

UNDERSTANDING THE DYNAMICS OF POVERTY IN NIGERIA: WHAT ROLE HAS HUMAN CAPITAL DEVELOPMENT?

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ABSTRACT

Poverty remains eminently high in Nigeria, in spite of the various measures that have been implemented. Reproductive health, particularly adolescent childbearing, has been recognized as a contributory factor to high level of poverty in many developing countries including Nigeria. However, the current study examines the transmission channels linking adolescent childbearing to poverty, an area which is scarcely investigated in the literature. Data was sourced from the Demographic and Health Survey (DHS) for the year 2018. The study employed probit and ordered probit estimation methods and showed that adolescent childbirth increases the chances of being poor. Moreover, a reduction in the probability of higher education attainment, which also reduces the chances of labour market participation emerged as a channel of poverty propagation in Nigeria. Results show that the effect of adolescent childbearing on poverty could be mitigated via accumulation of schooling. Hence, more schools and higher labour force participation may reduce poverty incidence, and the effect of adolescent childbearing on poverty could be mitigated via schooling. A finding that keeps resounding is that adolescent childbirth increases the chances of being poor.

Keywords: Adolescence; Nigeria; Intergenerational Poverty; Education; Labour force.

1.0 INTRODUCTION

Poverty as a phenomenon has gained the attention of scholars and researchers in Nigeria and many developing countries, since the 1990s. In 2022, a World Bank report revealed that about 95.1 million Nigerians live in extreme poverty - about 8.5 percentage increase from 2018 - 50% of which are women. In a bid to eradicate poverty, the Nigerian government has formulated various poverty reduction strategies (PRSs), parts of which are National Economic Empowerment Development Strategies (NEEDS) and National Poverty Eradication Programmes (NAPEP), however, the problem persists.

Poverty is related to poor reproductive health outcomes (Garwood *et al.*, 2015). This is because poor reproductive health outcomes - such as early pregnancy, unintended pregnancy, excess fertility, poorly managed obstetric complications – severely affect the chances of poor women, their children and families to escape poverty (World Bank Data, 2022). The girls who get married early are usually forced into multiple pregnancies. Specifically, adolescent mums are more likely to have another birth within 2 years of the first, leading to large family size. Since fertility has been found to influence time allocation for productive economic activities among households, adolescent childbearing (please note this will further be referred to as AC) could influence education, labour market participation and poverty through large family size, which reduces the time available for productive activities. Klepinger, Loundberg and Plotnick (1997) and Fletcher and Wolfe (2008) revealed that young mothers are less likely to be healthy, more likely to have a large family size, more likely to drop out of school and more likely to have low labour market potential (Klepinger *et al.*, 1997; Fletcher and Wolfe, 2008; World Bank Data, 2022). This may increase the likelihood of low income, leading to low household welfare, intergenerational transmission of poverty and widening inequality in the society.

In Nigeria, about 20 million children aged 6-18 are out of school (UNESCO Report, 2022). Specifically, UNESCO reported that 20% of the entire population in Nigeria are out-of-school. The picture is even pervasive in the northern part of the country, as the net attendance is put at 53%. Factors that have been found accountable for such educational marginalization include; gender, poverty, religion, early marriage, adolescent childbirth etc. Girls are mostly at the receiving end of this menace, as UNESCO statistics reported that about half of the girls in North East and North West of Nigeria are out of school.

Policies targeted at delaying childbirth might also help in achieving the goal of poverty reduction across generations. Hence, it becomes very important to understand this issue to proffer the right solutions. On 25th of February, 2020, the Governor of Kano State of Nigeria, Abdullahi Ganduje placed a ban on street begging (the *Almajiri* system among children) as a bid to consolidate the free and compulsory primary and secondary school education policy, while parents or guardians who disobey will be sued to court for disobeying the law. While this might be commendable, it will prove helpful to look beyond ‘the act’ of street begging and ‘school absenteeism’ to the predisposing factors generating such symptoms.

Authors have tried to understand this issue from different perspectives. However, there has been varying findings, owing mostly to methodological and conceptual issues in addition to the neglect of the linkage between adolescent childbearing and poverty. Scholars have raised issues bothering on predictive factors leading to child marriage, adolescent pregnancy and early childbearing, such as: poverty (Sah, 2014; Goli, Rammohan and Singh, 2015; Islam *et al.*, 2016; McIntyre, Kwok and Patten, 2017), low/no education (Sah, 2014; Collins *et al.*, 2014; Izugbar,

2015; Medhi *et al.*, 2016; Kassa *et al.*, 2018; Paul, 2019), social, and environmental factors, examples of which are; religion, social norms, structural norms, parental delinquency history, parental supervision/curfews and immigration rates (Collins *et al.*, 2014; Bijleveld, 2016; Hutchinson and O'Leary, 2016; Seth *et al.*, 2018).

Some other scholars have raised discussions around the *consequences* associated with early childbearing on both adolescent mothers and their children, such as poverty, school drop-out, low educational attainment, low cognitive skills, poor nutrition and high chances of being underweight, birth and post-birth health complications (Ezegwui, Ikeako and Ogbuefi, 2012; Minnis *et al.*, 2013; Herrin, 2016; Nguyen *et al.*, 2019; Almanza and Sahn, 2018; Prakash, 2011). Despite commonly held views on the socio-economic issues associated with early childbearing, the evidence base of this impact is still very much limited in poor countries compared to more advanced countries.

One of the studies in Nigeria that has examined teenage pregnancy and childbirth is Kupoluyi, Njoku and Oyinloye (2015), which was on the factors associated with teenage pregnancy and childbirth in Nigeria. This is similar to many other studies in Nigeria; many of which adopt predominantly descriptive methods of analysis such as chi-square, percentages, and frequencies, as well as probability models such as probit and logit (Maduforo and Ojebode, 2011; Ezegui *et al.*, 2011; Isa and Gani, 2012; Envuladu *et al.*, 2014). However, we cannot make much inference from these papers due to the limitations of the analysis - causal effect was omitted, and the model has weak explanatory power. Therefore, the current study focuses on causation, which is more dependable than correlation, to make inference and draw policy implications. This is in addition to the inclusion of social welfare, as a core variable of investigation, which have been neglected in the literature.

Although many studies have reviewed and presented results in favour of the negative consequences of adolescent childbirth; an interesting dimension which this study adds to the discussion is in explaining the role of educational attainment in the relationship between AC and poverty. We can explain this through the use of interaction terms. An interaction effect indicates that a relationship is contingent upon the values of another (moderator) variable. Thus, interaction effects describe conditions under which relationships change in strength and/or direction (Aguinis and Gottfredson, 2010).

2.0 DATA AND METHODOLOGY

2.1 Model Specification

Figure 1 outlines the possible implications of adolescent reproductive health on poverty, controlling for demographic and socio-economic factors. Herrin (2016) presented a model which explains the channel through which adolescent childbearing affects lifetime earnings in the Philippines. The author found that early childbearing reduces the earnings' profile of young women via its effect on education. Young women who get pregnant as teenagers are more likely to drop out of school, this then reduces their labour market potential (Chaaban and Cunningham, 2011). Prakash *et al* (2011) also identified three main channels through which early childbirth could be linked to poverty. These are reduction in educational attainment, hence, limited participation in economic activity; poor reproductive health which affects children's health might exert economic burden on households, and poor health, restricting school attendance, low labour market potential. We tie these ideas together in this study by proposing a model as follows;

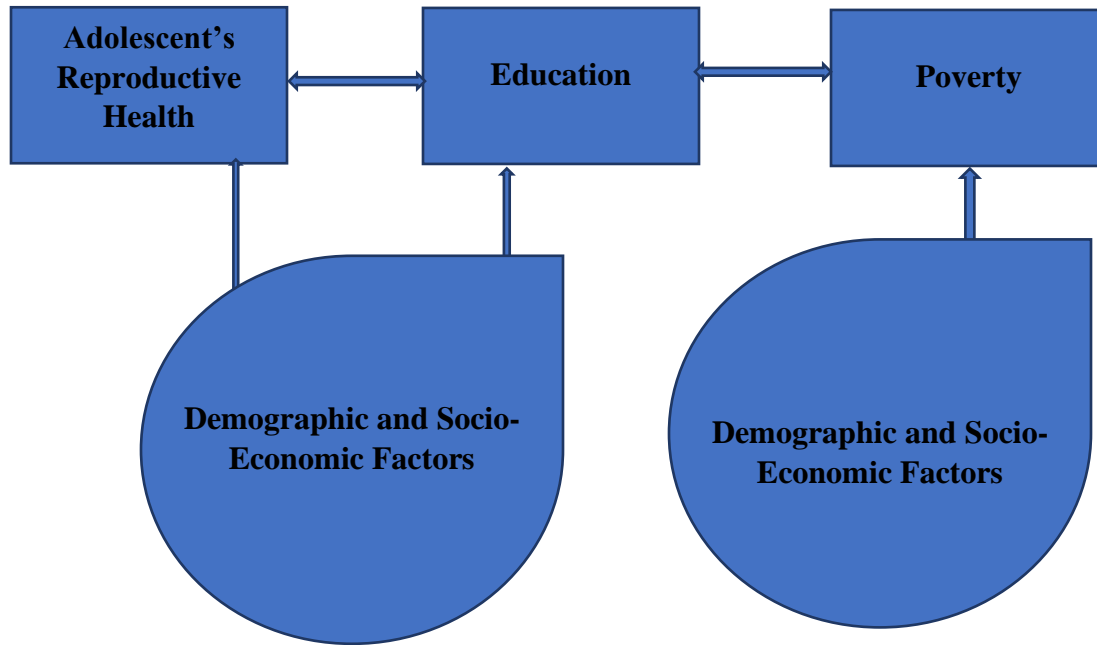


Figure 1: Hypothesized implications of Adolescent Childbirth on Poverty.

The study employs the model as used by Fletcher and Wolfe (2008) (henceforth F&W) to the peculiarity of our data and environment. As earlier stated, the main interest of this study is to understand the *true* effect of adolescent childbirth on later-life outcome. For the study, the estimated model is as follows:

$$Y = \alpha + \beta B + \mu \tag{1}$$

From equation 1, Y, which is the outcome of interest, represents education (in the first set of analysis) or poverty (in the second set of analysis), B indicates giving birth before age 18, while β is the coefficient of interest. However, drawing from our discussions in the introduction section, we understand that those who give birth may differ systematically from those who do not, owing to certain unique heterogeneities which could then mislead the result. Hence, this may lead to a biased result by overestimating the true effect of giving birth on Y. One common way of handling this is by including control variables, such as background characteristics depicting the environment in which the adolescent was raised. Hence, equation 1 becomes;

$$Y = \alpha + \beta B + \delta Z + \mu \tag{2}$$

Estimating equation 2 might also not yield the true effect of adolescent childbirth. This is because there might still be some unobserved heterogeneities yet to be captured by the equation. Following F&W's modelling, as a robustness check we limit the sample to be considered only to those women who experienced pregnancy before they turned 18¹. We believe that this helps to control to a large extent the unobserved differences between the treatment and control groups. This is because they share a common experience (Fletcher and Wolfe, 2008). To address the concerns as raised by Ashcraft and Lang (2006), we make these two assumptions following F & W: (1) All the women who had miscarriages would not have chosen an abortion. (2) All the women who had

¹ Note that this analysis was carried out and the results are available upon request. We could not include the results of the analyses in this paper due to restrictions on number of pages.

late miscarriages would not have chosen an abortion. Fletcher and Wolfe (2008) argued that previous studies which used miscarriages as an instrument might still have presented biased results because they might not have controlled for community characteristics that could influence the probability of having a miscarriage. Hence, we shall be including in our model a community fixed-effect to address this issue. In this study, we shall alternate the specifications to test for variations in size and direction of estimates as a result of different specifications.

2.2 Data Sources & Measurement of Variables

It was imperative to collect data from a reliable source for empirical analysis. However, reliability is not the only important factor; availability and accessibility are equally important. Hence, data from the Demographic and Health Survey (DHS) was utilized. Even though the DHS questionnaires have over time been adjusted to reflect changes, the survey data are largely consistent in terms of structure and methodology. The standard survey has been conducted by the DHS in Nigeria for the years 1990, 2003, 2008 and 2018. For this study, 2018 survey dataset was utilized. The sampling frame for the 2018 DHS is the Population and Housing Census of the Federal Republic of Nigeria (NPHC) which was conducted in 2006 by the National Population Commission (NPC). The stratified sampling method was employed and the stratification was done by separating each of the 36 states and the Federal Capital Territory (FCT) into urban and rural, which leads to a total of 74 sampling strata from which samples were independently selected in every stratum via a two-stage selection. In the first stage, 1,400 Enumeration Areas (EAs) were selected with probability proportional to the number of households in the EAs. The listing operation was done across households in selected EAs and the listing then formed the sampling frame for the selection of households in the second stage. 30 households were selected in every cluster through equal probability systematic sampling in the second stage's selection, resulting in a total of 42,000 households. Interviews were restricted to pre-listed households and to avoid bias, no replacements or changes were allowed at the implementing stages.

The unit of observation for this study is the household within the state government areas (which correspond to the first subnational level) in both the northern and southern states of Nigeria. In all, this covers the whole 36 states in Nigeria, including the Federal Capital Territory (FCT). The variable named *Adolescent childbirth* takes the value of 1 if a woman had a live birth before 18 and takes the value of 0 if a woman within that age range had a child after age 18. In the first phase, we use the whole sample – including those who experienced adolescent pregnancy and those who did not, across all ages. In the second phase, however, we restrict the sample to only those who experienced adolescent pregnancies (results available on request). *Education* variable is constructed from the question on the number of years of education attained by the woman. *Labour market participation* is captured by the occupation of the respondent.

The variable *poverty* is constructed from the household questionnaire relating to wealth category to which the household belongs. The measure of household wealth used in this study is the wealth index as constructed by the DHS. It is an aggregate of household assets which then allows each household to be classified as *poorest*, *second*, *middle*, *fourth* or *richest*. The selected *demographic and socio-economic variables* relate to religion, residence and geopolitical zone. These have been found to have a significant influence on the incidence of adolescent childbearing. The child's health-related variable in this study is constructed from child mortality related questions, which includes whether the household has recorded incidence of child death.

Furthermore, the DHS contains other information regarding the number of children born by the woman, suggesting whether low or high fertility is associated with early childbearing.

These variables, as constructed in this study, follow the Sustainable Development Goal (SDG) methodology as applicable and also follow previous studies that have modelled issues around adolescent childbearing.

2.3 Summary and Description of Variables

In the appendix, we present some tables and figures which describes and summarizes the variables used in this study. As contained in Table A1, certain characteristics of women who experienced live birth before age 18 and the full sample were compared using averages. The mean wealth index among those who experienced adolescent childbirth is lower than the full sample average. In an explicit term, an average person who experienced a live birth before age 18 belongs to the poorer income group, which is lower than the full sample average of ‘middle’ income class. Also, the average years of schooling among those who experienced adolescent childbirth is below the full sample average.

The correlation matrix in Table A2 shows some interesting preliminary results, which conform to a-priori expectation and are significant at 5% level. The results show that there is a negative correlation among *education*, *wealth index* and *Adolescent Childbearing*, meaning that education (either respondent’s or her partner’s) and household wealth are negatively associated with the incidence of adolescent childbearing. The *number of children (fertility)* and *child mortality (sonsdead)* are positively correlated with *adolescent childbearing*. There is also a positive relationship between *wealth index* and *education*, which means that an educated person has a high labour market potential and could earn more income. *More children* and *child mortality* have negative associations with *education*, *wealth index* and *husband’s education*.

Figure A2 further reinforces this as it shows that 92.42% of women who delayed childbirth till after 18 attained a higher level of education, compared to just about 8% among women who had a live birth before age 18. The gap (difference in percentages) in educational attainment between women who had a live birth before age 18 and those who delayed childbirth is as wide as 84% and 68% for completed secondary and higher education respectively, also as wide as 24% for those who completed primary education.

There seems not to be a difference between women who had a live birth before age 18 and those who delayed childbirth in terms of completion of primary school and those without a formal education. This means that at lower levels of education, there is not much difference between those who had a live birth before age 18 and those who delayed childbirth, but a large number of women who had adolescent childbirth are less likely to move up the education attainment ladder in getting higher degrees. This sums up reasonably, given the fact that adolescent pregnancy increases the likelihood of girls dropping out of school and many girls who drop out of school are not likely to return, which could then permanently alter the education life path of women. Not only this, women without education are more likely to get married off and initiate sex at a young age.

Figure A3 depicts that more than 50% of those in the *poorest* and *poorer* wealth categories are women who had a live birth before the age of 18, while over 80% and 70% of those in the *richest* and *richer* wealth categories respectively are women who delayed childbirth. We really cannot draw much inference from these descriptive analyses but what is clear is that wealth level

is associated with the timing of first birth, which however is plausible given that adolescent childbirth is associated with lower educational attainment and reduced labour market potential.

Other tables and charts which depict the relationship between variables in the study are contained in the appendix.

3.0 EMPIRICAL RESULTS AND DISCUSSION

3.1 Adolescent Childbirth (AC) and Human Capital Accumulation in Nigeria

Table 1a: Assumption of No Endogeneity

Dependent Variable: Education	Marginal Effect of Ordered Probit Estimates			
	Model 1	Model 2	Model 3	Model 4
Adolescent Childbearing				
No_education	0.11***	0.10***	0.10***	0.09***
	(26.85)	(21.74)	(21.18)	(20.22)
Primary	-0.00***	0.01***	0.01***	0.00***
	(3.97)	(12.84)	(12.69)	(9.59)
Secondary	-0.06***	-0.05***	-0.06***	-0.05***
	(25.71)	(20.91)	(20.67)	(19.71)
Higher	-0.05***	-0.05***	-0.05***	-0.04***
	(25.29)	(20.77)	(20.06)	(19.27)
Residence: Rural (reference group is Urban)				
No_education	0.20***	0.14***	0.17***	0.14***
	(45.65)	(30.98)	(36.46)	(29.52)
Primary	0.00***	0.01***	0.02***	0.01***
	(8.03)	(16.78)	(18.95)	(14.12)
Secondary	-0.11***	-0.08***	-0.10***	-0.08***
	(38.68)	(26.97)	(32.39)	(26.48)
Higher	-0.09***	-0.07***	-0.08***	-0.06***
	(41.12)	(29.51)	(32.75)	(27.77)
Religion: Christian (reference group is other religion)				
No_education	-0.24***	-0.26***	-0.21***	-0.24***
	(40.10)	(40.24)	(33.33)	(38.13)
Primary	0.00	-0.01***	-0.01***	-0.01***
	(1.69)	(12.75)	(7.98)	(7.25)
Secondary	0.15***	0.17***	0.14***	0.16***

	(34.94)	(34.70)	(30.15)	(33.90)
Higher	0.09***	0.10***	0.08***	0.09***
	(40.38)	(40.60)	(35.11)	(38.40)
Region: North East (reference is other regions asides NE)				
No_education	0.12***	0.11***	0.09***	0.10***
	(15.74)	(13.55)	(11.39)	(12.29)
Primary	-0.01***	0.01***	0.00	0.00***
	(7.57)	(7.46)	(0.86)	(4.17)
Secondary	-0.07***	-0.07***	-0.06***	-0.06***
	(15.24)	(13.04)	(11.22)	(12.02)
Higher	-0.04***	-0.04***	-0.03***	-0.04***
	(16.02)	(13.96)	(11.74)	(12.61)
Region: North West (reference is other regions asides NW)				
No_education	0.15***	0.20***	0.16***	0.20***
	(19.59)	(22.88)	(18.27)	(23.09)
Primary	-0.01***	-0.00**	-0.01***	-0.01***
	(10.28)	(2.66)	(5.62)	(6.84)
Secondary	-0.09***	-0.13***	-0.11***	-0.13***
	(18.71)	(21.62)	(17.89)	(22.31)
Higher	-0.05***	-0.07***	-0.05***	-0.06***
	(19.87)	(22.74)	(18.85)	(22.91)
Region: South East (reference is other regions asides SE)				
No_education	-0.01	0.01	-0.02*	-0.00
	(1.45)	(1.26)	(2.45)	(0.01)
Primary	-0.00	0.00	-0.00*	-0.00
	(1.32)	(1.28)	(2.29)	(0.01)
Secondary	0.01	-0.01	0.01*	0.00
	(1.45)	(1.26)	(2.43)	(0.01)
Higher	0.00	-0.00	0.01*	0.00
	(1.45)	(1.26)	(2.43)	(0.01)
Region: South-South (reference is other regions asides SS)				
No_education	-0.08***	-0.05***	-0.08***	-0.06***
		(6.93)	(11.40)	(8.08)

Primary	-0.01***	-0.01***	-0.01***	-0.01***
	(7.96)	(6.18)	(8.96)	(6.87)
Secondary	0.05***	0.03***	0.05***	0.04***
	(11.40)	(6.84)	(11.17)	(7.95)
Higher	0.04***	0.03***	0.04***	0.03***
	(11.06)	(6.76)	(10.83)	(7.84)
Region: South West (reference is other regions asides SW)				
No_education	-0.07***	-0.04***	-0.07***	-0.04***
	(10.30)	(5.49)	(10.18)	(5.64)
Primary	-0.01***	-0.01***	-0.01***	-0.01***
	(7.50)	(5.14)	(8.50)	(5.16)
Secondary	0.04***	0.02***	0.05***	0.03***
	(10.10)	(5.42)	(9.97)	(5.57)
Higher	0.04***	0.02***	0.04***	0.02***
	(10.02)	(5.46)	(9.95)	(5.60)

Z-statistics in parenthesis, * p<0.05, ** p<0.01, *** p<0.001

Author's Computation (2021)

We understand from the previous explanations that there is a negative association between human capital accumulation (using education) and AC. This is because, school attendance becomes the forgone alternative for many caregiving young mothers (Klepinger *et al.*, 1997). Results of studies from other countries suggest that AC increases the probability of school drop-out and reduces the likelihood of obtaining a higher degree (Hofferth, Reidn and Mott, 2011). To properly understand this in the Nigerian context, we estimate an ordered probit model with educational attainment as the dependent variable. The ordered probit estimation has an advantage over multinomial probit in that it can be employed when the order of the dependent variable matters. For example, in this case, having no education is lower in rank compared to having a primary level education, which is also lower to having a secondary school level of education. This helps us to see the effect of the dependent variable on each independent variable in relation to different categories of the dependent variable.

The factors which we understand from literature (Olaniyan, 2011; Al-Samarrai and Reilly, 2000) to be associated with educational enrolment and attainment were rightly included in the models. Table 1a contains 4 models, though similar, but represent different specifications. Model 1 presents results using only *currentlynotworking* as a measure of labour market participation, Model 2 is specific on the occupation as it uses *Agriculture* in driving the point home, Model 3 has *Professional* as the occupation type, while Model 4 presents a full result, having *Agriculture*, *Professional* and *Services* as occupation dummies. The dependent variable for the four models is education (*Edu attainment*) which is in five categories (No Education, Incomplete Primary, Complete Primary, Incomplete Secondary, Complete Secondary and Higher Education).

Our variable of interest, adolescent childbearing (AC), seems to be consistent across the 4 different specifications. The results show that AC increases the probability of having ‘no education’ by about 11%, having controlled for other relevant variables, while the likelihood of gaining a higher level of education is associated with delayed childbirth. Following the previous discussion, this is reasonable, AC is associated with school drop-out, as care-giving time competes with time to go to school, especially for adolescent mothers without the support of an elderly woman, either the mother or a nanny.

The likelihood of gaining a higher level of education is increased by being in an urban area, being a Christian, living in the South, less number of children and having a professional job. The justification can be explained thus; urban dwellers tend to have more access to information and even more schools; access, quality and affordability are important concepts to note when discussing educational attainment. Generally, there are more schooling opportunities in urban areas. In rural areas, however, many schools are situated very far from dwellings. Besides this, rural dwellers are mostly farmers, many of who prefer having their kids help out in the family agricultural business, to going to school. This should guide policy formulation and implementation, by building schools that will be conformable to rural dwellers and would suit into their peculiar situations.

Table 1b: Assumption of No Endogeneity

Child Health: Sonsdead	Model 1	Model 2	Model 3	Model 4
No_education	0.06***	0.06***	0.06***	0.06***
	(12.74)	(11.15)	(11.01)	(10.98)
Primary	-0.00***	0.00***	0.00***	0.00***
	(3.89)	(8.93)	(8.86)	(7.60)
Secondary	-0.03***	-0.03***	-0.03***	-0.03***
	(12.59)	(11.01)	(10.91)	(10.87)
Higher	-0.03***	-0.03***	-0.03***	-0.03***
	(12.55)	(11.00)	(10.84)	(10.82)
Fertility: Fivechildrenandabove				
No_education	0.11***	0.10***	0.10***	0.09
	(27.32)	(22.44)	(23.74)	(21.61)
Primary	-0.00***	0.01***	0.01***	0.00
	(3.88)	(13.81)	(13.96)	(10.24)
Secondary	-0.06***	-0.05***	-0.06***	-0.05
	(26.29)	(21.67)	(23.11)	(21.08)

Higher	-0.05***	-0.05***	-0.05***	-0.04
	(26.02)	(21.59)	(22.52)	(20.74)
Occupation: Professional (reference is other occupations asides Professional)				
No_education	-	-	-0.34***	-0.31***
			(41.62)	(38.68)
Primary	-	-	-0.02***	-0.01***
			(17.19)	(11.65)
Secondary	-	-	0.20***	0.18***
			(34.44)	(32.11)
Higher	-	-	0.16***	0.15***
			(44.62)	(41.95)
Occupation: Agriculture (reference is other occupations asides Agriculture)				
No_education	-	0.17***	-	0.14***
		(33.40)		(26.27)
Primary	-	0.01***	-	0.01***
		(17.69)		(11.79)
Secondary	-	-0.09***	-	-0.08***
		(32.16)		(26.27)
Higher	-	-0.09***	-	-0.06***
		(31.20)		(24.77)
Occupation: Services (reference is other occupations asides Services)				
No_education	-	-	-	-0.04***
				(6.29)
Primary	-	-	-	-0.00***
				(5.65)

Secondary	-	-	-	0.03***
				(6.28)
Higher	-	-	-	0.02***
				(6.27)
LMP: currentlynotworking				
No_education	0.04***	0.03**	0.02	0.02
	(8.49)	(2.65)	(1.69)	(1.61)
Primary	-0.00***	0.00**	0.00	0.00
	(3.67)	(2.61)	(1.68)	(1.59)
Secondary	-0.02***	-0.01**	-0.01	-0.01
	(8.46)	(2.65)	(1.69)	(1.61)
Higher	-0.02***	-0.01**	-0.01	-0.01
	(8.43)	(2.65)	(1.69)	(1.61)
N	29,605	22,502	22,502	22,502
Log likelihood	-29075.27	-22755.53	-22366.70	-21957.51
Pseudo R2	0.21	0.21	0.23	0.24

Z-statistics in parenthesis, * p<0.05, ** p<0.01, *** p<0.001
Author's Computation (2021)

Similarly, it is plausible to note that religion, geographical zone and fertility also explain the reduction in educational attainment. Specifically, being a Christian reduces the likelihood of having no formal education by 24-26%, relative to being Muslim. Furthermore, religion, geopolitical zone, cultural and tribal beliefs can explain the prevalence of certain practices. In the North, for example, western education is not widely experienced in certain parts, not only this, but family planning is also frowned at. So, we see a connection among religion, geopolitical zones and choices, one of which is the decision to accumulate human capital.

It is also profound to note that current labour market participation is associated with educational attainment. This is quite logical, in the sense that the more educated a person is, the higher the likelihood of getting a professional job in the labour market. Hence, we see from the results that those in *professional* jobs are more likely to have had a *secondary* and *higher* education, while those in *agriculture* are more likely to have no education or have a primary school education, higher levels of educational attainment are associated with the ability to secure professional jobs. Ahmanza and Sahn (2018) also found similar results in Madagascar as they reported that AC reduces the likelihood of completing secondary school education.

3.2 Adolescent Childbearing (AC), Human Capital (HC), and Poverty in Nigeria

Table 2: Adolescent Childbirth, Education and Poverty

	All States	South	North	All States	All States	All States
Residence: Urban	<i>Reference</i>					
Rural	0.31*** (45.68)	0.14*** (16.70)	0.45*** (45.65)	0.28*** (37.01)	0.23*** (32.33)	0.31*** (46.65)
Religion: Other	<i>Reference</i>					
Christian	0.08*** (14.79)	0.03*** (2.99)	0.05*** (8.96)	0.07*** (11.71)	0.03*** (5.08)	0.07*** (13.14)
Region: North Central	<i>Reference</i>					
North East	0.14*** (16.47)	-	-	0.15*** (14.32)	0.18*** (16.46)	0.14*** (16.81)
North West	0.11*** (12.82)	-	-	0.10*** (9.22)	0.16*** (15.20)	0.11*** (13.07)
South East	-0.04*** (4.33)	-	-	-0.04*** (3.77)	-0.03* (2.52)	-0.05*** (5.01)
South South	-0.14*** (13.01)	-	-	-0.14*** (12.11)	-0.12** (10.76)	-0.15*** (14.09)
South West	-0.08*** (7.74)	-	-	-0.08*** (7.59)	-0.03** (3.23)	-0.09*** (8.42)
Sonsdead	0.03*** (5.00)	0.02** (2.20)	0.03*** (5.71)	0.03*** (4.79)	0.03*** (4.24)	0.03*** (5.52)
Fivechildrenandabove	-0.03*** (7.30)	0.01 (0.72)	-0.04*** (8.04)	-0.04*** (6.47)	-0.04*** (7.70)	-0.03*** (6.35)
Occupation: Professional	-	-	-	-	-0.01 (0.97)	-

Agricultural	-	-	-	-	0.20*** (34.19)	-
Services	-	-	-	-	0.01 (0.87)	-
Paidwork	-	-	-	-0.07*** (9.31)	-	-
Currentlynotworking	-	-	-	0.02 (1.58)	0.02 (1.81)	-
AC	0.03*** (5.41)	-0.02 (1.93)	0.03*** (5.55)	0.02*** (3.93)	0.02** (3.25)	0.03*** (5.05)
EducAttain	-0.08*** (64.50)	-0.09*** (41.10)	-0.08*** (46.47)	-0.09*** (58.19)	-0.07*** (44.61)	-
Noeducation	-	-	-	-	-	0.20*** (21.90)
AC*Noeducation	4.76*** (38.92)	1.62*** (14.26)	5.24*** (35.34)	4.58*** (31.68)	5.59*** (28.28)	4.87*** (36.55)
AC*IncompPri	2.89*** (46.61)	1.19*** (19.72)	3.60*** (40.05)	2.98*** (37.08)	3.64*** (32.27)	1.85*** (23.72)
CompPri	-	-	-	-	-	0.01 (1.73)
AC*CompPri	1.47*** (45.66)	0.74*** (27.00)	2.10*** (33.59)	1.45*** (39.61)	1.74*** (34.29)	1.42*** (22.45)
AC*IncompSec	0.95*** (33.40)	0.51*** (24.54)	1.44*** (23.73)	1.03*** (28.84)	1.32*** (25.28)	1.35*** (24.28)
CompSec	-	-	-	-	-	-0.19*** (19.49)
AC*CompSec	0.50*** (25.39)	0.32*** (17.38)	0.74*** (18.19)	0.51*** (22.59)	0.59*** (20.47)	0.49*** (16.45)

Higher	-	-	-	-	-	-0.33**
						(17.35)
AC*Higher	0.27***	0.23***	0.30***	0.27***	0.27***	0.22***
	(19.73)	(12.50)	(14.30)	(17.55)	(16.24)	(6.21)
_cons	-0.13**	0.07	-0.02	0.30***	-0.37***	-1.07***
	(3.26)	(1.07)	(0.47)	(5.37)	(7.22)	(23.05)
Observations	23324	8,443	14881	17536	17536	23324
Log likelihood	-7859.3	-3259.62	-4515.98	-6077.10	-5540.26	-7872.72
Pseudo R2	0.51	0.24	0.48	0.5	0.54	0.51

Z-statistics in parenthesis, * p<0.05, ** p<0.01, *** p<0.001

Author's Computation (2021)

The AC reduces the likelihood of educational attainment and labour market participation is associated with educational attainment, hence, our a-priori expectation is that education and labour market participation should be associated with income and welfare. This is because, we expect an educated person to have better labour market potential, better access to professional jobs and get better pay, other things being equal. Table 2 presents marginal effects from probit estimations, explaining the role of educational attainment in the relationship between AC and poverty. The dependent variable *poor* is a dummy which takes the value of 1 if a woman belongs to either the *poorer* or *poorest* group, according to DHS wealth index, and takes the value of 0 if a woman belongs to either the *richer* or *richest* group.

Table 2 contains 6 different specifications, with explanatory variables such as residence type, geopolitical zones, religion, AC, fertility, education attainment and labour market participation to explain the outcome variable-poverty. These variables appear to be significant in explaining the incidence of poverty, which is similar to the results of Klein's study in 2005, which stated that about 83% of adolescents who give birth in the United States are from poor families.

In the full sample, being in a rural area (relative to urban) increases the chances of poverty by about 31%, having controlled for other variables. According to World Bank statistics, about 50% of Nigerians live in the rural areas, the study by Etim and Udoh (2013) and the report by World Bank's Nigeria Poverty and Equity Team revealed that poverty is largely a rural phenomenon as many of the poor live in rural areas and derive their livelihood from farming (64% of all poor live in rural areas according to the World Bank, 2016). This is not to say that poverty is not an issue in the urban areas, urban poverty has attracted global attention in recent time, however, the incidence of poverty in the rural areas outweighs that of the urban areas. Typical rural communities are deficient in the supply of public goods and institutions, less access to schools, hence, this result is not a surprise.

From the previous discussion, we understand that people living in rural communities are less likely to have high educational attainment, same goes for those in the North. Given the relationship we have been able to establish between educational attainment and labour market participation, it is not surprising to see those variables which explain low educational attainment, also explain poverty.

Wilson's (1987) conservative view under the theory of the truly-disadvantaged stated that 'individuals who lack training, skills and either experience long-term unemployment or are not members of the labour force...are engaged in street crime...., and experience long-term spells of poverty and/or welfare dependency.' This is in line with the findings of our estimation, education attainment (*EducAttain*) consistently reduces the likelihood of poverty across various specifications, even across different zones; the size and sign remain consistently significant, ranging between 7-9%. Also, adolescent mothers are more likely to be poor, especially in the North, which shows that wealth is an important factor associated with AC. An interesting dimension which this study adds to the discussion is in explaining the role of educational attainment in the relationship between AC and poverty. We can explain this through the use of interaction terms.

An interaction effect indicates that a relationship is contingent upon the values of another (moderator) variable. Thus, interaction effect describes conditions under which relationships

change in strength and/or direction (Aguinis and Gottfredson, 2010). We interacted AC with each level of education, and we found that each level of education is accompanied by a reduction in the size of the effect of AC on poverty. This then means that even though AC could lead to poverty, however, this effect could be reduced through the attainment of higher levels of education.

We employed a different dependent variable which enables us to see the variations across ordered categories. Hence, the dependent variable which is 'wealth index' is in 3 categories; *poor, middle, and rich*². The results reveal that AC reduces the chances of being in the middle and rich wealth categories and increases the likelihood of being in the poor category. Both the previous analysis on Table 2 and this emphasize the fact that higher educational attainment increases the probability of being in the middle/rich class by about 20-30%.

Overall, AC increases the incidence of poverty, but the size of the effect could be reduced by higher educational attainment and skilled labour market participation. This means that the effect of AC on wealth index could be mitigated by educational attainment and labour participation, which are related, as educational attainment leads to better labour potentials, other things being equal.

4.0 CONCLUSION AND RECOMMENDATIONS

Some conclusions could be drawn from this study. There is still a high prevalence of AC and poverty in Nigeria, with the incidence rate varying across different socio-economic characteristics of women and their partners. Specifically, there is a correlation between AC and poverty, AC is more prevalent among the poor, those with little or no education, rural dwellers, northern states, non-Christians, and those in unskilled or semi-skilled occupation. A finding that kept resounding through various models and estimations is that adolescent childbirth increases the chances of being poor. Not only this, the channel through which AC leads to poverty is a reduction in the probability of higher education attainment. Therefore, the study found that the effect of AC on poverty could be mitigated via accumulation of education. This result remained consistent across various specifications.

Studies in developed countries, especially in the United States of America have found that the negative consequences of AC could be mitigated through sound and effective policies. Based on the findings of this study, the following policies might prove helpful in addressing the issue of AC and poverty in Nigeria:

The Child Right Act which was introduced in the year 2013 has only been domesticated in 25 out of 36 states in Nigeria. All the 11 states yet to domesticate this act are all in the Northern part of the country. Since many cases of AC in the North of Nigeria are due to early marriage, Government should intensify efforts to ensuring the Child Right Act is domesticated in the other Northern states as well. Teenagers and adolescents should not be forced into marriages they are not physically, socially, emotionally and even psychologically prepared for.

There should be more programs targeted at creating awareness about the importance of education. Given that most adolescent pregnancies are unwanted, basic sex education should be taught

² The results of this analysis are available upon request.

at home and in schools. The educational sector should be a good platform where reproductive health is advocated for through the delivery of sex education. This gives young women unbiased, scientifically accurate information on issues bothering on sexuality. This could help in promoting safer reproductive health practice such as abstaining from or delaying the start of sexual relations. Awareness and sensitization could also be done effectively by religious and traditional rulers; given the important positions of influence such occupy in communities.

More than addressing poverty, the issue of education should be prioritized in formulating policies that could reduce AC. Existing policies such as ‘conditional cash transfer’ and ‘school feeding’ have been more effective in certain states than others. Government should invest more in research to evaluate the effectiveness of the program so far and areas where improvements are needed, to further encourage school enrolment and discourage school drop-out.

Basic health facilities should be made available and accessible to young pregnant women. Health professionals should give such counsel and guidance to them such that they would be both helped to care for themselves and the child. Also, they should be advised on family planning as it was found from this study that such women tend to have higher fertility.

The government should put measures in place to promote access to quality education, especially in education disadvantaged regions (north) and residence (rural). At least, secondary school education should be made compulsory across regions, and this could be encouraged by ensuring there is access to free education and schooling materials. Given that some communities in the North from at western education, policies in such regions should be in such a way that basic literacy and numeracy is integrated into their traditional/religious syllabus (e.g. the *Almajiri* case). Not only this, Government should pass such policies discouraging discrimination against pregnant adolescent girls in school. School regulations should be such that would encourage young adolescent mothers to go back to school, with a relevant support system.

This study has used a cross-sectional dataset to study the implications of early childbirth. It would be worthwhile to investigate this issue using a longitudinal dataset that would permit an analysis of the short, medium and long-run implications of early childbirth. Future studies could include more qualitative methods such as the focus group discussion and in-depth interview.

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APPENDIX

Table A1 Summary Statistics (Full Sample)

Variable	Obs	Mean	Std.Dev.	Min	Max
Edu attainment	41817	2.20	1.84	0	5
Edu (Single yrs)	41817	6.69	5.58	0	20
Wealth Index	41817	3.03	1.39	1	5
No of Children	41817	2.61	2.48	0	15

Author's Computation (2021)

Notes: Obs - Number of observations, Std.Dev. – Standard deviation, Min-Minimum, Max-Maximum, Edu attainment – Educational attainment, Edu (Single yrs) – Number of years of education attained, No of Children – Number of children given birth to by a woman

Table A2 Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)
(1)AC	1.000				
(2) Education (yrs)	-0.353*	1.000			
(3) Wealth Index	-0.281*	0.638*	1.000		
(4) No of Children	0.214*	-0.343*	-0.176*	1.000	
(5) Sonsdead	0.189*	-0.247*	-0.189*	0.274*	1.000

Author's Computation (2021)

*** shows significance at the 0.05 level**

Notes: AC – Adolescent Childbearing, Sonsdead – have recorded at least one incidence of death of her son

Table A3: Prevalence of Adolescent Childbearing Across Woman's Occupation

	Livebirth 18 and above	Livebirth before 18
Respondent Currently Working	66.25	33.75
Categories of Employment:		
Professional	9.87	3.43
Clerical	1.85	0.48
Sales	50.06	56.03
Services	9.11	7.06

Skilled Manual	4.68	3.65
Unskilled Manual	0.14	0.05
Agricultural	24.14	29.06

Source: Author’s Computation based on NDHS 2018 Report

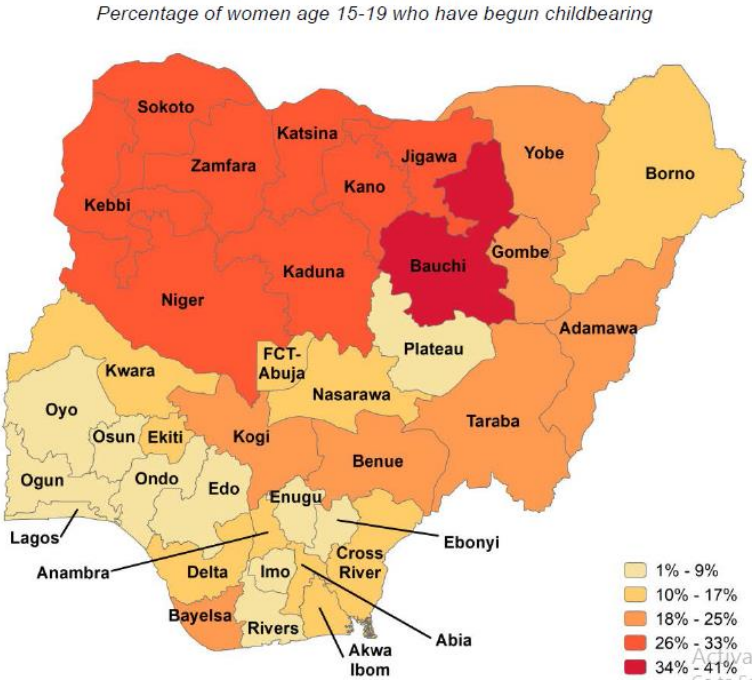


Figure A1: Percentage of women age 15-19 who have begun childbearing across states in Nigeria.

Source: NDHS 2018 report

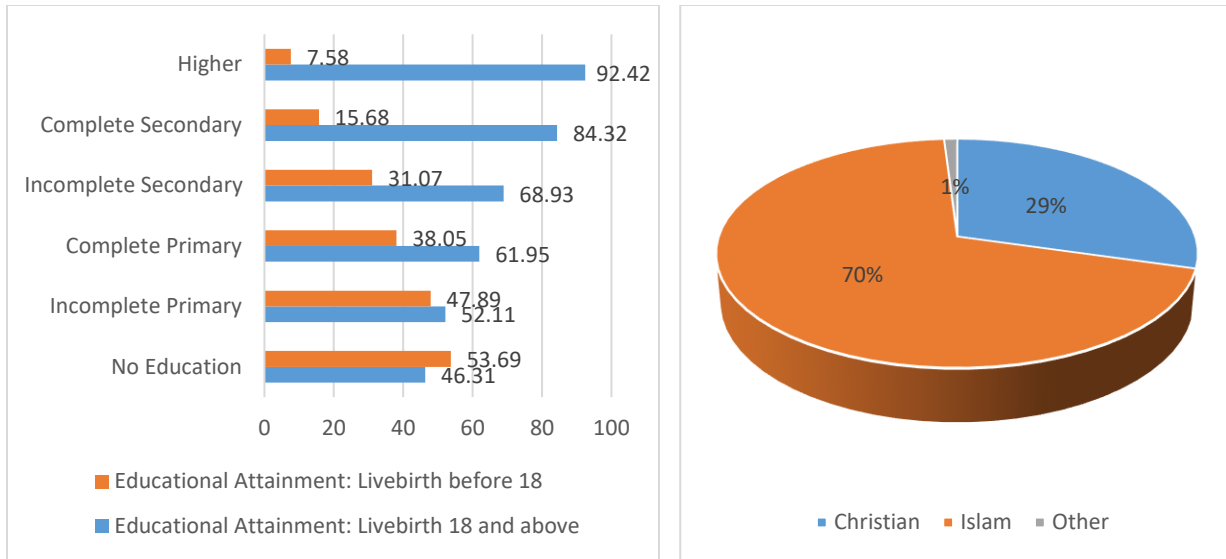


Figure A2: Prevalence of Adolescent Childbearing Across Educational Attainment and Region

Source: Author's Computation based on NDHS 2018 Report

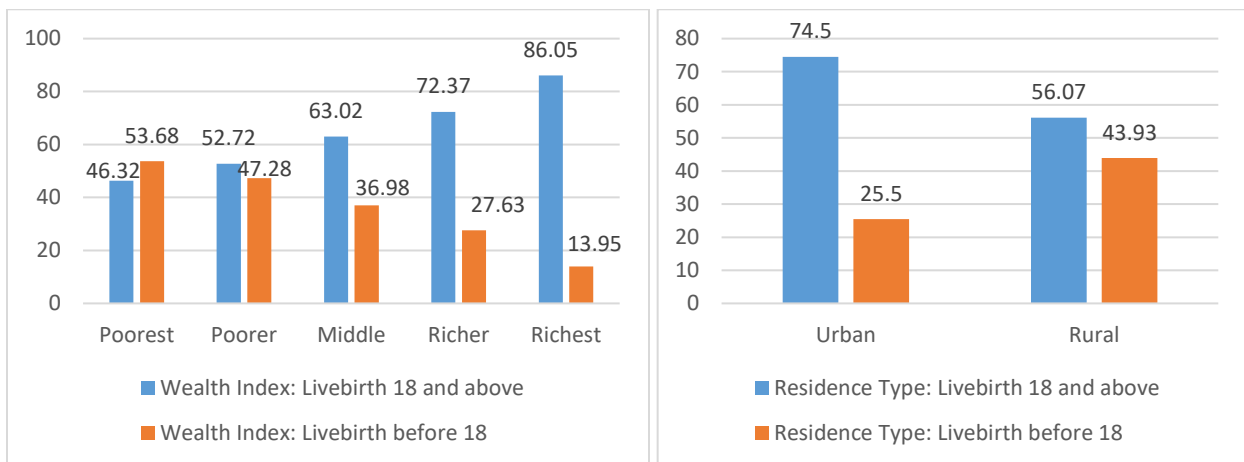


Figure A3: Prevalence of Adolescent Childbearing Across Wealth Index and Residence Types

Source: Author's Computation based on NDHS 2018 Report