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ORIGINAL RESEARCH

Contextual Determinants of Repeat Unintended Pregnancy among Women of Reproductive Age in Nigeria: A Population-Based Cross-Sectional Study

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Abstract

Background: Repeat unintended pregnancy (RUP) is a significant public health concern in Nigeria which contributes to maternal morbidity, mortality, and socioeconomic disadvantage among women of reproductive age.

Objective: This study examined the contextual determinants of RUP among women of reproductive age in Nigeria.

Methods: The study employed a cross-sectional analysis of population-based data involving 21792 women of reproductive age drawn from the 2018 Nigeria Demographic and Health Survey (NDHS). The study adopted a multilevel mixed-effects logistic regression model to assess individual and community-level predictors of RUP.

Results: The national prevalence of RUP was 2.2%. Women with primary education had over twice the odds of experiencing RUP compared to those with no education (AOR = 2.15; 95% CI: 1.14–4.06). Similarly, the use of modern contraceptives was associated with increased likelihood of RUP, potentially due to improper use or method failure (AOR = 2.14; 95% CI: 1.04–2.25). At the community level, women residing in the South-south region were over three times more likely to experience RUP compared to other regions. Bivariate analysis revealed significant associations with union status, religion, ethnicity, parity, and exposure to family planning messages. The multilevel model indicated significant clustering effects, with 30% of the variance in the null model attributable to community-level differences.

Conclusion: Regionally tailored strategies addressing both individual behaviors and systemic barriers are essential for effective prevention.

Keywords: Contextual determinants, Cross-sectional study, Multilevel analysis, Nigeria, Repeat unintended pregnancy, Women of reproductive age

Introduction

A significant number of women encounter repeat unintended pregnancies and some of these pregnancies culminate in abortion, while others result in unintended births.^[1] It is quite common for a woman to experience

both outcomes, along with one or more planned pregnancies, during her lifetime, especially if she has a history of multiple unintended pregnancies.^[2] Women who undergo abortions may possess distinct characteristics that render them a high-risk group, making them more vulnerable to repeat unintended pregnancies compared to other patient populations.^[3]

Mostly, a pregnancy that follows a woman's report of not wanting any additional births is classified as unwanted/unintended. Therefore, repeat unintended pregnancy is defined as pregnancy by women of reproductive age who have had /reported more than one unintended pregnancy in their lifetime.

Repeat unintended pregnancy can inflict emotional, psychological, and educational damage on young women, frequently with lasting consequences for their life opportunities.^[4] While the adverse effects of unwanted pregnancies are already established, repeat unintended pregnancies present an even more significant health risk for mothers and their infants. Women who experience more than one unintended pregnancy are at increased risk of maternal morbidity and mortality, as well as socioeconomic disadvantages, such as limited educational and employment opportunities.^[5]

Unintended pregnancies are recognized issue globally, but repeat unintended pregnancies, in particular, needs more attention in the context of sub-Saharan Africa and Nigeria, specifically among women of reproductive age. Furthermore, existing studies have highlighted the lack of

comprehensive interventions targeting women who have already experienced one unintended pregnancy, leaving them vulnerable to further unintended pregnancies.^[6] Studies indicate that RUPs are associated with inadequate contraceptive use, low contraceptive knowledge, and socio-cultural barriers to family planning.^[7] However, the specific factors influencing repeat unintended pregnancies in Nigeria, a country with diverse ethnic groups and varying levels of access to healthcare services, remain poorly understood. Addressing this gap is critical for the development of targeted interventions that address not only the prevention of unintended pregnancies, but also the unique challenges faced by women at risk of repeat unintended pregnancies.

A number of studies have explored the broader issue of unintended pregnancies in Nigeria, ^[8-13] but there is a need for more focused research on the contextual determinants of repeat unintended pregnancies specifically among women of reproductive age. Also, some of the earlier studies were on adolescents and sub-national, with primary data obtained from respondents in one or few states within the region. ^[6, 8, 14] Furthermore, we included a significant number of individual and community-level factors to assess the contextual factors influencing repeat unintended pregnancy among women. To the best of our knowledge, no previous study has assessed the contextual determinants of repeat unintended pregnancy among women of reproductive age using the current national sample. The study addresses this gap to enable policymakers develop

appropriate policies, plan, and implement targeted intervention across the regions of the country. This study assessed the contextual determinants of repeat unintended pregnancy among women of reproductive age in Nigeria.

Methods

Study design: The study was conducted using the 2018 NDHS, a population based, cross-sectional survey. The data collection was performed from 14 August to 29 December, 2018 by the National Population Commission with the technical support of ICF International. The NDHS is conducted every 5 years and provides up-to-date estimates of basic demographic and health indicators from the country's six geographical zones, the 36 states and Federal Capital Territory (FCT).

Study Population: The population for this study were women of reproductive age in Nigeria who had experienced unintended pregnancy in the past 5 years of conducting the survey.

Inclusion and exclusion Criteria: Women who responded to whether or not their pregnancies in the last 5 years of conducting the 2018 National Demography survey, were wanted or not. The exclusion criterion was no history of unintended pregnancy.

Sampling Technique: The 2018 NDHS sample was selected using a two-stage stratified cluster sampling method. Initial stratification was achieved by separating each of the 36 states and the FCT into urban and rural areas. In total, 74 sampling strata were identified. The samples were then

selected independently in every stratum using a two-stage selection method. In the first stage, 1400 enumeration areas (EAs), referred to as clusters for the 2018 NDHS, were selected using probability proportional to EA size. The EA size is the number of households in the EA. Household listing of the selected EAs was performed using tablets, with the random selection of households carried out through computer programming. The household lists were used as the sampling frame in the selection of households in the second stage. In the second stage, 30 households were selected in every cluster by systematic sampling; 42 000 households were selected for the survey. The interviews were conducted only in pre-selected households. A detailed sampling method is available in the 2018 NDHS report.^[15]

Sampling technique information was obtained from 36 administrative entities and the Federal Capital Territory (FCT) using a two-stage sampling procedure. The samples were randomly selected from clusters and enumeration areas (EAs), which constitute the primary sampling element for the survey. The 2018 survey drew a total of 21,792 women of reproductive age who had experienced unintended pregnancy. From this number, 487 women who had experienced repeat unintended pregnancy, were included in this study. The sample, pretesting, and comprehensive methodology of the 2018 NDHS have been published by the National Population Commission (NPC) and ICF International. When writing this manuscript, the study complied with the epidemiology reporting standards for observational studies. The dataset is freely

accessible for download via <https://www.dhsprogram.com/publications/index.cfm>.^[15]

Variables:

Outcome Variable: We used a subset of the 2018 NDHS individual data of 21,792, from which the data of 487 women with repeat unintended pregnancy within 5 years before the survey were extracted and included in the final analysis. In this study, repeat unintended pregnancy was defined as the self-reported occurrence of two or more unintended pregnancies within the past five years. A pregnancy was classified as unintended if it was reported as unwanted, and women who reported more than one of such pregnancy were categorized as having experienced repeat unintended pregnancy. Repeat unintended pregnancy was coded as a binary outcome variable as '0' for NO if the woman reported unintended pregnancy once and '1' for YES if the woman reported unintended pregnancy more than once.

Explanatory Variable: Individual and community-level factors were considered. The individual-level factors included age in years (15–24, 25–34, 35+), education attainment (no education, primary, secondary, and higher), union status (not in union, currently in union), religion (Christian, Islam & others), ethnicity (Hausa, Yoruba, Igbos, others), family planning messages exposure (not exposed, exposed), and current contraceptive method (not using modern method, using modern method). Community-level factors include the type of place of residence (urban or rural) and region (North-central, Northeast, Northwest, Southeast, South-south, and

Southwest). All these variables were considered based on their availability in the 2018 NDHS data set and their relevance to repeat unintended pregnancy.^[16]

Statistical Analysis: This was conducted using Stata Software (version 15). Using frequency distributions for categorical data, we first produced a descriptive analysis of the variables. A p-value of 0.05 was established as a significant level at a 95% confidence level for bivariate analysis.^[16] Pearson's chi-square test was used to examine the association between individual and community-level characteristics and repeat unintended pregnancy. The significant variables with $p < 0.01$ and those with $p < 0.25$ were entered for multivariable regression analysis. Additionally, a multivariable mixed-effects logistics regression model was used to examine the effect of community-level factors on the outcome variables, with women of reproductive age at level 1 nested within the community at level 2. Four models were built. Model 1 (the random intercept model) was fitted without the use of any explanatory variables to test the random variability of the intercept and display the overall variance in the exposure to repeat unintended pregnancy among women of reproductive age in various communities. Model 2 examined the effect of individual-level variables. Model 3 looked into the effects of factors at the community level, while Model 4 looked into the effects of both individual and community-level factors concurrently. The results of fixed effects were presented as odds ratios with a 95% confidence level. To explain the percentage of variance and compare the succeeding

models, the inter-cluster correlation coefficient (ICC) for each model was computed. The measures of association (fixed effects) estimate the associations between repeat unintended pregnancy and independent variables (individual and community level factors) and are expressed as adjusted OR (AOR) and 95% CIs. The level of significance was set at $p < 0.05$ for each test. The measure of variation (random effects) was assessed using the ICC and estimated to determine the percentage variance explained by community-level variables.^[17]

In addition, we employed Schwarz's Bayesian information criteria and Akaike's information criteria to estimate the goodness of fit of the model.^[18] The Variance Inflation Factor (VIF) was used to evaluate multicollinearity, with a VIF cutoff of 5.^[19]

Results

Socio-demographic characteristics

Of the 21,792 participants, almost half (48%) of the respondents were between the ages of 25-34 years. Also, more than two-fifth (44%) had no formal education, a vast majority (94%) were currently in union and more than half (62%) practiced Islam and other religion. Furthermore, a large proportion (44%) of the respondents were Hausas', over one third (37%) had five or more children, nearly two thirds (65%) were not exposed to family planning messages, and a significant majority (87%) were not

using modern contraceptive method. Also, more than half of the respondents (60%) resided in the rural areas, about one third (35%) were from the Northwest region (Table I).

Factors associated with repeat unintended pregnancy among women of reproductive age

Bivariate analysis was used to determine the factors associated with repeat unintended pregnancy among women of reproductive age. A significant association was found between education and repeat unintended pregnancy, with a higher proportion (3.4%) of women of reproductive age with secondary education having experienced repeat unintended pregnancy than any other group ($p = 0.000$). Repeat unintended pregnancy occurred in a higher proportion of unmarried women (3.2%) than married women, and in an even higher, statistically significant proportion of Christian women (3.6%) ($p < 0.001$). Ethnicity was also significantly associated with repeat unintended pregnancy, with higher rates observed among women from the Igbo ethnic group (3.2%) and those from other ethnic groups (3.3%), compared to women from another ethnic group ($p = 0.000$).

The number of children ever born showed a strong association with proportion increasing from 1.1% among women with 1-2 children to 3.2% among women with five or more children ($p = 0.000$).

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Table 1: Socio-demographic characteristics of respondents, NDHS 2018 (n= 21792)

<i>Variable</i>	<i>Frequency</i>	<i>Percentage</i>
Age in years		
15-24	5399	24.7
25-34	10287	47.8
35+	6106	27.5
Highest educational level		
No education	9527	44.4
Primary	3410	15.0
Secondary	7064	31.8
Higher	1791	8.8
Union status		
Not currently in union	1373	5.8
Currently in union	20419	94.2
Religion		
Christian	8929	38.1
Islam and others	12863	61.9
Ethnicity		
Hausa	8736	43.9
Yoruba	2836	12.6
Igbos	2357	12.6
Others	7863	30.9
Children ever born		
1-2	7493	35.1
3-4	6233	28.2
5+	8066	36.7
Family planning messages exposure		
Not exposed	14749	65.4
Exposed	7043	34.6
Current contraceptive method		
Not using modern method	19067	87.4
Using modern method	2725	12.6
Place of residence		
Urban	7710	39.8
Rural	14082	60.2
Region		
Northcentral	3875	13.8
Northeast	4506	17.6
Northwest	6309	34.9
Southeast	2365	9.8
Southsouth	2174	9.2
Southwest	2563	14.7

Contrary to expectation, exposure to family planning messages was also significantly related to repeat unintended pregnancy. Women of reproductive age who were exposed to family planning messages had slightly higher proportion of repeat unintended pregnancy (2.5%) compared to

those not exposed (2.0%) ($p = 0.018$). Furthermore, there was a statistically difference ($p = 0.000$) between the proportion of women who were currently using modern contraceptive method than those who are not.

Table II: Bivariable analysis on repeat unintended pregnancy among women of reproductive age in Nigeria

Characteristics	Repeat unintended pregnancy		P-value
	Non-repeat unintended pregnancy (%)	Repeat unintended pregnancy (%)	
Age in years			
15-24	5287 (98.05)	112 (1.95)	0.490
25-34	5922 (97.82)	240 (2.18)	
35+	5971 (97.67)	135 (2.33)	
Highest level of education			
No education	9423 (98.85)	104 (1.15)	0.000
Primary	3302 (98.86)	108 (3.14)	
Secondary	6812 (96.63)	252 (3.4)	
Higher	1768 (98.73)	23 (1.)	
Union status			
Not in union	1327 (96.83)	46 (3.17)	0.018
Currently in union	20419 (97.9)	441 (2.10)	
Religion			
Christian	8608 (96.45)	321 (3.56)	0.000
Islam and others	12863 (98.69)	166 (1.31)	
Ethnicity			
Hausa	8629 (98.7)	107 (1.30)	0.000
Igbo	2739 (96.85)	97 (3.15)	
Yoruba	2320 (98.66)	37 (1.34)	
Others	7617 (96.67)	246 (3.33)	
Children ever born			
1-2	7399 (98.95)	94 (1.05)	0.000
3-4	6099 (97.74)	134 (2.26)	
5+	7806 (76.84)	259 (3.16)	
Exposure to family planning messages			
No	14749 (98.03)	296 (1.97)	0.018
Yes	6852 (97.46)	191 (2.54)	
Current contraceptive method			
Not using modern method	19067 (98.05)	384 (1.95)	0.000
Using modern method	2622 (96.34)	103 (3.66)	
Place of residence			
Urban	7515 (97.65)	195 (2.35)	0.204
Rural	14277 (97.96)	292 (2.04)	
Region			
Northcentral	3812 (98.31)	63 (1.70)	0.000
Northeast	4430 (98.14)	76 (1.86)	
Northwest	6241 (98.9)	68 (1.10)	
Southeast	2284 (96.79)	81 (3.21)	
Southsouth	2024 (92.86)	150 (7.14)	
Southwest	2514 (98.31)	49 (1.69)	

Women of reproductive age currently using a modern method had a higher rate (3.7%) of repeat unintended pregnancy than non-users (2.0%). Lastly, regional differences were significant, with the highest proportion of repeat unintended pregnancy found in the

Southsouth region (7.1%), followed by the Southeast (3.2%) ($p = 0.000$). However, age ($p = 0.490$), and place of residence ($p = 0.204$) had no association with repeat unintended pregnancy (Table II). The significant variables and those with $p < 0.25$

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were entered for multi-variable multilevel regression analysis.

Multilevel effect analysis for factors associated with repeat unintended pregnancy

On multi-variable multilevel regression analysis, as presented in Table III, and after adjusting for both individual and community level factors in the final model, women with primary education had significantly higher odds of experiencing repeat unintended pregnancy compared to those with no education, with more than twice the likelihood (AOR = 2.35; 95% CI: 1.14–4.06).

In addition, women of reproductive age who reported using modern contraceptive methods had 2.14 times higher odds of experiencing repeat unintended pregnancy than non-users (AOR = 2.14; 95% CI: 1.04–2.25).

Furthermore, residing in the South-South region was associated with a substantially increased likelihood of repeat unintended pregnancy. Women from this region had over three times higher odds of a repeat

unintended pregnancy compared to women from other regions (AOR = 3.72; 95% CI: 2.09–6.66) (Table III).

Random effect and model comparison for factors associated with repeat unintended pregnancy using multilevel regression analysis

To determine the random or clustering effect and deviance, we utilized the inter-class correlation coefficient (ICC) and compared the models. The ICC value for the null model was 0.29, indicating that approximately 30% of the total variation in repeat unintended pregnancy was due to unmeasured or immeasurable factors (random effects), which was significant. This suggests that while individual factors play the largest role, clustering contributes slightly to the variability in outcomes. The variation in repeat unintended pregnancy in models 2, 3, and the final model remained significant. The best-fitted model was identified as the final model, which had lower deviance (Table IV).

Table III: Multilevel effect analysis for factors associated with repeat unintended pregnancy among women of reproductive age in Nigeria, NDHS 2018 (n = 487) *

<i>Variable</i>	<i>Total number</i>	<i>Repeat unintended pregnancy</i>	<i>Model 4 AOR (95% CI)</i>
All women of reproductive age	21792	487 (16.08)	
Individual level characteristics			
Age in years			
15-24	5399	112 (13.85)	1
25-34	10287	240 (17.64)	1.23 (0.80-1.88)
35+	6106	135 (15.71)	0.75 (0.45-1.26)
Highest education level			
No education	9527	104 (21.36)	1
Primary	3410	108 (22.18)	2.35 (1.14-4.06) **
Secondary	7064	252 (51.75)	0.82 (0.81-3.00)
Higher	1791	23 (4.72)	0.26(0.24– 1.47)
Union Status			
Not in union	1373	46 (8.37)	1
Currently in union	20419	441 (17.58)	0.97 (0.45-2.09)
Religion			
Christian	8929	321 (15.59)	1
Islam and others	12863	166 (16.95)	0.34 (0.41-1.36)
Ethnicity			
Hausa	8736	107 (19.97)	1
Igbo	2836	97 (14.81)	0.30 (0.19-1.66)
Yoruba	2357	37 (7.68)	0.37 (0.22-1.77)
Others	7863	246 (17.93)	0.21 (0.27-1.33)
Exposure to family planning messages			
No	14749	296 (16.16)	1
Yes	7043	191 (15.95)	1.17 (0.83- 1.65)
Current contraceptive method			
Not using modern method	19067	384 (16.06)	1
Using modern method	2725	103 (16.11)	2.14 (1.04-2.25) **
Place of residence			
Urban	7710	195 (14.03)	1
Rural	14082	292 (18.07)	0.80 (0.54-1.18)
Region			
Northcentral	3875	63 (12.93)	1
Northeast	4506	76 (19.83)	0.62 (0.28 -1.37)
Northwest	6309	68 (19.04)	0.74 (0.32-1.71)
Southeast	2365	81 (15.37)	1.25 (0.50 -3.12)
Southsouth	2174	150 (19.83)	3.72 (2.09-6.66) **
Southwest	2563	49 (9.41)	0.67 (0.29– 1.56)

*n= number of repeat unintended pregnancy **Significant p < 0.05

Table IV: Random effect and model comparison for factors associated with repeat unintended pregnancy using multilevel regression analysis

<i>Random effects (a measure of variation in repeat unintended pregnancy)</i>	<i>Null model</i>	<i>Final Model</i>
Deviance	1.382021	0.6838894
Intraclass coefficient (%)	0.2958163 (30 %)	0.1721014 (0.7190-0.3580)
Akaike Information Criterion	4556.948	1505.624
Loglikelihood	-2276.474	-728.812
Swhwarz's Bayesian criterion	4572.927	1668.711

Discussion

The current study assessed the contextual determinants of repeat unintended pregnancy among women of reproductive age in Nigeria using the 2018 NDHS. In this study, the national prevalence of repeat unintended pregnancy among women who reported to be pregnant in the last five year that the study was conducted was 2.2%. This finding is significant because it demonstrates that despite global and national efforts to improve reproductive health services, many women find themselves facing repeat unplanned pregnancies. As discussed in earlier study, this is often due to a combination of factors including inadequate access to modern contraceptive methods, insufficient sexual education, and socio-cultural barriers.^[20] This finding necessitates a strategic transition from a uniform family planning approach to a multifaceted, equity-centered strategy that targets high-risk groups, such as women with primary education and postpartum women, while also enhancing the entire contraceptive care continuum from primary prevention to sustained usage. In this study, women who had primary level education compared to those with secondary

or higher-level education had higher odds of experiencing repeat unintended pregnancy in keeping with a study in Nigeria which found that women with lower educational levels had higher likelihood of unintended pregnancies, highlighting the importance of education in reproductive health outcomes.^[9] A plausible explanation for this is that higher educational attainment is linked to better reproductive health outcomes. Equally the number of women who had experience repeat unintended pregnancy significantly increase even with attainment of secondary level education. This contradicts previous study which shows that women with higher educational levels are less likely to experience unintended pregnancies.^[21] Although secondary education was found to be ineffective in protecting against repeat unintended pregnancy, this is not a valid reason to discourage education. Rather, it is a compelling call to action to improve the quality of that education and build a supportive health system that enables educated young women to translate their knowledge into safe reproductive outcomes. This study also found that women using modern contraceptives are more likely to experience repeat unintended pregnancies

which is suggestive of issues with pattern of post-pregnancy initiation or contraceptive failure. Women are likely to adopt a method after experiencing an index unintended pregnancy to prevent a subsequent one. This points to critical gaps in the healthcare system, including a focus on post-partum and post-abortion family planning rather than primary prevention. This finding is supported by research from Nigeria that highlights the high unmet need for family planning and the common practice of adopting contraception only after achieving a desired family size or experiencing a reproductive shock.^[22] A study in Bangladesh, a low middle income country (LMIC) like Nigeria found out that after experiencing unintended pregnancies, women were more likely to bring no change in contraceptives use or switch to relatively low effective contraceptives than switching to relatively high effective contraceptives. This pattern of contraceptive use is likely to cause further unintended pregnancies.^[7] A credible reason for this is that factors such as incorrect use, method failure, or inconsistent use can contribute to contraceptive failure. Ineffective or no use of contraception following an unintended pregnancy contributes to a subsequent unintended pregnancy.^[7]

At the community level, findings from this study revealed that, women who are from the south-south region were more likely to experience repeat unintended pregnancy. Previous study in Nigeria has shown that unintended pregnancy among women varied widely across states, with some regions experiencing higher rates than other.^[8] Furthermore, as stated in a study, in some

parts of Nigeria, the education of the female child is not prioritized, and girls may have limited access to information about sexual and reproductive health. Early sexual activity and early marriage are more prevalent in certain regions, contributing to higher rates of unintended pregnancies.^[23] A plausible explanation to this is that environment, cultural and social norms play a significant role in reproductive health behavior and outcomes. Deep-seated cultural preferences for larger families and low female autonomy in reproductive decision-making can persist despite individual education or knowledge.

In addressing the findings from this study, it is important that the government come up with strategies and interventions that ensure appropriate sexual and reproductive health education which should be given by healthcare providers at every opportunity of contact with women of reproductive age within the healthcare facility. Also, family planning programs must be reoriented from simply promoting first-time use to ensuring sustained and correct use. This includes robust counseling on side-effect management and access to a wide range of methods. Furthermore, because of the peculiarity of different regions in Nigeria, addressing the challenges of repeat unintended pregnancy requires targeted, region-specific strategies that consider the interplay of cultural, socioeconomic, and healthcare factors.

Finally, the study has revealed opportunities for future research regarding repeat unintended pregnancy, especially for other factors not covered by the NDHS which may be contextual or otherwise and may

explain the high prevalence of repeat unintended pregnancy among women of reproductive age. Furthermore, it is essential to strengthen and scale up existing program targeted at preventing unwanted pregnancy such as family planning services.

The strength of this study is its use of a nationally representative data set, which enhances the generalization of our findings to women in Nigeria. The study, however, has its limitations. First, is in the cross-sectional nature of the data that restricts inferring cause-and-effect relationships. Secondly, it relied on secondary data; thus, the reliability of our findings depends on the quality of the NDHS. Nevertheless, the DHS is widely recognized as one of the most reliable data sources, particularly because it is the most extensive data collection program on health at the population level in Nigeria and most sub-Saharan African nations. Lastly, the self-reported nature of data on repeat unintended pregnancy makes it susceptible to recall bias with no means of verification of all information supplied. Future research using qualitative methods is suggested to explore other factors contributing to repeat unintended pregnancy that this study may not have addressed, mainly because it used secondary data sets.

Conclusion

The study revealed the high prevalence of repeat unintended pregnancy among women of reproductive age who reported to be pregnant in the last five years in Nigeria. It further showed the influence of both individual and community level factors associated with repeat unintended pregnancy. There is need for a right

combination of interventions to ensure that repeat unintended pregnancy is avoided and in addressing the identified influencing factors as suggested where applicable.

Ethics Approval: Permission to use the 2018 NDHS dataset for the study was sought and obtained from ICF International. Because we used a secondary dataset, all the information that could be used to identify the respondents was already removed by ICF International, and there was no attempt to identify any household or individual respondent interviewed in the survey. The 2018 NDHS protocol was approved by Nigeria's National Health Research Ethics Committee (NHREC/01/01/2007). Equally, the ICF Institutional Review Board approves all DHS to ensure they follow the U.S. Department of Health and Human Services ethical standards and regulations for the respect of human subjects. Detailed information on the ethical processes involved in the DHS programme can be accessed at <https://goo.gl/ny8T6X>

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Authors' Contributions: OEB conceived the study. All the authors designed the study, did a literature review and collected the data. OAO and OEB analyzed the data. OAO and OEB interpreted the data. OEB, OAO, ATF and OYA drafted the manuscript. All the authors revised the manuscript for sound intellectual content and approved the final version of the manuscript

Conflict of Interest: The authors have no conflicts of interest to declare.

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