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Maternal Age and Fertility Behaviour in Northern Nigeria: Evidence from the 2021 Multiple Cluster Indicator Survey (MCIS)

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Abstract

Fertility level in sub-Sahara Africa countries (SSA) such as Nigeria still remain high. This can be attributed to early marriage in most countries in sub-Sahara Africa. Maternal age of mothers has the tendency of determining level of fertility behaviour. It also has implications on reproductive health conditions of women most especially in northern Nigeria. Reproductive health of women in the Northern region of Nigeria in terms of family planning is very poor due to low age at marriage thereby leading to high fertility behaviour in terms of children ever born (CEB) in the region. This study made use of cross-sectional study design of secondary data extracted from the 2021 multiple cluster indicator survey (MCIS) on selected socio-demographic variables of children ever born (CEB) and maternal age in the region in examining the association and relationship between maternal age and fertility behaviour in terms of children ever born (CEB) in the region. Findings revealed that maternal age is associated with children ever born (CEB) in northern Nigeria with: $\chi^2=1,649$, $p=0.000$; $\chi^2=2,248.85$, $p=0.000$ and $\chi^2=3,352.157$, $p=0.000$ for north central, north east and north west region respectively at 0.05 level of significance. Multivariate analysis also revealed relationship between maternal age and fertility behaviour in the region with: $\text{Prob}>F = 0.0000$, $R. \text{Squared } 0.045$ at 5% level of significance. It was concluded that there is need for the Nigerian government to improve on girl child education in the northern Nigeria as this will help in reducing early marriage in the region. The government also need to address issues relating to women empowerment as this will go a long way in improving women autonomy in terms of financial autonomy there by reducing the tendency of girls been forced to early marriage because of financial benefits.

Keywords: age, fertility behaviour, maternal, north, Nigeria



Introduction

Maternal age has relationship with fertility behaviour as well as reproductive health conditions of women most especially in northern Nigeria. Reproductive health of women in the Northern region of Nigeria is very poor due to low age at marriage. Fertility level in sub-Sahara Africa countries remains high, (Michael *et al.*, (2025). Nigeria, been a country in sub-Sahara has been witnessing population growth due to high fertility behaviour in terms of children ever born In sub-Sahara Africa countries such as Nigeria, population explosion and high, National Population Commission, (NPC, 2023). Fertility rates have been a serious concern to individuals, societies and governments. Nigeria has been experiencing high fertility over the last five decades (Solanke, 2022). Countries which have population policies and sustained family planning programmes have the potential of achieving socio-economic progress and in turn, improvement in general well-being of the populace (Kemi, 2021). There is a positive relationship between maternal age, religion, place of residence, age and fertility level in Northern Nigeria. Access to reproductive health care facilities of women in northern Nigeria has been hindered due to poverty in terms of lack of money, distance to health care services and permission of the male partner (Lawal *et al.*, 2024). Demographic dividend in Nigeria can only be achieved with population reduction and socio-economic policies such as increase in per capita income, schooling and employment opportunities (Olufunkeet *al.*, 2020).

Maternal Age and Fertility Behaviour in Northern Nigeria

In Northern part of the country, child marriage is still being practiced. This is a socio-cultural norm not peculiar to Nigeria alone but in other sub-Saharan African countries. This has the implication of leading to early entry into reproduction, increasing high fertility in terms of children ever born (Ismailaet *al.*, 2023). Age of entry into reproduction is used in the context of early marriage, so that the earlier the marriage of every couple (either male or female), the longer the reproductive life span of such couples, thereby leading to increased fertility. Regionally, early marriage is mostly associated with the Northern part of Nigeria and this is one of the factors that explain the high fertility rate in the Northern part of the country when compared to other regions such as the south western part of Nigeria (Michael, 2024). Early marriage in the Northern part of Nigeria can also be attributed to the low education status of women, high importance attached to childbearing and having families, cultural practices of early giving the girl child in marriage and religious believes attributed to early marriage most especially the Islamic importance of giving the girl child in hands to her husband for marriage.

There is a positive significant relationship between maternal age, educational background of women of reproductive age and divorce rates among these couples. There is also a significant positive relationship between religious affiliations of women and divorce rates. Social workers, helping professionals and family counsellors need to provide strategies towards solving or reducing divorces facing families in Nigeria. Despite the fact that Ibadan is a south western part of Nigeria with multi-religious groups and high literacy rate, age of entry into reproduction is still exacting influence on fertility through divorce rates. There is need for intervention study in all parts of the country on age of entry into marriage and reproduction as a factor affecting fertility in Nigeria (Lawalet *al.*, 2024; Godswill, 2010).

Maternal age has relationship with reproductive health of women most especially in northern Nigeria. Reproductive health conditions of women in the Northern region of Nigeria are among the poorest in the world. The demand and utilisation of reproductive care facilities in the northern region has been low, the condition been ascribed to lack of formal education by the women and predominance of Islamic religion. The poor state of utilisation of health care services in the region can be ascribed to early marriage; with large proportion of couples been married in their teens and majority of them are neither socially nor economically empowered; most especially the women. In northern Nigeria, the husband is the sole



decision maker in the household, thereby affecting the utilisation of health care services in the region and making women's health-seeking behaviour difficult (Iritet *et al.*, 2020).

There is a positive relationship between maternal age, religion, place of residence, age and fertility level in Northern Nigeria. Most of the institutional factors such as maternal health care services, family planning services and educational institutions are often hindered in the Northern Nigeria in terms of access and utilisation. Access to these facilities may be hindered in terms of money, distance to health care services and permission of the male partner (Jecinta *et al.*, 2020). There is a less incidence rate of children ever born for women aged 15-19 years when compared to the incidence rate of women that were less than 14 years. There is relative risk being employed in high job category instead of moderate category will increase by 2.09 for those aged 15-19 years when compared with women that fall with the less than 14 years age category. Age at first marriage is significantly associated and related with fertility of women and empowerment (Solanke, 2022; Solanke *et al.*, 2015).

Age at first birth and early marriage are not peculiar to Nigeria alone. It is phenomenon spread across most developing countries most especially sub-Saharan African countries. Fertility in Uganda has almost been unchanging till 2006 where reduction in birth rate became visible. In comparison with age at first marriage, age at sexual debut, contraceptive use and preference for specific family size are other factors affecting fertility behaviour. Thirty seven (37) percent and sixty three (63) percent of changes in fertility behaviour within the said years can be attributed to changes in proportion of women by preference for specific family size, age at first marriage, age at first sex, and contraceptive use and these factors have affected fertility behaviour in Uganda at a very significant level of about 45 percent change. There is need for accessibility of family planning services that are youth-friendly and address low age at first sex in order to achieve the country's desired fertility level. Other factors such as place of residence and women's level of education need to properly addressed in order to achieve further reduction in fertility (Paulino & Allen, 2020).

Fertility intentions of young adults and age at first marriage have implications on gender relationships and family life styles in the society. Of the 268 respondents sampled, majority of them which were male; 62.7 percent in the age range 21-25 years, their preferred age at marriage was 27 years. A greater proportion of the males; 64.3 percent desire to have more than 5 children. Socio-cultural factors, most especially patriarchal family system as a significant influence on timing of marriage, with many of the young adults desired to have more children. Information regarding fertility education, timings and family formation should to more targeted at adolescents and other young adults towards promoting better reproductive decision making (Taiwo *et al.*, 2020).

Multiple high risk behaviours on fertility can indirectly or directly affect survival outcomes among under-five children in the society. There is scarce data and information on these two phenomena in Nigeria and as such, their study was aimed at evaluating the prevalence of survival of under-five mortality and multiple high risks behaviour on fertility among women that have ever married in Nigeria. Among women who had multiple high risk behaviours on fertility, under five mortality was more prevalent most especially among young adults that fall with less than 18 years age and short birth intervals of less than 24 months were reported to be prone to experiencing under five mortality. Children born to women that received post-natal care after delivery were more likely to survive under five mortality. This is also applicable to children born to women that have educated husbands. Strengthening of education systems and creating resilient reproductive health education programmes and policies for ever-married women for women that fall within the reproductive age is very necessary (Obasanjo *et al.*, 2023; Matyek *et al.*, 2024).

The Nigerian population is projected to increase from 200 million in 2019 to 450 million in 2050 if the current rate of fertility is not checked. There is a minimal decline in mean children ever born between 2003 and 2018 across all maternal age groups except ages 20-24 years. There is a reducing but slow rate

in fertility decline in the country with variations across the regions. In order to achieve downward change in fertility level in the country, policies that will be directed towards constricting spread of fertility across the regions need to be in place as matter of urgency (Tubosun *et al.*, 2023). There is a positive relationship between age at marriage, belief system, sex preference and fertility behaviour of women. Young adult women should take consultation of registered gynecologists as an habit as this will be helpful in controlling and regulating childrearing. Appropriate and adequate laws that will encourage marriage within age range 25-35 years need to be enacted. Also, traditional clerics and religious leaders need to enlighten their members on issues that pertain to fertility behaviour in the country (Ismaila *et al.*, 2023).

Theoretical Framework

The theoretical framework used for this study is the theory of planned behaviour for fertility. The theory of planned behaviour for fertility was first developed by a psychologist, Icek Ajzen in 1983. Other notable scholars or researchers that have contributed to this theory and applied this theory in studying fertility intentions or decisions are: John Casterline (a renowned scholar in demography interested in studying the application of this theory on fertility intentions in many contexts); Philip Morgan (a renowned sociologist interested in exploring the relationship between individual perceived behaviours and fertility intentions). The theory seeks to explain how subjective norms, personal or individual attitudes, behavioural control influence and subjective norms have the tendency of influencing individual behaviours and intentions; in this case, fertility behaviour in terms of bearing or having children..

Method

This study made use of a cross-sectional study design of secondary data extracted from the 2021 multiple cluster indicator survey (MCIS). The multiple cluster indicator survey (MCIS) provided the quantitative data for the study. The target population for the study was women that are currently married that fall within the reproductive age (15-49) years that are residing in Northern Nigeria. The estimate of the targeted women from the 2021 multiple cluster indicator survey (MCIS 2021) was 13,150 women. By sub-regions in the North, the North Central had 3,413, North East had 3,195 while the North West was made up of 6,542 sampled women to be analysed, (MCIS, 2021). The unmarried women were excluded. Analysis was conducted on maternal age and fertility behaviour in terms of children ever born (CEB) at univariate, bivariate and multivariate levels. The diagram bellow presents the geographical location of the Northern region in Nigeria

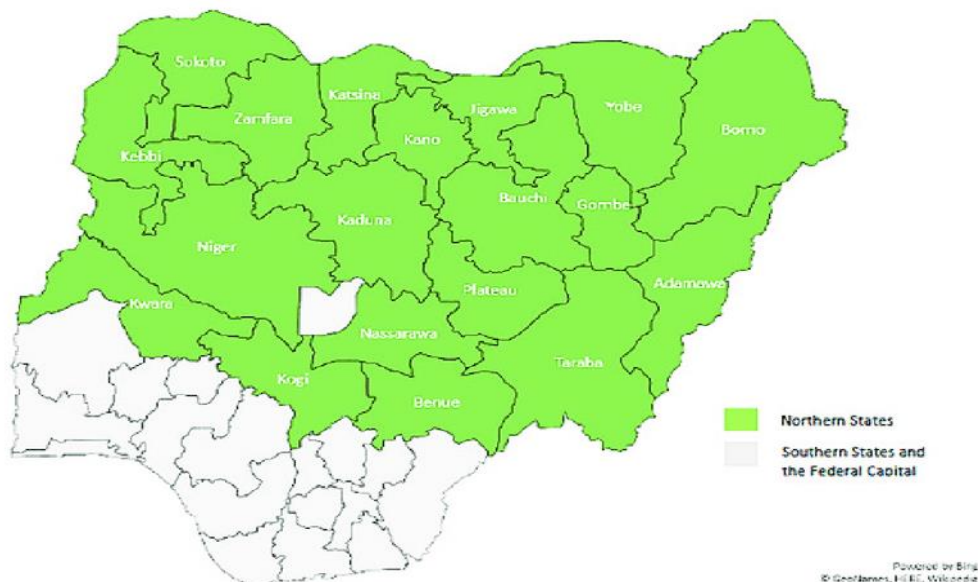




Fig 2.1: Geographical Representation of Northern Nigeria

Findings

This section presented the results of analysis performed at the univariate, bivariate and multivariate level on maternal age and fertility behaviour of women in terms of children ever born (CEB) in northern Nigeria. The following paragraphs below presented the results:

Percentage Distribution of Maternal Age across the Northern Region of Nigeria

This section presents the percent distribution of age of mothers of sampled women resident in Northern Nigeria across sub-geopolitical zones of north-central, north-east and north-west respectively

Table 3.1 Percent Distribution of Maternal Age across Northern Nigeria

	Regions					
Variables	North Central (N = 3,413)		North East (N = 3,195)		North West (N = 6,542)	
Maternal Age	Frequency	Percent	Frequency	Percent	Frequency	Percent
15-19	67	1.96	174	5.45	333	5.09
20-24	412	12.07	524	16.40	1,070	16.36
25-29	751	21.99	647	20.26	1,357	20.73
30-34	672	19.70	585	18.30	1,176	17.98
35-39	616	18.04	528	16.53	1,078	16.48
40-44	517	15.15	420	13.14	886	13.54
45-49	378	11.09	317	9.92	642	9.81

Source: MCIS, 2021

From Table 3.1, out of the number of sampled women in north central Nigeria which was 3,413 women, a larger percentage of the sampled women fall within the age range 25-29 years with 21.99 percent followed by 30-34 years with 19.70 percent. This is also consistent with other sub-regions with north east having the highest percentage of sampled women in age range 25-29 years with 20.26 percent followed by age range 30-34 years with 18.30 percent. The north west had the highest percentage of sampled women falling within the age range 25-29 years with 20.73 percent followed by 30-34 years with 17.98 percent. From this analysis, majority of the sampled women in northern Nigeria are within age range 25-29 years and 30-34 years. The implication of this figure is that there is tendency for the northern region to experience high birth rate since majority of the married women are still in their early ages of their reproductive life span.

The two extremes of the age groups 15-19 years and 45-49 years recorded the largest percentages of 1.96 percent and 11.09 percent respectively for north central, 5.45 percent and 9.92 percent for north east, 5.09 percent and 9.81 percent for north west. This corroborates the fact that majority of the sampled women fall within the age range that are most reproductively active. This may have the tendency of leading to high fertility behaviour in region in terms of children ever born.

Association between Maternal Age and Children Ever Born in Northern Region

This section presents the association between maternal age of mothers of sampled women resident in Northern Nigeria and children ever born (CEB) across sub-geopolitical zones of north-central, north-east and north-west respectively

Table 3.2 Association between Maternal Age and Children Ever Born across Northern Nigeria

	North Central			North East			North West		
Individual Factors	Children Ever Born			Children Ever Born			Children Ever Born		
Maternal Age	Low (N = 1,087)	Moderate (N = 629)	High (N = 1,697)	Low (N = 795)	Moderate (N = 480)	High (N = 1,920)	Low (N = 1,555)	Moderate (N = 798)	High (N = 4,189)
15-19	65 (5.96)	2 (0.35)	0 (0.00)	170 (21.42)	4 (0.80)	0 (0.00)	322 (20.7)	11 (1.37)	0 (0.00)
20-24	334 (30.68)	54 (8.54)	25 (1.46)	327 (41.13)	126 (26.33)	71 (3.68)	700 (45.02)	245 (30.72)	125 (2.98)
25-29	350 (32.22)	188 (29.88)	212 (12.51)	146 (18.32)	165 (34.45)	336 (17.51)	315 (20.26)	360 (45.12)	681 (16.26)
30-34	160 (14.69)	161 (25.52)	352 (20.76)	67 (8.45)	76 (15.91)	441 (22.97)	124 (7.99)	93 (11.71)	959 (22.88)
35-39	91 (8.39)	113 (17.91)	412 (24.27)	38 (4.72)	46 (9.55)	445 (23.16)	46 (2.96)	45 (5.59)	987 (23.57)
40-44	50 (4.63)	75 (11.93)	392 (23.08)	30 (3.72)	33 (6.86)	357 (18.62)	28 (1.79)	29 (3.66)	829 (19.79)
45-49	37 (3.43)	37 (5.87)	304 (17.93)	18 (2.25)	29 (6.11)	270 (14.06)	20 (1.27)	15 (1.83)	642 (9.82)
Statistics	$\chi^2 = 1,649, p=0.000$			$\chi^2 = 2,248.85, p=0.000$			$\chi^2 = 3,352.157, p=0.000$		

Source: MCIS, 2021

From Table 3.2, the cross-tabulation of maternal age with children ever born in north central revealed statistics: $\chi^2=1,649, p=0.000$. with the 0.05 level of significance, since $p<0.05$, this implies that maternal age is associated with children ever born in north central part of Nigeria. The statistics for north eastern Nigeria revealed: $\chi^2=2,248.85, p=0.000$. Since $p<0.05$, this implies that maternal age is significantly associated with children ever born in north eastern part of Nigeria at 0.05 level of significance. For north western part of the region, with statistics: $\chi^2=3,352.157, p=0.000$; since $p<0.05$, this implies that maternal age is significantly associated with children ever born in north western part of the region with 0.05 level of significance. In over all, since $p<0.05$ across the sub-regions in northern Nigeria, we can infer that maternal age has an influence in determining fertility behaviour in terms of children ever born in northern Nigeria. This is due to the fact that majority of the sampled women in northern Nigeria fall within the age range 25-29 years across the sub-regions in northern Nigeria. The higher the population of women that falls within lower age range of their reproductive life span, the higher the possibility of witnessing high fertility behaviour in the region in terms of children ever born.

Multivariate Analysis between Children Ever Born (CEB) and Maternal Age in Northern Nigeria

This section presents the relationship between maternal age of mothers of sampled women resident in Northern Nigeria and children ever born (CEB) in Northern Nigeria



Table 3.3 Relationship between Maternal Age and Children Ever Born across Northern Nigeria

Source	SS	DF	MS	
Model	40.4944509	3	13.4981503	Number of Obs = 3,088
Residual	866.663256	3,084	.281019214	F(3, 3084) = 48.03
Total	907.157707	3,087	.293863851	Prob> F = 0.0000
				R. Squared = 0.0446
				Root MSE = .53011

CEB	Coefficient	Std.error	T	P>/t /	[95% Conf. Interval]
Maternal Age	.0020413	.0068923	.030	0.767	-0.0114726 .0155553
-Cons	2.30322	.0551977	41.67	0.000	2.192094 2.40855

Source: MCIS, 2021

From Table 3.3, the linear regression between children ever born (CEB) and maternal age revealed a significant positive relationship between children ever born (CEB) and maternal age. at 5% level of significance with Prob>F = 0.0000, R. Squared 0.045. It can be inferred from statistics above that the earlier the age at first marriage, the longer the reproductive life span of the women thereby leading to increase in fertility behaviour of the concerned women. The northern part of the country is featured with early and child marriage which can be much attributed to their customs or traditional believes. This has led to high fertility behaviour in the northern part of Nigeria when compared to the south. The individual factor that was captured in this model was maternal age of women that fall within the reproductive age 15-49 years in northern Nigeria and children ever born (CEB). The first multivariate model; linear regression presented the relation and influence of maternal age on children ever born. Thereafter the multinomial regression model was presented. The multinomial regression model is presented below:

Number of Obs = 3,088
 LR Chi2(12) = 240.49
 Prob>Chi2 = 0.0000
 Pseudo R2 = 0.0487

Log likelihood= -2350.4399

CEB	Coefficient	Std. error	Z	P>/Z/	[95% Conf.Interval]
Maternal Age	.0649836	.0563996	1.15	0.249	-0.0455577 .1755249
-Cons	-2.261148	.5805513	-3.89	0.000	-3.399007 -1.123288

Source: MCIS, 2021

From statistics above, maternal age has association with fertility behaviour in northern Nigeria in terms of children ever born (CEB) with Prob>Chi2=0.0000 and can also influence children ever born (CEB). This implies that early marriage is still very paramount in northern Nigeria has as led to high fertility behaviour witnessed in the region.

Discussion

In northern Nigeria, it is obvious that majority of women living in this region married early. This may be attributed to their religious believe (Islamic doctrine) coupled with the custom and tradition in this region on polygamy family structure and having large family size (Michael *et al.*, 2025). Findings from this study do not refute the theory of planned behaviour for fertility because maternal age is one of the individual factors that can determine fertility behaviour of women in terms of children ever born (CEB). For example, out of the number of sampled women in north central Nigeria which was 3,413 women, a larger



percentage of the sampled women fall within the age range 25-29 years with 21.99 percent followed by 30-34 years with 19.70 percent. This is also consistent with other sub-regions with north east having the highest percentage of sampled women in age range 25-29 years with 20.26 percent followed by age range 30-34 years with 18.30 percent. The north west had the highest percentage of sampled women falling within the age range 25-29 years with 20.73 percent followed by 30-34 years with 17.98 percent. From this analysis, majority of the sampled women in northern Nigeria are within age range 25-29 years and 30-34 years. The implication of this figure is that there is tendency for the northern region to experience high birth rate since majority of the married women are still in their early ages of their reproductive life span. The two extremes of the age groups 15-19 years and 45-49 years recorded the largest percentages of 1.96 percent and 11.09 percent respectively for north central, 5.45 percent and 9.92 percent for north east, 5.09 percent and 9.81 percent for north west. This corroborates the fact that majority of the sampled women fall within the age range that are most reproductively active. This may have the tendency of leading to high fertility behaviour in region in terms of children ever born.

At the bivariate level, analysis showed association between maternal age and fertility behaviour in terms of children ever born in northern Nigeria. For example, the cross-tabulation of maternal age with children ever born in north central revealed statistics: $\chi^2=1,649$, $p=0.000$. with the 0.05 level of significance, since $p<0.05$, this implies that maternal age is associated with children ever born in north central part of Nigeria. The statistics for north eastern Nigeria revealed: $\chi^2=2,248.85$, $p=0.000$. Since $p<0.05$, this implies that maternal age is significantly associated with children ever born in north eastern part of Nigeria at 0.05 level of significance. For north western part of the region, with statistics: $\chi^2=3,352.157$, $p=0.000$; since $p<0.05$, this implies that maternal age is significantly associated with children ever born in north western part of the region with 0.05 level of significance. In over all, since $p<0.05$ across the sub-regions in northern Nigeria, we can infer that maternal age has an influence in determining fertility behaviour in terms of children ever born in northern Nigeria. This is due to the fact that majority of the sampled women in northern Nigeria fall within the age range 25-29 years across the sub-regions in northern Nigeria. The higher the population of women that falls within lower age range of their reproductive life span, the higher the possibility of witnessing high fertility behaviour in the region in terms of children ever born.

Conclusion and Recommendation

From results, it is evident that the high fertility behaviour witnessed in the northern region can be attributed to low age of mothers, implying that most women marry at a very early age. It is therefore recommended that there is need for the Nigerian government to improve on girl child education in northern Nigeria as this will help in reducing early marriage in the region. There is need for the government to address issues relating to women empowerment as this will go a long way in improving women autonomy in terms of financial autonomy there by reducing the tendency of girls been forced to early marriage because of financial benefits. Financial autonomy of women will help a lot in improving women access to and utilisation of reproductive health care services most especially relating to family planning thereby reducing fertility behaviour in terms of children ever born in the region.

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