	1608.16	621.64	751.65
ADJUSTED MULTINOMIAL LOGIT REGRESSION MODEL							
Maternal Health Care Services Access Index							
Low †	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Medium	2.72*	1.74***	2.62*	5.64**	1.70***	3.69	2.08
High	6.22*	1.52***	5.47*	9.94*	1.34	6.02**	4.36***
Family Planning Media Exposure							
Low†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Medium	1.85*	0.89	1.78*	2.45*	0.84	1.15	1.54
High	2.97*	1.03	2.64*	4.86*	0.92	1.78	2.11**
Health facility visit in the last 1 year with Family Planning information received							
Did not visit†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Visited not receive	1.23	1.59**	1.22	1.19	1.54***	1.86***	1.28
Visited received	2.08*	1.49***	2.06*	2.05**	1.46***	1.70***	1.22
Home visit by Family Planning worker in the last 1 year							
No†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.82*	1.43***	1.88*	1.35	1.49***	1.12	0.81
-2loglikelihood	2793.70	1702.29	2605.20	740.61	1591.16	590.36	724.52

*Significant at 0.1%; **Significant at 1.0%; ***Significant at 5.0%; †Reference category

Table 4: Odds ratios of current use of family planning methods by background characteristics

Background Characteristics	Modern	Modern	Short term	Long term	Short term	Long term	Long term
				Reference			
	Not using	Traditional	Not using	Not using	Traditional	Traditional	Short term
Maternal Health Care Services Access Index							
Low†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Medium	2.10*	1.83***	1.99*	4.82***	1.79***	4.23	2.64
High	2.38*	2.35*	2.17*	7.73**	2.19**	9.16**	4.21***
Family Planning Media Exposure							
Low†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Medium	1.33***	0.85	1.30***	1.81***	0.81	0.94	1.38
High	1.76**	0.98	1.63***	2.95**	0.91	1.19	1.54
Health Facility Visit in the last 1 year with Family Planning information received							
Did not visit†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Visited not receive	1.19	1.26	1.19	0.87	1.26	1.04	0.99
Visited received	1.79*	1.20	1.82*	1.46	1.14	1.87***	1.14
Home visit by Family Planning worker in the last 1 year							
No†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.45**	1.56***	1.47**	1.19	1.60**	1.16	0.80
Age							
15-24	1.41	1.62	1.33	0.95	1.53	0.90	0.85
25-29	1.20	1.71***	1.10	1.71	1.62	1.93	1.19
30-34	1.32	1.89**	1.25	1.64	1.76***	2.19***	1.11
35-39	1.50***	1.95**	1.48***	1.13	1.97**	1.64	0.82
40+†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Residence							
Urban	1.02	0.72	0.95	1.75	0.69***	1.27	1.73
Rural†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Number of living children							
0-2†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
3-4	1.48**	0.90	1.38***	2.65**	0.83	1.46	1.98***
5+	1.75**	1.29	1.57***	4.06*	1.11	2.99***	2.44***
Region							
North Central†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
North East	0.48*	1.72	0.56**	0.21**	2.15	0.51	0.28***
North West	1.27	2.31***	1.33	2.28	2.46***	2.84	1.07
South East	0.59	0.24*	0.68	0.35	0.29*	0.12*	0.54
South South	0.65***	0.33*	0.75	0.13*	0.37*	0.06*	0.22**
South West	0.90	0.58***	0.93	0.79	0.62***	0.49**	0.88
Education							
No education†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Primary	2.10*	2.43**	2.30*	1.58	2.63**	1.33	0.43
Secondary	2.00**	2.61**	2.26*	1.07	2.97**	1.19	0.37
Higher	1.85***	1.61	1.86***	1.55	1.61	1.09	0.61
Wealth Index							
Poorest†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Poor	1.31	1.07	1.27	2.79	1.12	0.96	1.77
Middle	1.34	0.89	1.31	2.83	0.98	0.74	1.38
Rich	1.36	0.84	1.35	2.41	0.90	0.92	1.05
Richest	2.01***	0.89	1.98***	3.36	0.95	0.69	1.19
Religion							
Christian†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Islam	0.62**	0.90	0.66**	0.59	0.95	0.79	0.69
Others	0.56	0.70	0.58	0.69	0.66	0.97	0.86
Ethnicity							
Hausa†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Igbo	3.56*	0.74	3.26**	7.20**	0.64	1.32	2.06
Yoruba	8.22*	1.63	8.06*	8.94*	1.62	1.74	1.21
Others	3.70*	1.59	3.72*	6.91**	1.62	2.07	1.10
Family type							
Single†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Monogamy	0.62	0.83	0.60	0.71	0.90	0.81	0.42
Polygamy	0.51	1.20	0.48	0.75	1.22	1.63	0.58
Work status							
Not working†	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Working	0.88	0.80	0.93	0.66	0.82	0.79	0.62
-2loglikelihood	*2444.20*	*1515.56*	*2293.96*	*598.14*	*1413.29*	*474.43*	*655.59*

*Significant at 0.1%; **Significant at 1.0%; ***Significant at 5.0%; †Reference category