CONTEXTUAL FACTORS ASSOCIATED WITH TEENAGE PREGNANCY AND CHILDBEARING IN NIGERIA

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Abstract

Background: Teenage pregnancy and childbearing seem to be continuing unabated in Nigeria despite efforts to reduce the rates.

Objective: This study examined the individual and community-level factors associated with teenage pregnancy and childbearing in Nigeria.

Methods: Using the 2013 Nigeria Demographic and Health Survey (NDHS) data; a sample of 7,819 female teenagers who were pregnant as at the time of the survey or having had a child in the last five years preceding the survey were analyzed using multilevel binary logistic regression.

Findings: The fixed effects results show inverse relationship between age of respondent, educational levels, age at marriage, and age at first sex (p<0.05). A significant low incidence of teenage pregnancy and childbearing was found among teenagers from the North East (OR=0.6, CI: 0.33-0.95) and North West (OR=0.5, CI: 0.29-0.84). The random effects (ICC=4.1 % and

PCV= 97.7%) show effect of individual and community-level factors on teenage pregnancy and childbearing.

Conclusion: The study concluded that policy that could promote education; increasing the age at marriage and age at first sex and individual-level hold great potentials in reducing the incidence of teenage pregnancy and childbearing in Nigeria.

Keywords: Teenage pregnancy, childbearing, multi-level, contextual factors, Nigeria

Introduction

Teenage pregnancy, the pregnancy that occurs to a young person between thirteen to nineteen years has become a major social and health problem in Nigeria in the recent times (Adekanle, et al., 2008). This is because of its association with high morbidity and mortality for both the mother and child (Ajala, 2014; Al Riyami et al. 2004; Alan Guttmacher Institute, 2004; and Alika, 2012). Several studies have reported an increase in pregnancy complications associated with teenage pregnancy Ayele, 2013; Bamiwuye, 2014) such as anemia, pregnancy induces hypertension, preterm labour, obstructed and prolonged labour, unsafe abortion, and high incidence of operative deliveries due to physical immaturity of the pelvis of the teenage mothers as well as low birth weight babies, and even death Bauni, 1990; ChannelsTV, 2013). Social consequences of teenage pregnancies include cases of dropping out of school (Chau-Kuang, 2013), child abandonment, abortion and loss of skill and opportunities to find a job due to little or no education (Duze, & Mohammed, 2006), among others.

The incidence of teenage pregnancy is fast declining in the developed countries, with the lowest incidence of 3 percent in Sweden (Ekefre et al., 2014). However, in other developing countries particularly African countries; the incidence ranged from 3.7 percent to 22.9 percent of all pregnancies (Ezegwui et al., 2012). Nigeria has the highest rate of teenage pregnancy in Africa. About 22.9 percent of the world's teenage pregnancies in 2010 were from Nigeria (Federal Ministry of Health [FMoH], 2011; Ezra & Gurmu, 2002). According to World Health Organization and NPC & ICF International, 23 percent of young women age 15-19 have begun childbearing; 18 percent have had a child while 5 percent were pregnant with their first child.

The incidence of teenage pregnancy varied greatly between the Northern and Southern geo zones in Nigeria. Teenage pregnancy rates are higher in the Northern parts of the country than in the Southern parts: in the north, one (1) in every three (3) teenage girls, whereas in the south – one

(1) out of every ten (10) girls (Ajala, 2014). Among the zones, teenage pregnancy ranges from 8 percent in the South West and South East to 36 percent in the North West (FMoH, 2011). In addressing these variations, the Federal and State Governments have embarked on programmes and strategies aimed at teaching teens how to handle peer pressure to have sex, using contraception, engaging in sex abstinence, and promoting sex education. However, achieving these aims still remains an illusion in Nigeria.

To understand causes of teenage pregnancy and childbearing in Nigeria, studies have linked teenage pregnancy with African traditional society (Gilda et al., 2015; Hanes, 2012). This is because women often marry at a very young age Bauni (1990) and childbearing occurred early and within marriage (Henry et al., 2012). In Nigeria, premarital teenage pregnancy has increased and more teenage girls are getting pregnant (Iheanacho, 2004). Studies have linked declining age at first menstruation (menarche), increasing the age at marriage, increasing premarital teenage sexual activity (Jatau, 2011; Jimoh and Abdul, 2004), cohabitation Kyei (2012), age at first sexual intercourse and educational levels (Metal et al., 2013), low or ineffective use of contraceptives (NPC and ICF International, 2009) as risk factors in teenage pregnancy and childbearing.

Other factors associated with high rate of teenage pregnancy in Nigeria include loss of the elders' traditional social controls over sexual behaviour of the teenagers (NPC and ICF International, 2009; Nifi et al., 2002), the collapse of the extended family structure (Njogu et al., 1990), societal approval of teenage sexual relationship and premarital pregnancy as a sign of fruitfulness before marriage (Ayele, 2013, Bamiwuye, 2014), poverty (Ocholla-Ayayo, 1990), sexual abuse and rape, and the effect of globalization, modernization, urbanization and education on the sexuality (Ritcher and Mlambo, 2005). Ajala (2014) also reported religious beliefs and ignorance. In spite of these studies; factors influencing teenage pregnancy and childbearing at

the community level in Nigeria have been minimal. What are the community-level factors associated with a persistent increase in teenage pregnancy and childbearing in Nigeria? Thus, the aim of the study is to examine the community and individual factors influencing teenage pregnancy in Nigeria using multilevel modeling.

Methods

Data from the 2013 Nigeria Demographic and Health Survey (NDHS) were used for the study. The survey used enumeration areas (EAs) prepared by National Population Commission (NPC) for the 2006 Population Census of the Federal Republic of Nigeria as the sampling frame. The primary sampling unit (PSU) for the survey was regarded as a cluster on the basis of EAs. The sample was selected using a three-stage cluster design consisting of 904 clusters, 372 in urban areas and 532 in rural areas. Data were gathered from 33,385 women in the reproductive age (15-49 years). The study used data obtained from females between aged 15-19 years at the time of the survey from the individual recode dataset. Overall, 7,820 female teenagers were used as the weighted sample size and were analyzed. Weighting factor provided by measure DHS was applied in the data management to account for oversampling of some sections of the population.

Study variables and measurements

The response variable for this study is teenage pregnancy and childbearing. This is defined as women who have had a child or pregnant. The variable is dichotomized coded as one (1) if the respondent reported either being pregnant or had a child at the time of the survey and zero (0) otherwise. Explanatory variables include individual-level: age, education, age at first sex, religion, wealth status, marital status, type of marriage, family type, and community-level: place of residence, region, community education, community media exposure, community poverty, and community autonomy. The community-level variables were generated by aggregating

individual-level responses' at the community level (PSU/Cluster). Aggregates were categorised as; high, middle, or low subject to the distribution of the proportion values considered for each community. The inclusion of the all the explanatory variables was carefully determined by reviewed literature.

Data analysis

The data were analyzed using descriptive and inferential statistics. Descriptive analysis was used to describe the background characteristics of the data. The Chi-Square was used to test for statistical significance of variables at 5 percent level. The multilevel mixed-effects binary logistic regression (MMBLR) model was used to establish the effect of individual and community-level variables on teenage pregnancy and childbearing. The MMBLR was employed to accounts for clustering in complex sample designs like DHS (Merlo et al., 2005). Data were analyzed using a 2-level model with fixed and random components under the assumption that individuals or households were nested in communities and were specified as:

$$\text{Logit}\left[\frac{\pi_i}{1-\pi_i}\right] = \beta_0 + \beta_1\chi_{1ij} + \ldots + \beta_n\chi_{nij} + u_{0j} + e_{ij}$$

Where

π_{ij} = probability of teenage pregnancy and childbearing

$1 - \pi_{ij}$ = probability of no teenage pregnancy and childbearing

β_0 = log odds of the intercept

$\beta_1 - \beta_n$ = effect sizes of individual and community-level factors

$\chi_{1ij} - \chi_{nij}$ = independent variables of individuals and communities

u_{0j} = random errors at cluster levels

e_{ij} = random errors at the individual levels.

The distribution of u_{0j} is normal with mean 0 and variance σ^2_{u0}.

Three models were constructed and xtmelogit command in Stata was employed to estimate the models. The first model (Model 0) was fitted with no explanatory variable. The second model (Model 1) fitted with only individual/household-level variables. The final model (Model 2) was fitted with both community-level and individual/household-level variables. The odds ratios were employed to measure the fixed effects at 95% confidence intervals while the Proportional Change Variance (PCV) and Intra-Class Correlation (ICC) were employed to measure the random effects. The ICC was calculated as: $ICC = V_A / (V_A + \pi^2/3) \times 100$ Where V_A denotes the estimated variance and $\pi^2/3 = 3.29$. Also, PCV was calculated as: $PCV = [(V_A - V_B) / V_A] \times 100$ Where V_A is the variance in teenage pregnancy and childbearing in the empty model; and V_B is variance in successive models. Also, Akaike Information Criteria (AIC) was employed to determine the goodness of fit of the regression models. The lower value of AIC was taken into cognisant for the better fit of the model (Boco, 2010).

Ethical Considerations

Both written and signed an informed consent of the respondents was obtained and approved by the Ethical Committees in USA and Nigeria before the conduct of the Survey. Information was collected anonymously and confidentially (NPC and ICF International, 2014).
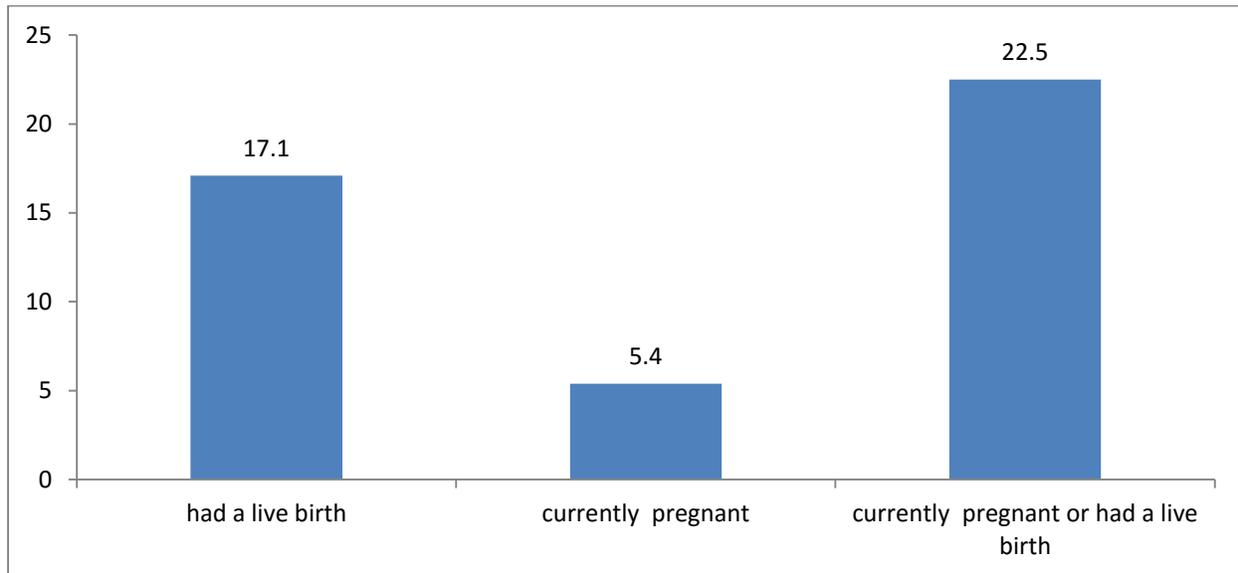
Results

Figure 1: Percentage of teenagers who have begun childbearing and who are pregnant with their first child by age

Figure 1 shows that 5.4% of the teenagers were currently pregnant with their first child, 17.1% have had a live birth and 22.5% have begun childbearing (pregnant or have had a child). The distribution shows that 38% of teenagers who have begun childbearing were aged 18 years, 59% had no formal education, 82% were rural dwellers, three-quarters (76%) were Muslims, and 89% were married. The North-West zone had the highest proportion of teenagers who have begun childbearing (49%). More than 3 in 5 of the teenagers (64%) were from the lowest wealth status and 65% had their first sexual intercourse between ages 12 to 15 years. Also, at least three-quarter (76 percent) of the teenagers were from monogamous family and more than half (58%) were married between ages 15-19 years. On the community-level factors, the results showed that at least 3 in 5 of the teenagers (64%) who have begun childbearing were from low educational level clusters, 44% were from low economic status clusters, and 39% were from high media exposure clusters.

Table 1: Distribution of selected characteristics and teenage pregnancy and childbearing in Nigeria

VARIABLES	Teenagers who Have had a Child or Pregnant	
Total	**1758 (100.0)**	**22.5**
Age groups		
15	104 (5.9)	5.2*
16	196 (11.2)	13.4
17	312 (17.7)	22.6
18	665 (37.8)	37.2
19	481 (27.4)	41.3
Mean age	**16.8**	
Educational level		
No education	1033 (58.8)	47.7*
Primary	307 (17.5)	32.2
Secondary	414 (23.6)	9.1
Higher	2 (0.1)	1.7
Marital status		
Single	167 (9.5)	3.0*
Married/cohabiting	1557 (88.6)	69.2
Divorce/separated/widowed	34 (2.0)	56.8
Religion		
Christians	415 (23.8)	11.5*
Islam	1322 (75.7)	32.3
Traditional/others	10 (0.5)	14.8
Wealth status		

Lowest	1116 (63.5)	38.5*
Medium	351 (20.0)	21.4
Highest	290 (16.5)	8.9
Age at first sex**		
8-11	55 (3.3)	53.3*
12-15	1100 (65.2)	57.7
16-19	533 (31.5)	40.1
Mean age at first sex	**7.35**	
Age at Marriage**		
10-14	664 (41.7)	73.0**
15-19	927 (58.3)	66.1
Mean age at marriage	**15.0**	
Types of marriage**		
Monogamous	1171 (75.7)	69.6
Polygamous	377 (24.3)	67.6
Knowledge of contraceptive		
No method	435 (24.7)	435(22.3)*
Traditional method	48 (2.7)	48 (68.9)
Modern method	1275 (72.6)	1275 (22.0)
Place of Residence		
Urban	321 (18.3)	9.7*
Rural	1437 (81.7)	31.9
Region		
North Central	218 (12.4)	18.9*

North East	381 (21.7)	32.1
North West	867 (49.3)	35.7
South East	73 (4.2)	0.82
South South	127 (7.2)	12.3
South West	91 (5.2)	8.2
Community education		
Low	1118 (63.6)	42.8*
Middle	348 (19.8)	15.9
High	292 (16.6)	9.7
Community poverty		
Low	779 (44.3)	39.0*
Middle	571 (32.5)	23.2
High	407 (23.2)	12.1
Community media exposure		
Low	586 (33.3)	33.3*
Middle	684 (38.9)	25.0
High	488 (27.8)	14.7

*Note: The figures in parentheses indicate the values of Chi-square. * = p<0.01, **=p<0.05,*

Bivariate Analysis

The results in Table 1 show a statistically significant relationship between age, education level, wealth status, age at marriage, religion, marital status, age at first sex, and knowledge of contraceptives methods and teenage childbearing (p< 0.05). Educational level, wealth status and age at marriage were inversely related to the likelihood to have begun childbearing. For instance,

the proportion of teenagers who have had a child or pregnant declined as educational level, wealth status and age at marriage increases. Also, an increasing age is associated with an increase in the proportion of teenagers who have begun childbearing. Religion, marital status, age at first sex and knowledge of contraceptive methods were statistically significantly associated with teenage pregnancy (p<0.05). The proportion of teenagers who have begun childbearing is higher among Muslims (32 percent) than Christians (12 percent) and Traditionalists (15 percent). It is also higher among teenagers who were from monogamous family (67%) compared to their counterparts from polygamous family (66 percent). In addition, teenagers who have started having sex between ages 12 and 15 (56 percent) were more likely to have begun childbearing than their counterparts between ages 8 and 11 (52 percent) and ages 16 and 19 (39 percent). On the community- level factors, the results shows that teenagers who were from rural cluster (32%), North West (36%), low educational level (43%), low poverty level (39%), low media exposure (33%) were statistically significantly associated with teenage pregnancy compared to their counterparts who were not.

Multi-level Analysis

Table 2 presents the multilevel binary logistic regression results of the fixed effects (a measure of association) and random effects for the selected individual and community-level variables and teenage pregnancy and childbearing. The response variable is dichotomous and was coded "1" if teenagers reported having a child or pregnant (have begun childbearing) and "0" otherwise. Three models were fitted using Stata 12 and the xtmelogit command. Model 0 (empty model) was fitted without any variable to test for association of between-cluster and within-cluster variability. The second model (model 1) was fitted with individual socioeconomic characteristics of the teenagers on the odds of teenage childbearing. The last model (model 2) is a full model

that fitted individual socioeconomic and demographic characteristics of the teenagers and the community-level variables to know their net fixed and random effects. The results of the random effects were measured as ICC and PCV. Intra-class correlation coefficient (ICC) was employed to establish the use of multilevel modeling method. The ICC results in the empty model (model 0) shows 66% of the total variance in the odds of teenage childbearing that was accounted for by between-cluster variation (p<0.01). In the model 1 and 2, the ICC variability between-cluster dropped significantly from 66% in the empty model to 6% in model 1 and 4% in model 2. Also, the proportional change in variance (PCV) revealed that the inclusion of individual-level variables and community-level variables in model 1 and model 2 respectively slightly explained teenage pregnancy and childbearing. The results reveal that 97% of the variance in teenage childbearing in model 1 could be explained by individual-level factors while 98% of the variance in teenage childbearing in model 2 could be explained by the combination of the individual and community-level factors.

The results of the fixed effects in the model 2 after controlling for the community and individual-level factors show a statistically significant association between age of respondent, educational level, age at marriage, age at first sex, region and knowledge of contraceptives, and the odds to have begun childbearing (p<0.05). The odd to have begun childbearing increases significantly with the age of the teenagers (p < 0.05) For instance, teenagers aged 19 were 55.6 times more likely to have begun childbearing than their counterparts aged 15. The likelihood to have begun childbearing was higher among teenagers with primary education (OR=1.6, p<005) compared with teenagers without formal education. Teenagers whose age at first sex is between 16-19 years (OR=0.4 p<0.05) have lower odds to have begun childbearing compared with those who had first sex at ages 8-11 years. Also, the odds to have begun childbearing is lower among teenagers who married between ages 15- 19 years (OR= 0.4, p<0.05) compared with those who

married between ages 10-14 years. Also, teenagers who have knowledge of traditional method and modern method of contraception had higher odds to have begun childbearing (OR= 3.8, $p<0.05$ and 1.8, $p<0.01$ respectively) compared to their counterparts with no knowledge of any contraceptive methods. Teenagers from North East and North West had a significantly lower odds to have begun childbearing (OR=0.6, $p<0.05$ and OR=0.5, $p<0.01$ respectively) compared with their counterparts from North Central.

Table 2: Multivariate Analysis Showing the Adjusted Odds Ratio from Logistic Regression Model of Teenage Pregnancy and Childbearing with 95 percent Confidence Interval (C.I.)

VARIABLES	Model 0	Model 1	Model 2
Fixed Effects	**Odds ratio**	**Odds ratio**	**Odds ratio**
Age groups 15 (RC)			
16		5.90*	5.91*
17		12.54*	12.19*
18		26.75*	26.31*
19		58.96*	55.62*
Educational level No education (RC)			
Primary		1.58**	1.56**
Secondary		1.01	0.96
Higher		0.29	0.28
Religion Christians (RC)			
Islam		0.46*	0.81

Traditional/others		0.31**	0.54
Wealth status			
Lowest (RC)			
Medium		1.31	1.18
highest		0.89	0.72
Age at first sex			
8-11 (RC)			
12-15		1.04	1.03
16-19		0.36**	0.35**
Age at Marriage			
10-14 (RC)			
15-19		0.36*	0.36*
Type of family			
Monogamous (RC)			
Polygamous		0.86	0.89
Knowledge of Contraceptives			
No method (*RC*)			
Traditional method		3.95**	3.84**
Modern method		1.70*	1.75*
Place of Residence			
Urban (*RC*)			
Rural			1.22
Region			
North Central (*RC*)			

North East			0.56**
North West			0.50**
South East			2.56
South South			1.27
South West			1.94
Community Education			
Low (*RC*)			
Middle			0.77
High			0.76
Community Wealth			
Low (*RC*)			
Middle			1.04
High			1.32
Community media exposure			
Low (*RC*)			
Middle			1.02
High			1.51
Random effects			
Community-Level Variance (SE)	6.27 (2.41)*	0.21 (0.11)*	0.14 (0.11)*
ICC (%)	65.6	6%	4.1%
PCV (%)	Ref	96.7%	97.7%
Model Fitness			
Log-likelihood	-3682.715	-923.864	-911.3502
Model fit Statistics (AIC)	7371.429	1887.728	1886.70

*Notes: RC means Reference Category,   * = p<0.01, **p<0.05*

Discussion

The findings revealed a high proportion of teenagers who have begun childbearing from the North East and North West. This was in line with Allan Guttmacher Institute (2004) and Treffers (2003) that, the incidence of teenage pregnancy and childbearing varies from one region of Nigeria to the other and even in the same region. Islam and socio-cultural differences might have influenced the relationship as most northern women often marry at a very young age and their childbearing occurred early and within marriage. The study also found increasing odds to have begun childbearing among teenagers as their age increases. This lends credence to the previous study by Ekefre, Ekanem, & Esien (2014) which found a steady increase in the incidence of teenage pregnancy and childbearing between the ages of 16 and 17 and between the ages of 17 and 18. However, this may not be unconnected with poverty and current level of sexual activity. It is expected that teenagers will be more exposed as age increases. The study also found a direct significant relationship between age at first sex and the odds to have begun childbearing. The odd to have begun childbearing is higher among those who had first sex at age 15. The finding also revealed that the incidence of teenage pregnancies declined with increasing level of education. Previous studies by Duze & Mohammed (2006); Al Riyami, Afifi & Mabry (2004) have also shown an inverse relationship between teenage pregnancy and level of education. This implies that education is an important factor of teenage pregnancy and childbearing. However, this finding contradicts that of Njogu, Rutenberg, & Ekouevi (1990) that reported an increasing level of education as teenage pregnancy and childbearing increased. Time lag, improvement in modern medicine, widespread of sex education across the country and so on, might have contributed to the observed relationship in this study. The finding further revealed an association between the incidence of teenage pregnancy and childbearing and wealth status. Ayele (2013)

has made similar observations that the odd to have begun childbearing is higher in economically poor households. Teenagers from poorest households are more likely to have begun childbearing than from the wealthiest households.

Conclusion

The study confirmed high incidence of teenage pregnancy and childbearing in Nigeria particularly among teenagers who are poor and with a low level of education. While individual-level factors may be the major determinants of the incidence of teenage pregnancy, it is noteworthy to find that community-level such as a region of residence also played a significant role in the proportion of teenagers who have begun childbearing. Thus, the study suggests that efforts should be geared towards ensuring that both individual and community-level factors are addressed. More awareness on the health, social and economic effects of teenage pregnancy should be created through sex education and information mobilization and dissemination, particularly in the Northern region.

Acknowledgements

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