

Assessment of the Fertility Pattern of Women in North Western Nigeria

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Abstract: Fertility behavior is conditioned by both biological and social factors. Knowledge of fertility pattern gives insight into drivers of human fertility. The paper investigated the birth pattern of women in Kebbi State, North Western Nigeria. A total of 2,256 questionnaires were distributed to the women of child bearing age using simple random sampling across five local government areas. The aim of the study was to analyze the pattern of fertility among age group of women of childbearing age and the effects of some exogenous variables on the fertility of women in the state. Poisson regression was applied for the positive count value recorded. The results from the analysis revealed that experience of birth or history of birth, financial reliant, obesity, individual age are highly significant to the study and have direct impact on fertility. Despite our ability to breed continuously, all human populations exhibit variation in reproduction.

Keywords: Birth pattern, Child-bearing age, Exogenous Variables, Poisson Regression.

I. INTRODUCTION

A reproductive life of a woman extends from about 15 to 49 years(i.e child bearing age), and few women reproduce below this age group, all women in this age group do not have uniform reproduction. There are some biological, economical and socio-cultural variables which mainly hinders reproduction of women. In some countries there have been efforts to establish registration of births in a simple list of village, local government or even state in an attempt to collect vital statistics (vital registration) by periodic measurement (Bell 1997). The knowledge of the age pattern of fertility of certain country or state has various uses in demography; it is not only improving the fertility but also helps in population projection, project fertility component implementation of policies as well as strengthening the family planning program. The paper shall provide a model on fertility pattern. The model will help in identifying the fertility pattern of the country as proclaimed in some previous literature in the eighteenth century that the size of a nation's population is always limited by economic resources and possibilities. If a country gets richer, women will get better income possibilities and the cost of raising children will increase. Fertility analysis is important in understanding current, past and future trends of the population size, composition and growth. Information on the fertility levels, pattern and trends experienced by a country is important for socio economic planning, monitoring and evaluation programs. According to Hinde and Mturi (2000), fertility rate is high in sub-Saharan Africa (SSA) than any part

of the world, mainly due to high economic and social value attach to children. The low economic development is contributing to high infant and child mortality (Cutler *et al*, 2006)

High fertility rates could be one of the major deterrents to sustained economic growth in sub-Saharan Africa (SSA) countries and this effect can be examined at each level of population. In developing countries, study on the pattern of fertility is most important topic because of its direct relevance to the government for planning and making polices. The ill-effects of population growth can be examined at macro and micro levels. Different fertility regulation mechanism such as modern contraceptives, termination of pregnancy, delayed marriages have contributed much towards fertility reduction in urban (Markos, 1997). Therefore the level of fertility in kebbi state, North Western, Nigeria will be examined in order to ascertain the influential factors on the fertility of women.

Fertility analysis is important in understanding current, past and future trends of the population size, composition and growth. Information on the fertility levels, pattern and trends experienced by a country is important for socio economic planning, monitoring and evaluation programs. In Europe, the declining population growth and the ageing population causes concern about the future of the welfare status, while the same trend in developing countries is regarded as good news because high population growth usually is seen as closely linked with low economic and human development (Gudbrandsen, 2010). Guilimoto and Rajan (2001) tried to understand the mechanism behind the regional variation in fertility. They took fertility as a regionalized variable, i.e. a variable which is assumed to be spatially continuous. The maps based on geospatial data revealed that spatial variation in fertility is far from random. Fertility decline began in periphery along the coast and in the extreme south and then spread progressively towards interior. Morgan (2002) made a comparative study of Muslim and non-Muslim fertility in Asian countries. The study revealed that Muslims have more children, and are more likely to want another child and are consistently less likely to use contraceptive. Tsegaye (2010) assessed the association between employment status and fertility of married people in the context of Ethiopia. The analysis was made based on the 2000 and 2005 Ethiopian Demographic and Health survey data. The findings showed

that there was an insignificant relationship between women employment status and fertility behavior at a country level.

Al-Awad and Chartouni (2010) examined the factors that have contributed to the decline in fertility in Gulf Cooperation Council countries in recent years, employing data from the 2008 U.A.E Household Expenditure survey, however the research analyzed the determinants of fertility using a Poisson fertility model on the data collected through questionnaire and established that low-income has effect on fertility. In the view of Feyisetan and Bankole (2012), fertility behavior is conditioned by both biological and social factors. And as in other traditional African societies, several factors have contributed to sustain relatively high levels of fertility in Nigeria. These factors include high level of infant and child mortality, early and universal marriage, early child bearing as well as child bearing within much of the reproductive life span, low use of contraception and high social values placed on child bearing.

Angeles (2010) regression analysis of fertility decline in the period 1960–2000, established that GDP per capita has negative coefficient but its estimated effect is far weaker than mortality and education. One possible explanation for this relatively weak estimated effect is that the true effect of income growth on fertility is heterogeneous, raising the demand for children in some subgroups and lowering it in others (as economic theory would predict). Feyisetan and Bankole (2012), set out to ascertain declining fertility trend in Nigeria and identified the key determinants that facilitated such trend. They concluded that a sustained fertility transition had commenced in Nigeria. They found out that the trend was more emphatic in the South than in the Northern part of the country. The survey revealed that there was clamor to reduce the desired family size. Other important factors that determine the fertility transition included: use of contraception, changes in nuptiality patterns, particularly in the proportion marrying before age 20, and increased education of women. Further declines in desired family size were coupled with increased use of contraception for limiting, rather than as a substitute for traditional birth spacing methods, increases in age at marriage and education of women generated further declines in fertility.

Ushie (2009) in their study examined the socio-cultural and economic determinants of fertility differentials in rural and urban Cross River State, Nigeria with specific focus on Calabar and Bendi communities. Survey design utilized data from a sample of eight hundred and eighty respondents which was drawn using purposive, quota and systematic sampling techniques. The study elicited data via structured questionnaire and focused group discussions (FGD). Hypotheses of the study were tested using Bi-variate and Multi-variate techniques. Findings revealed that age at entry into marital union, contraceptive use and educational level significantly determined fertility differentials between rural and urban communities in Cross River State. The study recommended among others that public enlightenment

campaigns on the use of contraceptives and proper family planning should be embarked upon by relevant agencies.

Onoja and Ikpotokin (2012) tested effects of some determinants of fertility on child bearing women to determine the level of fertility in Nigeria using data from the 2008 Nigerian Demographic Health Survey (NDHS). Data on 20,974 women were extracted from the 2008 NDHS data and analyzed using descriptive statistics and Poisson regression. Women with no education and those with secondary school education had 1.36 times risk and 17% increases in fertility (respectively) over those with higher education. Rural women were 1.02 times more likely to be at risk of high fertility compared to women in urban areas. Fertility level in Nigeria is higher in the rural areas than in the urban areas while level of education of women negatively impacted on their risk of having high fertility.

According to Olorok (2012) Nigeria have a total fertility rate (5.7) that is high and higher than many other countries of about similar level of development. (see the National Population Commission (NPC)): North-West and North-East having high total fertility rates.” Adolescent childbearing has many negative health, social, and demographic consequences. Women who start having children at a young age often do not complete secondary school, limiting their future employment possibilities and other life choices. Additionally, early childbearing often results in larger families and reduced economic circumstances. Nationwide, 23% of girls age 15-19 have either already had a live birth or are pregnant with their first child.

Bratti (2002) used data from the 1993 Survey of Household Income and Wealth conducted by the Bank of Italy in order to estimate a reduced form purist model of female marital fertility and labor force participation. It focused in particular on the effect of formal education on both fertility and labor force participation, and accounted for the potential endogeneity of education. After estimating an education regression and testing for weak exogeneity of education and controlling for a wide range of characteristics of a woman’s family and marital background, the research did not find any residual evidence of endogeneity of education with labor force participation and fertility. Estimates showed that increasing education up to the upper secondary level exerted a positive effect on marital fertility at ages 21–39 and that highly educated women postponed fertility and had a higher labor market attachment.

In the Middle East, Khraif (2002) assessed determinants of fertility in Saudi Arabia, using a regression analysis. He found that age at marriage and woman’s education are apparently the most important determinants of fertility behavior. Ayebale (2005) examined the determinants of cohort fertility in Uganda. The study utilized three datasets from the Uganda Demographic and Health Surveys (UDHS) carried out in 1988/89, 1995 and 2001. These datasets were combined to form four cohorts. To establish the determinants of cohort

fertility preference, a Poisson regression model was used. The study found that women in the rural areas had higher fertility preferences than their counter parts in urban areas. Women who had attained secondary level of education and above had lower fertility preference than those with no education at all. In the study, increasing age of mother was associated with increasing fertility preference. Increasing age at first birth was associated with decreasing fertility preference.

EI Lahga and Olfa (2008) assessed the main socioeconomic determinants of the household fertility decision in Tunisia, referring to Becker and Lewis hypothesis (1973). A count data model, which reasonably describes observed completed fertility patterns, was used. A Poisson regression model of household fertility decision was applied. To accommodate the under-dispersion exhibited in the sample a model based on squared polynomial expansion of Poisson density was also used. They found that husband characteristics were almost as important as those of wives in determining fertility decision.

1.1 Need For The Study

North Western Nigeria has high rate of fertility and there are numerous consequences on the household level. For instance, women may not have enough time to give proper care to their young children. High fertility rates could be one of the major deterrents to sustained economic growth. This study will tend to contribute to the literature using recent cross sectional data. In addition, factors that determine fertility are measured as count data (i.e. children ever born to a woman by the time of the research) and are assessed using the recently developed count data modeling; namely, the Poisson regression model. Our result could be used in policy formulation towards strengthening the family planning programs. Summarily, the paper examined the relationship between fertility of women and exogenous variables; It also assessed the impact of those variables on the fertility of women and determined the pattern of fertility of women with Kebbi State as a case study.

II. MATERIALS AND METHODOLOGY

2.1 Data Collection and Exploration

The study covered five Local Government Areas (LGA)., namely: Argungu, Aleiro, Yauri, Bagudo and Bunza of which 2286 questionnaires were distributed and Poisson regression was used to determine the relationship between fertility and some selected exogenous variables. However the study is limited to the women in child bearing age in the study area. This study estimated a reduced form equation for the number of children ever born.

2.2 The Poisson Model

Factors determining fertility measured as count data (i.e children ever born to a woman by the time of the survey) are assessed using the recently developed count data modeling; namely, the poisson regression model, it is a recently adopted model used to investigate the relation between the number of children ever born and the socioeconomic and demographic

variables of women obtained from a given survey (Winkelmann and Zimmermann, 1995). Poisson regression is one of the robust models for the analysis of discrete data that are based on the assumption that the dependent variable is Poissonly distributed and its logarithm is a linear function of the independent variables. An important feature of this model is that the heterogeneity of y is modeled as a deterministic function of the explanatory variables, therefore the randomness is intrinsic and not due to other factors as in the classical regression model. Given the discrete and non-negative nature of our dependent variable, the OLS model is clearly inappropriate as it specifies a conditional mean function $x'\beta$ that may take negative values and a variance function that is homoscedastic. If the conditional mean function is an fact $\exp(x'\beta)$, the OLS estimator is inconsistent for β and the computed OLS output gives the wrong asymptotic variance matrix (EI Lahga and Olfa, 2008). The dependent variable is a count variable denoting the number of children ever born to a spouse which takes on non-negative integer values. The expected value of the count variable (y) conditional on a set explanatory variables x is modeled.

$$E(y/x) = e^{(x'\beta)} \quad \dots (1)$$

The specification above ensures that $E(y/x) > 0$ thus, the number of children ever born to a spouse conditional on x is the Poisson distribution with probability density of

$$P(Y = y/x) = \frac{e^{-e^{(x'\beta)}} e^{(x'\beta)^y}}{y!} \quad \text{Where } y = 0, 1, 2, \dots, N \quad \dots (2)$$

The maximum likelihood Poisson fertility equation is the specified as

$$L(\beta) = \sum_{i=1}^n \{ y_i x_i \beta - e^{x_i \beta} \} \quad \dots (3)$$

The explanatory variables x_i 's in the fertility equation refer to socio economic variables describing household and women's characteristics.

The full model is therefore given as:

$$\mu_i = e^{\beta_0 + \sum_{j=1}^k \beta_j x_j} \quad \dots (4)$$

Where:

μ = the expected number of children per woman I; e = the base of natural logarithms;

β_0 = the intercept; β_j 's = regression coefficients; X_j 's = Explanatory variables.

2.3 Method and Area of Data Collection

Primary information is required for estimating fertility, like number of live births by mothers in particular age group during the specific time interval, the educational attainment of mothers, access to media (like computer and Hand set), age of mothers, class status. Therefore, the method used for data collection is questionnaire and Kebbi State is the area of study.

2.4 Sample Selection

In order to avoid bias during the study Local Government areas in the state were arranged in alphabetical order and numbers were allotted to each Local Government, then table of random numbers was used to select five Local Governments out of twenty one (21) Local Governments in the state, having done this the following Local Government (Argungu, Aleiro, Badugo, Bunza and Yauri) were sampled and used in the study.

2.5 Variables Definition

Total number of children ever born is modeled as a function of socio economic and demographic variables which include the following independent exogenous variables: Age (min: 15years and a maximum of 49years.) Access to media: (Handset, Computers, Newspaper). Class Status (This is a wealth indicator and it is measured as poor, poorer, middle, richer, richest; these variables are expected to have impact on the fertility of women). Work Status (labour-work of the interviewed females) Education Status(The educational attainment is directly related to her opportunity cost of time and inversely related to the fertility decision)/ This inverse relationship is expected to be stronger and the number of years of schooling by female are important variables to consider in the analysis of fertility.

III. RESULTS ANALYSIS AND DISCUSSION

3.1 Transformation of Variables

The Descriptive Statistics such as the Mean, Median, Skewness, Kurtosis and Standard Deviation were examined. Tables and Figures were plotted and discussed.

3.1.1 Count Number of Birth (Nbirth=Y)

It represents the number of count of fertility in Kebbi State.

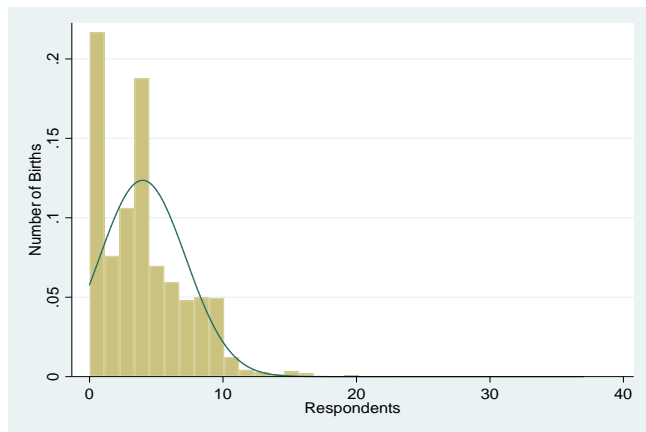


Figure 3.01 Distribution of Number Birth

The result in 3.01 above revealed the distribution of number of births which clearly showed that the variable in question is skewed to the right, meaning that the variable needs transformation to be normalized, However the transformation

showed that natural logarithm of number of births will be a better for the analysis.

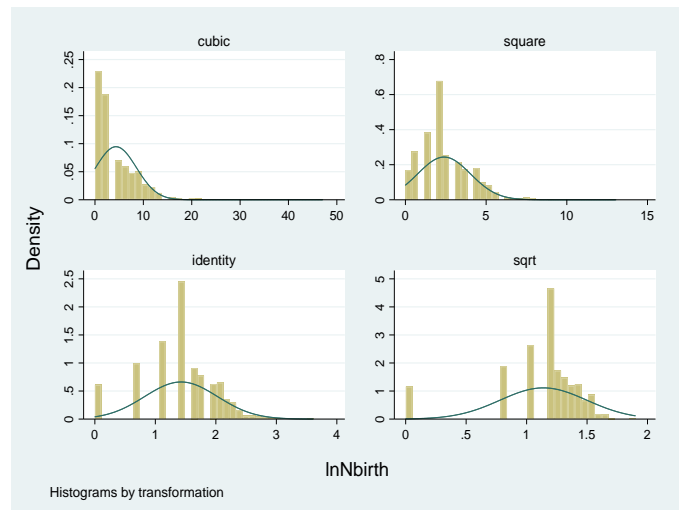


Figure 3.02 Set of Transformations Considered

The results in Figure 3.02 showed the set of transformations considered in the study of which natural logarithm of the variable taken.

3.1.2 Age of Women

This is the recorded age of women within the fertility age (child bearing age 15 - 49) that were considered in the survey

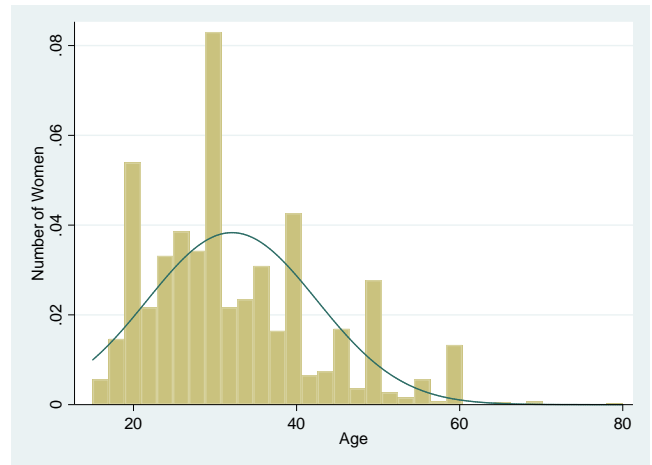


Figure 3.03 Distribution of Age of Women.

The Figure showed the transformation of age of women within the fertility period and it clearly revealed it is evenly distributed along the curve.

3.1.3 Age group of women

The result in figure 3.04 below revealed the distribution of age groups of women which are divided in to eight group with equal class interval and equal sizes.

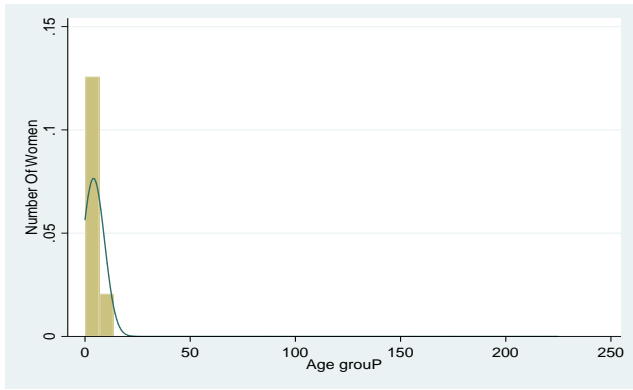


Figure 3.04 Distribution of Age Group of Women

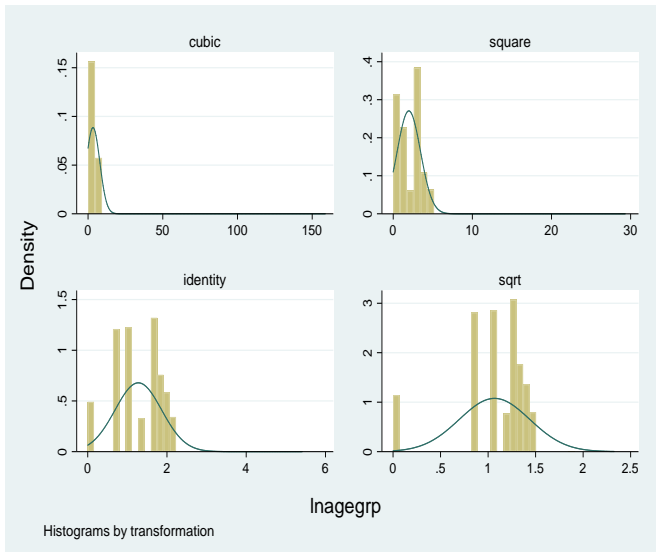


Figure 3.05 Set of transformation of Age Group of women that were considered.

This showed other transformations that were considered of which natural logarithm is used.

3.1.4 School Attainment of Women

Presentation of recorded school attainment of women within the fertility period in kebbi state

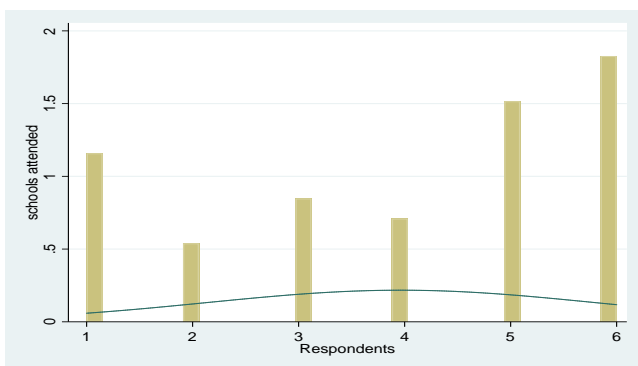


Figure 3.06 Distribution of School Attainment of Women

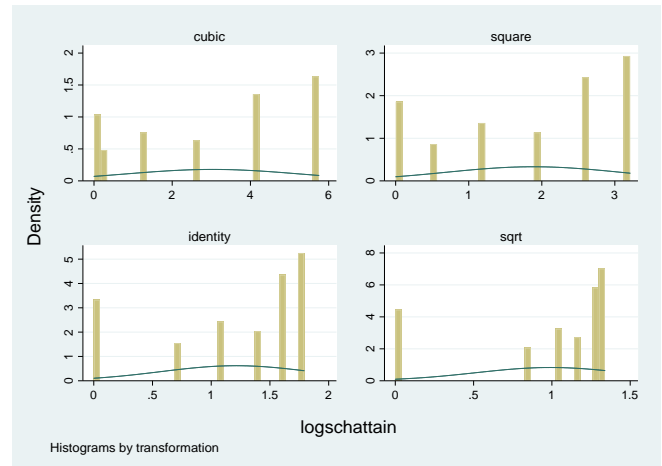


Figure 3.07 Distribution of general logarithm of School Attainment

Results in Figure 3.07, revealed more spread points in log-transformation of school attainment which was used in the analysis.

3.1.5 Class Status of Women

Recorded class status of women of reproductive age represented in figures below

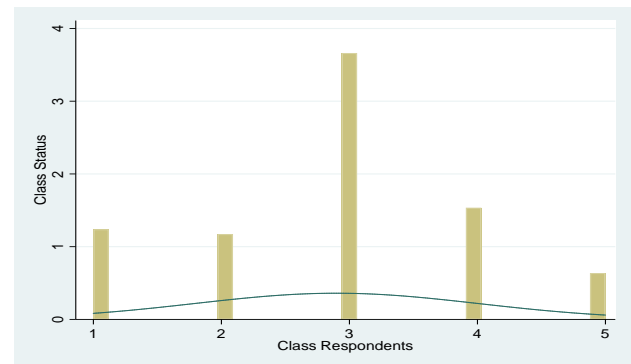


Figure 3.08 Distribution of Class Status of Women

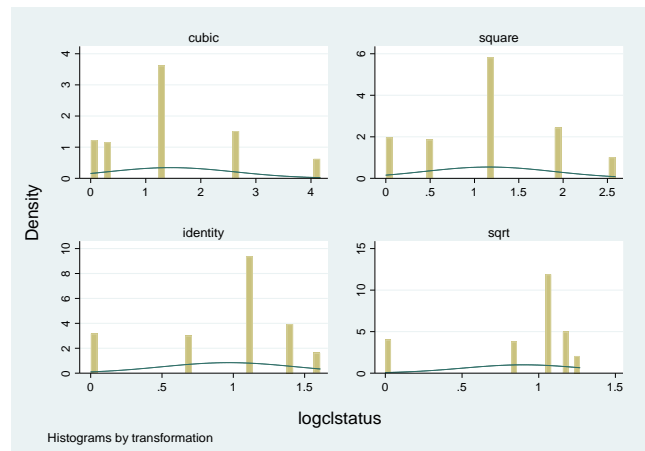


Figure 3.09 Showing The Transformation That were Considered in The Class Status

Results in Figure 3.09 revealed more spread points in log-transformation of class status of women which was used in the analysis.

3.2 Descriptive Statistics of the Variables Used in the Study

Table 3.01 Distribution of School Attainment

School Attainment	Frequency	Percentage	Cumulative Frequency
No Education	395	17.56	17.56
Incomplete Prim	184	8.18	25.73
Complete Primary	289	12.84	38.58
Incomplete Sec	242	10.76	49.33
Complete Sec	517	22.98	72.31
Tertiary	523	27.69	100
Total	2250		

Kelly and Allen (1996) suggested that school attainment should be considered as variable in the regression fertility study, the distribution of the school attainment in Table 3.01 above indicated that 17.56% of the women of reproductive age have no education and 8.18% have not completed their primary school education though 12.84% have completed primary education as revealed from the table. Similarly, 10.76% of women have incomplete secondary school education while 22.98% among women of reproductive age have complete secondary education, and 27.69% of women have tertiary education. Based on the preliminary analysis made on the responses from the questionnaires distributed, the following results were obtained:

Distribution of Financial Status of women: it was revealed that 47.20% of women are not financially reliant and 52.80% of women in reproduction age are financially reliant.

Distribution of Class Status of women: it was revealed that 15.02% of women are poor and 14.22% of them are poorer. Similarly, 44.40% of women are middle class and 18.62% of women are richer with 7.73% in the richest class.

Distribution of women working: The distribution of working status of women in childbearing age revealed that 60.53% of women are unemployed with only 39.47% of women were employed.

Distribution of Women Reading Newspapers: The distribution of women reading newspapers. 64.31% of the women are not reading newspapers and 35.69% of women are newspaper readers.

Distribution of Women Accessible to handset or computer: The result showed that 30.93% of the women have no access to handset or computer.

Distribution of Women Smoking habit: Smoking is one of the variables considered to have vital role in the research because of some beliefs in the existing literature that smoking habit

may tend to hinder the reproductive system of child-bearing mothers (Gudbrandsen, 2010). Our findings revealed that 19.29% of the women are smoking.

Distribution of Drugs Addiction of Women: This showed that 74.62% of women are not drugs addicted with only 25.38% addicted to drugs.

Distribution of Women Taken Orthodox Medicine: This revealed that 32.13% of the women are not using orthodox medicine while 67.87% of the women have been using orthodox medicine for fertility treatment.

Distribution of women with Diabetes: It revealed that 80% of women have no diabetes and only 20% are diabetes positive.

Distribution of women with obesity: it revealed that only 35.24% are obsessed.

Distribution of women living with HIV: This indicated that 64.76% of women are HIV negative and 35.24% of women are HIV positive.

Distribution of Age group of women: Reproduction of women is always determined by age of women and it reflects the characteristic of life cycle therefore it can condition some of the explanatory variable used in the research though age is a continuous variables with minimum of 15 years and the maximum of 49years (Childbearing Age 15 – 49).

Table 3.02 Distribution of number of children ever born by mothers

Number of children ever born	Frequency	Percentage	Cumulative Frequency
0	429	19.07	19.07
1	118	5.24	24.31
2	192	8.53	32.84
3	268	11.91	44.76
4	474	21.07	65.82
5	176	7.82	73.64
6	150	6.67	80.31
7	121	5.38	85.69
8	126	5.60	91.29
9	68	3.02	94.31
10	57	2.53	96.84
11	31	1.38	98.22
12	11	0.49	98.71
13	7	0.31	99.02
14	4	0.18	99.20
15	8	0.36	99.56
16	5	0.22	99.78
17	1	0.04	99.82
18	1	0.04	99.87
20	2	0.09	99.96
37	1	0.04	100.00

History of fertility of set of women investigated is paramount in this type of study as suggested by (Giroso and King, 2008). The results in Table 3.02 revealed distribution of number of children ever born by mothers that were investigated. 19.07% of them were reported not to have given birth before. Remaining percentages were distributed among child bearing ones.

Table 3.03 Result of the Poisson Regression Estimates

lnN birth	Coef.	S td. Err.	Z	P> z [95% Conf.Interval]
Ebirth-	.1966182	.0567618	-3.46	0.001 -.3078693 -.0853671
agegrp1	-.117349	.2639302	-0.44	0.657 -.6346286 .3999587
agegrp2	-.1174112	.2102217	-0.56	0.576 -.5294382 .2946158
agegrp3	-.0596062	.1598257	-0.37	0.709 -.3728589 .2536466
agegrp4	-.0744319	.0943988	-0.79	0.430-.2594501 .1105864
agegrp5	-.0031927	.1285559	-0.02	0.980-.2551576 .2487723
agegrp6	.0412773	.1018298	0.41	0.685-.1583054 .2408599
agegrp7	.0575816	.0882091	0.65	0.514-.1153051 .2304682
lnage.	.6882043	.2424771	2.84	0.005.212958 .1163451
schattain1	.1610895	.0680591	2.37	0.018.0276961 .2944828
schattain2	.1863022	.0893061	2.09	0.037 .0112656 .3613389
schattain3	.1851364	.0736653	1.85	0.064 -.0079813 .2807813
schattain4	.1149535	.0777737	1.48	0.139-.0374801 .2673872
schattain5	.0443349	.0586192	0.76	0.449-.0705566 .1592264
finrlnt	-.0907982	.0431724	-2.10	0.035-.1754147 -.0061818
clstatus1	-.0124321	.091156	-0.14	0.892 -.1910946 .1662304
clstatus2	.0021899	.0903978	0.02	0.981-.1749866 .1793664
clstatus3	-.0340998	.0766104	-0.45	0.656-.1842534 .1160537
clstatus4	-.1134345	.0814085	-1.39	0.163 -.2729921 .0461232
rdnews	.0599195	.0503835	1.19	0.234 -.0388304 .1586695
Acsshndset	-.0121483	.0474316	-0.26	0.798 -.1051125 .0808159
smoke	.018631	.0638876	0.29	0.771 -.1065863 .1438484
drgadct	-.0237902	.0603404	-0.39	0.693 -.1420552 .0944747
othodox	.0036299	.0456742	0.08	0.937 -.0858898 .0931496
diabetic	.0611463	.0610503	1.00	0.317 -.0585102 .1808027
obsessed	.0324255	.04779810	.68	0.004 -.3636101 .1261081
Hiv	-.1016362	.0710134	-1.43	0.152 -.2408199 .0375474
_cons	-1.874967	.9497257	-1.97	0.048 -.3.736395 .0135383

Result in Table 3.03 Revealed the number of observations = 1,821, $\chi^2(27) = 170.40$, $\text{Prob}>\chi^2 = 0.0000$ and Pseudo $R^2 = 0.0372$. It's also I indicate that experience of birth or history of birth (Ebirth), individual age (lnage), school attainment 1 and school attainment 2, financial reliant and obesity are highly significant to the study of fertility regression. The

result obtained may not be necessarily surprising as from the literature review history of fertility of women counts. Age group tends to be insignificant but individual age (lnage) tends to be highly significant but not age group. Women without any formal education (School attainment 1) and women who have no complete primary school education (school attainment 2) were highly significance at 5% level of significance. However, women with complete primary education (school attainment 3), was significant at 10% level of significance. Possibly school attainment 1 and 2 are mostly housewives without any formal education.

In addition with the inclusion of handset, obesity financial reliant, smoking only, financial reliant and obesity tend to be significant at 5% level. However, class status, reading of newspaper, intake of orthodox medicine was statistically insignificant to the fertility study.

The overall model specification is highly significant in that $\text{prob}>\chi^2 = 0.000$ and the log likelihood is -2203.618, which specified that the model is adequately fitted.

The history of fertility or experience of birth on both women sides and their respective parents tend to show a negative impact on fertility of these women. The indication of this is that if their respective parents have low fertility there is tendency for decrease in the fertility life of these women. The results revealed 19.66% chance of reduction in fertility of such women.

Individual age tend to show a positive impact on fertility. The indication of this result is that between 15 to 49 years of individual ages of women studied, the fertility tends to be at its peak at 23 to 35 years. The result revealed 68.8% chance of increase on fertility level.

Financial reliant tend to show negative impact on the fertility. This implies the fact that women in the studied area might be fertility deficient as a result of lack of money or wealth to handle their daily needs. This might also possibly increase maternal and neonatal mortality rates in the area as discussed (Booth and Tickle, 2008). There is 9% chance of the effect of this variable on the fertility of women.

School attainment tends to exert positive impact on fertility, education they say, is power. The literacy of mother may likely increase fertility. Literacy goes with awareness about 8-7% chance of this effect on the fertility.

Obesity tends to show negative impact and this implies about 3% chance effect on fertility.

Thus, the fertility of women in the studied area tend to follow a pattern that is most from the results obtained) likely to be affected by these significance determinants.

Table 3.04: Incidence Rate Ratio

lnNbirth	IRR	Std. Err	Z	P> z	[95% Conf.	Interval]
Ebirth	.7387503	.0561446	-3.98	0.000	.6365124	.8574099
Agegrp1	.7585812	.2755924	-0.76	0.447	.3721866	1.546121
Agegrp2	.8075731	.2391274	-0.72	0.470	.4519973	1.442872
Agegrp3	.9362677	.2134466	-0.29	0.773	.5988892	1.463705
Agegrp4	.8231167	.1384869	-1.16	0.247	.5919013	1.144652
Agegrp5	1.003054	.182454	0.02	0.98	.7022509	1.432705
Agegrp6	1.083804	.1572926	0.55	0.579	.8154851	1.440409
Agegrp7	1.09583	.142788	0.70	0.482	.4848495	1.414672
Lnage	1.839657	.632511	1.77	0.076	.9377274	3.609084
Schattain1	1.208504	.1300233	1.76	0.078	.9787394	1.492207
Schattain2	1.22357	.1571939	1.57	0.116	.9512036	1.573924
Schattain3	1.181774	0.1331467	1.48	0.138	.9476153	1.473793
Schattain4	1.13086	0.1291323	1.08	0.281	.9049013	1.414517
Schattain5	1.055248	.1107013	0.51	0.608	.8591310	1.296135
Finrlnt	.9050788	.0525414	-1.72	0.086	.8077508	1.014154
Clstatus1	1.114684	.2090136	0.58	0.563	.7718689	1.609756
Clstatus2	1.115117	.2070947	0.59	0.557	.7748885	1.604731
Clstatus3	1.103312	.1983712	0.55	0.585	.7756314	1.569426
Clstatus4	.9835152	.192948	-0.08	0.932	.6695617	1.444680
Rdnews	1.016417	.0865624	0.19	0.848	.8601610	1.201057
Acsshndset	.9669276	.0590859	-0.55	0.582	.8577875	1.089940
Smoke	.9656738	0.103197	-0.33	0.744	.7831890	1.190678
Drgadct	.9244577	0.837006	-0.87	0.386	.7741393	1.103964
Orthodox	.9891355	.0612275	-0.18	0.860	.8761257	1.116722
Diabetic	1.073537	0.933152	0.82	0.414	.9053743	1.272935
Obese	1.065969	.0666661	1.02	0.307	.9429967	1.204978
Hiv	.8289795	.0867641	-1.79	0.073	.6752333	1.017733
_cons	.2027318	.2732767	-1.18	0.236	.0144386	2.846542

Note: _cons estimate baseline incidence rate.

Table 3.04 Indicates that number of observations is 1,806, $\chi^2 = 1.2393$, $\text{Prob} > \chi^2 = 0.0000$ and Pseudo $R^2 = 0.0468$. Furthermore due to history of fertility from the parent, the result showed that there is tendency of decrease of about 27% in every unit of fertility. The indication is that if their respective parents have low fertility there is tendency for decrease in fertility life of these women.

Incidence rate ratio revealed that there is likelihood of 84% increase in fertility of women due to individual age in the studied area. This implies the fact that women in the study area might be fertility deficient as a result of lack of money or wealth to handle their daily need.

Incidence rate ratio also clearly indicate a possibility of positive impact on the fertility due to school attainment/educational level of women in the area with about 21%, 22%, 18%, 13% and 5% respectively. Financial reliant of women also indicate to be negatively important from the incidence rate ratio. Furthermore due to incidence rate ratio

there is indication that smoking habit has negative impact on the fertility of women of about 4% decrease.

IV. DISCUSSION OF THE RESULTS

The study investigated the relationship between fertility and some exogenous variables such as Experience of birth or history of fertility (Ebirth), age-group, individual age, work status, educational status of women, class status of women, intake of orthodox medicine and HIV. Aside from some of the variables in the existing literature, this study included use of handset, obesity, smoking, financial reliant, HIV and diabetes. The initial inspection of these variables showed that the variables must be transformed as suggested by (Tsegaye, 2010; Girosi and King, 2008; Booth and Tickle, 2008; Khraif, 2002; El Lahga and Olfa, 2008; Bratti 2002; Aldeiri and Vinci, 2007). Furthermore, the results obtained in Table 3.04 showed similar assertions with (Cameron, 1996) where Ebirth, age and school attainment are also significant. However work status, age group, reading of newspaper were insignificant in this study which contradicted (Cochrane, 1980; Ayebele,

2005; Guzman, 1994; Becker and Lewis, 1973), where these variables were highly significant which indicate that the pattern to which women of child bearing age in Kebbi State must consider include the fertility history or experience of birth, individual age (linage) financial reliant, obesity, School attainment 1 and school attainment 2. The discrepancies in the two results might likely due to the different study area.

Financial reliant, obesity, factors included in the regression showed highly significance in the study area. Nevertheless the inclusion of the use of handset, diabetes, HIV, Smoking, do not affect the regression.

The history of fertility or experience of birth on both women sides and their respective parents tend to show a negative impact on fertility of these women. The indication of this is that if their respective parents have low fertility there is tendency for decrease in the fertility life of these women. The results revealed 19.66% chance of reduction in fertility of such women as discussed by (Aldeieri and Vinci, 2007).

Individual age tend to show a positive impact on fertility. The indication of this result is that between 15 to 49 years of individual ages of women studied, the fertility tends to be at its peak at 23 to 35 years. The result revealed 68.8% chance of increase on fertility level.

Financial reliant tend to show negative impact on the fertility. This implies the fact that women in the studied area might be possible fertility deficient as a result of lack of money or wealth to handle their daily needs. This might also possibly increase maternal and neonatal mortality rates in the area which is in line with (Booth and Tickle, 2008; Bratti, 2002; El Lahga and Olfa 2008). There is 9% chance of the effect of this variable on the fertility of women.

School attainment tend to exert positive impact on fertility education they say power. The literacy of mother may likely increase fertility. Literacy goes with awareness about 8-7% chance of this effect on the fertility.

Obesity tends to show negative impact and this implies about 3% chance effect on fertility.

Thus, the fertility of women in the studied area tends to follow a pattern that is most likely to be affected by these significant determinants.

V. CONCLUSION

Having studied the relationship between fertility and some exogenous variables that determine the fertility behavior of women in Kebbi State, the results revealed that experience of birth or history of fertility, financial reliant, obesity, individual age, zero education level and women with incomplete primary school education were significant at 5% level. The history of fertility or experience of birth on women and their respective parents tend to show a negative impact on fertility of these women. The indication of this is that if their respective parents have low fertility there is tendency for decrease in the fertility life of these women. The results revealed 19.66% chance of

reduction in fertility of such women. Individual age tend to show a positive impact on fertility. The indication of this result is that between 15 – 49 years of individual ages of women studied, the fertility tends to be at its peak at 23 – 35 years. The result revealed 68.8% chance of increase on fertility level. Financial reliant tend to show negative impact on the fertility. This implies the fact that women in the studied area might be possible fertility deficient as a result of lack of money or wealth to handle their daily needs. This might also possibly increase maternal and neonatal mortality rates in the area. There is 9% chance of the effect of this variable on the fertility of women. School attainment tends to exert positive impact on fertility, education they say power. The literacy of mother may likely increase fertility. Literacy goes with awareness about 8-7% chance of this effect on the fertility. Obesity tends to show negative impact and this implies about 3% chance effect on fertility. Thus, the fertility of women in the studied area tends to follow a pattern that is most likely to be affected by these significant determinants. The indication of this result is that the birth pattern of the women of child bearing age in Kebbi State is most likely to be affected by these determinants. Thus, it was recommended from this study that the Government should sensitize the women in this area on the need to educate them on these crucial determinants.

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