**ANGLIA RUSKIN UNIVERSITY**

 **FACULTY OF BUSINESS AND LAW**

**THE EFFECT OF EDUCATION ON HOUSEHOLD POVERTY IN OYO STATE, NIGERIA**

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ANGLIA RUSKIN UNIVERSITY

 ABSTRACT

FACULTY OF BUSINESS AND LAW

MASTER OF PHILOSOPHY

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Poverty is a multidimensional phenomenon that affects many people’s progress and development in this present age, especially in the developing country like Nigeria. The existing literature reviewed in this study established that education and poverty are negatively associated. Even the Sustainable Development Goals (SDGs) of the United Nations recommends education has one of the most important grand designs required to eradicate poverty and other deprivations (United Nations, 2019). Education raises people’s productive capacity and thus increases their earnings in the workplace (Schultlz, 1961). In household production, consumers use inputs and times to produce goods, and education reduces the absolute and relative marginal costs of producing these goods. In addition, education affects some individuals’ decisions such as quantity and quality of children, addiction to drugs, growth in consumption (savings) during the life cycle etc. (Grossman, 2005, Cutler and Lleras, 2006, Haveman and Wolfe, 1984, Micheal, 1972 and Becker, 1965), and consequently may allow them to avoid or get out of poverty. This study aims to examine the effect of education on household poverty in Oyo state, Nigeria using data collected from the Nigeria General Household Survey (GHS), Panel 2015-2016, Wave 3 conducted by the National Bureau of Statistics (NBS). The total sample size for this study is 186 respondents, and the probit regression model is used to estimate model. Results show that education has a negative impact on the probability of being income poor, probability of having poor health conditions, likelihood of living under poor housing conditions, probability of having poor children educational attainment and likelihood of experiencing child mortality, irrespective of the educational indicator employed. Another notable finding is that, the higher the level of education, the lower the probability of being poor. A key contribution of this study is that it estimated the effect of education on various dimensions of poverty which will give a better understanding to why education should be considered an essential tool in targeting poverty. The study recommends investment in education as strictly necessary for the poverty reduction reforms, particularly in tertiary education.

**Key words:** Education, Human capital, income poor, poor health conditions, poor children educational attainment, Oyo state, Nigeria.

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**DECLARATION**

I declare that “THE EFFECT OF EDUCATION ON HOUSEHOLD POVERTY IN OYO STATE, NIGERIA" is my work and has not been submitted for any degree or examination in any university. All the sources I used and cited have been indicated and acknowledged in the references.

**CHAPTER ONE:** **INTRODUCTION**

* 1. **Background to Study**

Poverty is a multidimensional issue, although many attempts to measure poverty have centre attention on the income dimension. From the multifaceted approach, poverty is not just a shortage of income and productive resources adequate to maintain one's set of activities essential to everyday life that are conducted over one's life span. Such activities could include securing clean water, food, shelter and clothing. It can also indicate lack of sufficient nutrients in the body as a result of starving, unwell, deficiency or not having enough opportunity to education and other basic services, living on the street or housing with inadequate facilities, living in a life-threatening areas, low self-confidence and powerlessness (World Bank, 2011).

Additionally, Gordon (2005 p.4) defines that "poverty is a denial of choices and opportunities, a violation of human dignity. It means lack of basic capacity to participate effectively in society. It means not having enough to feed and clothe a family, not having a school or clinic to go to; not having the land on which to grow one's food or a job to earn one's living, not having access to credit. It means insecurity, powerlessness and exclusion of individuals, households and communities. It means susceptibility to violence, and it often implies living on marginal or fragile environments, without access to clean water or sanitation". Another definition of poverty, according to Onibokun and Kumuyi (1996 p.36) is “deprivation of entitlement through lack of access to economic and social resources, as well as political participation and consultation”.

Countries, where the level of poverty is relatively large, tend to exhibit developments outcomes for households and economic problems. For example, when the income level in a particular nation is low, consumers usually spend less money and consequently impede the strength of its overall economy (Grunewald, 2006). A large number of studies, such as Blau (1999), Shea (200), Maurin (2002), Auginbaugh and Gittleman (2003), Taylor, Dearing and McCartney (2004) and Berger, Paxson and Waldfogel (2009) investigate the associations between families’ income and children’s development. The general conclusion of these studies is that there is a clear association between family income and measures of children intellectual and behavioural development and this is consistent with the recent work of Joseph Rowntree Foundation (2013) that reviewed 34 studies on the effect of household incomes on children’s outcomes and concluded that, although, a parent’s educational level, attitude towards bringing up children and other parental factors also have an impact, there is a considerable evidence that money itself is important in children’s outcomes.

The children growing up in low-income households do less well than their better-off counterparts on many outcomes of life, such as cognitive development, school achievement and social-behavioural development because they are poor. Children from high-income households are more likely to have access to funding school or early childhood programmes (Joseph Rowntree Foundation, 2013), such as summer sports/recreational activities and community-based clubs, such as boy’s scout and girl’s clubs, music lesson, science and computer programs, educationally relevant summer camps etc. (Furstenberg et al, 1999 and Terzian, Anderson and Hamilton, 2009), and these identified cause and effect for better cognitive outcomes, achievement and engagement in school (Joseph Rowntree Foundation, 2013).

In addition, Cooper and Stewart (2017) that reviewed 61 studies on the causal effect of household income on children’s outcome from the OECD countries, including the US, UK, Australia and Germany. The study concluded that although parental education or attitude towards parenting and other parental characteristics have an impact, there is a shred of reliable evidence that income itself is essential for children’s cognitive development, physical health, social and behavioural development. That is, children from low-income household have worse cognitive, social behavioural and health outcomes because they are from less wealthy homes, and not just because poverty is associated with other household and parental characteristics. Income is also essential for children’s home environment and mother’s mental health, both of which are significant for child development.

Impaired health amplifies poverty and undermines development, whether directly or indirectly through lowering growth. Historically, malaria, one of the deadliest diseases in the tropics, has been detrimental to development and has contributed to poverty, particularly in Africa, as has HIV/AIDS more recently (Fosu, 2007).

Education is a human right (World Bank, 2018), and it has been placed in the literature as one of the essential factors for poverty reduction and economic growth. For example, Food and Agriculture Organization of the United Nations (2005, p. 14) “acclaimed education as one of the most powerful engines for reducing poverty and hunger”.

At the individual level, investment in education conveys productive knowledge and skills, and modify people into more valuable human capital. The skills and productive knowledge conveyed through education raises the productive capacity of people who have them. Hence, enhances their salary range (Schultz, 1961). At the national level, it increases the capability of a country to innovate its own technology and enhances the ability of the country to adopt new technologies developed by others and successfully implement them and thus promotes economic growth (Nelson and Phelps, 1966 and Aghion, Ufuk and Howitt, 2014).

Furthermore, investment in education is insofar not only relevant for poverty reduction through an economic role, but also a non-economic role. According to Becker (1992) asserts that the productivity of people in the market and the non-market situation is changed by investment in education, skills and knowledge. In the literature of economics of education, there are important contributions on non-economic returns to education, such as Grossman (2005), Cutler and Lleras-Muney (2006), Haveman and Wolfe (1984), Micheal (1972), Becker (1965), and the main idea of these contributions is that education has a positive effect on the efficiency of non-economic or household sector. In household production, consumers use inputs and time to produce goods, and education reduces the absolute and relative marginal costs of producing these goods. Moreover, education affects some individuals’ decisions, such as quantity and quality of children, addiction to drugs, growth in consumption (savings) during the life cycle etc.

Based on the literature reviewed in this study, education and poverty are negatively associated. That is, the higher the level of education of the population, the lesser will be the number of poor individuals. Even, the Sustainable Development Goals (SDGs) of the United Nations recommended education has one of the principal strategies needed to end poverty and other deprivations. Moreover, the SDGs recognized that ending poverty and other deprivations must go hand-in-hand with the plans that improve health and education, reduce inequality and stimulate economic growth. Hence, all efforts and learning opportunities focus on eliminating gender disparities in education and ensuring equal access to all levels of education and vocational for the vulnerable, including persons with disabilities. This proposal calls for building and upgrading education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all (United Nations, 2019b).

Indeed, the SDGs show that making a smart and effective investment in people’s education is critical for developing the human capital that will end extreme poverty.

The poverty level in Nigeria is inconsistent with its economic growth. Despite that, Nigeria’s GDP per capita has risen through the years in terms of the nominal US dollars. For example, the Nominal GDP in Nigeria showed 2,028.2 bn in 2018, compared with 567.9 bn in 2000 (World Bank Group, 2019a), reducing poverty still remains a challenge in Nigeria (World Bank, 2019).

Many of the population still live in poverty, according to United Nations (2014), Nigeria ranked the third position out of the top five countries in the global extreme poor in 2010 with 8.9% share. In 2018, the Nigeria population living in extreme poverty represents 86.9 million Nigeria out of the estimated 180 million population (Kazeem, 2018). This indicates that poverty incidence in Nigeria is exceedingly high as compared to other African countries, such as Democratic Republic of Congo, Tanzania, Mozambique, Kenya and Uganda with poverty population of 60.9 million, 19.9million, 17.8 million. 14.7 million and 14.2 million, respectively (Kazeem, 2018).

Poverty and its effect on the individuals in Nigeria are multidimensional. The health performance indicator of the country showed a very poor outcome across the board. Nigeria's undernourished incidence indicates about 13% of the population in 2018 (World Bank Group, 2019b).

Another troubling indicator of poverty is the high rate of infant mortality. As at 2018, the estimated infant mortality of children under the age of one (1) showed 76 per 1000 live births (World Bank Group, 2019 c), and the estimated infant mortality of children under the age of five (5) showed 120 per 1000 live births (World Bank Group, 2019 d).

These high rates of infant mortality are caused mainly by mothers not having sufficient money to take care of them. Many mothers have no knowledge of the use of some preventive measures, such as immunisation and vaccines (Ucha, 2010). In 2007, the recorded rate of immunisation against diphtheria, pertussis and tetanus (DPT) for children between 12 – 23 months in Nigeria was about 54% (Ucha, 2010). Many mortality of children under the age of five (5) in Nigeria is as a result of malaria, pneumonia, diarrhoea, measles and some similar diseases, and most of these diseases are preventable or treatable, but due to insufficient money, lack of access to or use of quality health services contribute significantly to the death of these children (Ucha, 2010 and United Nations International Children’s Emergency Fund, 2014). Malnutrition is also another cause of morbidity and mortality of large proportion of children under the age of five (5) in Nigeria (United Nations International Children’s Emergency Fund, 2014).

Poor people in the country have a lower level of education, low-income level and few opportunities for lucrative jobs, low rate of employment due to lack of skills and hence, unemployment turns out to be their problem (Ayoade and Adetola, 2012). Majority of the poor households in Nigeria tend to have children with less education because they cannot afford to train them in school as well as have difficult and limited access to social services and infrastructure (Adesanoye and Okunmadewa, 2007, Oshowole and Ugbechie, 2011 and Ayoade and Adeola, 2012). Also, many of the poor people in Nigeria depend on (low yield) subsistence farming or other informal sectors, such as trading as a means of securing the necessities of life (Yusuf, Adesanoye and Awotide, 2008).

Both urban and rural areas in Nigeria experience poverty, but it is more of rural area phenomenon and mostly with the uneducated people (El-rufai, 2011).

* 1. **Statement of the Problem**

Oyo state is a state in Nigeria and it has its own share of poverty incidence in the country. According to Nigeria poverty profile 2010 report, 51.8% of the population in the state lived below US$1 per day poverty line (National Bureau of Statistics, 2012).

Poor households in the state are characterised by lower educational attainment (Adesanoye and Okunmadewa, 2007 and Oshowole and Ugbechie, 2011). Low-income and few opportunities for well-paid jobs, low rate of employment due to lack of skills, insecure means of getting income to secure the necessities of life, such as food, clothing, shelter etc. (Ayoade and Adeola, 2012). Lack of money for children's education, difficult and poor access to good security, standard health facilities and clean water and other basic needs, and poor housing conditions. Also, children in this state are affected by high malnutrition, morbidity and mortality rate (Ayoade and Adeola, 2012).

According to United Nations Educational, Scientific and Cultural Organization (2012), the state literacy rate was 52.9%, which means the state has a high rate of illiteracy of about 47.1%. The unemployment rate was about 49% (Nyong, 2013), indicating that a large portion of the state does not have means of getting income to secure the necessities of life. This unfortunate situation could be attributed to a lack of skills necessary to gain formal employment and earn a higher income (Ayoade and Adeola, 2012).

To the purpose of reducing poverty, Nigeria has embarked on several poverty reduction reforms, such as Directorate of Food Roads and Rural Infrastructure (DFFRI), National Economic Empowerment Development Strategy (NEEDS), National Development Plans (NDPs), and Poverty Alleviation Programme (Arogundade, Adebisi and Ogunro, 2011, International Monetary Fund, 2005, Obadan, 2007, and Oyeranti, 2005). Contrary to expectations, the rate of poverty increases in Nigeria, in which highlighted poverty incidence in Oyo state is evidence. Besides, none of these reforms has been the focus of educational policies towards eradicating poverty. Investment in education reduces poverty through different channels as discussed in the theoretical framework as well as empirical studies evident in chapter 2.

Nevertheless, it is important to know the effect of education on poverty in order to recommend educational policies towards reducing poverty in Oyo state and Nigeria as a whole.

* 1. **History and Importance of Studying Oyo state**

Oyo state, as one of the states in Nigeria, has no exception of poverty incidence, and the idea of studying this state stemmed down from my personal encounter with the victims of poverty. In 2010, I was opportune to do my National Youth Service Corps in Oyo state. Oyo state is a state located in the South-west geographical zone of Nigeria. It is bounded in the south by Ogun state, in the north by Kwara state, in the west it is partly bounded by Ogun state and partly by the Republic of Benin, while in the East by Osun state. The state covers a total of 28,454 square kilometres of landmass (Oyo State Government, 2019). The National Youth Service Corps is a year mandatory programme established by the Nigeria government to involve all the graduate in Nation’s building and development of the country.

During this programme, I became aware that many families struggled to have a square meal. Also, have school-aged children not in school, which I never knew could exist coupled with the fact that I was born into a family that I get whatever I desire. This discovery got me worried. Therefore, I was curious to know an effective policy to target poverty. Then, I started reading papers, based on the review of the literature, many studies, such as Geda et al, 2005, Botha, 2010, Njong, 2010 and Wanka, 2014 have established that investment in education is a means to poverty reduction.

Following this, I have found no study in Oyo state examines the effect of education on poverty, both in monetary and non-monetary indicators. Also, I have found no study in Nigeria examines the impact of education on non-monetary indicators separately. Hence, the importance of studying Oyo state lies in the attempt to investigate the effect of education on poverty in Oyo state, with a specific focus on each indicator of non-monetary poverty. Then the results of this study are expected to be useful to the policymakers, the people of Oyo state and Nigeria at large as to why education should be considered an essential instrument to target poverty.

**1.4** **Contribution to Knowledge**

The main contributions of this study are as follows:

Firstly, based on the review of the literature, to the best of my knowledge, I have found no study concerned with the effect of education on poverty, both monetary and non-monetary multiple indicators in Oyo state. Also, upon all the several empirical studies on this vital issue in Nigeria, to the best of my knowledge, only a few studies, which are Adetola and Olufemi (2012), Adetola (2014) and Ataguba, Fonta and Ichoku (2011) have estimated the effect of education on poverty in terms of non-monetary indicator, and only Ataguba, Fonta and Ichoku (2011) has brought on board the determinants of poverty in terms of monetary and non-monetary indicators in the very same study. Also, none of these studies has estimated the effect of education on non-monetary poverty indicators separately. They have all indicated poverty based on aggregate multidimensional poverty index. Based on this, my study filled a very significant research gap by estimating the effect of education on each indicator of non-monetary poverty.

Secondly, I was opportune to test my innovative hypotheses with the current dataset from the General Household Survey (GHS), Panel wave 3 of 2015/2016 conducted by the National Bureau of Statistics (NBS), Nigeria. Also, to the best of my knowledge, I am the first person to utilized this current dataset concerning the effect of education on poverty in Oyo state and Nigeria.

Given the current dataset, I have the opportunity to also reconsidered, the relationship between education and income poverty in Nigeria. I have provided the outcome, which will be useful to the policymakers, the people of Oyo state and Nigeria at large.

Lastly, my study contributes to knowledge by offering statistics, including the share of poverty in both monetary and non-monetary indicators in Oyo state. The results are expected to be useful to the policymakers as they will be aware of the percentage of the population that need special attention for educational policies.

**1.5** **Aims and Hypotheses of the study**

The main aim of this study is to examine the effect of education on both monetary and non-monetary multiple household poverty indicators. Five (5) hypotheses stem from the main aim of this study and are as follows:

* **H1:** Education is negatively associated with income poverty. That is, the higher the educational level of the household head, the lower the probability of the household being income poor
* **H2:** Education is negatively associated with poor health conditions. In other words, the higher the educational level of the household head, the lower the probability of him and his family having poor health conditions
* **H3:** Education is negatively associated with poor housing conditions. That is, the higher the educational level of the household head, the lower the probability of the household living under poor housing conditions.
* **H4:** Education is negatively associated with poor children educational attainment. That is, the higher the educational level of the household head, the lower the probability of the household having poor children educational attainment.
* **H5:** Education is negatively associated with child mortality. That is, the higher the level of education of parents, the lower the probability of the household experiencing child mortality.

Other aims of this study are as follows:

* Demonstrate the share of each poverty indicator in terms of the educational level of the household head, father and mother, gender, area of location, age, household size and marital status in Oyo state, Nigeria.
* Show the share of educational attainment regarding gender and area of location.

**1.6 Study’s Structure and Rationales**

In investigating the effect of education on household poverty in Oyo state, Nigeria, this study is arranged in six (6) chapters.

Chapter 1 provides the introduction chapter of this study including the background to the study, statement of the problem, history and importance of studying Oyo state, contribution to knowledge and the aim of the study.

Chapter 2 provides a theoretical explanation relating to poverty followed by a review of empirical studies concerned with the association between education and poverty. Section 2.2 in this chapter provides the theoretical background that provides a link between education and poverty. Following this section, the empirical review is presented, and the review is centred on the studies in Nigeria and other countries. Moreover, the review focuses on identifying the flaws in these empirical studies, as well as identifying the issues that have not been investigated empirically in Oyo state, and in recommending educational policies to target poverty reduction may be significant. This chapter summed up by providing the research gap and set hypotheses.

Following the theoretical and empirical chapter, chapter 3 starts with presenting some of the definitions of poverty that have been established in the literature with different perspectives leading to the definitions and measurements used in this study which is in chapter 4 for investigating the effect of education on poverty in Oyo state, Nigeria. The privilege of measuring poverty using multiple dimensions is like a development as it will highlight the fact that people suffer from multiple deprivations, which income is only one of these multiple dimensions on which many attempts to measure poverty have centre attention. According to the multidimensional approach, the characteristics of poverty is not just a lack of a sufficient income, but also include the little or no essential basic needs, like education, shelter, food, clothing, health care, as well as poor sanitation, water pollution, poor housing status, ill-health, insufficient location security, prevention from the culturally normal interaction in the society, inability to speak and self-determine, incapacity and powerlessness to manage one’s affairs (World Bank, 2011). Hence, multiple dimensions of poverty are needed to be taken into consideration when designing poverty reduction policies. This study aims at estimating the effect of education on poverty including monetary and multiple non-monetary poverty in Oyo state.

Following the multidimensional approach, poverty is measured based on the monetary and non-monetary approach. According to the monetary approach, both absolute and relative poverty line is set to differentiate those who are poor from those who are not. However, absolute poverty line is widely utilised in developing countries where there is mass poverty (Eric, 2014).

In the most recent studies in Nigeria such as National Bureau of Statistics (2012), Anyanwu (2010 and 2012) on the monetary measure of poverty, this approach has been employed. Hence, the absolute approach is adopted in this study and poverty line is set at US$1.90 (#378. 251) per adult equivalent per day and (#11,348) per month in 2015 prices, because the data used in this study are collected in 2015/2016, and # is a symbol for Nigeria currency (naira).

For the non-monetary approach, authors like Ataguba, Fonta and Ichoku (2011), Adetola and Olufemi (2012) and Adetola (2014) in the most recent studies on the effect of education on non-monetary multiple measures of poverty in Nigeria have focused their contributions in indicating poverty based on weighted sum of multidimensional poverty index. Of which this study does not adopt but adopts the approach of indicating poverty in each dimension.

A potential reason for adopting this method is that it will allow the aim of this study to estimate the effect of education on various dimensions of poverty, particularly on multiple non-monetary dimensions of poverty and also to support the results with theory as education takes different routes to influence each dimension of poverty. Also, it will give a better understanding to policymakers, the people of Oyo state, and Nigeria as a whole to why education should be considered an essential instrument to target poverty. Another reason why this method is useful is that the study may identify the certain type of individuals that need special attention for educational policies since they obtain higher poverty to a given poverty dimension, for instance, female household heads and rural located households. For this choice of method to indicate poverty at each dimension, the study used deprivation threshold method to differentiate those households who are poor from those who are not. The method is adopted based on the formula by Santos and Alkire (2011) that identifies poverty as that household deprived in each dimension of the non-monetary measure of poverty.

Chapter 4 provides the source of the data used in this study. Data collected at household level from the Nigeria General Household Survey (GHS)-Panel wave 3 of 2015/2016 conducted by National Bureau of Statistics (NBS), and the total sample of data used is 186 respondents. Moreover, I described the variables used in the study and showed the derivation of the poverty line and deprivation threshold used in differentiating those who are poor from those who are not. For the statistical analysis provided in chapter 5, the probit regression model is employed to estimate the effect of education and other explanatory variables, which are stated as control variables in this study.

In the model, the dependent variable is poverty with the indication of income poor, poor health conditions, poor housing conditions, poor children educational attainment, and child mortality. The explanatory variables in this study are the educational level of the household head, father's educational level, mother's educational level, the gender of the household head, household location, age of the household head, household size and marital status of the household head. These variables are specified based on the existing studies reviewed and shown in (section 4.4 of this chapter) and the availability of data. Moreover, in this chapter, the study emphasised on knowing whether there is any significant impact of educational attainment on household poverty in Oyo state, Nigeria.

Chapter 5 provides the descriptive statistics, empirical results and interpretation of the results obtained for Oyo state households. Findings are mostly in accordance with the prior expectation; H1) household head education has a negative association with the probability of a household being income poor, irrespective of the education indicator used, and statistically significant for secondary education and tertiary education; H2) household head education indicators have a negative association with the probability of a household having poor health conditions, and statistically significant for secondary education and tertiary education; H3) household head education has significant and negative association with the probability of a household living under poor housing conditions, irrespective of the education indicator used; H4) the educational levels of the household head have significant and negative association with the probability of a household having poor children educational attainment; H5) education of the father and mother is found to have a negative association with the probability of a household experiencing child mortality, irrespective of the education indicator employed. Following this, chapter 6 concludes the study by bringing together the main findings of the study, summarises the main contributions to knowledge, limitations and area of further research and policy recommendations.

**CHAPTER TWO: A REVIEW OF THEORETICAL AND EMPIRICAL STUDIES ON THE RELATIONSHIP BETWEEN EDUCATION AND POVERTY**

**2.1 Introduction**

Aiming to estimate the effect of education on poverty in Oyo State, Nigeria identifies the theory relating to poverty and a review of empirical studies concerned with the association between education and poverty is presented.

The review of the literature will centre on the studies in Nigeria and other countries. Section 2.2 presents the theoretical background that provides the link between education and poverty. Following this, section 2.3 contains the empirical review. The review focuses on identifying the flaws in these empirical studies, as well as identifying the issues that have not been investigated empirically in (Oyo state, Nigeria) and in targeting poverty reduction may be important.

The approach taken will be to consider the literature and identifies these issues rather than consider the empirical studies chronologically. Following the review of empirical studies, this chapter sums up by providing the research gap and set hypotheses.

**2.2 Theoretical Review**

**2.2.1 Review of Factors Affecting Poverty**

Poverty, in the light of World Bank (2011) is considered as not having enough income for a person’s essential needs that allow him or her to do as a member of the society. The limited or lack of basic human needs. These needs include food, shelter, clothing, as well as poor access to health care, poor health conditions, indecent housing conditions, poor access to safe drinking water and adequate sewage disposal, lack of opportunity to social experiences, insecurity, not having the ability or enough ability and right to speak to maintain safe, stable and healthy life.

To gain a deeper understanding of factors influencing poverty, factors include but are not limited to gender, marital status, household size, age, location, and education will be reviewed in this chapter.

**Figure 2.1: Reveals a Framework for Poverty**

Source: author’s diagram based on the factors considered in the theoretical framework.

Each of these factors represents an input towards poverty reduction and is seen to be important in its own right. But much research suggests that the education factor is a more important source in poverty reduction than other factors. For example, Food and Agriculture Organization of the United Nations (2005, p.14) "acclaimed education as one of the most powerful engines for reducing poverty and hunger" and this will be the focus of this study. Therefore, a more detailed review of the educational factor is established first, and a brief discussion of other factors later.

**2.2.1.1 Education**

Education is an essential aspect of the development of a country. Even the goal 4 of the Sustainable Development Goals (SDGs) emphatically states that education is one of the most powerful and proven vehicles for sustainable development (United Nations, 2019b). It is the groundwork on which much of economic and social well-being of the citizens is built (Omoniyi, 2013). Education increases the value and efficiency of the labour force and consequently raises the poor from poverty (Omoniyi, 2013). In addition, Bloom and Canning and Chan (2006) asserts that the economic benefits of education including better employment opportunities, higher earnings and a greater ability to save and invest may result in other developments outcomes that include better health and improved quality of life.

In the knowledge economy, education can contribute to technological advancement, with those who possess education being more likely to be aware of and better able to adopt new technologies and innovate its own technologies (Nelson and Phelps, 1966 and Aghion, Ufuk and Howitt, 2014). This is supported by Bloom, Canning and Chan (2006) that asserts that investing in higher education in Africa will speed up the process to which innovations are adopted by the population, decreasing knowledge gaps and reducing poverty.

Venkatraja and Indira (2011) report evidence showing an association between level of education and social development. In this study, social development is confined to a set of five dimensions including health, empowerment, safety and security, ability to go about with shame, and meaning and value in one’s own life. The results show that all dimensions of social development are positively influenced by educational attainment. Gould (1993) reveals that expansion of education has contributed significantly to the quality of life, economic and social development.

In the literature of political behaviour, one of the most well-established findings is that citizens with a higher level of education to a great extent have greater political knowledge, higher levels of political participation and a stronger commitment to democratic core values (Nie, Junn and Stehlik-Barry, 1996). Campbell (2006) shows that education affects individuals' civic skills and cognitive capacity, which in turn increase political participation. This is also supported by the findings of Campbell (2009) that indicates that education increases the democratic enlightenment (political knowledge and tolerance).

Arguably, these political knowledge and participation may help the political administration of their country. Also avert the political instability and its infinite problems including unemployment, corruption, unequal distribution of wealth and increasing inflation rate faced by many countries which are the root cause of lack of education (Azy, 2018).

**2.2.1.1.1Human Capital Theory**

**2.2.1.1.1.1 Sources of Human Capital**

The word "human capital" first comes into sight in the American Economic Review article "invest in human capital" by Theodore W. Schultz, the Nobel Prize-winning economist (Schultz, 1961). Ever since then, there have been many terms freighted by economists in the human capital portmanteau.

According to Davenport and Jossey-Bass (1999), most people agree that human capital constitutes knowledge, skills and experience. Some, such as Gary Becker, a Nobel Laureate economist add personality, reputation, appearance and credentials to mix (Davenport and Jossey-Bass, 1999).

Human Capital according to Douglass (1997, p. 362) is "the acquired energy, motivations, skills, and knowledge possessed by human beings, which can be harnessed over a period of time to the task of producing goods and services". Hill (2008) shows that the productive knowledge and stock of skills incorporated in human beings form human capital. Organization for Economic Co-operation and Development (1996, p. 22) defined "human capital as the knowledge that individuals acquire during their life and use to produce goods or ideas in the market or non-market circumstances".

For Davenport and Jossey-Basey (1999) model, the definition of human capital was refined by breaking into four elements, which are the ability (knowledge, skill, talent) + behaviour x effort x time. Essentially, human capital is any non-separable asset that increases the labour productivity of those who possess it.

It is worth noting the possible sources of human capital, and this would be based on the Davenport and Jossey-Basey (1999) explanation.

An ability can be referred to as mastery in a set of activities or types of job which constitutes three elements:

Knowledge: direct a body of facts needed to carry out a task. Knowledge is broad-ranging compare to skill as it indicates the intellectual context within which someone executes a task (Davenport and Jossey-Basey, 1999).

Skill: facility with the ways and techniques of successfully completing a specific job. Skills may range from physical power and capacity in performing tasks, especially with hands to specific learning designed for a particular purpose or task. The common idea of skill is specificity (Davenport and Jossey-Basey, 1999).

Talent: the innate ability for carrying out a particular job or task. Talent is roughly the same meaning with aptitude. Someone displays a talent, particularly in carrying out a task with the use of his or her hands. He or she was birthed with it and has practised to sharpen it (Davenport and Jossey-Basey, 1999).

Considering the sources of each component of ability. Skill merges talent and knowledge and in many cases specific to a particular job or set of tasks. Someone can acquire numerous skills through use and iteration, and improve virtually all through practice and additional training. Likewise, someone can get knowledge through specific instruction, gathered experience and schooling. In contrast to knowledge and skills, talent is mainly inborn. Practice can revamp talent and raise the effectiveness of its application, but no amount of practice can produce a talent that was not born with someone at birth (Davenport and Jossey-Bass, 1999).

**2.2.1.1.1.2 Human Capital Theory in Education**

Human capital theory associated with the work of Schultz (1961) asserts that education imparts productive knowledge and skills, and transform people into more valuable human capital. The skills and productive knowledge imparted through education enhances the productive capacity of those who possess them and thus increase their earnings in their workplace (Schultz, 1961). Moreover, Becker (1992) suggests that the productivity of people in the market and non-market situation is changed by investments in education, skills and knowledge. There is a strong and empirically verifiable positive association across most societies between the wages and salaries people earn at work and the educational level attained by them, exemplified by the study of Psacharopoulos (1995) and Wang, Lv and Qu (2010).

In the presumed competitive labour and good markets, it is found that people with higher educational levels appear to have, on average higher levels of productivity. Employers usually make use of educational features to determine appropriateness and qualification for a job and potential productivity of their member of staff (Ezebuilo and Emmanuel, 2014). Moreover, it is asserted by numerous studies such as Kothari (1993), Nafziger (1997) and Grant (2012) that the acquisition of education to a great extent enhances individual's skills and capability to go into the employment market. Therefore, there is a positive association between employment and educational level.

In addition, the earnings of higher educated people do not begin only at a higher level but also increase very quickly to greatest possible level, which occurs later in life than the earnings profiles of those with a low level of education. Indeed, the earnings profiles of those without education often stay pretty flat all through their life (Ezebuilo and Emmanuel, 2014). The above patterns are shown to point out that education, not just only makes people more productive but also increase the ability to learn-by-doing that causes productivity and thus increase earnings rapidly than for those with a low level of education (Ezebuilo and Emmanuel, 2014). That is, as the educational level of an individual increases/decreases, the likelihood of gaining employment increases/decreases.

Education perhaps is the most commonly studied mechanism through which one's human capital is enhanced, some scholars, such as Sweetland (1996) considered "human capital" the branch of economics that studies education. To Schultz (1961) and his colleagues, such as Becker (1965 and 1996), human capital is an indicator of aggregate economic potential.

Schultz (1961) attributes the differences in earnings to differences in the level of education. In short, in human capital theory, a strong linear association is predicted between education and earnings as depicted in figure 2.2 below.

**Figure 2.2: The association between education and earnings in the human capital approach**

Education

Skills and knowledge

Productivity

Earnings

Source: author’s diagram based on the association between education and earnings in the human capital approach.

Based on this assessment, the economics of education is large with several studies that established firmly the association between the wages and salaries people earn at work and the educational level attained by them, in the case of overall population, and also of sub-groups of population, such as females, males, urban, socially deprived areas, rural etc.

An important extension of the human capital theory is made by Mincer (1974), which has been a point of reference for a large number of empirical studies in the economics of education's field. Based on both the empirical and theoretical arguments, Mincer (1974) modelled the logarithms of earnings function of years of education and years of potential labour market experience:

……………………………………………………………eq. 1

Where represents individual’s earnings in a given period, denotes years of education completed, denotes the number of years a person has been in employment since he or she has completed education, and denotes the statistical residual.

This model was based on the belief that higher investment in education by an individual will lead to higher earnings. This simple model of Mincer (1974) was followed by a large number of empirical studies across countries, amongst others by Day and Newburger (2002), Matita and Chirwa (2009), Wang, Lv and Qu (2010), Tansel and Bircan (2010), Diaz (2010), Ewert (2012), Graham and Paul (2014), and their evidence generally supports the Mincer log-earnings specification. That is earnings increase with an increase in educational level.

According to the human capital model, the choice to enrol for schooling is a function of direct costs, indirect costs, available aid, work opportunities, opportunity cost and anticipation of future returns. In the human capital micro-economic based model, post-college education earnings normally represent the anticipated returns of investment in higher education (Hill, 2008, Becker, 1965, and Schultz, 1961). Below shown figure 2.3 illustrates investment options available to potential students - that is a high school degree holder of aged 18 and college degree holder aged 20 and the general earnings connected with educational choices. Investment college education includes direct costs (e.g. tuition fees, transports, books) and indirect costs, corresponding to opportunity cost (i.e. forgone earnings) and time that individual has to give up to acquire education instead of working to receive current salaries. Loans, grants and work opportunities may reduce direct costs (Hill, 2008, and Desjardins and Totkoushian, 2005).

**Figure 2.3: Human capital investment framework, wherein the post-college earnings disparity is interpreted as justifying the shorter-term costs**

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Source: Desjardins and Totkoushian, 2005.

On average, these investments should generate higher first-job salaries and over the career span of the individual, greater net wealth. Human capital micro-economic based models of college education investment are predicted on this interaction of direct costs, indirect costs and perceptions of wealth possibilities of post-investment (Schultz, 1961, Becker, 1965, Desjardins and Totkoushian, 2005, and Hill, 2008).

According to human capital theory, individual consumers of higher education though experienced delay in earnings, increased direct costs and indirect costs, corresponding to the opportunity of spending money and time given up instead of working to earn present earnings of the individual that stopped at the high school level. In this case, for most of these individuals who invested in college education, the anticipated earnings disparity is a strong justification for the short-term sacrifices (Schultz, 1961, Becker, 1965, Desjardins and Totkoushian, 2005, and Hill, 2008).

Making investment schooling decision is vital to economic benefit as it relates to or affects the overall earnings. As noted by Rosen (1977), Card (1999), Borjas (2009), and Wanka (2014), when person has to deal with schooling decision, and he or she has two or more options, then he or she has to take the educational degree that maximizes his or her current worth of salaries, holding all other factors constant. The person works out the current worth associated with every schooling choice (e.g. one year, two years, three years and so on) and takes the choice that maximizes the current value of the earnings stream, so as to know the best stage to quit schooling and go into labour market, Wage Schooling Locus (WSL) will be more appropriate for illustration and rationale for this method is that it assists in estimating the rate of returns to education. WSL refers to the salaries firms are willing to pay a particular worker for each attained level of education. The WSL is depicted in figure 2.4 below.

**Figure 2.4: The Wage Schooling Locus (WSL)**



Source: Rosen (1977), Card (1999), Borjas (2009), and Wanka (2014).

 This wage schooling locus shows that a worker with schooling stage 12 years, that is a high school degree holder receives  per year and the wage rises as the worker increases year of education. If the worker then finishes college (e.g. 18 years of education), the salary moves up to per year. The earnings gap between the high school degree holder and the college graduate is . In this case, one can conclude that, as a worker or an individual's educational degree rise, the likelihood of he or she earns higher wage increases, which intend may result in a lower likelihood of he or she is in poverty (Rosen, 1977, Card, 1999, Borjas, 2009, and Wanka, 2014).

Besides, this wage schooling locus is market determined. That is, the salary for each educational level is decided by the interception of the supply and demand of workers with a particular educational degree. As stated by the worker, the salary associated with each level of education is fixed. The gradient of the curve is directly connected to any empirical analysis of the rate of return to education (Rosen, 1977, Card, 1999, Borjas, 2009, and Wanka, 2014).

An individual's schooling decision is illustrated in figure 2.5 shown below, is the optimal educational degree. A rise in marginal cost of education, that is, a fee added for acquiring an extra year of education from  as denoted in Graph I Figure 2.5 shown below or decrease in the marginal rate of returns , that is decrease in the marginal incremental earnings resulting from an extra year of schooling from  as denoted in Graph II Figure 2.5 shown below, results to a reduction in the optimal quantity of schooling from , students will stop acquiring education when their marginal rate of return to schooling is equivalent marginal cost of schooling as the return to education is what inspires most people to acquire education (Rosen, 1977, Card, 1999, Borjas, 2009, and Wanka, 2014).

**Figure 2.5: The Optimal Schooling Option**



Source: Rosen (1977), Card (1999), Borjas (2009) and Wanka (2014).

Becker (1992) and Teal (2001) highlighted that individuals with higher education are more likely to gain employment. Besides, individuals with higher education are more likely to receive higher earnings, and this is supported with the work of Van der Berg (2002 p.1), which states that "education enhances the earnings potential of the poor, both in competing for jobs and earnings and as a source of growth and employment in itself". Degree of higher education represents a sign of diligence to employers and rising opportunity to a more considerable amount of obtainable employments. Contrarily, people with no education or less education are less likely to get a job, and if they do, they are commonly the first to be laid off when there is an economic slowdown (Schiller, 2004). Therefore, the likelihood of being in poverty is higher for those with less or no education and is lower for those with higher education, which suggest a positive association between education and earnings and thus a negative association between education and poverty. This is depicted in figure 2.7.

It appears therefore that, education affects poverty mainly through labour market (Schiller, 2004). Below figure 2.6 illustrates the link between unemployment and poverty. It presents a summary of the connection between labour force engagement and earnings. In this figure, those who do not engage in the labour market, that is non-participants may have either zero earnings or generate passive income, while those who engage in the labour market, that is participants have a higher probability of receiving earnings. Besides, it is visible in this figure that, those who lose their job or unable to get a job usually possess reduction in their income and consumption spending. Therefore, they tend to have a decrease in the consumption of some of the necessities of life. Unemployed labour market participants who have no opportunity to get a job have a higher probability of being in poverty, as it becomes tough for them to sustain an effective purchasing power during the time that their income drop to zero, particularly if they lack another source of earnings (Schiller, 2004, and Mbuli, 2008).

Moreover, it should be noted that there are others, that is some working poor. In other words, some of the employed labour force participants who have jobs but still live below the poverty line, because the income they earn is not enough to put them on or above the poverty threshold. This case is specifically for those employees with lower skilled or unskilled labour (Schultz, 1999, Van der Berg, 2008, and Ganguli, Hausmann, and Viarengo, 2011, Schiller, 2004, and Mbuli, 2008).

**Figure 2.6: Labour force status, earnings and poverty status**

|  |
| --- |
|  Labor Force Status Earnings Poverty Status  Employed Hours worked x wage rate None  Participants  Unemployed Zero Yes  Non-participants  Zero Yes  Interest/passive income None  |

Source: Schiller (2004) and Mbuli (2008).

It is worth noting that, returns to schooling vary based on factors such as the supply of educated workers, development level and shift in demand for such workers in the development process (Van der Berg, 2002 and Van der Berg, 2008). Besides, the emergence of globalisation has resulted to increased competition in the labour market within and among countries and the world as a whole, causing ever more replacement of the lower skilled or unskilled workers and therefore investment in higher education level is absolutely necessary (Bonal, 2007, and Tarabini, 2010).

According to Acemoglu (2010), there are also many notable factors presumed to be related to pay differences, some of which are;

• Compensating differentials: an employee may be paid less in money as a result of he or she received part of his or her compensation in terms of other (difficult to discern) features of the job, such as lower effort requirements, better facilities, more pleasant working conditions and so on.

• Labour market imperfections: two workers with the same human capital perhaps receive different salaries as a result of jobs difference in terms of their productivity and payment, and one of the workers finally matched with the high productivity job, while the other matched with the low productivity job.

• Taste-based discrimination: employers may pay an employee a lower salary due to the gender or race of the employee as a result of their preconceived opinion (Acemoglu, 2010).

**2.2.1.1.1.3 Education Channel in Other Economic Production**

Education can also influence poverty through it's another economic production channel. In most cases, this is achieved by increasing agricultural productivity through two important channels.

Education develops both cognitive skills and non-cognitive skills. Cognitive outputs of education include the imparting of specific information in addition to the formation of general skills and proficiencies. Attitudes, behaviour and beliefs, also described in the literature are non-cognitive skills associated with education (Cotlear, 1990, and Appleton and Balihuta, 1996). Just as mentioned above that education increases agricultural productivity through two principal channels, and these two important ways will be explained here.

Firstly, increasing literacy and numeracy may help farmers to obtain and understand information and to work out suitable input quantities in a modernising or rapidly changing environment (Cotlear, 1990 and Appleton and Balihuta, 1996). Hussain and Byerlee (1995) argue that education creates general skills that decrease technical and allocative inefficiencies in production. A farmer is technically efficient if it is not possible to increase agricultural productivity without an increase in the use of at least one input. Technical inefficiency may occur due to improper timing or method of input usage, which is in many instances originated by lack of information but may also reflect problems of input supply (Ali and Byerlee, 1991). Allocative (or price) efficiency is achieved when the cost of producing a given output is reduced, as shown by the equality of the ratio of the marginal products of inputs to the input price ratio. A farmer is allocative inefficient if the chosen input-output combination does not reduce costs (to increase profits), given prevailing prices, i.e. production occurs off the farm's expansion path. Allocative inefficiency may occur due to failure to select the most cost-efficient inputs mix, and this may be caused by lack of information and also sub-optimal tenancy agreement, unreliable input supply, risk aversion and other institutional constraints (Ali and Byerlee, 1991).

Furthermore, inefficiency may occur when there are fixed factors of production or economies of scale. Farmers may fail to take advantage of profit-maximising opportunities to move up along the expansion path, and this in most cases principally attributed to limited available farmland, risk aversion or credit market constraints, rather than lack of information (Ali and Byerlee, 1991). However, where education gets rid of credit market constraints and decreases risk aversion, education may also play a role in raising output through greater scale efficiency. In the short run, education may affect the quantities of variable used inputs, while in the long term it may influence the optimal scale of operation (Wu, 1977).

Education gets rid of credit market constraints by substituting for access to credit through creating the skills needed to acquire employment with paying salaries. By that means, cash is generated to fund investments in agriculture (Appleton and Balihuta, 1996). It is noted that farmers with education tend to involved directly or communicate with credit agencies, and this is because they understand financial transactions and keep records, which increase the probability of acquiring credit (Philips, Robert and Marble, 1986).

Secondly, the acquired beliefs, behaviours, and attitudes may lead to higher willingness to accept a risk, adopting of new ideas, save for investment and generally to embrace productive practices (Cotlear, 1990, and Appleton and Balihuta, 1996). Hussain and Byerlee (1995) argue that education develops attitudes that strengthen the take up of new ideas causing production frontier to shift outward.

Psacharopoulos and Woodhall (1985) adapt Heyneman (1983) approach to explaining the role education may play in four stages of adoption of agricultural technology. The first stage, traditional farming, father passed on information to son, which means, there is little or no education required. The second stage, adoption of only one input, for example, fertiliser. To understand instructions and adjust quantities of new input, farmers need basic literacy and numeracy. The third stage, adoption of multiple inputs at the same time requires more than literacy and numeracy, and some basic science knowledge is beneficial. The fourth step, irrigation-based agriculture. The farmer must make complex calculations of the effects of changes in weather and crops, and at this level, for efficient production, more education is required (Psacharopoulos and Woodhall, 1985).

Education is not only helpful after the new ideas or methods have been taken up but also help to determine whether a farmer decides to adopt new technologies early and the extent to which the new technologies will be utilised (Weir, 1999). There are at least three reasons for this. Firstly, educated people are more likely to be wealthy and are at less risk of famine if the prospective new idea is not successful. Secondly, those farmers with education have a higher probability of being contacted by agricultural extension workers seeking for model farmers to test new technologies, and thirdly, educated farmers have better access to information concerning prospective new technologies and to make reasonable evaluations of the dangers included in testing new inputs or methods (Weir, 1999).

Education may directly or indirectly increase farm output through the channels shown above. The income generated from farm inputs or crops is different from the income generated from non-agricultural work. Both incomes from these activities (farm and non-farm) are essential in reducing poverty. According to De Muro and Burchi (2007), the diversification of income-generating works is important in reducing vulnerability and recovering more quickly from emergencies such as natural disasters.

As above, the following conclusions may be drawn; educational attainment is an important determinant of personal income and employment status. In the human capital approach, not only educational accomplishment is an important determinant of individual returns and employment status but also an important determinant of productivity at the aggregate level. According to Angel de la and Ciccone (2002), there is a wide-ranging agreement in the academic literature that education or human capital is an important determinant of productivity and other economic outcomes, both at the microeconomic level and macroeconomic level, and that its role is specifically essential in today's economy based on knowledge.

**2.2.1.1.1.4 Human Capital in Growth Theory**

While the neoclassical growth theory paid whole attention on the accumulation of factors of production (i.e. physical capital and labour) as an important determinant of long-term growth in the economy and added the technology advancement as exogenously determined factor (Swan, 1956 and Solow, 1957). The endogenous growth model where the link between human capital and economic growth takes its root set factor of production (i.e. acquisition of human capital) at the heart of its framework. It presumes that the amount of human capital in the economy determines economic growth. To explore the association between human capital and economic growth is mainly formalized in two basic frameworks (Benhabbib and Spiegel, 1994 and Aghion and Howitt, 2009).

The first approach has its formation in Schultz (1961) and Becker (1964) theory of human capital and has drawn attention with the work of Lucas (1988). In the economy assumed by Lucas (1988), individuals choose to acquire human capital (i.e. education or training) by allocating their time at each date between present production and education (or training), with the expectation of higher returns in the future (i.e. productivity and earnings) that arise from the current time spent in acquiring education or training. This approach is based on the idea that the accumulation of human capital is the primary driver of economic growth. According to this approach, differences in the growth rates of the economy across countries are largely accounted for by differences in the accumulation rates of the countries human capital.

The second approach has its early history in the seminar paper by Nelson and Phelps (1966) and recently been refreshed in the literature on “Schumpeterian Growth Theory” by Aghion, Ufuk and Howitt (2014). This approach claims that the human capital stock determines the economy’s ability to create new ideas or catch up with more developed countries, which in turn promotes economic growth. Thus, the level of human capital stock is a determinant of economic growth, although, in this approach, the human capital stock is indirectly a determinant of economic growth.

 In both (as in first approach and second approach), an increase in educational attainment assuming this is related to human capital leads to an increase in productivity.

Based on the assessment above, the following conclusions can be extracted. There is a positive effect of education on economic outcomes, which in turn allows people to avoid or get out of income poverty. Figure 2.7 below summarises the economic effect of education on poverty.

**Figure 2.7: Economic effect of education on poverty**

Source: author’s diagram based on the assessment shown above.

Although, education as shown above in human capital approach, is insofar relevant for poverty reduction through increasing individual earnings and productivity and economic growth at the national level (Schultz, 1961 and Becker, 1964 and Lucas, 1988), this approach has been criticised. This is because it is very economistic, it only identifies the instrumental economic role of education (Sen, 1997, Woodhall, 2001 and Robeyns, 2006). Education, to the opposite, has a double role, which are "economic role" and non-economic role". The last mentioned is disregarded in the human capital approach. Considering both approaches concerning education is relevant for poverty reduction. Counting the different kinds of important contributions on non-economic outcomes of education, we explain more in-depth some mechanisms through which education affects non-economic poverty below.

**2.2.1.1.2 Basic Needs Approach**

In the basic needs approach, education though is identified as a basic need itself, according to International Labor Office (1977, p.28), "Education is itself a basic need and equality of access to educational services, particularly in rural areas, is, therefore, an important ingredient of basic needs strategy". Noor (1980) asserts that education is a basic human need, it provides people with knowledge, skills, attitudes, and values and increases their ability to change and their willingness to take new ideas that come into light. In developing countries where technological change is completely changing the way in which people live, education is becoming continuously more necessary for a living (Streeten, 1977). It helps people to be thoroughly familiar with change and also benefit from the change and to persist in obtaining their economic rights (Streeten, 1977). At the same time, closely related to the theory of human capital, this approach also identifies that education helps to reach the success of other basic needs, and assists in the improvement of the quality of life (Streeten, 1977). Education helps in the fulfilment of basic requirements such as effective use of health facilities, clean drinking water, sanitation, adequate nutrition and shelter (Noor, 1980, Cochrane, 1988 and Jeffery and Basu, 1996). This is because education equips the necessary knowledge for change in current practices and skills to better use of the services provided (Noor, 1980). It also affects the behaviour of women on decisions relating to fertility, family planning, family welfare and health etc. (Noor, 1980, Cochrane, 1988 and Jeffery and Basu, 1996).

The behaviour and some decisions of people might change to their good as education increases, giving them chances of avoiding or escaping poverty. Notably, a higher capability to take convenient and important decisions increases the likelihood of fulfilling basic needs (Diaz, 2010).

It is understood that the fulfilment of other basic needs increases the productivity and earnings of people, therefore putting them above the poverty line. This is because the relationship between education and other basic needs is reciprocal (Noor, 1980, Tilak, 1989 and Ordonez, Kasaju and Seshadri, 1998). Figure 2.8 below depicts this linkage.

**Figure 2.8: Education as an important factor in the basic needs approach**

**For Society**: Raises Ability to provide More Services

**For Individuals**: Raises Consumption

Leads to More Integrated or Sectoral Developmental Activities

Productivity

Higher

Food and Nutrition

Reducedd

Fertility

Water and Sanitation

Education

Longevity

Health

Greater

Shelter

**For Individuals**: Influences Learning Ability and Stimulates Desire for increased Knowledge Individula Needs

**For Society**: Raises Demand for Complex Skills necessary Beyond Individual Needs

Source: Noor, 1980

The achievement of these basic needs is shapely influenced by education. Increased productivity and greater duration of life springing up directly from education raise the demand for more food, clean drinking water, better housing and more health and educational facilities while also enabling the whole society to better meet such needs (Noor, 1980 and Austin, 1980). The fulfilment of each of these needs, and conversely, the lack of fulfilling anyone puts greater importance on achieving the others (Noor, 1980 and Austin, 1980). For example, the reduction of gastrointestinal and parasitic diseases which can be done through education, sanitation and water, and health programs to a notably large extent increases the nutrition gained from a given quantity of food (Austin, 1980). Enhancement in nutrition, especially in infants and young kids but also in adults, can considerably develop their learning ability and thus their returns from schooling, and eventually their productivity and earnings. On the other hand, though clean drinking water can make a significant contribution to better health, whether it will fulfil that, depends on the relevant education and understanding of the people who use it (Richard, 1983).

It is worth noting that, so as much as the achievement of any one of the necessities, e.g. clean drinking water, education, shelter, health and nutrition can be of benefit to the achievement of each of the others. On the other hand, deficiency of any one of the necessities hurts the fulfilment of other basic needs (World Bank, 1980a and 1980b). However, education was awarded a higher position amid various necessities. Education in the basic needs approach forms a critically important factor because it is a necessary base for the fulfilment of all other necessities (Noor, 1980).

In the literature of economics of education, there are important contributions on non-economic returns to education such as Grossman (2005), Culter and Lleras-Muney (2006), Haveman and Wolfe (1984), Micheal (1972), Becker (1965), and the main idea of these contributions is that education has a positive effect on the efficiency of non-economic or household sector. In household production, consumers use inputs and time to produce goods, and education reduces the absolute and relative marginal costs of producing these goods. Moreover, education affects some people's decisions such as quantity and quality of children, addiction to drugs, growth in consumption (savings) during the life cycle etc.

Grossman (2005) emphasises on the impact of education on the increase in production efficiency, he used health as an example and concluded that "an increase in schooling is predicted to increase the quantity of health demanded but to lower the quantity of Medicare demanded" (Grossman, 2005, p. 585).

This outcome is attributed to the allocative efficiency effect of education. People with higher education are able to choose different combination of inputs than those with no education (and less education) to produce a certain commodity. The combination of chosen inputs by the higher educated people gives them, the higher output of that commodity than the combination of chosen inputs by no education (and less education) people (Micheal and Becker, 1973, Rosenzweig and Schultz, 1981, Muurinen, 1982 and Grossman, 2005).

Typically, allocative efficiency models incorporated multivariate nature of health production function which include different market inputs (i.e. alcohol use, cigarette smoking, diet), in addition to medical care (Grossman, 2005) and assumed that people with better education have better knowledge about the true nature of health production (Rosenzweig and Schultz, 1981, Muurinen, 1982 and Grossman, 2005). For example, better-educated people are more likely to choose an appropriate diet needed to attain a proper level of nutrition (Grossman, 2005 and Diaz, 2010). Likewise, people with better education have better knowledge of the dangers of smoking, and therefore, they have the option to adopt good habits, such as less smoking that allows them to live a healthier lifestyle (Grossman, 2005), and consequently will enable them to avoid or get out of poor health conditions.

This is supported by Cutler and Lleras-Muney (2006) that argued that, better educated people have better health behaviour, for example, better educated people are less likely to smoke, drink a lot of alcohol, use illegal drugs and also more likely to take appropriate diet, do exercise and use preventive medical care, such as flu shot, vaccine and colorectal screening which allows them to live a healthier lifestyle, and all these health outcomes behavior that determine better health resulted because education provides opportunities to learn specifically about health and health risks, both in the form of health education in the lessons and academic content taught in the school and also by giving individuals the degree to which they have the capacity to obtain, process and understand necessary health information and services needed to make appropriate health decisions to prevent or manage diseases (Zimmerman, Woolf and Haley, 2012).

Cutler and Lleras-Muney (2006) and Lee (1999) argue that education is an engine that increases human's knowledge and cognitive skills, allowing them to take a better decision on health-related information and options available for them and their households, including those related to obtaining and managing medical care. Similarly, De Walque (2004) argues that education provides individuals with better access to health information and improves critical thinking skills.

Kigali (2014) argues that education has an important role in accessing public information, particularly in health, hygiene, and nutrition. This is because, it "can open the mind of people" (Robeyns, 2006, p. 3). Obtaining information about how to keep away from illness or fight illness is important since people with diseases need more calories to be food secure. Moreover, it is widely recognised that people require to possess, where possible, an appropriate and diversified diet to attain a proper level of nutrition to build a stronger immune system and avoid morbidity and mortality (Diaz, 2010 and Cutler and Lleras-Muney, 2006).

Finally, even following good practices of hygiene is essential to promoting good health by preventing bacteria, viruses, and illnesses such as diarrhoea (Mills and Cumming, 2016). Mass media such as radios are widely spread in African countries, even amongst individuals that are poor in the rural areas (Van der Puye, 1998). Only educated people are able to capture correctly and elaborate the information. Even more relevant is the role of education and literacy in acquiring this type of information from written messages (De Walque, 2004).

**2.2.1.1.2.1 Importance of Education in Receiving and Using Information on Health**

How information is received, and the way it is used do matters. People with more education are indeed better informed about health risks in developed countries (Cutler and Lleras-Muney, 2010). Besides, they tend to be the first making use of new health-related information. This is because, when information newly becomes accessible, it appears to become first known to the individuals with more education and consequently, they seem to be the first to respond (Cutler and Lleras-Muney, 2011). For example, Aizer and Stround (2010) document that, after the first widely publicised dangers of smoking in Surgeon General Report of 1964, there were higher rates of educated mothers that quitted smoking, and consequently the health of their babies increased more. De Walque (2004) reports that as the risks of smoking were increasingly discovered prior to the Surgeon General Report of 1964, smoking decreased for the best educated in the 1950s.

Similarly, De Walque, et al. (2005) shows that, from a long-term study in rural Uganda, carried out over an 11 years period from 1990 to 2001, which covers distinct stages of the epidemic reveals that there was no association between education and HIV/AIDS in 1990, but one turned out in 2000. This finding suggests that over a decade, educated young adults, particularly females, became more likely to respond to HIV/AIDS information and prevention campaigns by effectively reducing their sexual risk behaviour mainly through the more use of condoms. Anderberg, Chevalier and Wadsworth (2011) report how when information was first (incorrectly) publicised regarding the dangers of autism associated with MMR vaccines. There were more declined in vaccination rates in areas with people with more education.

It is also claimed that more educated people tend to make use of information better (Anderberg, Chevalier and Wadworth, 2011). For example, today most people are aware of the risk of smoking, but still, smoking is more common among those individuals with no education or less education and lesser among those with better education (Cutler and Lleras-Muney, 2011). This is because individuals with more education are more likely to trust science (Anderberg, Chevalier and Wadworth, 2011). For example, according to National Science Foundation (2000), in the 1999 National Science Foundation Survey, there is a higher percentage of those with college degree or higher who have the thought that the advantage of new technologies strongly outweigh the harmful results, whereas there is lower percentage of those with less than high school degree that thought so and this may be due to the fact that they understand the nature of scientific inquiry (National Science Foundation, 2000). Besides, individuals with better education might be better at following the instructions given by doctor because they have better self-control or they might be more likely to trust the information produced by the scientific inquiry and follow recommendations that follow from these because they took science courses in school or know scientists directly (Kenkel, 1991).

Link and Phelan (1995) argue that gradients in health increase when there is knowledge or technology available to prevent or treat disease, because there is a universal demand for better health, people with more education (or more income, or more power) are more likely to use new knowledge or new techniques more rapidly and more effectively. This idea suggests that education offers people a wide range of helpful resources, including money, knowledge, prestige and beneficial social conditions that can be used to one's health advantage.

Education not only influences health because it directly provides information on how to improve health through the form of health education in the lessons and academic content in the school, but also according to Jesen and Lleras-Muney (2010) provides opportunities of being in school, which serves as a confinement that affects healthy behaviours, most boys that are not in schools start working or spend time doing nothing and the set of people that they get involved with when they are not in school is different from their peers in school and "treated boys" (those given the information in reference to the value of education) record that their peers are significantly less likely to smoke and drink. Moreover, exposing early to a different set of peers could have important long-term consequences, as drinking alcohol and smoking usually are addictive behaviours that affect the mental and physical development of young ones.

In addition to education impact on healthy behaviour, it affects the ability to navigate health care. In today's health care environment, attaining positive health outcomes requires a variety of factors to come together, which may be affected by educational attainment (Zimmerman, Woolf and Haley, 2012). Education impact skills in reading, mathematics and science/health literacy which allow patients to understand their health needs, follow or read instructions, advocate for themselves and their families, and communicate effectively with health providers (Zimmerman, Woolf and Haley, 2012). Berkman, Sheridan and Donahue (2011) report in a systematic review of health literacy and health outcomes that people with lower health literacy had poorer health-related knowledge and comprehension, ability to interpret the labels on medication and health messages, and ability to display taking medications correctly. They also had increased admission to hospital for treatment and emergency care, decreased preventive care, and amongst the elderly, poorer overall health status and higher mortality. For example, low literacy and low levels of other basic skills such as numeracy and listening were associated with higher difficulty in adults' asthma care.

Willems, De Maesschalck and Deveugele (2005), report in a review of the impact of socio-economic status on patient-physician communication that communication is influenced in part by communicative ability and style of the patient which is largely dependent of education and other personal attributes. Education gives rise to more active communication such as expressiveness and asking questions. In response, physicians are more likely to communicate less to patients who appear to have no education or less education and to provide care that is more directive and less participatory.

**2.2.1.1.2.2 Importance of Education in Health**

Grossman (2005) and Cutler and Lleras-Muney (2006) claim that education is an important correlate of good health. Grossman (2005) makes his point stronger by noting that this finding emerges whether health levels are measured by morbidity rates, mortality rates, self-evaluation of health status or physiological indicators of health, and whether the units of observation are individuals or groups. Cutler and Lleras-Muney (2006) supported his point by noting that this finding emerges from various health measures such as mortality, the risk of heart diseases, the risk of diabetes, the probability of reporting fair or poor health and loss of days at work due to sickness.

Education enhances health through the labour market. Education impacts on health outcomes through increasing access to available jobs and thus earning. In most cases, People with better education have a higher probability to be employed. Whereas, people with no or lower levels of education are more likely to be unemployed (Van de Berg, 2002). Obviously, this will affect their income, and they tend to experience economic hardship. Therefore, leaving them and their

family to not able to achieve appropriate diet needed for them to attain proper level of nutrition, and they tend to face health problems caused by a lack of balanced diet such as excess body weight, obesity, heart diseases, high blood pressures, high cholesterol levels etc. (Curinga, 2015). Unemployed individuals and less or no education individuals have a higher probability of being in poor health conditions while employed and higher levels of education individuals are less likely to be in poor health conditions (Van de Berg, 2002).

Education does not only gives an advantage in gaining employment and thus higher earnings but also gives an advantage in obtaining rewarding jobs that offer health-related benefits such as health insurance. Hall, Collins and Giled (1999), Acs and Blumberg (2001) and Gabel, Levitt and Holve (2002) argue that education enhances health-related benefits. For example, better-educated workers are generally in higher paying jobs with health insurance. By contrast, less educated workers are associated with lower paying jobs which are less likely to have health-related benefits such as sick pay, child and elder care resources and also employer-sponsored health insurance (Hall, Collins and Giled, 1999, Acs and Blumberg, 2001 and Gabel, Levitt and Holve, 2002).

Although, in America, workers receive health insurance in their workplace but yet not all workers have access to this benefit. This is because, employers with lower educated workers do provide less frequently health insurance and even if employment-sponsored benefits are available, low wage earners may not be able to afford the premiums, copayments and deductibles (Gabel, Levitt and Holve, 2002), leaving them not to be able to take good care of themselves when they are sick and can lead to other health issues or increasing contagious disease. To the extent of reducing wages or hours worked but these are reflected in market earnings and directly visible in the economic outcomes of education (Halveman and Wolfe, 1984).

Additionally, Braveman, Egerter and Barclay (2011) argue that, the economic vulnerability that can spring up from low level of education or no education can affect health through a cascade effect on the ability to obtain resources that are important to health such as stable housing, food, transportation, health care and health insurance. Generally, low-income individuals have the higher likelihood to be uninsured and to be vulnerable to the increasing health care costs, which employer health insurance sponsors are to a growing extent shifting to patients through higher copayments, premiums and deductibles (Denavas-Walt, Proctor, and Smit, 2013).

Hadley (2003), Institute of Medicine (2009), and Freeman, et al. (2008) reported that, in the United States, adults with health insurance use more services provided by the physician and have better health outcomes than those adults who are uninsured or inconsistently insured.

In addition, there is an association between education and occupation, in which education increases access to employment that does compromise physical and mental health. Generally, people with better education have better chances of choosing non-manual labour jobs with lower occupational risks (Diaz, 2010). By contrast, people with lower education and training have higher probability of being employed in lower paying jobs with more occupational hazards that involve environmental and chemical exposures such as pesticides, asbestos and poor working conditions (i.e. shift with few breaks, potentially harmful tools) which opens them to injury and fatality (Cubbin, LeClere and Smith, 2000). As shown by the World Health Organization (2002) and Libner, et al. (2014), dangers faced in the work environment have severe implications for health. The variety of possible dangers is extensive, ranging from exposures to chemicals to adverse ergonomic conditions. These exposures increase the risk of some health outcomes, which include cancers, loss of hearing, injuries, respiratory, reproductive, cardiovascular, musculoskeletal and psychological disorders.

Another occupation danger is a work-related injury. All the members of workforces are open to injury at work, but the highest injury is found amongst the agricultural and industrial workers. Data have revealed that overall annually, 310 000 workers die due to occupational injury which is not intentional. Examples include injuries among health care workers resulting in the contraction of infection, poisonings and falls. Injuries at work are accountable for 0.9% or 13.1 million of global Disability-Adjusted Life Year (DALY) (World Health Organization, 2002).

Exposure to carcinogens in the workplace is accountable for nearly one and a half million (1.4) DALYs (World Health Organization, 2002). Work hazard that involves chemical exposures such as beryllium, diesel exhaust, cadmium, asbestos, chromium, arsenic, silica and nickel are responsible for 1.3% of cancer of the lung, bronchus and trachea and 2.4% of leukaemia diagnosed worldwide. The probability of developing a related illness depends on the amount received, power, interaction with other present carcinogens, and individual susceptibility. The exposure to carcinogens accounts for 146 000 or 0.3% of mortality (World Health Organization, 2002).

Stress is a major source of lost time at work (World Health Organization, 2002). Stress encountered in the work environment is associated with coronary heart disease. The major part that generates huge quantities of stress in the workplace is high psychological job demands combined with low decision making power and control, and effort-reward imbalance, that is, putting in high levels of effort at work and earning low rewards regarding income, being value and promotion (Head et al., 2002).

Another stressor at work includes lifting and carrying heavy loads, demanding physical activity, uncomfortable postures, twisting and regular bending which are associated with low back pain (World Health Organization, 2002). According to Grzywacz, et al. (2004), Almeida (2005) and Almeida, et al. (2005), psychological stress at work is more likely to be experienced by less educated employees, and psychological stress has both short term and long-term effects on health.

Education provides opportunities for staying in school which serves as confinement (Jesen and Lleras-Muney, 2010), and consequently reduces youth's occupational hazards. In the US in the 1910s, most children that were not in school were either spending time doing nothing or working. The main job at the time for children between the age of 10 -15 was agriculture (Lleras-Muney, 2001) and agricultural work is substantially more dangerous to health than school work (World Health Organization, 2002).

Environmental health risks put an additional burden on the morbidity and mortality of populations (Feinstein, et al., 2005 and Hanninen, et al., 2014). The association between education and health risks posed by the living area is to a large extent attributed to individuals' ability to make choices about their location of living and how to deal with their resulting environment. Hence, the impact of education is limited to effects on those risks that can be controlled individually (Feinstein, et al., 2005). Generally, more educated individuals have higher probability of earning higher income which predicts increased access to healthier choices, although this is always not so (Feinstein, et al., 2005).

This is supported by Diaz (2010) that argued that people with better education have higher chances of earning a higher income, which allow them and that of their family to opt for a better location to live. In developing countries, the most impoverished neighbourhoods have a severe problem of public health majorly because of dusted roads and non-treated sewage waters, which obviously are detriment to good health (Diaz, 2010).

People of colour and those with low levels of education and low income are more likely to dwell in an unhealthier environment such as near highways, bus station/garage, factories, power plants and other air and water pollution sources which open them to risk of toxin (Bullard, Johnson and Torres, 2011).

Housing condition is another key environmental circumstance at the community level (Macintyre et al., 2003, Howden-Chapman, 2004 and Bullard, Johnson and Torres, 2011). Housing circumstances have a direct impact on health through the physical and social issues of the home and environment and the health-damaging effects of social exclusion (Macintyre, et al., 2003 and Howden-Chapman, 2004). The differences in self-reported health can be described by the housing stressors faced and perceptions of the local area. Factors such as the satisfaction of area, the reputation of the area, overcrowding, neighbourliness, dampness, fear of crime are important predictors of self-reported health (Macintyre, et al., 2003). Again, access to housing and neighbourhood healthier choices depends mainly on income. Higher income predicts increased access to healthier choices, and generally, people with more education are more likely to earn a higher income. Therefore, there is less probability for those with higher levels of education to live in a house or environments with health-damaging physical and social characteristics (Feinstein, et al., 2005).

Road traffic injuries are one of the leading cause of global mortality and disability (Feinstein et al., 2005, Murray, 2006, and Naeem, 2010). This risk factor can be reduced or avoided through the income effect of education on better choice of a safer living environment (Feinstein et al., 2005). Most safe living areas tend to be more expensive such as areas with highly regulated traffic and lower traffic density and in most cases can be afforded by better-educated people. This is because they have a higher likelihood of earning a higher income (Feinstein et al., 2005).

Crime and Violence is another predictor of health status and mortality. In the neighbourhoods inhabited with low levels of education and low-income individuals, there are higher crime rates and this impact health through the direct effect of violent crimes on victims such as trauma and high mortality rates of youth. Crime can also affect health indirectly such as through the mounting stress of dwelling in an environment that is not safe (Stafford, Chandola and Marmot, 2007).

Moreover, at one level, the features of the neighbourhood in which individuals tend to live, study and work do matter. This is because access to resources that are important to health is dependent of community-level resources and institutions. Amongst these characteristics are explained below.

**Health care access:** Due to unfair distribution of providers of health care, for example in the United States (Edmunds, 1998), access to health care professionals and facilities is more likely to be in limited supply in the low income and rural areas inhabited with less or no education individuals. Hence, residents may encounter difficulty in finding primary care providers, specialists and hospital in their community, apart from whether they have health insurance coverage and enough resources to pay for health care (Edmunds, 1998).

**Spaces and facilities for physical activity:** Higher educated and income individuals have higher probability of living in the communities with green space provision (e.g. parks), sidewalks and other places that make it possible for the residents to exercise, play outside, walk and cycle to shopping and work (Powell, Slater, Chaloupka and Harper, 2006). Whereas, low-income communities and those with a higher proportion of non-white inhabitants have less probability of having commercial exercise facilities (Powell, Slater, Chaloupka and Harper, 2006). According to Alcock, et al. (2014), there is a positive mental health effect of moving to urban areas with more green space.

**Food Access:** access to healthy foods is more likely to be limited in the communities inhabited with low income and low levels of education, which opens them to unhealthy eating behaviours that are associated with numerous acute and chronic health issues such as obesity, diabetes, stroke, hypertension, and heart disease in addition to higher mortality rates (Grimm, Moore, and Scanlon, 2013).

It is worth noting that the labour market outcomes of education are obtained only after when individuals or consumers of education have completed school and enter the labour market, while health knowledge and health behaviour might be perceived even before completing the schooling period (Diaz, 2010).

**2.2.1.1.2.3 Importance of Parental Education in Child Health**

The argument on the importance of education in health draws attention to the importance of education for general children's health and nutrition. Parental education impacts child health through many important channels. Here, the main channels through which parental education influences child health will be explained in depth.

Education may have an impact on child health because parents with education are more efficient ‘producers' of child health (productive efficiency) through allocative efficiency. Better-educated parents are able to choose different combination of health inputs than parents with no education (and less education) to generate higher health output. Typically, allocative efficiency models incorporated the multivariate nature of health production function which includes different market inputs (i.e. alcohol use, cigarette smoking, diet), in addition to medical care (Grossman, 2005). Alternatively, education may impact child health because better-educated parents are able to adopt better child care practices or superior hygiene standards (Grossman, 2005). Following good practices of hygiene promotes good health and avoids morbidity and mortality through preventing bacteria, viruses, and illness such as diarrhoea (Mills and Cumming, 2016).

This association arises because education provides better knowledge about the true nature of health production or ability to respond to new knowledge more promptly (Grossman, 2005). For example, parents with better education have better understanding of the harmful effects of maternal smoking on infant health and therefore, they have the option to adopt good habits, particularly, mothers from higher educated household less often smoke during pregnancy which allows both the mother and child to benefit healthy lifestyle throughout the course of the pregnancy (Lindeboom, Llena-Nozal and Klaauw, 2009). Besides, they use prenatal care more and also breastfeed more often which helps keep the baby healthy through supplying all the necessary nutrients in the proper proportions to attain basic nutrition and even through protecting baby from illness like diarrhoea or stomach upset as well as constipation as breast milk is easily digested (Lindeboom, Llena-Nozal and Klaauw, 2009).

 Although, as shown above, that parental education improves child health, and the effect is attributed to better health behaviour because education gives better knowledge concerning the true nature of health production or ability to respond to new knowledge more promptly (Grossman, 2005), there is a gender aspect here. Since Seminal work of Caldwell (1979), it has generally been maintained that mother's education is the more critical determinant of child health. This is consistent with a division of labour in the household in which the care of a child is the mother's larger responsibility (Grossman, 2006).

Additionally, studies in various developing countries indeed revealed that, there is no threshold level of mother's education that requires to be attained before the benefits of mother's education on child health are realised, and even little educational levels improve survival of a child (Hobcraft, McDonald, and Rustein, 1984, and Mensch, Lentzner and Preston, 1985). While a major body of research evidently establishes the larger association of maternal education with child health than father's education, some recent analyses found otherwise. Breievrora and Duflo (2004) find that in Indonesia, mother's education and father's education is equally important in child mortality reduction. Semba, et al. (2008) find that in Bangladesh, education of a father is found to be a more consistent determinant of childhood stunting than mother's education. This finding supports the past evidence of Ricci and Becker (1996) of Philippines study and Rahman and Chowdbury (2007) of Bangladesh study.

A small number of studies have centre attention on the father's education role in determining child health. This is because the role of a father in child care in the house is less (Aslam and Kingdon, 2012).

However, according to Chen and Li (2009), it is noted that the education of a father may be important because in developing countries on numerous cases, fathers are more educated than mothers. For example, in the study of Aslam and Kingdon (2012) in Pakistan, the average father has three (3) more years of education than the average mother and if the educational highest level matters in a household. The education of the father may be an important determinant of child health. Another explanation for the role of father's education lies on low social status and empowerment of mothers that possibly restrict the influence they have in making a decision regarding child health (Semba, et al., 2008).

Alternatively, it may be that fathers engage in a more active role in some types of health decisions, for example, immunisation decisions or participation decisions especially if they need to travel to a health clinic (Semba, et al., 2008). On the other round, mothers may be engaged in the day-to-day decisions on overall child's hygiene and nutritional intake. Therefore, one will conclude that education of the father has a higher association with participation decisions/health seeking behaviour and education of the mother has more effect on longer-term measures of child health, for example, height and weight (Semba, et al., 2008).

It is widely recognised that having too few resources in developing countries is a key factor impeding access to health services and possibly translating into inferior child health and nutrition (Aslam and Kingdon, 2012). Indeed, education can influence this through increasing access to skilled employment. In most cases, higher educated parents have a higher probability of being employed in skilled job with higher income, and these resources could be used to invest in health and cushion the impact of adverse health shocks (Case, Lubotsky, and Paxson, 2002). In the presence of assortative mating, people with higher educational level marry partners with higher educational level, which obviously augment family income and thus lead parents to obtain external information on healthy practices that increase their likelihood of using preventive and curative medicines and treat childhood illnesses (Case, Lubotsky, and Paxson, 2002, and Aslam and Kingdon, 2012). Case, Lubotsky, and Paxson (2002) find that parents' long run income is important for child health.

**2.2.1.1.2.4 Importance of Education in Fertility**

Education is also linked to fertility in both the capability to attain the desired family size and change tastes for children (Haveman and Wolfe, 1984). There are many important ways in which education takes to influence fertility. Here, the key channels through which education impacts fertility will be established below.

Education can influence fertility through increasing fertility knowledge. Individuals with education have better knowledge about fertility control and thus increase their understanding and use of birth control, particularly women (Garcia, et al., 2014, and Garcia, et al., 2016). The use of reproductive system and contraception may help avoid the birth of unwanted children, thereby enabling them to achieve desired family size. To the extent that desired family size changes as a result of the educational impact on tastes for children (Micheal, 1973, Micheal and Willis, 1976, and Haveman and Wolfe, 1984).

This impact on tastes for children emerges because education widens people's horizon which allows them to overcome preference for children (Hashimoto, 1974).

The desired family size can be influenced for at least two reasons. Firstly, the higher opportunity cost of having children (forgone earnings for spending time at home taking care of children is higher for those with education) (Rondinelli, Aassve and Billari, 2010, Gustafsson, 2001, and Liefbroer and Corijn, 1999), and secondly, time to get married and start having children delays while acquiring education.

According to Nahar and Rahman (2006), it is confirmed that factors connected with increased women's age at first marriage and interval between marriage and birth during 1983-1985 and 1992-1994 in rural areas of Bangladesh is strongly associated with increased female education. Similarly, Appleton (1995) confirmed that educational attainment of female increases the time of her getting married and in turn reduces the number of children she will give birth. Nag and Singhal (2013) argue that education is beneficial to a large extent increasing the age at marriage and also Kuar (2000) concluded that increased age at marriage shortens reproductive span and in turn lessen fertility rate.

Education can also influence fertility rate through allowing decision and flexibility. Education is very helpful to a large extent in improving the status of women and thus enable them to have a strong say in determining the size of their family (Nag and Singhall, 2013). Besides, in marriage, male status and dominance play a significant role in every aspect of sexual and reproductive dynamics. Without doubts, an educated man will be more flexible to the current changes in the women's status and be more amenable to their views and wishes (Isiugo-Abanihe, 2003).

**2.2.1.1.2.5 Importance of Parent Education in Children Educational Attainment**

Education is associated with lower levels of poverty through its impact on children's educational attainment. Parents' education influences children's educational attainment. For example, higher educated parents get involved in the educational system on their children's behalf, such as reading to their children at home and participating in their children's homework (Davis-Kean, 2005). This, in turn, leads to better school performance and therefore, children are inspired to follow additional years of education (Wanka, 2014).

Parental education may impact on children's education through beliefs and behaviours because parents' education influences parents' beliefs and behaviours on when to make decisions about the course selection and supplemental education, for example tutoring for their school-aged children, which in turn may be beneficial for those children in their college attendance (Davis-Kean, 2005). Likewise, parents' education may influence children's education through higher expectation, predicting a higher level of education, and this association is influenced by family income. For example, parents of moderate-high income and educational background have beliefs and expectations that were closer to their children's educational achievements than parents of low income and educational background. Low-income parents instead have strong beliefs and expectations that did not match their children's educational attainment (Alexander, Entwisle and Bedinger, 1994).

Highly educated parents with high income are more likely to open their children to lots of educational opportunities in their school and summer sports/recreational activities and community-based clubs, such as boy's scout and girls’ clubs, music lesson, science and computer programs, educationally relevant summer camps etc. (Furstenberg et al., 1999, and Terzian, Anderson and Hamilton, 2009).

Arguably, these entire educational opportunities would help children in shaping their educational achievement and also increase motivation and interest in learning that could lead to an increase in children's school engagement and attendance. In addition, parents with higher education and higher income are more likely to enrol their kids to best private schools and to get a private tutor to help their children if they start having difficulties in school (Eccles and David-Kean, 2005, and Kolko, 2014). Arguably, private schools would help open children to lots of learning opportunity. This, in turn, results in well academic performance and thus inspires them to progress in education (Kolko, 2014).

According to Karagiannaki (2012), parents' education may impact children's early schooling attainment and later on schooling attainment. For example, higher educated parents have better chances of earning a higher income and thus allow them to reside in a good neighbourhood with high performing schools and better peer groups or to fund private education. Maybe in the form of private schooling or in the way of top-up tuition for children attending public schools, and other education-enhancing activities and material things like music lessons, sporting and cultural events, computer programs, books and trips. Beyond that, allow them to fund further or higher education (funding such as school fees, subsistence expenses, housing) or enable their children to devote their time to study rather than taking up part-time jobs that will not give them enough time to study (Blanden, Gregg and Machin, 2002). While lower-educated parents with low income can take a route through the reduction in investments in educational development outside school (high-quality child care, after schooling coaching, educational materials in the home, trips to zoos, days out, holidays etc.). Later on in educational progress, the direct effect of low income and educational background parents are more obvious as parents may lack resources to fund their children through further and higher education (Blanden, Gregg and Machin, 2002).

**2.2.1.1.2.6 Importance of Education in Housing Conditions**

The effect of education on housing conditions has received little attention in the literature. Only recent research that has shown there is an association between education and housing conditions is Diaz (2010). This study analyses the effect that education had on housing conditions in Colombia and explained that better-educated people have a higher probability to be employed in jobs with higher paying income, which allows them to choose suitable housing conditions. In addition, individuals with better education have more appropriate spending priorities than individuals with less education and thus better housing conditions (Diaz, 2010).

Education may also influence housing conditions through its increased access to the credit market. For example, better-educated individuals have a higher probability to more effectively communicate with credit agencies because they have the understanding of financial transactions and records keeping that increase the possibility of attaining credit, which creates the likelihood of having adequate housing conditions (Diaz, 2010).

Based on the assessment shown above, there is arguably a positive effect of education on non-economic outcomes. This effect emerges through certain factors such as income, knowledge and behaviour and consequently, allows individuals to avoid or get out of poverty. Figure 2.9 below summarises the non-monetary effect of education on poverty.

**Figure 2.9: Non-economic Effect of Education on Poverty**

Increased earnings

Increased fertility knowledge

Increased health knowledge and literacy

Education

Confinement

Increased labor force and lower occupational hazard

Participation in the labor force

Better individual health

Better children’s health

Children’s higher educational attainment

Lower fertility

Better housing conditions

Lower non-economic poverty

Source: author’s diagram based on the assessment shown above.

**2.2.1.2 Household Size**

There is notably extensive evidence in the literature that often concluded that large households are associated with income poverty. In other words, individuals living in larger households are in most cases poorer (Lanjouw and Ravallion, 1994, Anyanwu, 2005, Anyanwu, 2010, Anyanwu, 2012 and Gang, Sen, and Yun, 2002, and Awopeju, 2012).

In developing countries, particularly Africa, there are lack of well-developed social security and low savings which are more likely to increase fertility rates, especially among the poor. Parents increase the number of children they give birth to in order to have a higher probability of getting economic support from the children at their old age (Anyanwu, 2014). Besides, according to Schultz (1981), the rate of infant mortality among the poor is high which likely to give rise to excess births replacement to insure against high infant and child mortality and thus increase the size of the household.

Following the micro-economic arguments in developing countries, especially Nigeria, children are regarded as an essential aspect of the workforce in the family in generating the family income as well as insurance for old age (Anyanwu, 2014). However, a high number of children and their participation in household production tend to hinder investment in their human capital (i.e. education and health), and the household maintains low-income status. Hence, bringing into existence or extending a poverty-fertility trap. Indeed, acquiring children reduces each member available share of household resources (Anyanwu, 2014). Besides, newly born children may reduce the productivity of the mother by either obtaining more resources (e.g. food) from her or hindering her work prospects (Anyanwu, 2014).

The conclusion of large households associated with poverty is cautioned against by the existence of size economies in household consumption. Certain goods (tap water, cooking tools, housing, and clothing) give chances for jointly use in a way that the cost of a given standard of living per person reduces when people live together compared to living apart (Lanjouw and Ravallion, 1994).

However, while size economies may be common in rich countries, it is in many times asserted that size economies are understated in developing countries. This is because a large budget share is allocated to rival goods such as food. Against this, it can be argued that, even though a small percentage of the budget is allocated to jointly consumed products, the large family sizes found in developing nations allow non-negligible benefits from sharing the cost of such goods (Lanjouw and Ravallion, 1994).

**2.2.1.3 Gender**

There is considerable evidence established in the literature that generally, women are more likely to be poor compared to their male counterparts (Casper, McLanahan, and Garfinkel, 1994, Wright, 1993, Pressman, 1998, and Pressman, 2002, Bastos, et al., 2009, Botha 2010, Njong, 2010, Anyanwu, 2010, and Wanka, 2014). This claim has been associated with the feminisation of poverty focusing on poverty as insufficient economic resources (Gornick and Boeri, 2017 and Chant, 2011). There are accumulative and complex causes of feminised poverty, that is, women's higher probability of being poor. The most strong reason advanced for this existence is gender differences in earnings in the labour market (Chant, 2011 and Anyanwu, 2014). On average, women command lower market income, including salaries and employment pensions compared to men counterparts and therefore they receive lower occupational related social transfers (Chant, 2011). This is because women are prone to engage in caring for family members particularly, young children and thus they are less likely to be in paid employment compared to their male counterparts. Besides, if they are in paid employment, they tend on average work few hours weekly, including those in full-time jobs and which impact heavily on their scope to exit poverty (Chant, 2011).

In addition, women tend to have less education compared to their male counterparts. People with lower education have a higher probability of being employed in lower paying jobs, and thus earn lower salaries that open women to the higher risk of economic insecurity (Anyanwu, 2010 and Anyanwu, 2012).

Poverty is multidimensional in nature, and it is very crucial to take into account poverty as an occurrence that is multidimensional with many contributing factors. The contributing factors to women's poverty are not only associated to gender differences in earnings but also associated to other factors such as gender inequality in owning assets, e.g. land and property, gender disparities in power and making decisions, and gender vulnerability to gender-based violence (Chant, 2011).

**2.2.1.4 Location**

The area in which an individual or household has their home also matters (Anyanwu, 2014 and Loxha, 2016). To be precise, residing in a local area influences the outcome of the production process, and thus household welfare as a result of the differences in the infrastructure, structure of the industry, access to public services, conditions to agriculture so also trade and economic integration (Loxha, 2016). Consequently, differences could arise across regions and between rural and urban locations with certain locations being more opened to poverty experiences (Loxha, 2016).

According to Anyanwu (2014), urban neighbourhoods are less likely to be poor compared to rural locations. This is because there are more employment opportunities in urban locations. Several studies have revealed that poverty in developing countries is prevalent in rural locations compared to urban areas (World Bank, 2001, African Development Bank, 2002, Jamal, 2005, Bruck, et al., 2007, Nestic and Vecchi, 2007, Anyanwu, 2010, Botha, 2010 , Anyanwu, 2014, Wanka, 2014, and Garza-Rodriguez, 2016).

**2.2.1.5 Age**

Age is another factor that influences household income. It is generally observed that the relationship between age and participation in a paid job is of hill-shaped (Njong, 2010 and Datt and Jolliffe, 1999). This is because, in the beginning, the probability of an individual engaging in paid job increases with age, when age gets to its peak level, the probability starts to decline as age continues to increase (Njong, 2010). Hence, we would expect that the probability of being poor is relatively high at a young age, reduces during middle age and then increases again at old age (Datt and Jollife, 1999, Garza-Rodriguez, 2016, Gang, Sen and Yun, 2002).

**2.2.1.6 Marital Status**

In this respect, a person's situation is regarded whether he or she is single, married, separated, divorced or widowed. Some studies have established in the literature that married families are less likely to live in poverty compared to the unmarried individuals and single-parent families (U.S Bureau of the Census, 1997, White and Rogers, 2000, Seccombe, 2000, U.S. Bureau of Census, 2012 and Dunga, 2017). This claim indicates the economic value of marriage, Waite and Gallagher (2000) asserts that marriage generally adds potential earner to the household, which apparently appears to enhance the economic well-being of the household members. Leman (2002) suggests that a long-term marriage relationship may also mean higher permanent income and a larger build up consumer durables, factors that could restrict the extent of economic hardship forced to contend with in the economic downturns.

Apart from the economic benefits, it also has social benefits which include social support during the stressful times which encourages engagement in healthy behaviours, such as venting feeling that can reduce the physical and psychological consequences of a stressor (Thoits, 2011). Stimpson, et al. (2007) assert that marriage confers many health benefits over being single, divorced or widowed, such as lower depressive symptoms, higher life satisfaction and better physical health.

Stimpson, Wilson and Peek (2012) show that poor and unmarried people reported most days of inactivity due to poor health, and this is because marriage may grant protective health benefits in part through shared economic resources than other types of marital status.

**2.3 Empirical Review**

**2.3.1 Education and Poverty**

Based on the review of literature in this study, it is fairly settled that there is an association between education and poverty regarding education as an important instrument to poverty reduction. Education creates skills and productive knowledge which enhances the productive capacity and thus higher earnings of those who possess them (Schultz, 1961). In addition, education increases the productivity of non-economic or household sector (Haveman and Wolfe, 1984). Therefore, an increase or decrease in education will increase or decrease economic and non-economic returns and increase or decrease poverty. In the literature, individual/household head educational attainment is a critical determinant of poverty.

A study by Weber et al. (2007) in the United States carried out the impact of education on household poverty, including the impact of education on poverty through migration. The study used macro data derived from the 1993 and 1999 Panel Study of Income Dynamics (PSID). For the data analysis, the two-stage probit model was used. They found that the likelihood of being poor reduces for each additional year of household head education by 39%. That is, as education increases, the likelihood of being in income poverty reduces. Their results indicated further that while education appears to have a negative effect on poverty, it does not have effect through encouraging migration. Although, the likelihood of being in poverty reduces and the likelihood of migrating to metro area increases with more education, it is additional education and not migrating as such that decreases the risk of poverty. Education reduces the probability of being income poor for both people who migrated and people who remain in their place of origin. Those with more education are at the less risk of poverty, whether they migrate or not. However, while this analysis might provide insight into the educational effect on poverty, it has a major flaw. The effect of education was undertaken indiscriminately, and as resources are limited, it is essential to know which level of education produces the highest returns and therefore is most pro-poor. This defect has been rectified by most of the studies reviewed in this study (section 2.3.1.1). This study will follow the rectification and examined the effect of different levels of education on poverty in Oyo State, Nigeria.

Faux and Ntembe (2013) examined the association between education and poverty in Cameroon using macro data of consumption and expenditures. This study employed logistic regression to estimate data and found both positive and negative effect of education on poverty. Primary education has a positive association with poverty, whereas, all other levels of education (secondary, high school and university) has a negative association with poverty. The major problem with their methodology is the omission of information on the size of data used which may have important implications for their findings. Wanka (2014) investigated the association between education and poverty in South Africa using macro data of consumption and expenditures. Probit regression model was employed to estimate data collected. Contrary to Faux and Ntembe (2013), the study found that all levels of education (primary, secondary, matric and post-matric) has a negative association with poverty.

Awan et al. (2011) carried out a study on the effect of different levels of education and other explanatory variables on poverty in Pakistan using macro data of income. The study used a logistic regression model to estimate data. The study found a negative association between education and poverty, and the remarkable finding in the study is the consistent increase in the probability of escaping the poverty of individuals as their level of education increases, which means the higher the level of educational attainment, the lower the likelihood of being poor. The main problem with their methodology is the information on the total numbers of data used not included, and this may have important implications for their results.

One of the existing studies on the effect of education on poverty in Nigeria is that of Olubanjo, Akinleye and Somerekun (2007) which deals with determinants of poverty among farmers in Ogun state, Nigeria, using year 2000 self-constructed data of income with total sample of 150 respondents and descriptive statistics used to estimate variables. Their results indicate that education reduces poverty. The author's choice of descriptive statistics compared to an inferential statistics, although descriptive statistics method of data analysis is simple and easy to follow, it is not the best to determine the effect of education on poverty. Because, unlike the inferential statistics such as probit/logit model that assists in drawing an inference regarding the hypothesis about a population parameter or yields the probabilistic statement about poverty, descriptive statistics only describe, show or summarise data, for example, poverty level measured by headcount ratio. This study, therefore, will employ a probability model as the objective of this study is to determine the probability of being poor.

Another existing study on the effect of education on poverty in Nigeria is Okojie (2002) which estimated the impact of education and other explanatory variables including age, sex, sector of occupation of the head of household, household size, location of the household residence such as rural or urban area and zone of household residence on household poverty and household welfare. The study used1980, 1985, 1992 and 1996 macro data of consumption and expenditures. The study employed logistic regression for data estimation. The study results indicate that education is negatively associated with poverty. Of course, education has a negative relationship with poverty as shown in this study. However, the data sets in which the conclusion was based are no longer current as they only dated back to 1996. This study, therefore, will use more current data of 2016 to estimate the effect of education on poverty in Oyo state, Nigeria. In addition, there was a problem with his methodology which is the omission of information on the size of the data sample used.

Ijaiya and Nuhu (2011) investigated the effect of low education attainment on poverty incidence in Ilorin metropolis, Nigeria using self-constructed consumption and expenditures data and a linear regression model to estimate the data. The study reported that the more the number of people with low educational attainment, the incidence of poverty is 7.7% more likely to occur in Ilorin metropolis. However, while this study might provide a good insight on the effect of low educational attainment on poverty incidence and also one of the few primary types of research that has been conducted to help support policy recommendations in this subject area in Nigeria, it has a flaw which is stated as follows. First, the study lacks depth in its explanation of the data collection process and sample selection criteria, and in the absence of adequate detail, it is difficult to assess the validity and reliability of the findings. Second, Ijaiya and Nuhu although justified their choice of linear probability model as to reflect the explanatory nature of the variables used, it has specific inherent weaknesses. One obvious weakness is that, when compared to the logit/probit model, the level of regression does not directly yield probabilistic statement about poverty. An important aspect of Ijaiya and Nuhu's study is that it analyses at the city level, which makes the level of analysis an innovative component of the subject area in Nigeria.

Adetola and Olufemi (2012) carried out a study on the determinants of children poverty of children less than five years in rural Nigeria using 2008 macro data of multidimensional (non-monetary) poverty estimates based on five dimensions which are safe drinking water, sanitation, housing, health and nutrition. The study employed logistic regression to estimate data. The study found that father and mother's education have a negative association with child multidimensional poverty and also statistically significant. This shows that as the educational level of the parents' increases, the probability of a child being multidimensional poor reduces. However, while this study has revealed the effect of parents' education on child multidimensional (non-economic) poverty, the study lacks theoretical background and information on the sample size used in the study.

Adetola (2014) estimated the determinants of household poverty in rural Nigeria using macro data of multidimensional (non-economic) poverty estimates based on five dimensions which are housing, sanitation, education, health and assets. The study employed logistic regression to estimate data. The study results indicate that education had a negative association with poverty and statistically significant. However, while this study might provide a good insight on the association between education and non-monetary poverty, the research lacks the theoretical background, and there was an omission of information on the sample size used in the study.

Ataguba, Fonta and Ichoku (2011) examined the determinants of poverty in Nsukka Local Government Area (LGA) in Enugu state, Nigeria using both self constructed data and macro data derived from the Core Welfare Indicator Questionnaire (CWIQ), General Household Survey (GHS), and Nigeria Living Standards Survey (NLSS) and total sample of 410 households. For poverty indicator, the study used both per capita household consumption expenditures and multidimensional (non-monetary) estimates based on eight dimensions which are housing characteristics, health, education, employment, employment quality, physical safety, empowerment, and shame/humiliation. The study employed ordinary least squares and probit model. The study uses ordinary least squares to estimate consumption and expenditure data and probit model to evaluate multidimensional (non-monetary) data. The study found a negative association between education and poverty. However, while this study has been one of all in Nigeria that has approached this issue in terms of monetary and non-monetary, it lacks a theoretical background and also omitted information on the date of macro data set used.

Tharpa (2013) estimated the association between education and poverty in Nepal using macro data from 199/96, 2003/2014 and 2010/2011 of the Nepal Living Standards Survey conducted by the Central Bureau of Statistics. In this study, there were different dimensions in which education was measured such as, literacy rate, mean years of schooling, gross enrollment rate, type of schools attended by individuals currently in school. The poverty status was indicated by consumption (five) quintiles, and the study concluded that education is inversely associated with poverty. However, while this analysis might provide evidence on the association between education and income poverty using different measures of education and poverty approached with five consumption quintile, it has a defect in its methodology. The study omitted the information on the total sample size used for the analysis.

**2.3.1.1 Summary of Previous Studies on the Effect of Education on Poverty**

 Table 2.1 presents a summary of the previously carried out empirical studies on the effect of education on poverty in Nigeria and other countries.

**Table 2.1: Summary of previous studies on the effect of education on poverty in Nigeria and other countries**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Author/Date**  | **Topic/Focus**  | **Data Source/Sample Size/Poverty approach**  | **Method of Data Analysis** | **Findings**  |
| Botha (2010) | The impact of educational attainment on household poverty in South Africa. “To examine the association between the educational attainment of the household head and household income poverty in South Africa”“To further examine the literacy of the household head on household income poverty in South Africa” | Data derived from the Income and Expenditure Survey from 2005 through 2006.24,000 households. Consumption-expenditure data. | Probit regression model.  | - The study found a negative association between education and household poverty.- At 40th percentile poverty line, the probability of being income poor reduces by 6.78%, 20.8% and 37.2% for households whose heads have a primary, secondary and post-secondary education respectively. - At 20th percentile poverty line, household income poverty decreases by 3.5%, 10.7% and 15.9% for household headed by primary, secondary and post-secondary education respectively. - Evidently, this result is an indication that as education increases, the probability of being poor decreases. - The study further reported household head’s literacy is inversely associated with household income poverty.  |
| Njong (2010) | The effect of educational attainment on poverty reduction in Cameroon.“To investigate the effect of education on income poverty in Cameroon”  | Cross-sectional data of 2001 derived from Cameroon Household Survey conducted by the National Institute of Statistics.19324 employed individuals.   | Logistic regression model  | -The study found that all levels of education (primary, secondary, higher and university) has a negative association with poverty for both male and female. Besides, the study recorded that, the higher the level of education, the probability of being income poor is slim.  |
| Faux and Ntembe (2013) | Does education reduce poverty? Response from Cameroon.“To determine the association between education and income poverty in Cameroon” | Cross-sectional data of 2007 derived from the third Cameroon Household Survey (ECAM III)Omission of sample size.Income data.  | Logistic regression model  | -The study found both positive and negative effect of education on poverty.-A positive association between primary education and income poverty, with odds showing 2.21, which indicates that employed individuals with primary education are two times more likely to be income poor.-However, for other levels of education (secondary, high school and university), the study found a negative association with poverty, with the odds ratio showing 0.96, 0.44 and 0.10 respectively.  |
| Wanka (2014)  | The impact of educational attainment on household poverty in South Africa. “To examine the association between education and income poverty” | Data derived from Income and Expenditure Survey (IES) for 1995, 2000, 2005 and 2010 and sample size of 2668, 3104, 1951 and 3306 respectively. Consumption-expenditure data. | Probit regression model  | -The study results indicate that education has a negative association with poverty.-For 1995, at primary, secondary, matric and post-matric, the probability of being income poor reduces by 9.1%, 16.4%, 32.8% and 45.9% respectively. - For 2000, at primary, secondary, matric and post-matric, the probability of being income poor reduces by 0.7%, 4.6%, 21.7% and 52,9% respectively.- For 2005, at primary, secondary, matric and post-matric, the probability of being income poor reduces by 7.1%, 9.7%, 9.9% and 40.2% respectively.-For 2010, at primary, secondary, matric and post-matric, the probability of being income poor reduces by 1.8%, 6.5%, 9.2% and 30.9% respectively.-Evidently, the results shown indicate that, as individual level of education increases, the likelihood of he or she being income poor reduces.  |
| Geda, et al. (2005) | Determinants of poverty in Kenya. A household level analysis.“To analyse the determinants of household income poverty in Kenya” | Data collected from Kenya Welfare Monitoring Survey of 1994.10000 households. Consumption-expenditure data. | Logit model  | -The study found that the probability of being income poor reduces by 32%, 62% and 97% for the household headed by primary, secondary and university education respectively. |
| Okojie (2002) | Gender and education as determinants of household poverty in Nigeria.“To analyse the determinants of household income poverty in Nigeria” | Data derived from the Nigeria Consumer Expenditure Surveys of 1980, 1985, 1995 and 1996 conducted by the Federal Office of Statistics (now called National Bureau of Statistics.Omission of sample size. Consumption-expenditure data. | Logistic regression model  | -Results indicate that education has a negative association with income poverty.- At primary, secondary and tertiary, the probability of falling into income poverty decreases by 21.4%, 23.9% and 25.2% respectively in 1980. - For 1985, the likelihood of being in income poverty decreases by 0.2%, 37% and 97.4% -In 1992, the probability of being in income poverty falls by 10.3%, 40% and 85%.-For 1996, the likelihood of being in poverty reduces by 44.3%, 62.4% and 99.3%.  |
| Olubanjo, Akinleye and Somerekun (2007) | Poverty determinants among farmers in Ogun state, Nigeria.“To investigate the determinants of income poverty among farmers in Ogun state” | Self-constructed data of 2000.150 households.Income data. | Descriptive statistics.  | -The study concluded that, education reduces household poverty incidence and that poverty incidence is huge at household with no education.-In details, household poverty incidence is 53.7%, 31.7%, 4.88% and 9.76% with household heads with no education, primary, secondary and tertiary education respectively.  |
| Babatunde, Olorunsanya and Adejola (2008) | Assessment of rural household poverty: Evidence from South-western Nigeria.“To estimate the determinants of farm household poverty in South-western Nigeria, using Ondo state as a case study” | -2005 Self-constructed data.-100 farm households.-Consumption-expenditure data. | Ordinary Least Square.  | -The study found that, the probability of farm household living below the poverty line reduces by 20% with each additional year of education of household head.  |
| Anyanwu (2010) | Poverty in Nigeria: A gendered analysis. “To analyse the effect of education (male headed and female headed) on household income poverty in Nigeria” | Data collected from 1980, 1985, 1992 and 1996 Nigeria Consumer Expenditure Surveys.14,395 households (1996 dataset). Consumption-expenditure data.  | Descriptive statistics for 1980, 1985 and 1992. Logistic regression model for 1996. | -For the 1996 dataset, the study found both negative and positive association between education and income poverty.-For male headed, a negative association between primary education and income poverty, with odds ratio showing 0.81. However, a positive association between education (secondary and post-secondary) and income poverty, with odds showing 1.49 and 2.31 respectively. -For female headed, a negative association between education (primary, secondary and tertiary) and income poverty, with odds ratio showing 0.67, 0.43 and 0.25 respectively. |
| Apata et al. (2010) | Determinants of rural poverty in Nigeria: Evidence from small holder farmers in South-western, Nigeria.“To examine the determinants of rural poverty in South-western, Nigeria, choosing smallholder farmers of Ondo and Ekiti state” | Data derived from the Central Bank of Nigeria (CBN), various annual agricultural surveys from 1994 – 2005, National Bureau of Statistics (NBS).500 households.Consumption-expenditures data. |  |  |
| Ijaiya and Nuhu (2011) | Low education attainment and the incidence of poverty in Ilorin Metropolis.“To investigate the effect of low education attainment on poverty incidence in Ilorin, metropolis”  | 2010 self-constructed consumption and expenditure based on the National Integrated Survey of Households (NISH), World Bank Living Standards Measurement Study (WBLSMS) and Federal Office of Statistics Method (now referred to as national Bureau of Statistics).440 households. | Linear probability model.  | The study reports that, the more the number of people with low educational attainment, the incidence of poverty is 7.7% more likely to occur.  |
| Ataguba, Fonta and Ichoku (2011) | The determinants of multidimensional poverty in Nsukka, Nigeria.“To investigate the determinants of poverty in Nsukka Local Government Area (LGA) in Enugu state | -Self-constructed data of 2009 and secondary data derived from the Nigeria living Standards Survey (NLSS), the Core Welfare indicator Questionnaire (CWIQ) and the General Household Survey (GHS).-Omission of date of the secondary data. -410 households.- Per capita household consumption-expenditures. -Multidimensional (non-economic) of eight dimensions which are housing characteristics, health, education, employment, employment quality, physical safety, empowerment and shame/humiliation | Ordinary least square (OLS) for consumption-expenditure data. Probit regression model for the multidimensional (non-economic) data.  |  |
| Anyanwu (2012) | Accounting for poverty in Africa: Illustration with survey data from Nigeria.“To estimate the effect of education on poverty for Nigeria as a whole, male headed households and female headed households and rural/urban households” | -Data derived 2004 Nigeria Consumer Survey.-19,158 households. -Consumption-expenditures data. | Logistic regression model. | -The study found both negative and positive association between education and income poverty for Nigeria as a whole, male headed, female headed and rural/urban households. -For Nigeria as a whole, the results indicate that, the probability of being income poor increases by 13%, 4% and reduces by 54% with secondary, secondary and post-secondary education respectively.-For the male-headed households, the probability of being income poor increases by 11%, 5% and reduces by 51%.-For female-headed households, the likelihood of being income poor increases by 28%, 1.1% and decreases by 65%.-For rural-located families, the likelihood of being income poor increases by 20%, 14% and reduces by 40%.  |
| Adetola and Olufemi (2012) | Determinants of child poverty in rural Nigeria: A multidimensional approach.“To estimate the determinants of children poverty less than five years in rural Nigeria ” | -Data derived from demographics and Health Survey of 2008.- Omission of sample size.-Multidimensional (non-monetary) data of five dimensions, which are safe drinking water, sanitation, housing, health and nutrition. | Logistic regression model.  | -The study reports that parents’ education is negatively associated with child multidimensional poverty and also statistically significant. -The probability of a child being multidimensional poor reduces by 9.2% and 53% with fathers who have secondary and higher education respectively and decreases by 10%, 12% and 23% with mothers who have a primary, secondary and higher education respectively.  |
| Anyanwu (2014) | Marital status, household size and poverty in Nigeria: Evidence from the 2009/2010. “To examine the determinants of poverty in Nigeria” | -Data derived 2009/2010 of Harmonized Nigeria Living Standard Survey (HNLSS).-34,619 households.-Consumption-expenditures data | Logistic regression model. | -The study found that, the probability of being income poor increases by 22% with no formal education and reduces by 29% with post-secondary education.  |
| Adetola (2014) | Trend and determinants of multidimensional poverty in Nigeria.“To estimate the determinants of household poverty in rural Nigeria” | -Data collected from 2010 National Living Standard Survey. -Omission of sample size.-Multidimensional (non-monetary) data of five dimensions, which are housing, sanitation, education, health and assets.  | Logit model  | The results show that education has a negative association with poverty. -The likelihood of being multidimensional poor decreases by 2.6%, 3.5% and 5.6% with primary, secondary and tertiary education respectively.  |
| Awan et al. (2011) | Impact of education on poverty reduction.“to determine the effect of different levels of education on poverty in Pakistan” | -Data derived from Pakistan Household Income and Expenditure (HIES) of 1998/1999 and 2001/2002.-Omission of sample size.-Income data | Logistic regression model. | -The study found a negative association between education and poverty.-For 1998/1999, the likelihood of being income poor reduces by 57.5%, 79.7%, 89.2%, 96.6% and 99.9% with middle, matriculation, intermediate, bachelors and professional respectively in comparison to the reference category of “primary education”.-For 2001/2002, in the same sequence of the educational levels, the likelihood of being income poor reduces by 54.8%, 78.5%, 88.9%, 97% and 99.1% as compared to the reference category of “primary education”.-In the yearly comparison of all these levels of education, it shows that, the lower level of education (primary education) still has a negative association with poverty, but its intensity decreases. -Evidently, the results show that, the higher the level of education, the lower the probability of being income poor.  |
| Tharpa (2013) | Relationship between education and poverty in Nepal.“To determine the association between education and poverty in Nepal” | -Data obtained from the 1995/96, 2003/04 and 2010/11 of the Nepal Living Standards Survey conducted by the Central Bureau of Statistics.-Omission of sample size.-Consumption-expenditure data.- Poverty was approached by consumption quintile (five quintiles, which are poorest(first), second, third, fourth and fifth) | Descriptive statistics.  | The study shows that the literacy rate of the poorer than, the richer. For example, the literacy rate of the poorest (first) quintile is 19.04, 23.1 and 36.8 for 1995/96, 2003/04 and 2010/11 respectively and the fifth quintile is 55.47, 72.3 and 77.4. -As shown in this study, income poverty reduces as the literacy rate increases. Consequently, the study concludes that there is a negative association between education (literacy rate) and income poverty.  |
| Siddique, Saleem and Abbasi (2016) | Feminization of poverty: A case study of Hazara Division of Pakistan.“To investigate the association between education and poverty in Hazara Division of Khyber Pakhtunkhwa province of Pakistan” | -Self-constructed data from both rural and urban areas of the province-200 households.-Consumption-expenditures data.  | Logistic regression model. | -The study reports a positive association between primary education and income poor, with the odds ratio of 2.24.-However, reports a negative association between education (secondary and post-secondary and income poverty, with the odds ratio of 0.378 and 0.414, respectively.  |
| Jamal (2005) | In search of poverty predicators: The case of urban and rural Pakistan. “To examine the association between education and household poverty in urban and rural Pakistan”  | -Data derived from the 2001/2002 Pakistan Integrated Household Survey.-77,000 households.-Consumption-expenditures data. | Logistic regression model.  | -For the urban area, the results show that the probability of being income poor increases by 0.30% with primary education and decreases by 0.34% and 0.46% with higher secondary and tertiary education respectively. -For the rural area. The results show that, the likelihood of being income poor reduces by 0.5% with tertiary educational level.  |
| Weber et al. (2007) | Education’s effect on poverty: the role of migration.“To estimate the effect of education on household poverty with the inclusion of the effect of education through migration on poverty” | Data collected  | Two-stage probit model  | -The results show that, the probability of being income reduces by 39% for each additional year of household head education. That is, as education increases, the likelihood of being poor reduces. -The results indicate further that while education appears to have a negative effect on poverty, it does not have effect through encouraging migration.  |
| Loxha (2016) | The effect of education on poverty in Kosovo and Albania.“To determine the association between education and poverty in Kosovo and Albania” | -Data obtained from the 2011 Kosovar Household Budget Survey (HBS) and 2012 Albanian Living Standard Measurement Survey (LSMS).-2,274 Kosovo households.-6,671 Albanian households. -Consumption-expenditures data.  | Probit regression model  | -The study found a significant negative association between education and income poverty.-Precisely, the probability of being income poor reduces by 8.9% and 2.9% with secondary education in Kosovo and Albania respectively, and decreases by 19.9% and 6.6% with tertiary education for Kosovo and Albania respectively.  |

Source: author’s compilation of the previous studies on the effect of education on poverty.

**2.3.1.2 Research Gap and Hypotheses**

Upon the several empirical studies on the determinants of poverty in Nigeria, only a few studies, which are Adetola and Olufemi (2012), Adetola (2014) and Ataguba, Fonta and Ichoku (2011) have estimated the effect of education on poverty regarding non-monetary dimension. Only Ataguba, Fonta and Ichoku (2011), to the best of my knowledge have evaluated the impact of education on poverty concerning both monetary and non-monetary dimension in the same study. None of these studies has assessed the effect of education on multiple non-monetary measures of poverty separately. They all have identified poverty based on aggregate multidimensional (non-monetary) poverty index. Using this method of poverty indicator possibly won't allow the estimation of the effect of education on each dimension of poverty. Therefore, this study will take the approach of indicating poverty uni-dimensionally. A potential reason for this method is that it will allow the study to support the results with theory as education takes different channels to influence each indicator of poverty.

Another reason for this method is that it will give a better understanding to policy-makers, the people of Oyo state and Nigeria as a whole to why education should be considered an effective instrument for targeting poverty. Finally, it will enable the study to offer statistics to a given poverty dimension, and therefore, policy-makers will be aware of the percentage of the population that needs special attention for educational policies.

Additionally, none of these previous studies in Nigeria has examined the effect of education on household poverty in Oyo state, Nigeria, and also used the macro dataset of 2015/2016 Nigeria General Household Survey (GHS). Therefore, this study aims to contribute to the existing literature by examining the effect of education on household poverty in Oyo state, Nigeria using this macro dataset of 2015/2016 Nigeria General Household Survey (GHS) through the following research hypotheses:

The human capital theory posits that education imparts productive knowledge and skills, and transforms people into more valuable human capital. The skills and productive knowledge imparted through education enhances the productive capacity of those who possess them and thus increase their earnings in their workplace (Schultz, 1961). Additionally, Becker (1992), argues that the productivity of people in the market and the non-market sector is changed by investments in education, skills and knowledge (Becker, 1992). Education provides economic returns in the form of higher earnings and employment opportunities (Schultz, 1961, Becker, 1992, and Teal, 2001), and this is supported with the work of Van der Berg (2002 p.1), which states that "education enhances the earnings potential of the poor both in competing for jobs and earnings and as a source of growth and employment in itself".

In the presumed competitive labour and good markets, better-educated people seem to have, on average higher levels of productivity. Employers generally use the features of education to decide the suitability and formal requirement for a job and potential productivity of their employees (Ezebuilo and Emmanuel, 2014). The degree of higher education represents a sign of diligence to employers and rising opportunity to a more considerable amount of available jobs. Contrarily, people with no education or less education are less likely to get a job, and if they do, in the economic recession, they are commonly the first to be laid off (Schiller, 2004). It is also claimed by many studies, such as Kothari (1993), Nafziger (1997), and Grant (2012) that the acquisition of education to a considerable degree enhances individual's skills and capacity to enter into the labour market.

Moreover, in the labour market, higher earnings for higher educated individuals may result from higher productivity, or from the fact that degree of higher educated people acts as a sign of ability to employers which enable them to get more lucrative employment (Berg, 2002, and Schiller, 2004). The earnings of the higher educated people do not only start at a greater level but also increase rapidly to a greatest possible level, which occurs later in life than the earnings profiles of those with a low level of education. Indeed, the earnings profiles of people with no education often remain pretty flat all through their life (Ezebuilo and Emmanuel, 2014). This pattern points out that education not just only make people more productive but also increase the ability to learn-by-doing that causes productivity and thus increase earnings very quickly than for those with no education (Ezebuilo and Emmanuel, 2014), and this indicate that as the educational level of an individual increases/decreases, the likelihood of gaining a lucrative employment increases/decreases.

There is a strong and empirically verifiable positive association across most societies the wages and salaries people earn at work and the educational level attained by them, exemplified by the study of Schultz (1961), Mincer (1974), Psacharopoulos (1995), Day and Newburger (2002), Matita and Chirwa (2009), Wang, Lv and Qu (2010), Tansel and Bircan (2010), Diaz (2010), Ewert (2012), and Graham and Paul (2014), and their empirical evidence suggests that earnings increase with an increase in educational level and thus income poverty reduces with an increase in educational level.

In consistent with the prior theoretical consideration, my first hypothesis is

**H1:** Education is negatively associated with income poverty. That is, the higher the level of education of household head, the lower the probability of the household being income poor.

Education enhances people's ability to be better informed of the true nature of health production, allowing them to take better decisions on health-related information. Better-educated people are more likely to choose an appropriate diet needed to attain a proper level of nutrition because they have better information about what combinations of the inputs required to produce better health. Moreover, people with better education are better informed of the risks associated with smoking, drinking alcohol, using illegal drugs and the advantages of preventive medical care. Therefore, they have the option to adopt good habits which allow them to live a healthier lifestyle (Grossman, 2005, and Cutler and Lleras-Muney, 2006). Therefore, better-educated people are more likely to be healthier than non-educated ones.

Education not only influences health because it provides the ability to be better informed on how to improve health but also affects health through labour market, although, labour market outcomes are obtained only after when individuals or consumers of education have completed education and started working (Diaz, 2010). Better-educated people have a higher probability of getting non-manual jobs with lower occupational risks (Diaz, 2010). By contrast, people with lower education and training have higher likelihood of being employed in lower paying jobs with more occupational hazards that involve environmental and chemical exposures such as pesticides, asbestos and poor working conditions (i.e. shift with few breaks, potentially harmful tools) which opens them to injury and casualty (Cubbin, LcClere and Smith, 2000).

Stress is another occupational hazard which is associated with coronary heart disease and low back pain (Head et al., 2002, and World Health Organization, 2002). The stressor at work includes high psychological job demands combined with low decision making and control, effort-reward imbalance, that is, putting in high levels of effort at work and receiving low rewards in terms of income, being value and promotion (Head et al., 2002), lifting and carrying heavy loads, demanding physical activity, uncomfortable postures, twisting and regular bending (World Health Organization, 2002).

Although all the members of workforces are open to stress at work, the highest stress is found amongst members of workforces with less education and psychological stress has both short-term and long-term effects on health (Grzywacz et al., 2004, Almeida, 2005, and Almeida, et al., 2005). Moreover, better-educated people have better chances to access available jobs and thus earn a higher income, and they tend to have the option to select more comfortable and clean environment to live (Feinstein et al., 2005, and Diaz, 2010). In developing countries, the most impoverished neighbourhoods have a serious problem of public health majorly because of dusted roads and non-treated waters, which are detriment to good health (Diaz, 2010). People of colour and those with low levels of education and low income are more likely to dwell in an unhealthier environment such as near highways, bus station/garage, factories, power plants and other air and water pollution sources which open them to risk of toxin (Bullard, Johnson and Torres, 2011).

Another source of influence is that better education enhances the probability of an individual to get non-manual jobs that offer health insurance, which allows himself and family to take good care of their health when they are sick or go for regular check up (Gabel, Levitt and Holve, 2002, Hall, Collins and Giled, 1999, and Acs and Blumberg, 2001). Hadley (2003), Institutes of Medicine (2009) and Freeman et al. (2008), for example, documented that, in the United States, adults with health insurance use more services provided by the physician and have better health outcomes than those adults who are uninsured or inconsistently insured. In short, better-educated individuals have a higher probability of getting health insurance and thus better health outcomes, and then one can expect a reduction in poor health conditions.

In consistent with the prior theoretical consideration, the second hypothesis is

**H2:** Education is negatively associated with poor health conditions. In other words, the higher the level of education of household head, the lower the probability of him and his family having poor health conditions.

There is limited data in the literature on the association between education and housing conditions. Based on the recent study of Diaz (2010), improved housing condition is greatly possible among those with education because they have better access to higher paying jobs. For example, highly educated people have a higher probability to be employed in jobs with higher paying income that make possible for them to choose a house with appropriate conditions. Likewise, they have increased access to credit market because they have a higher probability to more effectively communicate with credit agencies in the view of the fact that they have an understanding of financial transactions and records keeping that increase the possibility of attaining credit, and this creates a likelihood of possessing suitable housing conditions (Diaz, 2010). Therefore, a reduction in poor housing conditions.

In consistent with the prior theoretical consideration, the third hypothesis is stated as

**H3:** Education is negatively associated with poor housing conditions. That is, the higher the level of education of household head, the lower the probability of household living under poor housing conditions.

Educated parents have beliefs and expectation, predicting their children higher educational attainment but this is influenced by family income. For example, better-educated parents have beliefs and expectation that were closer to their children higher educational attainment. This is because better-educated parents have better chances of getting employment with higher paying income that gives them the possibility of funding their children's education (Blanden, Gregg and Machin, 2002, and Alexander, Entwisle and Bedinger, 1994). By contrast, less educated parents have beliefs and expectation that do not match their children higher educational attainment because they have a higher probability of getting jobs with lower paying salaries (Blanden, Gregg and Machin, 2002). It is documented for example that, later on in educational progress of children from less educated and low-income parents are strongly influenced because their parents may lack resources to fund them through further and higher education (Blanden, Gregg and Machin, 2002).

Highly educated parents with high income are more likely to open their kids to lots of educational opportunities and summer programs (Furstenberg et al., 1999, and Terzian, Anderson, and Hamilton, 2009). Likewise, they have a higher probability to enrol their kids in private schools and to get private tutor to help their children if they start having difficulties in school (Eccles and David-Kean, 2005, and Kolko, 2014). Arguably, these entire educational opportunities, enrollment into private schooling, and private tutoring would help children shaping their educational achievement and also increase motivation and interest in learning that could lead to increase in children's school engagement and attendance. This, in turn, results in well academic performance and thus inspires them to progress in education (Eccles and David-Kean, 2005, and Kolko, 2014).

By contrast, children from less educated parents in numerous cases use much of their free times, including summers in devoting to working to support their families. This reality allows very little space for investments in educational development programs, such as summer programs and the summer learning loss that occurs may be part of factors that affect children educational attainment (Blanden, Gregg and Machin, 2002).

In addition, highly educated parents get involved in the educational system on their children's behalf, such as reading to their children at home and participating in their children's homework (Davis-Kean, 2005). This, in turn, leads to better school performance and therefore, children are inspired to follow additional years of education (Wanka, 2014), one should expect a reduction in poor children's educational attainment.

In consistent with prior theoretical consideration, the fourth hypothesis is

**H4:** Education is negatively associated with poor children educational attainment. That is, the higher the level of household head education, the lower the probability of household having children with poor educational attainment.

Better child health is greatly possible among parents with education through many important ways. Better-educated parents are better informed of the true nature of health production, which allow them to choose different combinations of health inputs than parents with no education or less education to generate higher output. Alternatively, better-educated parents are able to adopt better child care practices or superior hygiene standards (Grossman, 2005).

Following good practices of hygiene promotes good health and avoids morbidity and mortality through preventing bacteria, viruses and illness such as diarrhoea (Mills and Cumming, 2016). This association arises because education provides better knowledge about the true nature of health production or ability to respond to new knowledge more promptly (Grossman, 2005).

Infant health could be affected even before they were born due to unhealthy behaviours. Having better-educated parents could be an effective way to reduce unhealthy behaviours. This is because better-educated parents have better knowledge of harmful conducts, such as the detrimental effects of maternal smoking on infant health, and thus they have the option to adopt good habits (Lindeboom, Llena-Nozal and Klauuw, 2009). Lindeboom, Llena-Nozal and Klauuw (2009) for example documented that, mothers from better-educated household less often smoke during pregnancy which allows both the mother and child to benefit a healthy lifestyle throughout the course of pregnancy. Likewise, they use prenatal care more and also breastfeed more often which helps keep the baby healthy through supplying all necessary nutrients in the proper proportions to attain basic nutrition and even through protecting baby from an illness like diarrhoea or stomach upset as well as constipation as break milk is easily digested.

There is a gender aspect in the role of parent's education in determining child health. The role of a father in child care in the house is obviously less, and the more substantial responsibility of child care in the house goes to the mother as mother engages in the day to day decisions on overall child's hygiene and nutritional intake. Therefore, one should expect more effect of mother's education on long-term measure of child health such as height and weight (Semba et al., 2008), while the explanation for the role of father's education lies on low social status and empowerment of mothers that possibly restrict the influence they have in making decision concerning child health. Alternatively, it may be that fathers engage in more active role in some types of health decisions, for example, immunization decisions or participation decisions especially if they need to travel to a health clinic, and therefore, one will conclude that a father's education has a higher association with participation decisions/health seeking behaviour, which obviously improve child health (Semba et al., 2008).

Having few resources could be a key factor impeding access to health services that possibly translate into inferior child health and nutrition, and this is widely recognized in developing countries (Aslam and Kingdon, 2012). Education indeed can influence this through increasing access to skilled employment and thus higher earnings. In numerous times, better-educated parents have a higher probability of being employed in skilled job with higher income, and these resources could be used to invest in health and cushion the impact of adverse health shocks (Case, Lubotsky, and Paxson, 2002), the one should expect a reduction in child mortality.

In consistent with prior theoretical consideration, the last hypothesis is

**H5:** Education is negatively associated with child mortality. That is, the higher the level of education of parent, the lower the probability of having child mortality.

Since investments in a child's health and thus reduce child mortality require both parental money and responsibility and their education influences these inputs. This hypothesis will not be estimated based on the level of household head education. The study aim is to separately evaluate the effect of a father's education and (mother's) education on child mortality.

**2.4 Conclusions**

This chapter provides a theoretical background that provides a link between education and poverty. Also provides a summary of the previous empirical studies on the association between education and poverty in Nigeria and other countries. The flaws in the empirical studies reviewed have been identified as well as the research gaps that are important investigating empirically in Oyo state, Nigeria in targeting poverty reduction. Hence, five (5) hypotheses are set for this study on a theoretical basis. Each of these hypotheses is a solid question.

Most of the empirical studies review in this chapter estimated the determinants of poverty at the household level and this approach is employed in this study also.

**CHAPTER THREE**: **DEFINITION AND MEASUREMENT OF POVERTY**

**3.1 Introduction**

To examine the effect of education on poverty, and recommend policy to target poverty, there is a need first to describe what poverty is, in order to differentiate those who are poor from those who are not. Poverty is multidimensional and broad in nature. Hence, many definitions and measures of poverty have been established over the past decades. This chapter aims at presenting the general review of the idea of the poverty definitions by establishing the set of dimensions expressed by the concept of poverty.

This chapter's review starts by presenting some of the definitions of poverty that have been established in the literature with different perspectives because understanding poverty has distinct perspectives rather than merely centre attention on lack of income (as one of several dimensions of poverty). The distinct perspectives on this phenomenon are influenced by the precise definition of poverty used by each of them. Therefore, it is essential to consider some definitions used by different perspectives. For instance, while Iguisi (2002) defines poverty as a lack of financial requirements for minimally acceptable fulfilment of human needs (including basic health, education and shelter). The United Nations (1995) definition of poverty highlights more specific condition such as hunger and malnutrition, illness, unsafe environment, and limited or lack of access to education and other basic services. Some of these features may be more applicable to developing nations, in which Nigeria is one of them than to the developed nations, even though their impact (e.g. morbidity and mortality levels, and educational opportunities of those who are poor) is still noticed (Davis and Sanchez-Martinez, 2015).

The concept of poverty is usually characterised by the absolute and relative measures of poverty. Some authors in the field of poverty, such as Townsend (1979) focused on the society-specific concept of poverty, which is purely relative measure and assumes is the key concept, but other authors such as Sen (1993) argues that the absolute idea of poverty defined in terms of basic human capabilities in place of material commodities, resources and incomes should be a relevant concept instead, all of which are established in the chapter.

On that account, the chapter will present a general review of some of the key definitions of poverty, and then goes on to deliberate about the interrelations between each definition and seek to put in place whether there exist common elements reflecting the same basic principles that a unified idea of poverty would have.

Another aim of this chapter is to present the poverty measure employed to discern those who are poor and those who are not. The aim of measuring poverty is to establish the extent to which poverty exists in the society or country. This assists in measuring the well-being of people in a country that are exposed to the risk of economic situations, nature of deprivation among people, so also living standards of a country (Pauw et al., 2003, and Bhorat, Poswell and Naidoo, 2004).

In general, poverty can be measured with the use of two approaches, which are objective and subjective approaches (Ravallion, 1992, Ravallion, 1998, Pauw, et al., 2003, Bhorat, Poswell and Naidoo, 2004, Kaplan and Makoka, 2005, Haughton and Khandker, 2009a, and World Bank, 2015). Both measures of poverty are considered to be important to the measurement and analysis of poverty. They address and capture the issue of poverty from distinct ideas and viewpoints, but not any of these approaches is certainly right or wrong. However, over the years in the literature, the objective approach (absolute and relative approaches) has dominated the measurement of poverty (Kaplan and Makoka, 2005).

In providing a more detailed idea of the poverty definitions and poverty measures established. This chapter is arranged as follows: Section 3.2 presents a general review of the idea of poverty definitions by establishing two approaches to poverty definition, which are objective and subjective approaches that a unified idea of poverty should have and also detailed review of several approaches to defining poverty, section 3.3 presents the preferred definition of poverty and its justification, 3.4 presents the general review of measures of poverty, section 3.5 presents the difference between the study's poverty measurement and Multidimensional Poverty Index (MPI) and section 3.6 presents the conclusion part.

**3.2 Definition of Poverty**

According to Smith (1776), poverty is an inability to buy the necessities required by nature or custom. In this definition, the social/psychological status of poverty aspect (custom) indirectly receives the same weight as the material, purely economic condition (nature). It is detailed further by stating the types of necessities needed for someone to be regarded as non-poor, which are not only commodities necessary for survival but whatsoever the custom of the country renders inappropriate for creditable people, even of the lowest order, to be without (Smith, 1776). Hence, this combines an absolute measure (necessities needed by nature) with the relative measure aspect (necessities needed by custom).

On the latter, ‘a linen shirt', for instance, is strictly speaking, not a necessity of life, and he assumed that Greeks and Romans lived very comfortably, even though they owned not a linen shirt. However, in the present times, through a larger part of Europe, a creditable day-labourer would feel ashamed to show up in the public with not a linen shirt on, the want of which to be assumed to represent a disgraceful degree of poverty that is assumed no one can well fall into without extreme bad conduct (Smith 1776). This claim thus establishes the truth that, there must be an aspect of relative measure concerning poverty status, and it also displays the critical view, which is shaming and stigmatising of those who are poor at the time (Davis and Sanchez-Martinez, 2015).

Wood (1988), clearly stated on the context-specific and relative measure of the concept of poverty and did not refer to the absolute measure of poverty. Our needs and pleasures come from society. Therefore, we measure them by society and not by what they fulfilled, as they are of a social nature, they are of a relative nature (Wood, 1988).

Rowntree (1901) in his proposed poverty definition, differentiated between primary and secondary poverty. He viewed primary poverty as an insufficient earning to meet the necessities needed to maintain merely physical efficiency, while the idea of secondary poverty was established on a more subjective judgement of whether those interviewed were in obvious need and dilapidated state, even though, they are above the set poverty line. Rowntree (1901), however, later on, extended the definition of primary poverty by specifying that a necessary need for someone to be regarded as ‘non-poor' included, owning a garden and a bath. This last consideration clearly shows that the definition of poverty depends on the socio-economic environment at the time, for example, it had an element of relativity as well as an absolute element (Davis and Sanchez-Martinez, 2015).

Sen (1993) defines poverty as a lack of basic capabilities required to function. Basic capabilities, refer to an ability to fully satisfy particular absolutely necessary functionings up to a specific minimum adequate level (Sen, 1993). The functionings refer to various relevant things that a person may value doing or being which comprises living a long life, well-nourished, being healthy, adequately clothed and sheltered, ride around etc. (Alkire, n.d, and Ferrer-I-Carbonell and Van Praag, 2006). In this definition, poverty is an absolute idea in the space of capabilities, but in most times, it will take a relative aspect in the space of material commodities, resources and incomes that are mapped into capabilities needed to live a good life (Sen, 1999). The good life is partly a real choice of life and not the one in which the individual is enforced into a particular life (Alkire, n.d). Therefore, money and publicly produced goods are significant. Here, the sense of relativity spring from the socio-economic environment surrounding the population of each society. Moreover, it is generally believed that an element of relativity is subjected to change over time (Sen, 1999). An example of this would be the increasing need in today's network economies to have opportunity to advanced communication technology services so as to attain the basic capability of being able to communicate with others and keep away from social isolation, it is sure to pinpoint that, to achieve the same social participation in the past did not require the use of such technology-intensive goods and services as it does in the present time (Sen, 1999).

World Bank (2011) shows that, “poverty is pronounced deprivation in well-being, and comprises many dimensions. It includes low income and inability to acquire the basic goods and services necessary for survival with dignity. Poverty also encompasses low level of health, education, poor access to clean water and sanitation, inadequate physical security, lack of voice and insufficient capability and opportunity to better one’s life”. This definition is more detailed and flexible to the poverty condition of different countries. Displaying both elements of absolute and relativity, this comprises a broad definition that involves a nature of the multi-dimensional concept of poverty Moreover, stressing the importance of political and individual freedoms more than any other definitions discussed.

World Bank (2001) defines poverty as an opportunity's deficiency, empowerment's deficiency and security's deficiency. This report detailed further by presenting a brief statement on these dimensions of poverty. A means of opportunity left unopened to those who are poor, and this hinders them from being practically active in the society. Poor people's lack of empowerment gives them no extension in their choices in virtually all things, and their security's deficiency opens them to the risk of violence, diseases and so on. The report's definition exhibits both absolute and relative elements. Apart from also constituting more of multidimensional concept of poverty, the description is more refined version than others because it points out the social exclusion, which is in most cases an effect of poverty, though the mention of the social exclusion is implicit. In this definition, poverty is a situation where someone's opportunity, empowerment and security are so seriously below those commanded by the average absolute measure of the country and relative measure of the society that they belong and consequently social excluded.

Townsend (1979) defines poverty as the lack of resources certainly needed to allow involvement in the activities, customs and diets very often accepted by society. In a clear and detailed manner, this definition recognises the society-specific idea of poverty, which is the relative measure of poverty. From this definition, the resources that need to be examined is not just earnings but also other different types of resources, such as inherited and accrued wealth are also of crucial importance.

Based on Townsend (1979), the flow of resources accumulated to people is managed by a set of different systems operating for each of them. Poverty is in part the result of the mixture of these systems at work. Some, for example, wage and social security systems affect greater portions of the population than others. Townsend (1979) idea of relative poverty definition is a more improved version than some others because it has a clearly stated exclusion effect of poverty. In his mind, relative poverty is a condition where someone's resources are so solemnly lower than those commonly approved for the average individual or family that they belong and consequently excluded from normal patterns of living, activities and customs (Seymour, 2009).

Onibokun and Kumuyi (1996 p.36) define poverty as "deprivation of entitlement through lack of access to economic and social resources, as well as political participation and consultation". This definition exhibit both absolute and relative aspects of poverty and points out social exclusion, which is the consequence of living in poverty. Also, from this definition, resources mentioned are context-specific, which are economic and social resources. Just as we can see, social exclusion is an important aspect for some of the explanations of poverty that have been established in the literature. However, this perspective is of major social researchers oriented.

Bello (2000) defines poverty as a deprivation of resources to consume particular goods and services, which include the basic necessities of life, for example, clothing, shelter, food and so on. This definition exhibits an absolute element of poverty, though not context-specific. By types of necessities needed to consider poverty status, according to Smith (1776), commodities are absolutely necessary for survival and are referred to as (necessities required by nature) which is an absolute element of poverty.

Organization for Economic Co-operation and Development (2001) shows that poverty comprises distinct aspects of deprivation that relate to human capabilities which include consumption and food security, rights, security, education, decent work, voice, dignity and health. Exhibiting absolute element of poverty and this definition points to the array of different potential sources of deprivation following from experiencing deprivation from education, health etc.

Iguisi (2002) shows that poverty is lack of financial requirements for minimally acceptable fulfilment of human needs which include basic health, education and shelter. This definition is a pure absolute measure of poverty. The feature of poverty can be lack of purchasing power, malnutrition, low life expectancy, inadequate access to social services, high rate of mortality, exposure to risk and few opportunities to income generation (Osinubi, 2003). This definition exhibits an absolute element of poverty and multidimensional poverty in nature.

Gordon (2005 p. 4) defines that "poverty is a denial of choices and opportunities, a violation of human dignity. It means lack of basic capacity to participate effectively in society. It means not having enough to feed and clothe a family, not having a school or clinic to go to; not having the land on which to grow one's food or a job to earn one's living, not having access to credit. It means insecurity, powerlessness and exclusion of individuals, households and communities. It means susceptibility to violence, and it often implies living on marginal or fragile environments, without access to clean water or sanitation". Displaying both absolute and relative elements and also comprises multi-dimensional features of poverty.

One of the extensive definitions of poverty is that established by the joint report of the Council of the European Union (2004 p. 8) which states that "people are said to be living in poverty if their income and resources are so inadequate as to preclude them from having a standard of living considered acceptable in the society in which they live. Because of their poverty, they may experience multiple disadvantages through unemployment, low income, poor housing, inadequate health care and barriers to lifelong, learning, culture, sport and recreation. They are often excluded and marginalised from participating in activities (economic, social and cultural) that are the norm for other people and their access to fundamental rights may be restricted". This definition directly acknowledges the relative measure, which is the society-specific character of poverty, and also highlights a wide range of possible sources of economic and social deprivation that follow from experiencing deprivation in ‘income and resources'. Therefore, there exists an indirect mapping between material resources and outcomes that are not necessarily material as such. Moreover, according to Atkinson (1998), this definition of Council of the European Union (2004) evaluates a wide-ranging description that comprises views that are absent in other aspects, for example, the exclusion from cultural activities. Incorporation of social exclusion constitutes a step forward from other views of poverty in being socially rather than individually defined, as well as in pointing out the importance of dynamics over time and the processes that bring about poverty (Atkinson, 1998).

In addition, there are numerous distinct ways of describing poverty in the literature over the years. However, the definition of poverty which makes an effort to enclose both the developing and developed nation contexts was published by the United Nations (1995). In the United Nations (1995 p.19), "poverty has various manifestations, including lack of income and productive resources sufficient to ensure sustainable livelihoods; hunger and malnutrition; ill health; limited or lack of access to education and other basic services; increased morbidity and mortality from illness; homelessness and inadequate housing; unsafe environments; and social discrimination and exclusion. It is also characterized by a lack of participation in decision-making and in civil, social and cultural life. It occurs in all countries: as mass poverty in many developing countries, pockets of poverty amid wealth in developed countries, loss of livelihoods as a result of economic recession, sudden poverty as a result of disaster or conflict, the poverty of low-wage workers, and the utter destitution of people who fall outside family support systems, social institutions and safety nets" . This definition marks out the distinct ways in which poverty indicates itself in developing and developed nations. Moreover, it points out the key sources of poverty which include the role of social goods, as well as suggested though not directly expressed the idea of social capital.

In addition, due to poverty having various and multidimensional nature, many definitions of poverty have been established in the literature over the years as exemplified above. However, according to the Human Development Report (1997), the overall agreement is that poverty has mainly been defined regarding the income approach, the capability approach and basic needs approach. As such, these three approaches will be detailed below.

**3.2.1 Income/consumption Approach**

This approach is the most frequently employed in identifying individuals in poverty especially in applied welfare economics (Lipton, 1997). According to this approach, poverty is measured by estimated income or consumption data (Laderchi, Saith and Stewart, 2003). According to the economists that mostly employed this approach, a person is regarded as poor if he or she falls below the estimated minimum level of income needed to fix the basic necessities of life known as poverty line (Lipton, 1997, and Laderchi, Saith and Stewart, 2003). In most cases in this approach, poverty is measured with respect to household and not the individual and is adjusted for the number of individuals in a household (Instituto Nacional De Estadistica, 2010). As such, Ravallion (1994) stated that, given a certain standard in a country, if a household lives below this level, then that household is considered to be in poverty.

There are some assumptions one makes when using the income/consumption approach of poverty. A fundamental premise of this approach is that it is considered to be able to include all the related/relevant heterogeneity across individuals (Laderchi, Saith and Stewart, 2003).

Another assumption relates to the issue of seeing poverty as a problem of individuals or households, and according to Glewwe (1991), Andersson, Engvall and Kokko (2006), Bruck et al. (2007) and Bruck (2001) in general, studies assume that household is the central unit, therefore take into account its size and/or composition. Another important assumption relates to the choice of a poverty line. In the literature, there are two main approaches; (a) absolute poverty line which is estimated based on the Food Energy Intake Method and the Cost of Basic Needs Method (Laderchi, Saith and Stewart, 2003, and Nunes, 2008) or (b) relative poverty line which is estimated based on income welfare indicator (Wanka, 2014).

The construction of the poverty line of the former involves some judgment on the basket of goods to be included or to the energy intake they provide and is resisted to them (Ravallion, 1998), whereas, the construction of the poverty line of the latter involves the second quintile or median of the national income (Wanka, 2014). An absolute poverty line is the standard practice in developing countries which Nigeria is one. Hence, the study will use absolute poverty line, and the derivation of the poverty line will be detailed in chapter four (subsection 4.3.1).

**3.2.2 Basic Needs Approach**

The concept of poverty is still ill-defined idea when only being revolved around money. The word "poverty" often finds a company with other terms amongst which is this approach. According to this approach, poverty is defined as the lack of basic necessities of life. In other words, those that are not able to fulfil their basic human requirements are regarded as poor (Gordon et al., 2003, and Mbuli, 2008). This approach identifies these needs to be food, clothing, shelter, clean water, education, and sanitation and once the necessary materials are assured, those in poverty are in better shape to improve their lives (Mbuli, 2008). The basic needs approach is easy and quite flexible to implement, which is the key strength of the method.

While it provides considerable flexibility to the policymakers, the approach has criticism levelled against it, which is arbitrariness. Experts and bureaucrats at the top generally decided on what and how much people need assuming that all individuals possess precisely the same needs, which is questionable. Therefore, it is a paternalistic approach having no particular interest to individuals' preferences (Schmidt, 2013, and Ghai, 1978). In an ideal world, evaluating the bundle of consumption should be carried out at the level of the individual regarding what people want (need). Being an entirely consumption-oriented approach and it fails to link poverty with individuals' values and wants and the end result (wellbeing) (Ghai, 1978).

**3.2.3 Capability Approach**

Unlike the basic needs approach which is a consumption-oriented approach (Ghai, 1978, and Mbuli, 2008), this approach is a people-focused approach. That is, it put people first. It aims at enhancement of people's well being through enlarging their capabilities in order to take care of themselves. This approach is underpinned by the human development approach and links the issue of poverty with the broader issue of human development. It does not support the welfare programs but supports the empowerment initiatives. The belief of this approach is firmly on the idea that individuals are responsible for their own lives and development should give them more opportunities and choices to do so (Deneulin and Shahani, 2009).

According to this approach, poverty is described as a lack of basic capabilities required to function. Basic capabilities refer to an ability to fully satisfy particular absolutely necessary functionings up to a specific minimum adequate level (Sen, 1993). The functionings refer to various relevant things that a person may value doing or being which comprises living a long life, well-nourished, being healthy, adequately clothed and sheltered, ride around etc. (Alkire, n.d, and Ferrer-I-Carbonell and Van Praag, 2006).

Although this idea is intellectually and instinctively attractive, there is a problem which is the difficulty of measuring broad definitions of capabilities. This is one reason why research in this field tends to measure outcomes rather than capabilities, for example, literacy rate, and life expectancy are employed in practice as proxies to capture non-directly measurable concepts like, the capability of critical thinking and autonomy/freedom of thought, the capability of obtaining a disease and disability-free life (Ferrer-I-Carbonell and Van Praag, 2006, and Davis and Sanchez-Martinez, 2015). Arguably, in applied research, these measures are the best approximation of the intangible concepts of capabilities (Ferrer-I-Carbonell and Van Praag, 2006, and Davis and Sanchez-Martinez, 2015).

 Moreover, though the overall agreement for defining poverty according to the Human Development Report (1997) regards in income approach, basic needs approach and capability approach. Social exclusion is another obvious approach nowadays that forms a key part in the European Union (EU) social policy, and it has gradually expanded to developing nations through the activities of different United Nations agencies (Laderchi, Saith and Stewart, 2003).

**3.2.4 Social Exclusion**

The foundation of this approach is mainly based on the work of researchers from other fields in social science, particularly sociology (Davis and Sanchez-Martinez, 2015). The approach constitutes a step forward from other views of poverty established above in being socially rather than individually defined, as well as in pointing out the importance of dynamics over time and the processes that bring about poverty (Atkinson, 1998). The idea of this approach refers to various dimensions which treat people insignificant and reduce their likelihood of engaging in social and political life (Scutella, Wilkins and Horn, 2009).

 According to Davis and Sanchez (2015 p.46), European Union definition of social exclusion in viewing poverty is "process through which individuals or groups are wholly or partially excluded from full participation in the society in which they live". Morazes and Pintak (2007) focus on social exclusion by viewing poverty as non-participation in consumption, production, political engagement and social interaction.

A definition poverty view of social exclusion by Burchardt, Le Grand and Piachaud (2002) involves non-participation in main activities identified as four dimensions by the UK in the 1990s, which are:

* Consumption (the capability to purchase goods and services);
* Production (engagement in activities that are valuable socially and economically);
* Political engagement (engagement in the decision made locally or nationally); and
* Social interaction (interaction with friends, family and community).

Moreover, Office of the Deputy Prime Minister (2004, p.3), shows the definition of United Kingdom social exclusion as “a shorthand term for what can happen when people or areas suffer from a combination of linked problems such as unemployment, poor skills, low income, poor housing, high crime environment, bad health and family breakdown”.

 Another important feature is the neighbourhood dimensions which question the absence or lack of communal facilities. There might be a broad agreement on the need to fight exclusion, but "fight exclusion means different things to different people" (Silver, 1994, p.544). As stated, that the social exclusion approach characterises multiple dimensions, e.g. rights, health, housing, education, social services by institutions such as Council of the European Union (2004), and by gathering data on various aspects of exclusion/disadvantage on Household Budget or Living Standard Surveys (Mathieson et al., 2008).

However, existing approaches for measuring social exclusion are faced with particular limitations which are much the same with other approaches (Mathieson et al., 2008). One of the leading critics levelled against this approach is that there is a lack of precise definition. Therefore, it lacks agreement on the number of dimensions and indicators to be considered (Laderchi, Saith, and Stewart, 2003).

An important issue relates to difficulties of defining appropriate society's normal activities to set out the standard of exclusion, and this is challenging, especially in developing nations because there is a possibility of what is normal contrasting what is desire. Hence, researchers’ methods in such countries need to be invented to identify dimensions and appropriate cut off points (Laderchi, Saith and Stewart, 2003). Another important issue is the aggregation of different aspects of exclusion which has shown problematic (Nolan and Marx, 2009, and Loxha, 2016), because, there is a possibility that people are impoverished in more than one dimensions which specified multidimensional nature of social exclusion. As a result of its multifaceted endogenous nature, there is possible endogeneity because specific dimensions could be a cause, as well as the consequence of social exclusion (Loxha, 2016).

There is also a common data issue with the measurement of social exclusion. An important issue is the different availability of data across countries, the cost and difficulty in gathering data. Furthermore, there is a risk of certain groups not including for analysis as a result of survey data being too small or as a result of that certain group not being touched by the survey (Loxha, 2016).

**3.3 The Choice of Poverty Definition**

Although, many definitions of poverty have been presented as shown above and one can conclude that understanding poverty has different perspectives rather than merely centre attention on lack of income, which is one of the several dimensions of poverty. Estimating poverty requires a choice among the stated definitions. For this study, the definition of the United Nations (1995 p.19) which states that "poverty has various manifestations, including lack of income and productive resources sufficient to ensure sustainable livelihoods; hunger and malnutrition; ill health; limited or lack of access to education and other basic services; increased morbidity and mortality from illness; homelessness and inadequate housing; unsafe environments; and social discrimination and exclusion. It is also characterized by a lack of participation in decision-making and in civil, social and cultural life. It occurs in all countries: as mass poverty in many developing countries, pockets of poverty amid wealth in developed countries, loss of livelihoods as a result of economic recession, sudden poverty as a result of disaster or conflict, the poverty of low-wage workers, and the utter destitution of people who fall outside family support systems, social institutions and safety nets" is preferred and the reasons are.

Firstly, it describes poverty in a wide-ranging description that comprises views that are absent in other definitions, for example, it makes an effort to marks out the different ways in which poverty indicates itself in developed and developing nations, which Nigeria is one of them.

Secondly, it acknowledges both relative and absolute character of poverty, which is the most commonly used poverty approach across the world (Ravallion, 1992, Ravallion, 1998, and Haughton and Khandker, 2009a), also used in most recent studies in Nigeria, such as Anyanwu (2010 and 2012) and National Bureau of Statistics (2012), and this is used in this study.

Thirdly, it incorporates social exclusion, which is a result of various poverty dimensions that treat people insignificant and reduce their likelihood of participating in decision-making and in civil, social and political life. This is a step forward from other views of poverty in being socially rather than individually defined, as well as pointing out the key sources of poverty which include the role of social goods, and suggested though not directly expressed the idea of social capital

Lastly, it depicts a nature of the multidimensional concept of poverty, that is, not just only describes the monetary aspect of poverty, but also the non-monetary aspect of poverty which is the specific focus of this study. Moreover, the choice of definition is made as it depicts the indicators of poverty that are relevant to the available data.

**3.4 Measurement of Poverty**

The aim of measuring poverty is to establish the extent to which poverty exists in the society or country. This assists in measuring the well-being of people in a country who are exposed to the risk of economic situations, nature of deprivation between people and well-being, so also living standards of a country (Pauw et al., 2003, and Bhorat, Poswell, Naidoo 2004).

In general, poverty can be measured with the use of two approaches, which are objective (absolute and relative) and subjective approaches (Ravallion, 1992, Ravallion, 1998, Pauw et al., 2003, Bhorat, Poswell and Naidoo, 2004, Haughton and Khandker, 2009a, and World Bank, 2015).

In computing a poverty measure, according to Coudouel, Hentschel and Wodon (2002), it requires the following steps:

* Firstly, define the relevant dimensions and indicators of welfare
* Next, choose and estimate poverty line, that is, a threshold for which a specified household or individual will be categorized to be poor or non-poor.
* Finally, choose and estimate poverty indicators. All these will be clearly explained below.
	+ 1. **Defining Welfare Dimensions**

This section focuses on the welfare dimensions which take both monetary and non-monetary aspects. In particular, the monetary aspect includes income and consumption, while the non-monetary dimension includes indicators such as nutrition and health, education etc. Both dimensions will be clearly explained in sub-section below.

**3.4.1.1 Monetary Dimension of Poverty**

This monetary dimension of poverty includes income and consumption indicators, and it is widely employed. For consumption, it is measured based on the minimum consumption bundle for the food and non-food products necessary for living, by affixing a value of sum of money so that poverty line can be set in order to differentiate those who are poor from those who are not (Ravallion, 1992, Ravallion, 1998, and Haughton and Khandker, 2009a). As for income, it is measured based on the household income and a level is set to find out those who fall below this level to be regarded as poor and those above it as non-poor (Poverty and Social Exclusion, 2014). Both indicators can be measured using a quantitative, objective approach and qualitative, subjective approach.

When estimating the monetary dimension of poverty, one may have to choose between the two indicators, either using income or consumption. Many analysts have argued in support and oppose to income and consumption as suitable measures of welfare indicators for analysis of poverty, and this will be summarised in table 3.1 below.

**Table 3.1: Which Welfare’s Indicator is Appropriate: Income or Consumption?**

|  |
| --- |
|  **Income**  |
|  | Pro:  | Con: |
| 1 | Given the few numbers of income sources, it is easy to measure. Moreover, much of the income comes from (wages and salaries), and such provide a check for data's quality in the household survey (Coudouel, Hentschel and Wodon, 2002). | Income is likely to be underreported because people may not be willing to tell of the illegal income earned, for example, corruption, prostitution or smuggling (Andersson, Engvall and Kokko, 2006 and Goverder et al, 2007). |
| 2 | Income data only costs a fifth of costs to collect consumption data, and hence sample can be of large quantities (World Bank, 2015).  | Reporting period may not apprehend the "average" household income. Developing countries whose economy is based on producing and maintaining crops and farmland, income for rural households may be irregular during the year, according to the harvest cycle of the crops. In urban economies with large informal sectors, the flow of income may as well be irregular which indicates a likely difficulty for households in accurately recollecting their income, and hence, income data obtained from the survey may be of low quality.An additional likely difficulty in estimating income associated with farming is removing the inputs bought for agricultural production from the farmer's income. Lastly, if households consume their agricultural product or trade in return of some other goods. This indicates large shares of income are not monetized, and hence may be difficult to estimate (Coudouel, Hentschel and Wodon, 2002). |
| 3 |  | The link between welfare and income is not very clear. Income is only one of the components that allow consumption of goods (Coudouel, Hentschel and Wodon, 2002).  |
|  **Consumption**  |
|  | Pro:  | Con: |
| 1  | Consumption estimation is more reliable in as much the consumption module is well designed and detailed in the household survey (Coudouel, Hentschel and Wodon, 2002). | Households may not be able to smooth consumption, for example, via borrowing, social network etc. (World Bank, 2015).  |
| 2  | Actual consumption is more closely related to the well-being of an individual in the sense of having sufficient to meet current basic needs. (Coudouel, Hentschel and Wodon, 2002) | The choices of consumption made by household may be confusing. For instance, if a wealthy family decides to live a simple life, that doesn't show the family is poor (Govender et al., 2007) |
| 3 | Smoothes out irregularities, and reflects long-term average well-being (Andersson, Engvall and Kokko, 2006). | Some expenses are not incurred regularly, and so data may be noisy (Govender et al, 2007). |
| 4 | Less understated than income. This is because expenditure is easier to recall (Andersson, Engvall and Kokko, 2006). | Difficult to measure some components of consumption, including durable goods (Andersson, Engvall and Kokko, 2006 and Govender et al, 2007). |
| 5 | In developing countries, consumption-expenditure is direct. Therefore, it is easy to calculate (Coudouel, Hentschel and Wodon, 2002). | In rich countries, consumption-expenditure is complex and hard to quantify (Coudouel, Hentschel and Wodon, 2002). |

Source: Coudouel, Hentschel and Wodon (2002), Govender, et al (2007), Andersson, Engvall and Kokko (2006), and World Bank (2015).

Although, arguments are presented in support and opposition to the income and consumption welfare indicators of poverty as summarised above. Estimating the monetary measure of poverty requires a choice between the two indicators, either using income or consumption. For this study, the consumption-expenditure approach will be preferred, and the reasons are. Firstly, consumption-expenditure data is preferred as it is of the opinion that is more reliable and reflects long-term average well-being much better than data on income. In other words, consumption may better measures and reflects a household's ability to meet its basic needs than income (Ravallion, 1992).

Secondly, it depicts more reliable data because it can reflect a household's effort to smooth out income irregularities (Andersson, Engvall and Kokko, 2006, and Govender et al., 2007). Income changes more over the time, while consumption-expenditure exhibits more stable and actual consumption level, especially among those groups who are in poverty (Coudouel, Hentschel and Wodon, 2002 and Govender et al., 2007).

Lastly, during the year, survey respondents can on numerous occasions participate in various income's earning activities which could be difficult to recall and netting out costs (Andersson, Engvall, and Kokko, 2006), particularly in the case of Nigeria where the informal sector tends to absorb most of the growing labor force in the urban areas. That is, informal activity in Nigeria is of large-scale (El-rufai, 2011). Also, may not be willing to tell of the illegal income earned (e.g. corruption, prostitution or smuggling). Hence, income is likely to be underreported, while consumption-expenditure is less underreported because it is easy for survey respondents to recall and also may usually be more willing to state consumption-expenditure (Coudouel, Hentschel and Wodon, 2002, and Haughton and Khandker, 2009a).

* + - 1. **Non-monetary Dimension of Poverty**

Even though many attempts to measure poverty have centre attention in monetary aspect, it has many other dimensions in non-monetary aspect. Poverty is characterized not only with insufficient income or consumption but also with insufficient outcomes regarding health, nutrition, literacy, education, and with deficient social relations, homelessness, insecurity, inadequate housing, low self-esteem, powerlessness, unsafe environments, morbidity and mortality from illness, hunger and malnutrition (United Nations, 1995, and Coudouel, Hentschel and Wodon, 2002).

A brief discussion of the relevant dimensions of non-monetary poverty will be presented, and these include the following.

**Nutrition and Health:** The health status of the members of the household can be used as an essential indicator of well-being. The nutritional status of children and adults is also an important measure of outcome, so also the frequency of certain diseases such as respiratory, malaria, diarrhoea diseases or life expectancy for distinct groups in the population (Coudouel, Hentschel and Wodon, 2002, Alkire and Housseni, 2014, and Alkire, Conconi and Seth, 2014). Experience of child mortality is another indicator of poverty (Alkire and Housseni, 2014, and Alkire, Conconi and Seth, 2014).

**Education:** this could be measured based on the level of literacy and use some level judged to represent a start point for illiteracy to set a poverty line. In countries where literacy is common, one might have to choose a particular test score in schools as the relevant outcome indicator to differentiate the poor from non-poor (Coudouel, Hentschel and Wodon, 2002). Another alternative would be to compare an individual's completed number of years of education to the number of years of education he or she is expected to complete by principle (Coudouel, Hentschel and Wodon, 2002, Alkire and Housseni, 2014, and Alkire, Conconi and Seth, 2014). The children school attendance is also an important measure of outcome and cut off point could be set to separate the poor from non-poor (Alkire and Housseni, 2014, and Alkire, Conconi and Seth, 2014).

**Housing conditions:** This could be measured based on the use of electricity, sanitation, flooring material and wall material, and a deprivation threshold is set to differentiate households that are poor from non-poor households (Alkire and Housseni, 2014, and Alkire, Conconi and Seth, 2014).

* + 1. **Choose and Estimate Poverty Line**

The most crucial step in measuring poverty is to derive the poverty line. This line is a level set to differentiate the poor from the non-poor individuals (Ravallion, 1992, Ravallion, 1998, Haughton and Khandker, 2009a, and Poverty and Social Exclusion, 2014). Also, World Bank (2001) asserts that in as much there are different characteristics in different regions, poverty line should be set within the context of a given society in order to reflect the socio-economic circumstances of that society. When setting a poverty line, there are many types of poverty lines, among these are the absolute, relative and subjective lines. However, the most commonly used when computing poverty line for statistical measures are absolute and relative poverty lines (Haughton and Khandker, 2009a), and will be explained in detail below.

* + - 1. **Absolute Approach Measure of Poverty**

Majority of researches that have measured poverty focused on the absolute poverty approach. This approach has two aspects, which are monetary and non-monetary. Amongst these studies that have used the absolute monetary measure of poverty in Nigeria include, Aigbokhan (2000), National Bureau of Statistics (2005), National Bureau of Statistics (2012), Anyanwu (2010) and (2012).

* + - * 1. **Monetary Absolute Poverty**

For this form of poverty, the consumption-expenditure approach is widely used, and this approach is objective. What makes it objective is the sense that it does not depend on people's feelings or opinion, but it is arbitrary based on personal choice (Stropnik, 1999).

**3.4.2.1.1.1 The Absolute Consumption-expenditure Approach**

This type of approach measures the individual's minimum consumption bundles for the food and non-food products necessary for living. It only captures the value of the sum of money to purchase these food/non-food items, and also this type of approach refers to a certain level of income/expenditure in which the poverty line can be set so that the poor individuals can be differentiated from non-poor individuals. The most commonly used approach to determine the poverty line across the world comprises of three main approaches, which are Cost of Basic Needs (CBN) and Food Energy Intake (FEI) and Dollar per day (Ravallion, 1992, Ravallion, 1998, and Haughton and Khandker, 2009a).

**3.4.2.1.1.1.1 The Food Energy Intake Method**

This method is used to set a poverty line by finding the consumption expenditure or income level at which food energy intake is enough to meet the agreed requirements of food energy intake (Ravallion, 1998).

The most sophisticated version of this method is a regression equation relating the consumption-expenditure to the food energy intake (Ajakaiye and Adeyeye, 2011).

The Recommended Dietary Allowance (RDA) of calories intake is employed to estimate it, and each country has its RDA of calories intake. The RDA of 3000 calories intake per adult equivalent per day for Nigeria was recommended by the World Health Organization (WHO) (National Bureau of Statistics, 2012).

Below figure 3.1 depicts this method. For a specify requirement of sufficient food energy intake, the curve can be employed to set the poverty line. The curve indicates the expected value of calories intake, for example, 3000 calories intake daily at a given value of total consumption (Z).

**Figure 3.1: The Food Energy Intake Method**

****

Source: Modified from Ravallion (1998)

There is a shortcoming of this approach, across regions or society, the relationship between food energy intake and consumption-expenditure is not going to be the same, but will shift according to differences in taste, levels of activity which determine food energy requirements, relative prices. Therefore, it is not likely to give constant poverty line (Ravallion, 1992, Ravallion, 1998, and Stropnik, 1999).

Moreover, this approach only reflects food poverty, and there is a need to take into account the non-food material needs individual may have, for example, clothing when estimating consumption-expenditure poverty line. Below presented the Cost of Basic Needs Method that took account of both food and non-food items.

**3.4.2.1.1.1.2 The Cost of Basic Needs Method**

This method is the most widely used approach in setting a poverty line, and it is used to establish a poverty line by finding the required value of resources to keep a minimum stage of welfare. The purpose is to estimate the cost used in buying a basket of necessary items that permits a person to get the minimum level of satisfaction regarding basic needs, such as food and non-food items (Ravallion, 1998, Haughton and Kaughton, 2009a, and Instituto Nacional De Estadistica, 2010).

As described by Ravallion (1998) and Haughton and Khandker (2009a), the cost of basic needs measure function follows these steps.

* A consumption basket judged to be adequate comprises food and non-food items . Usually, the nutritional requirement for better health is 2100 calories for an individual in a day (Ravallion, 1998). For Nigeria, it is 3000 calories intake per individual per day (National Bureau of Statistics, 2012).
* Estimate the cost involved in buying this nutritional food requirement and that of non-food items, which forms the base for setting a poverty line.
* After that, the poverty line for the cost of basic needs is specified as:

= + ------------------------------------------------------------------------------- eq.1

Even though this method is the most widely used approach in setting a poverty line, it still has shortcomings as there is no entirely satisfactory way to measure the non-food items of the poverty line. The theory has to call for compromise by constructing the poverty line with the use of Food Energy Intake, and this is considered in figure 3.2. In general, , where represents the food bought, and stands for the total consumption-expenditure (Haughton and Kaughton, 2009a). Following Ravallion (1998), let stands for the cost of purchasing 3000 calories. At that time, an upper poverty line is specified as:

 --------------------------------------------------------------------------------- eq. 2

This indicates the income level at which 3000 calories of food is purchased by the household and the non-food item is specified as (in fig 3.2)

The lower poverty line is specified as:

----------------------------------------------------------------------------------------- eq. 3

Which measures per capita expenditure level at which the household could just only afford to purchase sufficient food but have no money left to purchase anything else, this is said to be the food poverty line. But even in this case, households will typically buy non-food products as indicated by (in fig 3.2). Ravallion (1998) recommends that one might want to agree, and measure non-food at the midpoint between these two extremes, showing . In this case, the poverty line would be specified by:

---------------------------------------------------------------------eq. 4

**Figure 3.2: Method of Setting the Non-Food Allowance**

****

Source: Ravallion (1998) and Haughton and Khandker (2009a)

**3.4.2.1.1.1.3 Dollar per Day Measure of Poverty**

This method is also an absolute money-metric measure of poverty, but it is globally standard use. This type of approach is similar to the Cost of Basic Needs Method, but its poverty line is established on a dollar per day basis. The World Bank measure world poverty using a "dollar a day" poverty line that was based actually on the purchasing power of US$1.08 per individual a day in 1993 (Haughton and Khandker, 2009a). In the work of Chen and Ravallion (2008) of the World Bank, the poverty line was recalibrated to US$1.25 per individual per day in 2005 Purchasing Power Parity (PPP). This poverty line was based on the mean level of consumption per person per day in their sample of the 15 poorest nations (Chen and Ravallion, 2008), and the US$1.25 was further recalibrated to US$1.90 a day in 2011 (PPP) (Ferreira, 2015).

Under this approach, people are considered to be in poverty, if their expenditure per day is less than the set poverty line and above are deemed non-poor.

This approach has its shortcoming because the poverty line is measured at purchasing power parity, without reflecting the relative purchasing powers of different currencies. For example, a simple hairstyle cut in Hanoi (Vietnam) cost $0.33, while it costs $12 in Boston (USA). That is to say, a person living on $400 per month in the United States would be in poverty, while he or she would be better off in Vietnam. Therefore, the poverty line cannot be constant (Haughton and Khandker, 2009a).

Having discussed the most commonly used absolute consumption-expenditure approach in determining the poverty line across the world, which are Cost of Basic Needs, Food Energy Intake and Dollar per day. The most recent studies in Nigeria such as Anyanwu (2010 and 2012) and National Bureau of Statistics (2012) have employed the cost of basic needs method, and this is used in this study also.

* + - * 1. **Non-monetary Absolute Poverty Approach**

Restricting the measure of poverty to income/expenditure is not enough because poverty is an occurrence that is multidimensional, which comprises both monetary and non-monetary dimensions. The association of poverty is not only to an inadequate minimum level of income to meet basic needs, but also associated with lack of necessary basic needs, such as food, water, shelter, clothing, education, health care, as well as illness, social deprivation, bad housing condition, violence, inadequate security, low-self-confidence and less powerful to mention but few (United Nations, 1995, and World Bank, 2011).

This perspective of seeing poverty as an occurrence that is multifaceted as significantly led to multidimensional poverty study with the use of the objective approach. Though there has not yet been a general agreement about the best multidimensional poverty measure, for example, which is the best way to carry out the complete analysis of poverty, there are some relevant studies that have been able to capture multidimensional poverty, in the sense of non-monetary dimension. Amongst these studies is Alkire and Housseini (2014).

In 2010, the global Multidimensional Poverty Index (MPI) was lunched, and this was developed by Oxford Poverty and Human Development Initiative (OPHI) and reported in UNDP's Human Development Reports. This MPI is an international measure of poverty covering 108 developing countries, and it captures eight non-monetary dimensions of poverty, and each dimension has its indicator (Alkire and Housseini, 2014, and Oxford Poverty and Human Development Initiative, 2008), which are shown in table 3.2 below.

**Table 3.2: Poverty Dimensions, Indicators and Measurements**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Dimensions  | Indicator(s) | Measurement  |
| 1 | Health  | 1. Child mortality
2. Nutrition
3. Health conditions
 | 1. No child mortality in the household
2. Nutritional information (adult or child) not malnourished
3. Health not a limiting factor in most regular activities

  |
| 2 | Housing conditions | 1. Electricity
2. Sanitation
3. Flooring material
4. Wall material
 | 1. Good sanitation conditions
2. Use of electricity as a major source of lighting
3. Improved flooring material
4. Improved wall material
 |
| 3  | Education  | 1. Years of schooling
2. Child school attendance
 | 1. Completion of primary education
2. School age attending school
 |
| 4 | Empowerment  | 1. Autonomy: health
2. Autonomy: religion
3. Autonomy: prevent crime/violence
4. Autonomy: employment choice
5. Autonomy: change things at individual level
6. Autonomy: change things at community level
 | 1. Ability to decide on health/health care
2. Ability to practice a religion
3. Ability to make decisions on crime/violence prevention
4. Ability to make employment choice
5. Ability to change things at level of individual
6. Ability to change things at community level
 |
| 5 | Physical safety | Crime/violence  | No incidence of crime/violence experienced  |
| 6 | Shame/humiliation | 1. Stigma of poverty
2. Shame proneness
3. External humiliation (external experience)
4. Internal humiliation (accumulated humiliation)
 | 1. Shame associated with poverty
2. Feeling prone to shame
3. Humiliation relating to be lessened in dignity
4. Humiliation relating to an internal feeling
 |
| 7 | Psychological well being | 1. Meaningfulness in life
2. Psychological autonomy
3. Competence
4. Relatedness
 | 1. Having a clear and satisfactory meaning in life
2. Being totally free to decide in what way to live
3. Generally competent in what one does
4. General ability to interact and get along with people
 |
| 8 | Employment  |  Quality of employment  | 1. Having 3 months of savings
2. No perceived likelihood of job loss
3. Occupational safety and health
4. Perceptions of being valuably employed
 |

Source: Oxford Poverty and Human Development Initiative 2008, Alkire and Housseini, 2014, Alkire, Conconi and Seth, 2014, and Ataguba, Fonta and Ichoku, 2011.

Above are the eight (8) non-monetary dimensions of poverty. However, according to Oxford Poverty and Human Development Initiative (2008), the perception-based indicators have less frequently employed in nationally representative surveys but these indicators have been subject to psychometric testing for reliability and validity, and they probably need to be further scrutinised, especially in the context of poorer countries.

Under MPI approach, the identification method for identifying those who are poor and those who are not, arises from particular dimension-specific cutoffs. From this perspective of dimension-specific cutoff, the deprivation level that is, the cutoff point is set for each indicator of non-monetary poverty so that those who are poor are separated from those who are not poor in each indicator. Those who are deprived are considered to be in poverty and those who are not deprived regarded as non-poor (Bourguignon and Chakravarty, 2003, and Alkire and Foster, 2008). For this study, this method will be adopted, that is, the uni-dimensional non-monetary poverty method because this study aims to estimate the effect of education on each dimension of poverty.

After identifying poverty from a uni-dimension cutoff point, the number of dimensions to which individuals are deprived are considered to identify multidimensional poor.

According to Alkire and Foster (2008), the most frequently employed identification standard of multidimensional poverty is referred to as union method of identification. Under this identification, someone is classified to be multi-dimensionally poor, if he or she is deprived in at least one of the set indicators (Alkire and Foster, 2008, and Alkire and Robles, 2016). If sufficiency in every dimension were indeed extremely important in keeping away from poverty, this methodology would be fairly intuitive and easy to apply. However, this approach is not unambiguously acceptable, suggested though not directly expressed in the popular measures such as Human Poverty Index (HPI) because it may not be helpful for distinguishing and targeting the poorest of the poor, mainly when there is a large number of dimensions. Moreover, deprivation in specific single dimension, for example, education or health may be reflective of something other than poverty (Alkire and Foster, 2008).

A second identification method is called the intersection method. In this approach, someone is classified as being in poverty, only if he or she is deprived in all dimensions. This standard would rightly determine those who are poor if sufficiency in any single dimension were sufficient to avoid poverty (Alkire and Foster, 2008).

A natural alternative identification method is to use cutoff level referred to as dual cutoff approach. This approach provides an intermediate option between the union and intersection methods of identification. Under this approach, someone is considered to be multidimensional poor in absolute poverty, if he or she is deprived of at least two or more dimensions and as in severe deprivation, if he or she is deprived in at least one dimension (Alkire and Foster, 2007).

Another alternative identification method is to use the number of indicators (or weighted sum) in which an individual has to be deprived to be considered poor. Under this approach, a person is identified as multidimensional poor if he or she is deprived in at least one-third of the weighted indicators (Alkire and Housseini, 2014, and Alkire, Conconi and Seth, 2014).

* + - 1. **Relative Approach Measure of Poverty**

This approach came into practice as a result of absolute poverty measure that failed to consider that inequality can cause poverty. In this case, those who are poor are the ones suffering from relative deprivation in a society (Wanka, 2014). This type of approach mostly uses income variable to construct a poverty line to differentiate those who are in poverty from those who are not (Instituto Nacional De Estadistica, 2010). For the relative poverty line, the cut-off point that is usually utilised is the second quintile or median (Instituto Nacional De Estadistica, 2010, and Wanka, 2014).

* + - 1. **Subjective Poverty Measurement Approach**

The view that the association of poverty is multidimensional and which significantly brought out the need to approach poverty study in a multifaceted way brings in light, the subjective approach to measure poverty. This approach is different from objective (absolute and relative) method because the feature of subjective poverty line to differentiate those who are poor from those who are not is decided based on people's opinion and belief in what they have concerning what it is to be poor. When this approach is used to measure poverty, it is concluded that each person is the best judge of his or her situations. Indeed, this idea is arguably the most important element of defining poverty (De Vos and Garner, 1991, Instituto Nacional De Estadistica, 2010, and Ravallion, 2012).

Subjective poverty lines fully identify that poverty lines are naturally subjective judgments make by people on what represents a socially acceptable minimum standard of living in a particular society. Mostly, this method is based on the survey responses to "minimum income question" (Kapteyn, Peter, and Willemse, 1990, Ravallion, 1992, and Instituto Nacional De Estadistica, 2010).

Under the subjective poverty line, there are some famous poverty lines, which include the Kapteyn poverty line and this will be explained below.

**3.4.2.3.1 The Kapteyn Poverty Line**

Under this approach, households are studied with the purpose of collecting data on the minimum income that each household believes is sufficient for survival or to meet certain conditions, and survey question is always asked from the household head (Kapteyn, Peter, and Willemse, 1990, Ravallion, 1992, and Instituto Nacional De Estadistica, 2010). The minimum income question is framed this way:

Which monthly income after tax has been deducted, do household like yours consider to be absolutely minimal to survive, that is to say that, with less, family like yours could not survive.

Under this hypothesis, the minimum income stated by the household to survive depends primarily on the number of household members, and after-tax monthly income, a model is constructed to link the three variables.

 ………………………….. eq. 1

Where represents the stated minimum income by the respondents to survive and is the dependent variable, represents the number of the household members, and represents after-tax monthly income, which are the independent variables and is a statistical residual.

The model is depicted in Figure 3.3 below, where the number of the household members is fixed and the level at which the minimum income is equal to the actual income.

**Figure 3.3: Subjective Poverty Line**



Source: Kapteyn, Peter, and Willemse, 1990, Ravallion, 1992, and Instituto Nacional De Estadistica, 2010.

The point at which the minimum income meets the actual income ( ) is the subjective poverty line. Households whose income is below this point are considered to be in poverty, and those above are not.

Since the position of the subjective poverty line depends on the size of the household. In this way, each household's size will have a distinct poverty line established using the data given on what they believe is necessary for surviving (Kapteyn, Peter, and Willemse, 1990, Ravallion, 1992, and Instituto Nacional De Estadistica, 2010).

**3.4.3 Choose and Estimate Poverty Indicators**

It is important to know that after obtaining a satisfactory measure of welfare and a poverty line, there are many poverty measurement tools to use to construct summary statistical measures of the extent of poverty in a society or country. Amongst such poverty measurement tools are Foster-Greer-Thobecke (FGT), Multidimensional Poverty Index (MPI), Human Poverty Index (HPI), to mention but few. The FGT is a type of poverty measurement tool that is used for monetary poverty measures while HPI and MPI are non-income poverty measurement tools.

**3.4.3.1 Monetary Poverty Measurement Tool**

Under the income poverty measure, the most frequently employed poverty measurement tool is the Foster-Greer-Thobecke (FGT) class of decomposable poverty measure. This type of measurement tool comprises of three measures, namely, the headcount index , the poverty gap index and the squared poverty gap index, which can also be called poverty severity index, . These measures are explained below.

**3.4.3.1.1 The Headcount Index** .

By far, according to Haughton and Khanker (2009b), the headcount index is the most commonly used measure, and it is often denoted by . Headcount index measures the percentage of the population that is categorised as "poor" or in other words, the percentage of the population living below the set poverty line in a country or society. The headcount index is expressed as:

 ------------------------------------------------------------------------------------------------- eq.1

Where represents the number of poor individuals, and represents the total population (or sample).

For reasons that will be clearer below, it is always helpful to rephrase eq.1 as

-------------------------------------------------------------------------------- eq. 2

Here, ) represents an indicator function that takes on the value of one (1) if the expression in the bracket is true and 0 if not. Therefore, if the expenditure/income ( falls below the poverty line , then ) equals 1, and the individual/household will be considered as poor.

The remarkable qualities of the headcount index are that it is easy to construct and simple to understand. These qualities are essential qualities. However, headcount index still has its shortcomings (Haughton and Khanker, 2009b).

Firstly, the headcount index does not account for the poverty's intensity (Haughton and Khanker, 2009b).

Secondly, the headcount index does not show how poor the poor are and therefore does not change if individuals below poverty threshold become poorer (Haughton and Khanker, 2009b).

**3.4.3.1.2 Poverty Gap Index**

Poverty gap index is a moderately popular poverty measure, which adds up the extent to which individuals on average fall under the poverty threshold, and expresses it as the percentage of the poverty line. In a clear picture, this poverty measure defines the poverty gap () as the poverty line less actual income for those who are poor, the gap is considered to be zero for everyone else (Haughton and Khanker, 2009b). Using the index function is shown as:

----------------------------------------------------------------------------- eq. 3

Then the poverty gap index is stated as:

------------------------------------------------------------------------------------------- eq.4

The advantages of this measure are that it shows the average shortfalls of poor individuals, thus giving a clear image of depth of poverty, and also, it helps to easily think of the cost of eradicating poverty (relative to the poverty line) because it indicates the amount needed in an economy to transfer to the poor in order to move their income and expenditure up to the poverty line (Haughton and Khanker, 2009b, and Makoka and Kaplan, 2005). The main shortcoming of the poverty gap index is that it does not account for the differences in the severity of poverty between poor individuals and disregard inequality and poor individuals themselves (Wanka, 2014).

**3.4.3.1.3 The Square Poverty Gap Index**

Constructing a poverty measure that considers inequality among the poor, the squared poverty gap index is used (Haughton and Khanker, 2009b). This poverty measure is solely a weighted sum of poverty gaps (as the proportion of the poverty line), and here, the weights are the proportionate poverty gaps themselves, for example, a poverty gap of 20% of the poverty line is given a weight of 20%, while the poverty gap of 40% is given a weight of 50%, this is in contrast to the poverty gap index, where they are equally weighted. Therefore, the measure implicitly puts more weight on observations that fall well below the poverty threshold by squaring the poverty gap index (Haughton and Khanker, 2009b).

The Square poverty gap index is stated as:

--------------------------------------------------------------------------------------- eq.5

The advantages of the squared poverty gap index are, apart from apprehending the gap between individuals from the poverty line that is, the poverty gap, it points out also the inequality among the poor people (Ravallion, 1992). Although it weights the poorest of the poor more heavily in its estimation, it is not widely used because it is not easy to interpret as headcount index and poverty gap index (Haughton and Khanker, 200b).

**3.4.3.2 Non-monetary Poverty Measurement Tool**

Under the non-monetary poverty measurement tool, there are Multidimensional Poverty Index (MPI), Human Poverty Index (HPI) and Human Development Index and these measurement tools are composite index tool that assesses multiple non-monetary poverty. That is, they all are measurement tool that indicates multiple non-monetary poverty in an aggregate poverty index. However, the most commonly and recently used is MPL.

MPL comprises of three measures, namely the dimension adjusted headcount ratio , dimension adjusted poverty gap , and dimension adjusted square poverty gap (Alkire and Foster, 2008). These measures will not be developed as the focus of this study is not to aggregately indicate poverty but to estimate the effect of education on each dimension of poverty.

**3.5 The Difference Between this Study’s Measurement of Poverty and Multidimensional Poverty Index (MPI)**

The first Sustainable Development Goal of the 2030 agenda calls for eradicating poverty in all forms and dimensions (United Nations, 2019a). Therefore, recognizing that poverty is an occurrence that is multidimensional, which comprises both monetary and non-monetary dimensions. Although, many attempts to measure poverty have centre attention on the monetary measure of poverty and only a few studies, such as Adetola and Olufemi (2012), Adetola (2014), Ataguba, Fonta and Ichoku (2011) and Alkire and Houssenni (2014) have been able to capture the multidimensional poverty, in the sense of non-monetary dimension and these studies have indicated poverty based on aggregate multidimensional poverty index.

The main aim of this study is to examine the impact of education on both monetary and non-monetary dimensions of poverty, particularly on the multiple non-monetary dimension. For this, the poverty measurement is different from the Multidimensional Poverty Index (MPI), and this is explained below:

This study takes an innovative approach in poverty measure because it highlights the fact that people suffer from multiple deprivations, which income is only one of these multiple dimensions on which many attempts to measure poverty have focused. Moreover, it identifies the people suffering deprivation in each aspect, particularly on the non-monetary measure of poverty.

There are four (4) hypotheses under this measure of poverty, which are hypothesis 2 – hypothesis 5, and each hypothesis has a set deprivation threshold as follows:

A household is considered deprived in the health dimension if any of the house members has at least one type of the self-reported illness or injury that includes malaria, tuberculosis, yellow fever, typhoid, cholera, diarrhoea, meningitis, chickenpox, pneumonia, common cold and injury (hypothesis 2). In the housing conditions dimension, if the household suffers from at least one of the conditions that include household without flooring, i.e. a mud or dung floor, inadequate roofing and wall material household using firewood, coal as the main source of cooking fuel and those without electricity, solar and other improved sources as lighting material (hypothesis 3). In the children education dimension if the household has at least one school-aged child (5 – 18 years old) not enrolled in school (hypothesis 4), and in the child mortality dimension if the household suffered a death of one or more children (less than five years old) (hypothesis 5).

Whereas, under MPI approach that identifies multiple non-monetary deprivations at the household and individual level in health, housing conditions, education empowerment, physical safety, shame/humiliation, psychological well-being and employment, although there are different deprivation cut-off points (as shown in section 3.4.2.1.2) to differentiate poor from non-poor. Someone is classified as poor or non-poor depending on the weighted aggregate number of deprivations he or she suffers. That is, for example, according to “alternative identification method” which is one of the different deprivation cut-off points (as shown in section 3.4.2.1.2), a person is classified to be multidimensional poor if he or she is deprived in at least one-third of the weighted indicators of poverty (Alkire and Housseini, 2014, and Alkire, Conconi and Seth, 2014).

**3.6 Conclusions**

As presented above, the definition of poverty varies with different perspectives. Therefore, one can conclude that there is no universal definition of poverty. Poverty is defined mainly in terms of income/consumption, capability, basic needs and social exclusion approaches, and this suggests that the possibility of achieving poverty reduction target necessitate different policies.

The attempts to measure poverty have mainly centre attention on the traditional measure of poverty, which is income-based perspective and poverty is multidimensional in nature. Hence, the study will focus on Multidimensional poverty, that includes monetary (income-based) measure and non-monetary (deprivation-based) measure of poverty.

There is a gradual expansion towards the set of dimensions expressed by the concept of poverty. At the present time, it is widely considered that those who are poor cannot be measured in isolation from their socio-economic environment. Moreover, it is often postulated that the relevant standard against which they should be compared is featured by a wide range of factors which are subject to change over time (as a result of advanced technology of societies) and across countries. It is worth noting that, a typical example of this view is closely associated with the relative concept of poverty.

All the definitions by the authors and institutions presented above are not limited to a specific set of concept but range from the absolute to the relative idea of poverty.

**CHAPTER FOUR: RESEARCH METHODOLOGY**

**4.1 Introduction**

Aiming to estimate the effect of education on household poverty in Oyo state, Nigeria in this study identified from the above review that poverty is influenced by a wide range of factors, in which education is one of them. However, education was acclaimed to be the most important source in poverty reduction than other factors (Food and Agriculture Organization of the United Nations, 2005). I hypothesised that education is negatively associated with poverty both economic (income) and non-economic (health conditions, children education, child mortality and housing conditions) dimensions.

My approach is to estimate the effect of education in the context of a more general model explaining poverty reduction. This model tests and allows for other variables which include gender, location, age, marital status as well as household size. In general, this empirical analysis is aimed to display whether a specific variable, for example, education, affects poverty once allowance has been made for other determining variables, some of which may be to some extent associated with the outcome variable the study is wanting to know.

The study obtained data from the General Household Survey (GHS)-Panel wave 3 of 2015/2016 conducted by the National Bureau of Statistics in Abuja, Nigeria, and employed statistical modelling technique (probit regression model) to estimate the effect of education and other variables on poverty. Most of the existing empirical studies in this area in Nigeria have explored the income poverty and the correlates. Besides, only few existing studies which are Adetola and Olufemi (2012), Adetola (2014) and Ataguba, Fonta and Ichoku (2011) that have examined the effect of education on non-economic dimension of poverty such as housing characteristics, health, education, employment, employment quality, physical safety, empowerment, shame/humiliation, safe drinking water, sanitation, nutrition, education and assets. However, estimated those highlighted dimensions of poverty indiscriminately. At best, only leads to a partial understanding of this issue since the effect of education on different non-monetary aspects of poverty are not known.

In order to target poverty using education as a capable instrument, there is a need to carry out an analysis of the effect of education on each dimension of poverty in Nigeria. Therefore, we are now modifying the existing analyses to Oyo state, Nigeria by examining the impact of education on each aspect of poverty, using relevant and recent data sources.

The focus of this study will be to approach the non-economic dimension of poverty uni-dimensionally, and this dimension includes poor health conditions, poor housing conditions, poor children educational attainment, and child mortality.

To detail this chapter, section 4.2 presents the source of the data collected and used in this study. Section 4.3 gives the structure of poverty lines and its derivations. Section 4.4 model the determinants of poverty. Section 4.5 provides the model for regression analysis. Section 4.6 informs the test of reliability and validity of the study. Section 4.7 describes the data used. Following this, section 4.8 presents the concluding part.

**4.2 Data Source**

To evaluate the effect of education on household poverty in Oyo state, Nigeria, I utilise data which are secondary and at the level of the household. Data are raw secondary data mainly collected from the General Household Survey (GHS)-Panel wave 3 of 2015/2016 conducted by the National Bureau of Statistics (NBS), Nigeria. All data were obtained from the office of National Bureau of Statistics in Abuja, Nigeria.

The GHS-Panel households were visited twice. First after the planting season (post-planting) between August and October and second after the harvest season (post-harvest) between February and April. Regardless of whether household engaged in agriculture work, all families were paid a visit twice (World Bank, 2017).

The purpose of this survey is to provide data that can be used for regular monitoring of living standards and thus formulate policies aimed at improving the lives of population groups of the society, especially the poor Nigerians. The sample design of the GHS-Panel allows researchers to analyse data nationally and by geographical zones (at both urban and rural level), and the GHS-Panel data contains information for 5,000 households at the national level and 201 households for Oyo state, Nigeria (World Bank, 2017). However, the actual sample size used for this study is 186 respondents due to some missing information.

**4.3 Structure of Poverty Lines**

The analysis of poverty in this study is established on the absolute monetary and non-monetary measure of poverty as the aim of the study is to estimate the determinants of monetary and non-monetary poverty aspect.

The absolute monetary measure of poverty has two absolute income poverty lines, which are food poverty line and cost of basic needs poverty line and these poverty lines in their simplest term indicate a demarcation line on which those who are in poverty and not in poverty will be separated. Moreover, the absolute non-monetary measure of poverty has a deprivation threshold that differentiates those who are poor from those who are not. Therefore, construction of a poverty line or threshold is certainly a precondition to move forward in the analysis of poverty.

**4.3.1 Derivation of the Poverty Lines**

In the most recent studies in Nigeria such as the National Bureau of Statistics (2012) adopted both the food poverty line and cost of basic needs poverty line, and Anyanwu (2010 and 2012) employed only the cost of basic needs poverty line, which is used in this study. A potential reason for adopting the cost of basic needs method is that it accounted for both the food and non-food items.

Under this poverty line, there is only one (1) hypothesis, which is hypothesis 1. The poverty line for this hypothesis is approached based on National Bureau of Statistics (2012) that set the cost of basic needs poverty line with the application of adult equivalent per capita expenditures approach.

Total real per capita expenditures was used as a proxy for the monetary measure of the households in the dataset. Households were determined to be in poverty or not in relation to their level of total expenditure (food and non-food items). To do this, according to the Recommended Dietary Allowance (RDA) of 3000 calories intake per equivalent adult per day for Nigeria, recommended by World Health Organization (WHO) (National Bureau of Statistics, 2012). The required amount in naira needed to purchase food that will meet 3000 calories in addition to the amount required in naira to buy non-food items will give the "cost of basic needs poverty line".

National Bureau of Statistics (2012), constructed the cost of basic needs poverty line using the exchange rate of naira to US$1 per day poverty line in 2009/2010 prices which stood at #150.00 per day. For this study, this figure of US$1 is replaced by US$1.90 per day as the latest World Bank "dollar a day" poverty line (Ferreira, 2015), and the poverty line for this study is constructed using the exchange rate of naira to US$1.90 in 2015 prices which gave #378.251 per day and amounts to #11,348 per month. A potential reason for the exchange rate in 2015 prices is that the dataset used for this study was collected in 2015/2016. # is a symbol of Nigeria currency (naira).

The approach used in the most recent studies on the non-monetary measure of poverty in Nigeria such as Ataguba, Fonta and Ichoku (2011), Adetola and Olufemi (2012), and Adetola (2014) to differentiate those who are poor from those who are not is the deprivation threshold method and is used in this study.

There are four (4) hypotheses under this measure of poverty, which are hypothesis 2 - hypothesis 5 and each hypothesis has a set deprivation threshold. For hypothesis (2), the deprivation threshold is set based on the type of self-reported illness or injury during the past four (4) weeks (malaria, tuberculosis, yellow fever, typhoid, cholera, diarrhoea, meningitis, chicken pox, pneumonia, common cold and injury) used as proxy for the non-monetary measure of the household in the dataset. A household is determined to be poor if any of the household members suffer from at least one type of self-reported illness or injury mentioned above.

For hypothesis (3), the deprivation threshold is set based on the indicators of poor housing conditions (no flooring, i.e. a mud or dung floor, inadequate roofing and wall material, firewood, coal as main source of cooking fuel, no electricity, solar and other improved sources as main lighting material) used as proxy for the non-monetary measure of the household in the data set. A household is regarded to be in poverty if the household suffers from at least one of the indicators highlighted above.

For hypothesis (4), school-aged child (age 5 – 18 years old) registered in school was used as the proxy for the non-monetary measure of the household in the dataset. A Household is considered to be poor if the household has at least one school-aged child not registered in school at the time of the survey.

Lastly, for hypothesis (5), the death of a child (less than five years old) in a household was used as the proxy for the non-monetary measure of the household in the data set, and a household was determined to be in poverty if the household suffered a death of one or more children.

The deprivation threshold for these hypotheses is modified to Santos and Alkire (2011) who identify poverty as that household who is deprived in each dimension of the non-monetary measure of poverty.

In order to pinpoint the factors or variables associated with poverty, the details of the model will be shown below.

**4.4 Structure of Models**

In this study, five (5) hypotheses will be tested as formulated in chapter 3. Each hypothesis is a solid question. Hence, the most appropriate model will be considered for each hypothesis.

Let us start with the effect of education on income poor through.

H1 suggests that:

**H1:** Education is negatively associated with income poverty. That is, the higher the educational level of the household head, the lower the probability of the household being income poor.

To model the determinants of income poverty, I considered the following empirical studies, Weber et al. (2007).

Based on Weber et al. (2007), a probit model was estimated:

=

In the model, denotes predicted non-metro - metro migration, represents the educational level of the household head, denote the age of the household head, represents the racial group of the household head, refers to the marital status of the household head, represents the size of the household and denotes region area of the household.

Based on the above relevant literature and availability of data, the following model is estimated for H1:

*.*

For the development of this model, Weber et al. (2007) above was considered. There is a possible number of covariates available, for example in this study, eight (8) factors have been identified. While I could build a model incorporating all these factors, it is not possible. This is because the available data does not have all the factors. Therefore, some of these factors were captured based on the availability of data.

 In addition, all the captured factors were selected using a practical approach of model selection based on the test of multicollinearity. The test of multicollinearity was carried out to be certain about the isolation of the association between each independent variable and dependent variable in H1 and the results shown in (Appendix 1) indicate that multicollinearity is not present in the data under study.

Let us now pinpoint the effect of education on non-income poor, which is the focus of this study through hypothesis 2 to hypothesis 5.

Based on H2:

**H2:** Education is negatively associated with poor health conditions. In other words, the higher the educational level of household head, the lower the probability of him and his family having poor health conditions.

To model the determinants of poor health conditions, I considered Ataguba, Fonta and Ichoku (2011).

Ataguba, Fonta and Ichoku (2011) estimated a probit model:

In the model, denotes the householder's status of current health, represents the size of the household, is the age of the household head, refers to the marital status of the household head, represents the gender of the household head, whether male or female, denotes the occupational group of the household head and refers to the location of the household, whether rural or urban area.

The following model is estimated for H2 based on the relevant literature considered above and availability of data.

Based on H3:

**H3:** Education is negatively associated with poor housing conditions. That is, the higher the educational level of the household head, the lower the probability of household living under poor housing conditions.

The following model is estimated for H3 based on Ataguba, Fonta and Ichoku (2011) considered above and availability of data.

Based on H4:

H4: Education is negatively associated with poor children educational attainment. That is, the higher the level of education of the household head, the lower the probability of having children with poor educational attainment.

To model the determinants of poor children educational attainment and child mortality, the study considered Adetola and Olufemi (2012).

Adetola and Olufemi (2012) estimated a logistic model:

In this model, a child's age, and child's gender denote child characteristics, father's education, mother's education, father's occupation denote parent characteristics, size of household, household size squared, wealth index, ethnicity, region, presence of health facility and number of women who birthed first kid at age 16 years denote household characteristics.

The following model is estimated for H4 based on capturing some of the highlighted determinants of poverty in the model for Adetola and Olufemi (2012), however, with little adjustment as children educational attainment was not estimated in their model and children educational attainment is one of the poverty dimensions shown in table 2.2.

Based on H5:

H5: Education is negatively associated with child mortality. That is, the higher the level of education of parent, the lower the probability of having child mortality.

The following model is estimated for H5 based on the availability of data and Adetola, and Olufemi (2012) estimated logistic model, however with little adjustment as child mortality was not highlighted in their model, of which child mortality is one of the poverty dimensions as shown in table 2.2. Besides, the variables associated with H5 is specified differently from H4 because I aim to separately estimate the effect of a father's education and (mother's) education on child mortality since investments in child health and thus reduce child mortality require both parental money and responsibility and their education influences these inputs.

 The description and coding of the variables of Hypothesis 1 - Hypothesis 5 are provided in table 4.1.

**4.5 Model for Regression Analysis**

According to the studies reviewed in chapter 2, there have been many of these studies that have used a statistical model to decide the association between educational attainment and poverty.

The statistical model employed by these studies is the probability model such as linear, probit and logistic. However, there are associated drawbacks to the linear probability model, and these are provided below.

The Linear Probability Model (LPM) which is one of the probability models employed by the studies reviewed can be used when modelling for poverty to estimate the coefficients. However, there are inherent problems with this model often the case when applied to determine a model with the dichotomous dependent variable (Gujarati, 2015), which is poverty in this case. The problem includes:

* Unbounded predicted probabilities: the basic property of probability states that the likelihood of an event occurring must lie between 0 and 1. However, the nature of LPM is such that doesn’t make sure this fundamental property of probability is not violated. Although, some predicted probabilities from an LPM might have values (between 0 and 1), some predicted probabilities may also have values that are less than 0 and greater than 1, meaning, there is no restriction in the LPM estimation that ensures all the probabilities predicted are contained between 0 and 1 (Aldrich and Nelson, 1984 and Gujarati, 2015).
* Non-normality of the error term: it is assumed in statistics that for each set of values for the independent variables, the error term is normally distributed. However, in LPM, this assumption cannot hold when the error term is only free to take the values of 0 and 1 (Gujarati, 2015).
* Heteroskedasticity: one of the assumptions of Classical Linear Regression Model (CLRM) is that error term is homoskedastic (that is, all disturbances have the same variance). However, this assumption is violated in LPM as the error term in an LPM is heteroskedastic (that is the variance isn’t equal). Consequently, the traditional t-test for individual significance and F-test for overall significance are invalid. (Gujarati, 2015).

In contrast, the probit model and logistic model which are used in most of these studies reviewed, for example, Botha (2010), Njong (2010), Faux and Ntembe (2013), Wanka (2014), Geda et al (2005), Okojie (2002), Anyanwu (2010), Apata et al (2010), Ataguba, Fonta and Ichoku (2011), Anyanwu (2012), Adetola and Olufemi (2012) ensure that the predicted probabilities are indeed contained between 0 and 1 (Gujarati, 2015). This study, therefore, employs probit model to estimate the effect of education on household poverty in Oyo state, Nigeria.

This probit model, according to Gujarati (2015) is a qualitative response regression model, that is where the regressand has a binary variable which is often referred to as a probability model. A dichotomous response model is a model whereby the dependent variable only takes two values. In this case, the dependent variable which is poverty has only two values, either the household is poor which carries the value of (1) or non-poor which takes the value of (0). The aim of the study here is to estimate the probability of being poor which takes the value of (1).

The precise form of the probit model is stated as:

Poverty--------------------------------------------------------------------------- eq. 1

Where is the constant, is the vector coefficients related to the predictor variables, and is the error term, theme to the standard normal distribution. In a probit regression model, it is let to understand that, even though the values, 0 and 1 are observed for Y, there is an unobservable variable (also referred to as a latent variable) that determines the value of Y (Gujarati, 2015).

Let’s assume that there are latent variables that is expressed as,

 ……………………….eq. 2

In a linear regression model, is directly observed, but in probit,

……………………………………………………………………………..eq. 3

Since the study is concerned with ,

 …...........................................................................................................................eq. 4

Let’s assume error terms are normally distributed, ,

……………………………………………………………………… eq. 5

In a binary response model, the primary target is concerned with the response probability specified as:

………………………………………….eq. 5

Where denotes the probability that a household is poor given the values of the explanatory variables. To eliminate the imperfections of the LPM, the study make the following assumptions:

, the probit model assumes that follows a normal cumulative distribution and is written as (Gujarati, 2015),

 ……………………………………………………eq. 6

Fitting the probit regression model to data, equation (5) is re-written as:

………………………………………………………………………………………………eq. 7

………………………………………………………………………………………………eq. 8

………………………………………………………………………………………………eq. 9

The description and coding of the variables are provided in table 4.1.

**4.6 Tests of Reliability and Validity**

When estimating the models for this study, there is a need to test for reliability and validity of the estimate of the parameters, and this is often very crucial in statistical analysis. There are several tests of statistics used in testing the reliability and validity of the estimate of the parameters. However, in this study, Significant Level Test and Wald Test will be used, and these are detailed below.

**Significant Statistical Test:** This significant statistical test is used to determine the statistical significance of each parameter estimate. If statistical significant test result is less than the P-value scale of evidence, the study rejects the null hypothesis and accepts the alternative hypothesis. Alternately, if the significant statistical test result is higher than the P-value scale of evidence, the study accepts the null hypothesis and rejects the alternative hypothesis (Salkind, 2010).

**Wald Test:** This is one of the significance tests that find out if all independent variables in the model are significant. This test is sometimes called the Wald Chi-Square Test and can be used for a multitude of different models including those with continuous variables or binary variables which is the case in this study (Salkind, 2010).

Moreover, as stated above that is often crucial to know the reliability and validity of the estimate of the parameters in statistical analysis. Hence, study emphasis is to know whether there is any significant impact of educational attainment on poverty in Oyo state's household.

**4.7 Data Description**

The specific details of the variables included in the study are provided in table 4.1 below. The dependent variables include income poor, poor health conditions, poor housing conditions, poor children educational attainment and child mortality and also include the code for the variables. The estimated variables utilised probit model. Therefore, the study will employ dummy/dichotomous variables (0,1). In the hypothesis (1) equation, which the dependent variable is income poverty will take the value of (1) if the household is income poor and value of (0) if non-poor. For this task, the focus is on household total consumption expenditures in the dataset and poverty line is set. For the hypothesis (2) equation, the dependent dichotomous variable takes the value of (1) if any of the household members has poor health conditions, and value of (0) if otherwise and for this task, the focus is on the type of self-reported illness or injury in the dataset and deprivation threshold is set. In the hypothesis (3) equation, the dependent dichotomous variable carries the value of (1) for the household living under poor housing conditions, and value of (0) if otherwise and for this task, the focus is on the indicators of housing dimension in the dataset and deprivation threshold is set. In the hypothesis (4) equation, the dependent dichotomous variable carries the value of (1) for the household having poor children educational attainment and value of (0) if otherwise, and for this task, the focus is on school-aged child (age 5 – 18 years old) enrolled in school in the dataset and deprivation threshold is set, and the last hypothesis equation, which is hypothesis (5) takes the value of (1) if household has recorded child mortality and value of (0) if not so and deprivation threshold is set. For this task, the focus is on the household record of any death of child under the age of five (5) years old.

The explanatory variables defining each household comprise of household head's level of education [none education (reference category), primary, secondary and tertiary (teacher training, Nigeria Certificate in Education (NCE), modern school, vocational/technical courses, polytechnics, professional courses, first degree and higher degree combined as they all fall under the third level of education, which is also referred to as tertiary education], educational level of the father [none education (reference category), primary, secondary and tertiary], educational level of the mother [none education (reference category), primary, secondary and tertiary], gender classification [male (reference category) and female] of the household head, location type of the household [urban (reference category) and rural), marital status of the household head [widowed (reference category), married, and unmarried], size of the household [1- 2 persons (reference category), 3 – 5 persons, 6 – 8 persons and 9 and above persons ], and the age of the household head [20 – 34 years old (reference category], 35 – 44 years old, 45 – 59 years old, and 60 and above years old), and the code for the independent variables is included using dummy variables (0,1).

**Table 4.1 Dependent and Independent Variables**

|  |  |
| --- | --- |
|  | **Dependent Variables**  |
| Income poor  | \*dummy, the total household consumption expenditures, = 1 if a household is income poor (that is, if a household total consumption expenditures is below #11, 348), = 0 if otherwise. |
| Poor health conditions  | \*dummy, self-reported illness or injury includes malaria, tuberculosis, yellow fever, typhoid, cholera, diarrhoea, meningitis, chicken pox, pneumonia, common cold and injury, = 1 if any of the household members has at least one type of illness or injury highlighted, = 0 if otherwise. |
| Poor housing conditions  | \*dummy, poor housing conditions includes household without flooring i.e. a mud or dung floor, inadequate roofing and wall material household using firewood, coal as main source of cooking fuel and those without electricity, solar and other improved sources as main lighting material, = 1 if a household suffers from at least one of these conditions, = 0 if otherwise. |
| Poor children educational attainment  | \*dummy, includes at least one school-aged child (5 – 18 years old) not registered in school, = 1 if a household has at least one school-aged child not enrolled in school, = 0 if otherwise. |
| Child mortality  | \*dummy, includes death of a child (less than five years old) in a household, = 1 if a household suffered a death of one or more children, = 0 if otherwise.  |
|  | **Independent Variables**  |
| HHLE  | Educational level of the household head:  |
| None education\*dummy, 1= none education, 0= otherwise. (This category will be the reference category in the regression). |
| Primary education\*dummy, 1= primary education, 0= otherwise.  |
| Secondary education\*dummy, 1= secondary education, 0= otherwise.  |
| Tertiary education\*dummy, 1 = tertiary education, 0 = otherwise.  |
| FLE | Father’s educational level: |
| None education\*dummy, 1= none education, 0= otherwise.(This category will be the reference category in the regression). |
| Primary education\*dummy, 1= primary education, 0= otherwise. |
| Secondary education\*dummy, 1= secondary education, 0= otherwise. |
| Tertiary education\*dummy, 1= tertiary education, 0 = otherwise. |
| MLE  | Mother’s educational level: |
| None education\*dummy, 1= none education, 0= otherwise.(This category will be the reference category in the regression). |
| Primary education\*dummy, 1= primary education, 0 = otherwise. |
| Secondary education\*dummy, 1= secondary education, 0= otherwise. |
| Tertiary education\*dummy, 1 = tertiary education, 0 = otherwise. |
|  | **Control Variables**  |
| GENDER | Gender of the household head:  |
| Male\*dummy, 1 = male, 0 = otherwise.(This category will be the reference category in the regression). |
| Female\*dummy, 1 = female, 0 = otherwise.  |
| LOCATION | Location type of the household:  |
| Urban\*dummy, 1 = urban, 0 =otherwise. (This category will be the reference category in the regression). |
| Rural\*dummy, 1 = rural, 0 = otherwise.  |
| MSTA | Marital status of the household head:  |
| Widowed\*dummy, 1 = widowed, 0 = otherwise.(This category will be the reference category in the regression). |
| Married\*dummy, 1 = married, 0 = otherwise.  |
| Unmarried\*dummy, 1 = unmarried, 0 = otherwise.  |
| HHSIZE | Size of the household: |
| 1 – 2 persons HH\*dummy, 1 = 1- 2 person HH, 0 = otherwise.(This category will be the reference category in the regression).  |
| 3 – 5 persons HH\*dummy, 1 = 3 – 6 person HH, 0 = otherwise. |
| 6 – 8 persons HH\*dummy, 1 = 7 – 9 person HH, 0 = otherwise. |
| 9 above persons HH\*dummy, 1 = 9 above person HH, 0 = otherwise. |
| AGE  | Age of the household head  |
| 20 – 34 years old\*dummy, 1 = 20 – 34 years old, 0 = otherwise.(This category will be the reference category in the regression). |
| 35 – 44 years old\*dummy, 1 = 35 - 44 years old, 0 = otherwise.  |
| 45 – 59 years old\*dummy, 1 = 45 – 59 years old, 0 = otherwise. |
| 60 and above years old\*dummy, 1 = 60 and above years old, 0 = otherwise. |

Source: author’s description of dependent and independent variables.

**4.8 Conclusions**

A probit regression model is employed to estimate the effect of education and other explanatory variables, which are noted as control variables on poverty in this study.

In the probit model, the dependent variable (Y), which is poverty has a binary nature, which carries a value of (1) if the household is poor and value of (0) if non-poor. The aim of the study here is to estimate the probability of being poor that takes the value of (1).

The explanatory variables in this thesis are the educational level of household head, father’s education, mother’s education, gender of the household head, household location, age of the household head, size of the household and marital status of the household head. These variables are specified based on the existing studies reviewed (shown in section 4.4) and availability of data.

The Poverty indicators are income poor, poor health conditions, poor housing conditions, poor children educational attainment and child mortality.

It is often crucial to know the reliability and validity of the estimate of the parameters in statistical analysis. Hence, this study emphasises to know whether there is any significant impact of educational attainment on household poverty in Oyo state, Nigeria, and a statistical significance test is employed.

The study utilises data mainly collected from the Nigeria General Household Survey (GHS)-Panel wave 3 of 2015/2016 conducted by the National Bureau of Statistics (NBS). All data were obtained from the office of National Bureau of Statistics in Abuja, Nigeria.

**CHAPETR FIVE: DATA ANALYSIS AND INTERPRETATION OF RESULTS**

**5.1** **Introduction:**

As discussed earlier that the main aim of this study is to examine the effect of educational attainment on poverty in Oyo state household. The purpose of this chapter is to present the empirical results and interpret the results obtained from the data used and collected from General Household Survey (GHS)-Panel wave 3 of 2015/2016 conducted by National Bureau of Statistics (NBS), Nigeria. Chapter 3 reviewed the empirical studies and the independent variables and the modelling approach in this study is based on these empirical studies. This modelling approach is detailed in chapter 4. Probit regression model was run in Stata to estimate the effect of education and other explanatory variables on the probability of a household being poor and are presented in this chapter. This chapter is organised as follows: section 5.2 presents descriptive statistics of the results obtained, section 5.3 presents the results of the probit regression model and interpretation of results. Section 5.4 provides the conclusion.

**5.2 Descriptive Statistics**

This section provides the descriptive statistics for Oyo state household. The subsection 5.2.1 - 5.2.7 presents the extent of income poverty in Oyo state, including income poverty headcount, income poverty gap, and squared income poverty gap amongst the different levels of household head education, gender of the household head, location of the household, age of the household head, size of the family, and marital status of the household head.

Subsection 5.2.8 – 5.2.14 provides the share of poor health conditions in Oyo state household amongst the different levels of household head education, gender of the household head, location of the household, age of the household head, size of the household, and marital status of the household head.

Subsection 5.2.15 – 5.2.21 presents the share of poor housing conditions in Oyo state household amongst the different levels of household head education, gender of the household head, location of the household, age of the household head, size of the family, and household head's marital status.

Subsection 5.2.22 – 5.2.27 presents the share of poor children educational attainment in Oyo state household amongst the different levels of household head education, gender of the household head, location of the household, age of the household head, and size of the household.

Subsection 5.2.28 – 5.2.33 gives the share of child mortality in Oyo state household amongst the different levels of father education, mother education, location of household, age of the household head, and size of the household.

Subsection 5.2.34 and subsection 5.2.35 provide the share of the educational level according to household location and gender of the household head. Following this, subsection 5.2.36 presents the share of educational level of the father and mother.

**5.2.1 The Extent of Income Poverty in Oyo state, Nigeria**

In Table 5.1 below, the extent of income poverty in Oyo state, Nigeria is presented using the poverty line of #11,348. It is seen that the income poverty headcount index for Oyo state households represents 59.1%, and this figure shown is evidence that 59.1% of the families in Oyo state are income poor since their households' total consumption expenditure for the time of this survey is below the set poverty line.

The income poverty gap index is 29.2%, which represents households which their average consumption expenditure falls under the established poverty line. This figure gives a clear image of the depth of poverty of Oyo state poor households. Hence, indicating the amount needed to be transferred to each poor household below the set poverty line to move their income and expenditure up to the set poverty line.

The income squared poverty gap index is 0.36%, which represents the poorest of the Oyo state poor households that needed an exceptional consideration by the people involved in formulating policies in the distribution of social amenities (e.g. clean water, clean air, sanitation, food, education, health care facilities and generating income activities) that will help them meet their basic standard of living.

**Table 5.1: Income poverty figure households including poverty headcount, poverty gap and squared poverty gap for Oyo State**

|  |
| --- |
|  **Poverty Line:** #11,348, # is the symbol of Nigeria currency (naira) |
| **Income Poverty Measure**  | **Percentage of income poor**  |
| Income Poverty Head count  | 59.1 |
| Income Poverty Gap | 29.2 |
| Income Squared Poverty Gap  | 0.36 |
| Observations  | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.2 Education and Income Poverty**

The extent of income poverty according to the highest level of education of the household heads (Table 5.2). Regarding the income poverty headcount, it is shown that the income poverty headcount index is higher (94.1%) for the none level of education of the household heads compared to the tertiary level of education of the household heads (22%).

The income poverty gap index for the households with none level of education of the household heads is 57% compared to families with the tertiary level of education of the household heads of 7%. The income squared poverty gap index shows 0.70% for households with none level of education of the household heads whereas shows 0.11% for families with tertiary level of education of the household heads and these findings show the poorest of the poor households in Oyo state that needed consideration in the share of the social amenities by the policymakers in order to help improve their standard of living.

**Table 5.2: Income poverty figure households in Oyo State by household head highest level of education**

|  |
| --- |
|  **Poverty Line:** #11,348 |
| **Income Poverty Measure**  | **Frequency**  | **Percentage of income poor** |
| **Household Head Educational Level**  |  |  |
| **None**  | 34 |  |
| Income Poverty Head count  |  | 94.1 |
| Income Poverty Gap |  | 56.5 |
| Income Squared Poverty Gap  |  | 0.70 |
| **Primary** | 48 |  |
| Income Poverty Head count  |  | 87.5 |
| Income Poverty Gap |  | 45.6 |
| Income Squared Poverty Gap  |  | 0.58 |
| **Secondary**  | 44 |  |
| Income Poverty Head count  |  | 52.2 |
| Income Poverty Gap |  | 20.8 |
| Income Squared Poverty Gap  |  | 0.29 |
| **Tertiary**  | 60 |  |
| Income Poverty Head count  |  | 21.6 |
| Income Poverty Gap |  | 6.77 |
| Income Squared Poverty Gap  |  | 0.11 |
| Observations  | 186 |  |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.3 Gender and Income Poverty**

Given the presence of the Oyo state households, the figures shown in the Table 5.3 below show that the share of income poverty headcount index is higher (81%) for households with female-headed compared to male-headed of 53%.

For the income poverty gap index, it is shown that the depth of income poverty for poor households is higher (50%) for female-headed compared to male-headed (23%). In addition, the household income squared poverty gap index shows 0.58% for female-headed and 0.31% for male-headed.

**Table 5.3: Income poverty figure households according to gender of the household head in Oyo state**

|  |
| --- |
|  **Poverty Line:** #11,348 |
| **Income poverty Measure**  | **Frequency**  | **Percentage of income poor** |
| **Male**  | 144 |  |
| Income poverty Head count  |  | 52.8 |
| Income poverty Gap |  | 23.1 |
| Income squared Poverty Gap  |  | 0.31 |
| **Female**  | 42 |  |
| Income poverty Head count  |  | 80.9 |
| Income poverty Gap |  | 50.0 |
| Income squared Poverty Gap  |  | 0.58 |
| Observations | 186 |  |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.4 Location and Income Poverty**

As displayed in Table 5.4, similar households show that the share of income poverty headcount index is higher (75%) for the rural located families compared to the urban-located families of 52%.

Concerning the income poverty gap index, it is shown that the depth of income poverty for poor households is higher (44%) for rural-located families compared to urban-located households (22%).

The household income squared poverty gap index shows 0.54% for rural-located households and 0.28% for urban-located families.

**Table 5.4: Income poverty figure households in Oyo state by urban and rural division**

|  |
| --- |
|  **Poverty Line:** #11,348 |
| **Income poverty Measure**  | **Frequency** | **Percentage of income poor** |
| **Rural** | 60 |  |
| Income poverty Head count  |  | 75.0 |
| Income poverty Gap |  | 43.7 |
| Income squared Poverty Gap  |  | 0.54 |
| **Urban** | 126 |  |
| Income poverty Head count  |  | 51.6 |
| Income poverty Gap |  | 22.3 |
| Income squared Poverty Gap  |  | 0.28 |
| Observations | 186 |  |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.5 Age and Income Poverty**

In Table 5.5 displayed below, the income poverty headcount index is shown as 48%, 57%, 48% and 72% for 20 – 30 years old household-headed, 35 – 44 years old household-headed, 45 – 59 years old household-headed and 60 and above years old household-headed respectively.

The income poverty gap index shows the depth of income poverty for poor households as 19%, 18%, 20%, and 42% for 20 – 30 years old household-headed, 35 – 44 years old household-headed, 45 – 59 years old household-headed and 60 and above years old household-headed respectively.

The squared income poverty gap index shows 0.30%, 0.27%, 0.27% and 0.49% for 20 – 30 years old household-headed, 35 – 44 years old household-headed, 45 – 59 years old household-headed and 60 and above years old household-headed respectively.

**Table 5.5: Income poverty figure households in Oyo State according to the age of the household head**

|  |
| --- |
|  **Poverty Line:** #11,348 |
| **Income Poverty Measure**  | **Frequency** | **Percentage of income poor**  |
| **Age of the household head**  |  |  |
| **20 – 34 years old**  | 21 |  |
| Income Poverty Head count  |  | 47.6 |
| Income Poverty Gap |  | 18.9 |
| Income Squared Poverty Gap  |  | 0.30 |
| **35 – 44 years old**  | 23 |  |
| Income Poverty Head count  |  | 56.5 |
| Income Poverty Gap |  | 18.2 |
| Income Squared Poverty Gap  |  | 0.27 |
| **45 – 59 years old**  | 60 |  |
| Income Poverty Head count  |  | 48.3 |
| Income Poverty Gap |  | 19.8 |
| Income Squared Poverty Gap  |  | 0.27 |
| **60 and above years old**  | 82 |  |
| Income Poverty Head count  |  | 71.6 |
| Income Poverty Gap |  | 42.1 |
| Income Squared Poverty Gap  |  | 0.49 |
| Observations | 186 |  |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.6 Household Size and Income Poverty**

Given the presence of Oyo state households, the income poverty headcount index presented 81%, 61%, 57%, and 33% for 1 – 2 persons household, 3 – 5 persons household, 6 – 8 persons household, 9 and above persons household respectively.

The income poverty gap index shows the depth of income poverty for poor households as 52%, 30%, 24%, and 11% for 1 – 2 persons household, 3 – 5 persons household, 6 – 8 persons household, 9 and above persons household respectively.

The squared income poverty gap index shows 0.63%, 0.38%, 0.32%, and 0.17% for 1 – 2 persons household, 3 – 5 persons household, 6 – 8 persons household, 9 and above persons household respectively.

**Table 5.6: Income poverty figure households according to number of members in the household in Oyo state**

|  |
| --- |
|  **Poverty Line:** #11,348 |
| **Income Poverty Measure**  | **Frequency** | **Percentage of income poor** |
| **Household size**  |  |  |
| **1 – 2 persons HH**  | 26 |  |
| Income Poverty Head count  |  | 80.8 |
| Income Poverty Gap |  | 52.2 |
| Income Squared Poverty Gap  |  | 0.63 |
| **3 – 5 persons HH**  | 81 |  |
| Income Poverty Head count  |  | 60.5 |
| Income Poverty Gap |  | 30.4 |
| Income Squared Poverty Gap  |  | 0.38 |
| **6 – 8 persons HH**  | 58 |  |
| Income Poverty Head count  |  | 56.9 |
| Income Poverty Gap |  | 23.7 |
| Income Squared Poverty Gap  |  | 0.32 |
| **9 and above persons HH**  | 21 |  |
| Income Poverty Head count  |  | 33.3 |
| Income Poverty Gap |  | 11.2 |
| Income Squared Poverty Gap  |  | 0.17 |
| Observations | 186 |  |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.7 Marital Status and Income Poverty**

In Table 5.7 shown below, it is seen that the income poverty headcount shows 79%, 53%, and 67% for the households with widowed headed, married headed and unmarried headed respectively.

With respect to the income poverty gap index, it is seen that the depth of income poverty for poor households displays 51%, 23% and 32% for the families with widowed headed, married headed, and unmarried headed respectively.

The household squared poverty gap index shows 0.62%, 0.31% and 0.42% for widowed headed, married headed and unmarried headed respectively.

**Table 5.7: Income poverty figure households according to the marital status of the household head in Oyo state**

|  |
| --- |
|  **Poverty Line:** #11,348 |
| **Income Poverty Measure**  | **Frequency** | **Percentage of income poor** |
| **Marital status of the household head**  |  |  |
| **Widowed**  | 34 |  |
| Income Poverty Head count  |  | 79.4 |
| Income Poverty Gap |  | 50.9  |
| Income Squared Poverty Gap  |  | 0.62 |
| **Married**  | 134 |  |
| Income Poverty Head count  |  | 52.9 |
| Income Poverty Gap |  | 23.3 |
| Income Squared Poverty Gap  |  | 0.31 |
| **Unmarried**  | 18 |  |
| Income Poverty Head count  |  | 66.7 |
| Income Poverty Gap |  | 32.1 |
| Income Squared Poverty Gap  |  | 0.42 |
| Observations | 186 |  |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.8 Share of Poor Health Conditions in Oyo state, Nigeria**

Table 5.8 below presents the share of poor health conditions, and the result shows that 23% of the households in Oyo state suffer poor health conditions since any of their households' members suffers at least one of the illness or injury detailed in Table 4.1.

**Table 5.8: Share of poor health conditions households in Oyo state**

|  |
| --- |
|  **Poor health conditions threshold: if any household members suffers at least one of the illness or injury.** |
| Share of poor health conditions households | 23.2% |
| Observations | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.9 Education and Poor Health Conditions**

Table 5.9 below presents the share of poor health conditions households according to the highest level of education of the household head. The data suggest that families with none level of education of household head have a higher share of poor health conditions whereas the opposite holds for those households with the higher educated household head.

**Table 5.9: Share of poor health conditions households by household head highest level of education in Oyo state**

|  |
| --- |
|  **Poor health conditions threshold: if any household members suffers at least one of the illness or injury.** |
| **Educational level of the household heads** | **Frequency** | **Share of poor health conditions households** |
| None  | 34 | 41.1 |
| Primary | 48 | 31.5 |
| Secondary  | 44 | 11.4 |
| Tertiary  | 60 | 15.0 |
| Observations | 186 |  |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.10 Gender and Poor Health Conditions**

Table 5.10 below provides the share of poor health conditions according to the gender of the household head. The data show that the percentage of the poor health conditions is lowest amongst households with male-headed, whereas is highest with families with female-headed.

**Table 5.10: Share of poor health conditions households according to gender of the household head in Oyo state**

|  |
| --- |
|  **Poor health conditions threshold: if any household members suffers at least one of the illness or injury.**  |
|  | Frequency | Share of poor health conditions households |
| Male  | 144 | 20.1 |
| Female  | 42 | 33.3 |
| Observations | 186  |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data

**5.2.11 Location and Poor Health Conditions**

Table 5.11 below presents the share of poor health conditions according to the area in which households are located. The data show that the share of the poor health conditions is lowest amongst the households located in the rural area whereas is highest with the families located in the urban area.

**Table 5.11: Share of poor health conditions households by urban and rural division in Oyo state**

|  |
| --- |
|  **Poor health conditions threshold: if any household members suffers at least one of the illness or injury.**  |
|  | Frequency | Share of poor health conditions households |
| Urban  | 126 | 24.6 |
| Rural | 60 | 20.0 |
| Observations | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.12 Age and Poor Health Conditions**

The data in Table 5.12 presents the share of poor health conditions as 5%, 26%, 25% and 27% for households with 20 – 30 years old household-headed, 35 – 44 years old household-headed, 45 – 59 years old household-headed and 60 and above years old household-headed respectively.

**Table 5.12: Share of poor health conditions households according to the age of the household head in Oyo state**

|  |
| --- |
|  **Poor health conditions threshold: if any household members suffers at least one of the illness or injury.** |
| **Age of the household head**  | **Frequency** | **Share of poor health conditions households** |
| 20 – 34 years old | 21 | 4.76 |
| 35 – 44 years old | 23 | 26.1 |
| 45 – 59 years old  | 60 | 25.0 |
| 60 and above years old | 82 | 27.2 |
| Observations | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.13 Household Size and Poor Health Conditions**

Table 5.13 below presents the share of poor health conditions according to the numbers of members in the household in Oyo state. The figures show the share of poor health conditions of 31%, 25%, 19%, and 19% for the households with 1 – 2 persons, 3 – 5 persons, 6 – 8 persons, 9 and above persons respectively.

**Table 5.13: Share of poor health conditions households according to number of members in the household in Oyo state**

|  |
| --- |
|  **Poor health conditions threshold: if any household members suffers at least one of the illness or injury.** |
| **Number of household****members** | **Frequency** | **Share of poor health conditions households** |
| 1 – 2 persons HH | 26 | 30.8 |
| 3 – 5 persons HH  | 81 | 24.7 |
| 6 – 8 persons HH | 58 | 19.0 |
| 9 and above persons HH | 21 | 19.1 |
| Observations | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data

**5.2.14 Marital Status and Poor Health Conditions**

In Table 5.14 below, the share of poor health conditions according to the marital status of the household head displays 41%, 21% and 6% for households with widowed headed, married headed, and unmarried headed respectively.

**Table 5.14: Share of poor health conditions households according to the marital status of the household head in Oyo state**

|  |
| --- |
|  **Poor health conditions threshold: if any household members suffers at least one of the illness or injury.** |
| **Marital status of the household head** | **Frequency**  | **Share of poor health conditions households** |
| Widowed  | 34 | 41.2 |
| Married  | 134 | 20.9 |
| Unmarried  | 18 | 5.6 |
| Observations | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data

**5.2.15 Share of Poor Housing Conditions in Oyo state, Nigeria**

Table 5.15 provides the share of poor housing conditions in Oyo state. The figure shows that 32% of Oyo state households are living in a house with no adequate housing materials. Hence, their housing conditions are poor.

**Table 5.15: Share of poor housing conditions households in Oyo state**

|  |
| --- |
|  **Poor housing conditions threshold: household without adequate housing materials**  |
| Share of poor housing conditions households | 32.3 |
| Observations | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.16 Education and Poor Housing Conditions**

Table 5.16 presents the share of poor housing conditions according to the highest level of education of the household head in Oyo state. The data show that households with none level of education of household head have a higher share (65%) whereas the lowest (10%) holds for the families with tertiary education household head.

**Table 5.16: Share of poor housing conditions households by household head highest level of education in Oyo state**

|  |
| --- |
|  **Poor housing conditions threshold: household without adequate housing materials**  |
| **Educational level of the household heads** | **Frequency**  | **Share of poor housing conditions households** |
| None  | 34 | 64.7 |
| Primary | 48 | 52.1 |
| Secondary  | 44 | 13.6 |
| Tertiary  | 60 | 10.0 |
| Observations | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.17 Gender and Poor Housing Conditions**

In Table 5.17, the share of the poor housing conditions according to the gender of the household is displayed. The data show a higher share of poor housing conditions for the households with female-headed (50%) compared to the families with male-headed (27%).

**Table 5.17: Share of poor housing conditions households according to gender of the household head in Oyo state**

|  |
| --- |
|   **Poor housing conditions threshold: household without adequate housing materials.** |
|  | Frequency | Share of poor housing conditions households |
| Male  | 144 | 27.1 |
| Female  | 42 | 50.0 |
| Observations | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.18 Location and Poor Housing Conditions**

Table 5.18 below presents the share of poor housing conditions according to the location in which the households are located. The data show that the percentage of poor housing conditions is higher among rural-located families (63%) compared to urban-located households (18%).

**Table 5.18: Share of poor housing conditions households by urban and rural division in Oyo state**

|  |
| --- |
|   **Poor housing conditions threshold: household without adequate housing materials.** |
|  | **Frequency** | **Share of poor housing conditions households** |
| Urban | 126 | 17.5 |
| Rural | 60 | 63.3 |
| Observations | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.19 Age and Poor Housing Conditions**

Table 5.19 presents the share of poor housing conditions according to the age of the household head. The data shows that the percentage of the poor housing conditions according to the households with 20 – 30 years old household-headed, 35 – 44 years old household-headed, 45 – 59 years old household-headed and 60 and above years old household-headed represented 10%, 26%, 30%, and 41% respectively.

**Table 5.19: Share of poor housing conditions households according to the age of the household head in Oyo state**

|  |
| --- |
|  **Poor housing conditions threshold: household without adequate housing materials.** |
| **Age of the household head**  | **Frequency** | **Share of poor housing conditions households** |
| 20 – 34 years old | 21 | 9.52 |
| 35 – 44 years old | 23 | 26.1 |
| 45 – 59 years old  | 60 | 30.0 |
| 60 and above years old | 82 | 40.7 |
| Observations  | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.20 Household Size and Poor Housing Conditions**

Table 5.20 below provides the share of poor housing conditions according to households with 1 – 2 persons, 3 – 5 persons, 6 – 8 persons, 9 and above persons in Oyo state as 50%, 28%, 31% and 29% respectively.

**Table 5.20: Share of poor housing conditions households according to number of members in the household in Oyo state**

|  |
| --- |
|  **Poor housing conditions threshold: household without adequate housing materials.** |
| **Number of household****members** | **Frequency** | **Share of poor housing conditions households** |
| 1 – 2 persons HH | 26 | 50.0 |
| 3 – 5 persons HH  | 81 | 28.4 |
| 6 – 8 persons HH | 58 | 31.1 |
| 9 and above persons HH | 21 | 28.6 |
| Observations |  186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data

**5.2.21 Marital Status and Poor Housing Conditions**

In Table 5.21 below, the data shows 56%, 27%, and 22% for the percentage of poor housing conditions with households headed by widowed, married and unmarried respectively.

**Table 5.21: Share of poor housing conditions households according to the marital status of the household head in Oyo state**

|  |
| --- |
|  **Poor housing conditions threshold: household without adequate housing materials.** |
| **Marital status of the household head** | **Frequency** | **Share of poor housing conditions households** |
| Widowed  | 34 | 55.8 |
| Married  | 134 | 26.9 |
| Unmarried  | 18 | 22.2 |
| Observations | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.22 Share of Poor Children Educational Attainment in Oyo state, Nigeria**

Table 5.22 below displays the share of poor children educational attainment in Oyo state. The data shows that 22% of the households in Oyo state has at least one school-aged child not enrolled in school.

**Table 5.22: Share of poor children educational attainment households in Oyo state**

|  |
| --- |
|  **Poor children educational attainment threshold: household has at least one school aged child not registered in school.** |
| Share of poor children educational attainment households  | 22.0 |
| Observations  | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.23 Education and Poor Children Educational Attainment**

The data shows that in households with none level of education of the household head represents 35% share of poor children educational attainment compared to the families with the tertiary level of education household head, which represents 10% (Table 5.23).

**Table 5.23: Share of poor children educational attainment households by household head highest level of education in Oyo state**

|  |
| --- |
|  **Poor children educational attainment threshold: household has at least one school aged child not registered in school.**  |
| **Educational level of the household heads** | **Frequency**  | **Share of poor children educational attainment households** |
| None  | 34 | 35.3 |
| Primary | 48 | 25.0 |
| Secondary  | 44 | 22.7 |
| Tertiary  | 60 | 10.0 |
| Observations | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data

**5.2.24 Gender and Poor Children Educational Attainment**

In Table 5.24 below, the share of poor children educational attainment according to households headed by a female is lowest (14%), compared to families headed by a male (24%).

**Table 5.24: Share of poor children educational attainment households according to gender of the household head in Oyo state**

|  |
| --- |
|   **Poor children educational attainment threshold: household has at least one school aged child not registered in school.** |
|  | Frequency  | Share of poor children educational attainment households |
| Male  | 144 | 24.3 |
| Female | 42 | 14.2 |
| Observations | 186 |  |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.25 Location and Poor Children Educational Attainment**

In Table 5.25 below, it is seen that families located in the rural area have a higher share of poor children educational attainment whereas the lowest holds for urban-located households.

**Table 5.25: Share of poor children educational attainment households by urban and rural division in Oyo state**

|  |
| --- |
|  **Poor children educational attainment threshold: household has at least one school aged child not registered in school.** |
|  | Frequency | Share of poor children educational attainment households |
| Urban  | 126 | 20.6 |
| Rural | 60 | 25.0 |
| Observations  | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data

**5.2.26 Age and Poor Children Educational Attainment**

In Table 5.26 below, the data shows that the share of the poor children educational attainment according to the households with 20 – 30 years old household-headed, 35 – 44 years old household-headed, 45 – 59 years old household-headed and 60 and above years old household-headed in Oyo state represents 48%, 35%, 30% and 17% respectively.

**Table 5.26: Share of poor children educational attainment households according to the age of the household head in Oyo state**

|  |
| --- |
|  **Poor children educational attainment threshold: household has at least one school aged child not registered in school.** |
| **Age of the household head**  | **Frequency** | **Share of poor children educational attainment households** |
| 20 – 34 years old | 21 | 47.6 |
| 35 – 44 years old | 23 | 34.8 |
| 45 – 59 years old  | 60 | 30.0 |
| 60 and above years old | 82 | 17.3 |
| Observations | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data

**5.2.27 Household Size and Poor Children Educational Attainment**

The data shows as displayed in the Table 5.27 below, the share of the poor children educational attainment according to the number of the members in the household of 1 – 2 persons, 3 – 5 persons, 6 – 8 persons, 9 and above persons represents 4%, 25%, 24%, and 29% respectively.

**Table 5.27: Share of poor children educational attainment households according to number of members in the household in Oyo state**

|  |
| --- |
|  **Poor children educational attainment threshold: household has at least one school aged child not registered in school**  |
| **Number of household****members** | **Frequency** | **Share of poor children educational attainment households** |
| 1 – 2 persons HH | 26 | 3.85 |
| 3 – 5 persons HH  | 81 | 24.7 |
| 6 – 8 persons HH | 58 | 24.1 |
| 9 and above persons HH | 21 | 28.6 |
| Observations  | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.28 Share of Child Mortality in Oyo state, Nigeria**

Table 5.28 below presents the share of child mortality in the Oyo state households. The data shows that 17% of the households in Oyo state have suffered child mortality.

**Table 5.28: Share of child mortality households in Oyo state**

|  |
| --- |
|  **Child mortality threshold: household suffered a death of one child or children less than five years old.** |
| Share of child mortality households  | 16.7 |
| Observations  | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.29 Father Education and Child Mortality**

The data shows as displayed in the Table 5.29 below, the households with none level of education of the father represents 28% share of child mortality compared to families with a tertiary level of education of the father (10%).

**Table 5.29: Share of child mortality households by father highest level of education in Oyo state**

|  |
| --- |
|  **Child mortality threshold: household suffered a death of one child or children less than five years old** |
| **Educational level of the household heads** | **Frequency** | **Share of child mortality households** |
| None  | 29 | 27.5 |
| Primary | 45 | 24.4 |
| Secondary  | 54 | 7.41 |
| Tertiary  | 58 | 10.3 |
| Observations | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.30 Mother Education and Child Mortality**

Table 5.30 below presents the data which shows that the households with none level of education of the mother represent 23% share of child mortality compared to families with the tertiary level of the education of the mother, which represents 9%.

**Table 5.30: Share of child mortality households by mother highest level of education in Oyo state**

|  |
| --- |
|  **Child mortality threshold: household suffered a death of one child or children less than five years old.** |
| **Educational level of the household heads** | **Frequency** | **Share of child mortality households** |
| None  | 43 | 23.3 |
| Primary | 45 | 19.2 |
| Secondary  | 54 | 12.5 |
| Tertiary  | 58 | 9.30 |
| Observations | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data

**5.2.31 Location and Child Mortality**

Table 5.31 below displays that families located in rural area have higher (25%) share of child mortality whereas the lowest (13%) holds for urban-located households.

**Table 5.31: Share of child mortality households by urban and rural division in Oyo state**

|  |
| --- |
|  **Child mortality threshold: household suffered a death of one child or children less than five years old.** |
|  | Frequency  | Share of child mortality households |
| Urban | 126 | 12.7 |
| Rural | 60 | 25.0 |
| Observations  | 186 |  |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.32 Age and Child Mortality**

In Table 5.32 below, the percentage of child mortality according to the households with 20 – 30 years old household-headed, 35 – 44 years old household-headed, 45 – 59 years old household-headed and 60 and above years old household-headed in Oyo state represents 10%, 13%, 13%, and 21% respectively.

**Table 5.32: Share of child mortality households according to the age of the household head in Oyo state**

|  |
| --- |
|  **Child mortality threshold: household suffered a death of one child or children less than five years old.** |
| **Age of the household head**  | **Frequency** | **Share of child mortality households** |
| 20 – 34 years old | 21 | 9.50 |
| 35 – 44 years old | 23 | 13.0 |
| 45 – 59 years old  | 60 | 13.3 |
| 60 and above years old | 85 | 21.0 |
| Observations | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.33 Household Size and Child Mortality**

The data shows as displayed in the Table 5.33 below, the share of child mortality according to the number of the members in the household of 1 – 2 persons, 3 – 5 persons, 6 – 8 persons, 9 and above persons represents 23%, 11%, 21%, and 19% respectively.

**Table 5.33: Share of child mortality households according to number of members in the household in Oyo state**

|  |
| --- |
|  **Child mortality threshold: household suffered a death of one child or children less than five years old.** |
| **Number of household****members** | **Frequency**  | **Share of child mortality households** |
| 1 – 2 persons HH | 26 | 23.1 |
| 3 – 5 persons HH  | 81 | 11.1 |
| 6 – 8 persons HH | 58 | 20.7 |
| 9 and above persons HH | 21 | 19.0 |
| Observations  | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.34 Educational Attainment and Location**

The share of educational attainment according to the location of the household is presented in Table 5.34 below. The data shows that households located in the urban area on average have a higher educational level of household heads compared to households located in rural area. The data show that 28% is recorded for tertiary education of household-headed in the urban area, while 5% is recorded for tertiary education of household-headed in the rural areas. This result shown could be seen as one reason why income poverty headcount index (shown in Table 5.4) is lower in the urban-located household.

**Table 5.34: Educational attainment of household Head in Oyo state according to household location**

|  |
| --- |
|  **Household Location**  |
| **Educational level of the household heads** | **Urban** | **Rural** |
| None  | 10.8 | 7.52 |
| Primary | 13.1 | 13.1 |
| Secondary  | 16.9 | 7.10 |
| Tertiary  | 27.9 | 4.91 |
| Observations |  186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data

**5.3.35 Educational Attainment and Gender**

The share of educational attainment according to the gender of the household head is presented in Table 5.35 below. The data shows that households whose head is male recorded the highest (27%) for tertiary level of education, while households whose head is female records the lowest (6%) for the tertiary educational level.

Regarding the none educational level, the highest is recorded for households whose head is female (10%), and lowest is recoded for households whose head is male (8%).

**Table 5.35: Educational attainment of household heads in Oyo state by gender**

|  |
| --- |
|  **Gender**  |
| **Educational attainment level of the household heads** | **Male**  | **Female**  |
| None  | 8.06 | 10.2 |
| Primary | 21.3 | 4.43 |
| Secondary  | 23.0 | 1.09 |
| Tertiary  | 26.8 | 6.01 |
| Observations |  186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.2.36 Educational Attainment in Oyo state According to Father and Mother**

The share of educational attainment according to the father and mother in the household is presented in Table 5.36 below. The data shows that households whose father has none education, primary education, secondary education, and tertiary education recorded 16%, 24%, 29%, and 31% respectively.

Regarding mother's education in the household, the data shows that families whose mother has none education, primary education, secondary education and tertiary education recorded 23%, 28%, 26%, and 23% respectively.

**Table 5.36: Educational attainment of father and mother in Oyo state**

|  |  |  |
| --- | --- | --- |
| **Educational attainment level of the household heads** | **Father**  | **Mother**  |
| None  | 15.6 | 23.1 |
| Primary | 24.2 | 27.9 |
| Secondary  | 29.0 | 25.8 |
| Tertiary  | 31.2 | 23.1 |
| Observations | 186 | 186 |

Source: author’s own computation using (GHS)-Panel wave 3 of 2015/2016 data.

**5.3 Regression Analysis**

This section provides the probit regression results for all the hypotheses in the study and the detailed interpretation of the results in subsection 5.3.1 – 5.3.5.

**5.3.1 Probit Regression Results and Interpretation of Results for H1**

In the research methodology chapter, I presented a probit equation to determine the variables that influence the probability of an individual household being income poor. The explanatory variables associated to an individual household being income poor are the level of education of individual household head, gender of the household head, location of the household, age of the household head, size of the household and marital status of the household head.

The probit regression results from the variables used are shown in Table 5.37 below.

**Table 5.37: Probit regression results for (H1) displaying marginal effects of the household head’s highest level of education**

|  |
| --- |
|  **Dependent Variable**  |
|  | Income poor  |
| **Independent Variables**  | Probit Marginal Effects  | Sig | Decision |
| **Educational attainment level of the household head** |  |  |  |
| None\*  | - | - | - |
| Primary education | -0.067 | 0.527 | Not significant |
| Secondary education | -0.271 | 0.005 | Significant\*\*\* |
| Tertiary education | -0.605 | 0.000 | Significant\*\*\* |
| **Gender of the household head**  |  |  |  |
| Male\* | - | - | - |
| Female  | 0.168 | 0.156 | Not significant |
| **Location of the household**  |  |  |  |
| Urban\*  | - | - | - |
| Rural | 0.105 | 0.116 | Significant\* |
| **Age of the household head**  |  |  |  |
| 20 – 34 years old\*  | - | - | - |
| 35 - 44 years old | 0.116 | 0.281 | Not significant |
| 45-59 years old  | 0.090 | 0.360 | Not significant |
| 60 and above years old  | 0.182 | 0.066 | Significant\* |
| **Size of the household**  |  |  |  |
| 1 – 2 persons HH\* | - | - | - |
| 3 – 5 persons HH | -0.138 | 0.215 | Not significant |
| 6 – 8 persons HH | -0.121 | 0.315 | Not significant |
| 9 and above persons HH | -0.255 | 0.075 | Significant\* |
| **Marital status of the household head**  |  |  |  |
| Widowed\*  | - | - | - |
| Married  | 0.079 | 0.544 | Not significant |
| Unmarried  | 0.170 | 0.202 | Not significant  |
| Wald Chi-square (13) | 60.76 | 0.0000 | Significant\*\*\* |
| LR (13)  | 93.57 |  |  |
| Prob. >  | 0.0000 |  |  |
| Log Likelihood | -79.013481 |  |  |
| Pseudo | 0.3719 |  |  |
| Observations | 186 |

Source: Computed from Stata statistics. \*Reference category.

\*\*\* Significant at 1%, \*\* Significant at 5%, \* Significant at 10%

Given the focus of this study, the computed probit regression above was calculated to have an understanding of the sign nature of the effect among the variables in the model for (H1). Besides, the significance level of all the variables was computed.

**The Interpretation of the Sign of Parameter Estimates and Their Statistical Significance**

The empirical findings confirm the prior expectation that education has a negative association with the probability of a household being income poor in Oyo state, irrespective of educational attainment indicator employed.

The effect is strongly significant for secondary education and tertiary education of the household head. Holding other factors constant, a unit change of secondary education of the household head reduces the probability of a household being income poor by 27% as compared to the reference category (none educational level of the household head). Similarly, the likelihood of a household being income poor reduces by 61% with the tertiary education of the household head.

These results suggest that education has a poverty-reducing effect on the probability of a household being income poor, and the most significant impact is exerted from the tertiary education of the household head. As such, I concluded that a higher level of education is better for Oyo state, Nigeria. These findings are in accordance with the prior expectation as well as the human capital theory that predict a positive association between education and earnings. Hence, a negative association between education and poverty that some studies have established in the literature (Apata et al., 2010, and Ijaya and Nuhu 2011). In addition to Botha (2010), and Njong (2010), Wanka (2014), Geda et al. (2005), Okojie (2002) for all the indicators of educational attainment of the household head (primary, secondary and tertiary), Faux and Ntembe (2013) for secondary education and tertiary education, however not consistent for primary education.

The prior expectation result implies that education imparts knowledge and skills, and transforms people into more valuable human capital. The skills and productive knowledge imparted through education enhances the productive capacity of those who possess them and thus increase their earnings in their workplace (Schultz, 1961).

Education provides economic returns in the form of higher earnings and employment opportunities. Better educated people have a greater chance of getting employment, being economically productive and thus receive higher earnings (Schultz, 1961, Becker, 1992, and Teal, 2001). An individual's education level influences his income poverty mainly through the labour market (Van der Berg, 2002, and Schiller, 2004).

In the labour market, higher earnings for higher educated individuals may result from higher productivity, or from the fact that degree of higher educated people acts as a sign of capacity to employers which enable them to get more lucrative jobs (Van der Berg, 2002, and Schiller, 2004).

For the additional explanatory variables, the female household headed has a positive association with the probability of the household being income poor. More precisely, the probability of the household being income poor increases by 17% with household whose head is female compared to the household whose head is male (reference category). This result confirms the general expectation that women are more likely to be poor compared to their male counterparts due to the gender differences in earnings in the labour market (Chant, 2011 and Anyanwu, 2014). On average, women command lower market income, including salaries and employment pensions compared to their male peers and therefore, they receive lower occupational related social transfers (Chant, 2011).

A potential reason for this is that women are prone to particularly engage in caring for family members, most especially the young children of the family. Therefore, they are less likely to be in paid employment compared to their male counterparts, and even if they are in paid employment, they tend on average work few hours weekly, including those in full-time jobs and which impact profoundly on their scope to escape poverty (Chant, 2011).

Another reason is that women are more likely to have lower education compared to their male counterparts (Anyanwu, 2010 and 2012). For example, the share of none level of education recorded highest for female-headed household (see table 5.35), and people with lower education have a higher probability of being employed in lower paying jobs, and thus earn lower salaries that open women to higher income poverty risk (Anyanwu, 2010 and 2012). This finding is consistent with Casper, McLanahan and Garfinkel (1994), Wright (1993), Pressman (1998) and Pressman (2002), Botha (2010), Njong (2010) Bastos, et al. (2009), and Wanka (2014).

Similar households, the rural-located household has a positive association with the probability of the household being income poor and the effect appears significant. It is estimated that, in comparison to the urban-located household (reference category), the probability of a household being income poor increases by 11%. This finding confirms that the likelihood of being income poor is not a location equal condition as rural-located households are prone to poverty. A potential reason is that there are more employment opportunities in urban areas compared to rural locations (Anyanwu, 2014). This finding is consistent with Anyanwu (2010 and 2013), World Bank (2001), African Development Bank (2002), Jamal (2005), Bruck et al. (2007), Nestic and Vecchi (2007), Botha (2010), Wanka (2014), and Garza-Rodriguez (2016).

From the age indicators, it is found that all the age indicators of the household head have a positive association with the probability of the household being income poor. In details, the likelihood of a household being income poor increases by 12%, 9% and 18% for 35 - 44 years old, 45 - 59 years old and 60 and above years old respectively compared to 20 - 34 years old (reference category). The effect is statistically significant for 60 and above year's old household head. The result confirms the generally observed results of hill-shaped (Njong, 2010, and Datt and Jolliffe, 1999). That is the probability of the household being income poor is relatively high at a young age, reduces during middle age and then increases at the old age. A potential reason is that the probability of a person engaging in paid job rises with age, when age gets to its peak level, the prospect starts to decline as age continues to increase (Njong, 2010). This finding is in support of Datt and Jollife (1999), Garza-Rodriguez (2016), Gang, Sen and Yun (2002).

The results for all indicators of household size presents though only significant for (9 and above persons household) of Oyo state, yet with a counterintuitive sign. The household size is generally expected to have higher poverty risk as household size increases (Lanjouw and Ravallion, 1994, Gang, Sen and Yun, 2002, Anyanwu, 2005, Anyanwu, 2010, Anyanwu, 2012 and Awopeju, 2012), due to a substantial reduction in household savings rates, increase in the financial costs of bearing and raising children, reduction in engaging in paid employment, particularly mothers because women are mainly caregiver of family members, particularly young children (Anyanwu, 2014).

However, the results do not appear to be consistent with this. The probability of a household being income poor reduces as the number of members in the household increases. More precisely, the likelihood of a household being income poor reduces by 25% for the household with (9 and above persons) compared to the household with (1 – 2 persons) reference category. A potential reason for this result could be the existence of size economies in household consumption. Certain goods, such as tap water, cooking tools, housing and clothing allow rooms for joint usage in a way that the cost of a given standard of living per person reduces when people reside together compared to living away from each other (Lanjouw and Ravallion, 1994).

Being married headed and unmarried headed estimates as compared to widowed headed (reference category), present positive association with the probability of a household being income poor. That is the likelihood of a household being income poor increases by around 8% and 17% respectively compared to being widowed household headed.

The Wald chi-square which is used to test the overall significance of all the explanatory variables involved in the model indicates a strong statistical significance for Oyo state household.

**5.3.2 Probit Regression Results and Interpretation of Results for H2**

I presented the probit equation in the research methodology chapter to determine the variables that influence the probability of a household having poor health conditions. The explanatory variables associated to an individual household having poor health conditions are the level of education of individual household head, gender of the household head, location of the household, age of the household head, size of the household and marital status of the household head.

The probit regression results from the variables used are shown in Table 5.38 below.

**Table 5.38: Probit results for (H2) displaying marginal effects of the household head’s highest level of education**

|  |
| --- |
|  **Dependent Variable**  |
|  | Poor health conditions  |
| **Independent Variables**  | Probit Marginal Effects  | Sig | Decision |
| **Educational attainment level of the household head** |  |  |  |
| None\*  | - | - | - |
| Primary education | -0.076 | 0.326 | Not significant |
| Secondary education | -0.280 | 0.002 | Significant\*\*\* |
| Tertiary education | -0.265 | 0.001 | Significant\*\*\* |
| **Gender of the household head**  |  |  |  |
| Male\* | - | - | - |
| Female  | -0.305 | 0.042 | Significant\*\*\* |
| **Location of the household**  |  |  |  |
| Urban\*  | - | - | - |
| Rural | -0.113 | 0.065 | Significant\* |
| **Age of the household head**  |  |  |  |
| 20 – 34 years old\*  | - | - | - |
| 35 - 44 years old | 0.741 | 0.983 | Not significant |
| 45-59 years old  | 0.718 | 0.983 | Not significant |
| 60 and above years old  | 0.588 | 0.984 | Not significant |
| **Size of the household**  |  |  |  |
| 1 – 2 persons HH\* | - | - | - |
| 3 – 5 persons HH | -0.076 | 0.394 | Not significant  |
| 6 – 8 persons HH | -0.146 | 0.136 | Not significant  |
| 9 and above persons HH | -0.0834 | 0.492 | Not significant  |
| **Marital status of the household head**  |  |  |  |
| Widowed\*  | - | - | - |
| Married  | -0.406 | 0.008 | Significant\*\*\* |
| Unmarried  | -0.558 | 0.010 | Significant\*\*\* |
| Wald Chi-square | 24.89 | 0.0239 | Significant\*\* |
| LR (13)  | 41.47 |  |  |
| Prob. >  | 0.0001 |  |  |
| Log Likelihood | -79.836054 |  |  |
| Pseudo | 0.2062 |  |  |
| Observations | 186 |

Source: Computed from Stata statistics. \*Reference category.

\*\*\* Significant at 1%, \*\* Significant at 5%, \* Significant at 10%

Given the focus of this study, the computed probit regression above was estimated to have the understanding of the sign nature of the effect among the variables in the model for (H2), and the significant level of variables across the probit model was also calculated. The statistical significant test was carried out in determining the reliability and validity of each parameter.

**The Interpretation of the Sign of Parameter Estimates and Their Statistical Significance**

In line with the prior expectation, the empirical findings confirm that all measures of education have a negative association with the probability of a household having poor health conditions in Oyo state, and the effect is strongly significant for secondary and tertiary education indicators of the household head. More precisely, holding other factors constant, a unit change of tertiary education of the household head compared to none educational level of household head (reference category) reduces the probability of a household having poor health conditions by 27%. As such, the study concluded that higher level of education of household head is better for Oyo state, Nigeria as this as lower their households probability of having poor health conditions, and indicates that a more educated individual is less likely to have poor health conditions.

This finding is in support of the Diaz (2010) that predicts a positive association between education and health. Hence, a negative association between education and poor health conditions.

Moreover, this finding indicates that the more people with lower education in Oyo state, Nigeria, the more probability of having poor health conditions, and this is in accord with Cubbin, LcClere and Smith (2000) that noted that people with lower education and training have higher probability of being employed in lower paying jobs with more occupational hazards that involve environmental and chemical exposures such as pesticides, asbestos and poor working conditions (i.e. shift with few breaks, potentially harmful tools) which opens them to harm of injury and fatality. Stress is another occupational hazard which is associated with coronary heart diseases (Head, et al., 2002), although all members of workforces are open to stress at work the highest stress is found amongst members of workforces with less education (Grzywacz et al. (2004), Almeida (2005) and Almeida, et al. (2005) because they are more likely to be opened to heavier workloads, higher job demands, increased physical activity, limited control, poor psychological work environments (World Health Organization, 2002, and Head et al., 2002).

Better educated people have better chances to access available jobs and thus receive higher earnings, and they tend to have the option to select more comfortable and clean environment to live (Feinstein et al., 2005 and Diaz, 2010). In developing countries, the poorest neighbourhoods have a serious problem of public health mainly because of dusted roads and non-treated waters, which apparently are detriment to good health (Diaz, 2010).

In further support of the results, better-educated people are more likely to choose an appropriate diet needed to attain proper level of nutrition because they have better information about what combinations of the inputs necessary to produce better health (Grossman, 2005). People with better education are better informed of the risks associated with smoking, drinking alcohol, using illegal drugs and advantages of preventive medical care. Therefore, they have the option to adopt good habits which allow them to live a healthier lifestyle than non-educated ones (Grossman, 2005, and Cutler and Lleras-Muney, 2006).

The additional explanatory variable of female-headed household indicator appears statistically significant as well as negative association with the probability of household having poor health conditions. More precisely, it is estimated that the female-headed reduces the likelihood of a household having poor health conditions by 31% in Oyo state as compared to male-headed (reference category).

The rural-located household indicator appears statistically significant and shows a negative association with the probability of a household having poor health conditions. In comparison to the family located in the urban area, household situated in rural area have on average 11% lower probability of a household having poor health conditions.

From the age indicators, it is shown that age indicators of the household head have a positive association with the probability of household having poor health conditions, irrespective of the age indicators employed. Compared to the family with (20 – 35 years old headed) reference category, it is found that the probability of a household having poor health conditions increases on average by 59% for (60 and above years old headed).

The empirical findings for the household size indicator show that, the probability of a household having poor health conditions reduces for all household size indicator (3- 5 persons household, 6 – 8 persons household, 9 and above persons household) by 7.6%, 15%, and 8.3% respectively compared to (1 – 2 persons household), reference category.

Being married headed and unmarried headed, compared to widowed headed (reference category), the probability of household having poor health conditions have a statistical significant as well as decreasing effect of 41%, and 56% respectively.

This result of married families is in support of Stimpson et al. (2007) that asserted that marriage confers many health benefits over being single, divorced or widowed, such as lower depressive symptoms, higher life satisfaction and better physical health.

The social support of marriage during stressful times encourages engagement in healthy behaviours, such as venting feeling that can reduce the physical and psychological consequences of a stressor (Thoits, 2011).

The result of the Wald chi-square test shows that all the independent variables are jointly significant in determining the nature of influence on the probability of a household having poor health conditions.

**5.3.3 Probit Regression Results and Interpretation of Results for H3**

In the methodology chapter, I presented a probit equation to determine the variables that influence the probability of household living under poor housing conditions. The explanatory variables associated to an individual household likelihood of living under poor housing conditions are the educational attainment of individual household head, gender of the household head, household location, age of the household head, size of the household and marital status of the household head. The probit regression results from the variables used are shown in Table 5.39 below.

**Table 5.39: Probit results for (H3) displaying marginal effects of the household head’s highest level of education**

|  |
| --- |
|  **Dependent Variable**  |
|  | Poor housing conditions  |
| **Independent Variables**  | Probit Marginal Effects  | Sig | Decision |
| **Educational attainment level of the household head** |  |  |  |
| None\*  | - | - | - |
| Primary education | -0.124 | 0.089 | Significant\* |
| Secondary education | -0.341 | 0.000 | Significant\*\*\* |
| Tertiary education | -0.352 | 0.000 | Significant\*\*\* |
| **Gender of the household head**  |  |  |  |
| Male\* | - | - | - |
| Female  | 0.142 | 0.181 | Not significant  |
| **Location of the household**  |  |  |  |
| Urban\*  | - | - | - |
| Rural | 0.296 | 0.000 | Significant\*\*\* |
| **Age of the household head**  |  |  |  |
| 20 – 34 years old\*  | - | - | - |
| 35 - 44 years old | -0.033 | 0.793 | Not significant  |
| 45-59 years old  | 0.084 | 0.464 | Not significant |
| 60 and above years old  | -0.019 | 0.862 | Not significant |
| **Size of the household**  |  |  |  |
| 1 – 2 persons HH\* | - | - | - |
| 3 – 5 persons HH | -0.155 | 0.075 | Not significant |
| 6 – 8 persons HH | -0.118 | 0.217 | Not significant |
| 9 and above persons HH | -0.105 | 0.379 | Not significant |
| **Marital status of the household head**  |  |  |  |
| Widowed\*  | - | - | - |
| Married  | 0.035 | 0.765 | Not significant |
| Unmarried  | -0.159 | 0.210 | Not significant |
| Wald Chi-square | 59.48 | 0.0000 | Significant\*\*\* |
| LR (13)  | 88.58 |  |  |
| Prob. >  | 0.0000 |  |  |
| Log Likelihood | -72.668165 |  |  |
| Pseudo | 0.3787 |  |  |
| Observations | 186 |

Source: Computed from Stata statistics. \*Reference category.

\*\*\* Significant at 1%, \*\* Significant at 5%, \* Significant at 10%

Given the focus of this study, the computed probit regression above was calculated to have the understanding of the sign nature of the effect among the variables in the model for (H3), and the significant level of variables across the probit model was also calculated. The statistical significant test was carried out in determining the reliability and validity of each parameter.

**The Interpretation of the Sign of Parameter Estimates and Their Statistical Significance**

Irrespective of the measures of educational attainment employed, the empirical findings confirm the prior expectation that education has a negative association with the probability of a household living under poor housing conditions as well as statistically significant. The secondary and tertiary education indicators are not statistically different from zero, which indicates that their significant impact on the likelihood of a household living under poor housing conditions is near perfectness.

The interpretation of the household head with respective educational levels is done by comparing to the reference category (none educational level of the household head). These findings imply that the higher the level of education of household head in Oyo state, Nigeria, the lower the probability of the household living under poor housing conditions. In details, holding other factors constant, as compared to none educational level of household head (reference category), a unit increase on the household head education (primary, secondary and tertiary) reduces the likelihood of a household living poor housing conditions by 12%, 34%, and 35% respectively. These findings are consistent with Diaz (2010) who noted that highly educated people have higher chances to get employment with a higher paying salary that gives them access to choose a house with appropriate conditions.

Likewise, they have increased access to credit market because they have a higher probability to more effectively communicate with credit agencies in the view of the fact that they have the knowledge of financial transactions and records keeping, that increase the possibility of attaining credit, which creates the likelihood of possessing suitable housing conditions (Diaz, 2010). Hence a reduction in poor housing conditions.

The empirical finding shows that female-headed indicator has a positive effect on the probability of a household living under poor housing conditions. More precisely, the estimated result represents that the likelihood of a household residing under poor housing conditions increases, as compared to the male-headed indicator (reference category) by 14%.

Regarding the rural-located household indicator, the empirical finding indicates that the probability of a household living under poor housing conditions is positively associated with household located in the rural area. In comparison to the family located in the urban area, household situated in rural area have on average 30% higher likelihood of a family residing under poor housing conditions, and the effect is strong and statistically significant.

From the age indicators, it is found that age indicators of the household head have both negative and positive association with the likelihood of a household living under poor housing conditions. Compared to the family with (20 – 35 years old headed) reference category. The probability of a household residing under poor housing conditions reduces on average by 3%, and 5% for (35 – 44 years old headed, and 60 and above years old headed) respectively. Whereas, as compared to the household with (20 – 35 years old headed) reference category, the likelihood of family living under poor housing conditions increases by 8% (45 – 59 years old headed).

The household size indicators show to be negatively associated with the likelihood of a household residing under poor housing conditions, and the effect is statistically significant for (3 – 5 persons household). Compared to the household with (1- 2persons), the estimated result indicates that the probability of a family living under poor housing conditions reduces by 16%, 12%, and 11% for (3 – 5 persons household, 6 – 8 persons household, and 9 and above persons household) respectively.

Being married headed compare to widowed headed (reference category), the probability of household living under poor housing conditions increases by 4%. Whereas, being unmarried as compare to the widowed headed (reference category) reduces the likelihood of a household residing under poor housing conditions by 16%. That is, there is a negative association between unmarried headed and the probability of household living under poor housing conditions. A potential reason for this could be that being single grants a privilege to save more and reduces financial costs of bearing and raising children if being married.

Another reason could be that being single increases chances of participating in paid employment, and even on average work more extended hours, which reward is higher salaries, and creates a likelihood of possessing the desire and suitable housing conditions as they have more money at hand. Hence, a reduction in poor housing conditions.

The result of the Wald chi-square test indicates that educational level and other explanatory variables are jointly significant in determining the nature of the impact on the probability of a household residing under poor housing conditions, and the jointly statistical significant is strong.

**5.3.4 Probit Regression Results and Interpretation of Results for H4**

In determining the sign nature and significant level of the variables that influence the likelihood of a household having poor children educational attainment, the probit regression model was calculated. The explanatory variables used in the probit regression model to determine an individual household having poor children educational attainment are the educational attainment of individual household head, gender of the household head, age of the household head, household location and the number of the members in the household.

The probit regression results from the variables used are shown in Table 5.40 below.

**Table 5.40: Probit results for (H4) displaying marginal effects of the household head’s highest level of education**

|  |
| --- |
|  **Dependent Variable**  |
|  | Poor children educational attainment  |
| **Independent Variables**  | Probit Marginal Effects  | Sig | Decision |
| **Educational attainment level of the household head** |  |  |  |
| None\*  | - | - | - |
| Primary education | -0.180 | 0.028 | Significant\*\* |
| Secondary education | -0.234 | 0.007 | Significant\*\*\* |
| Tertiary education | -0.368 | 0.000 | Significant\*\*\* |
| **Gender of the household head**  |  |  |  |
| Male\* | - | - | - |
| Female  | -0.079 | 0.313 | Not significant |
| **Location of the household**  |  |  |  |
| Urban\*  | - | - | - |
| Rural | 0.028 | 0.645 | Not significant |
| **Age of the household head**  |  |  |  |
| 20 – 34 years old\*  | - | - | - |
| 35 - 44 years old | 0.326 | 0.027 | Significant\*\* |
| 45-59 years old  | 0.279 | 0.050 | Significant\*\*\* |
| 60 and above years old  | 0.148 | 0.293 | Not significant |
| **Size of the household**  |  |  |  |
| 1 – 2 persons HH\* | - | - | - |
| 3 – 5 persons HH | 0.173 | 0.119 | Significant\* |
| 6 – 8 persons HH | 0.155 | 0.192 | Not significant |
| 9 and above persons HH | 0.260 | 0.057 | Significant\* |
| Wald Chi-square (11) | 23.44 | 0.0153 | Significant\*\*\* |
| LR (11)  | 30.59 |  |  |
| Prob. >  | 0.0013 |  |  |
| Log Likelihood | -82.812388 |  |  |
| Pseudo | 0.1559 |  |  |
| Observation | 186 |

Source: Computed from Stata statistics. \*Reference category.

\*\*\* Significant at 1%, \*\* Significant at 5%, \* Significant at 10%

Given the focus of this study, the computed probit regression above was calculated to have the understanding of the sign nature of the effect among the variables in the model for (H4), and the significant level of variables across the probit model was also calculated to determine the reliability and validity of each parameter.

**The Interpretation of the Sign of Parameter Estimates and Their Statistical Significance**

The empirical results for all indicators of education of the household head indicate strongly significant effect for Oyo state household. In line with the prior expectation, education of the household head reduces the probability of a household having poor children educational attainment. That is, there is a negative association between education and the likelihood of a household having poor children educational attainment.

Holding other factors constant, households, where the education of the head is tertiary have a lower probability of household having poor children educational attainment by 37% as compared to those whose head has none level of education (reference category).

Similarly, those households whose head has primary and secondary education have 18% and 23% lower probability of household having poor children educational attainment respectively as compared to the families whose head has none level of education (reference category).

These findings are in support of Alexander, Entwisle and Bedinger (1994) who noted that educated parents have beliefs and expectation, predicting their children higher educational attainment but this is influenced by family income. For example, better-educated parents have beliefs and hope that were closer to their children higher educational attainment. This is because better-educated parents have better chances of getting a job with a higher paying income that gives them the possibility of funding their children's education (Blanden, Gregg and Machin, 2002).

In addition, highly educated parents, get involved in the educational system on their children's behalf, such as reading to their children at home and participating in their children's brought home school assignment (Davis-Kean, 2005). This, in turn, leads to better school performance and therefore, children are inspired to follow additional years of education (Wanka, 2014). Hence, a reduction in poor children educational attainment.

Regarding the additional explanatory variable of female-headed household indicator, the estimated result indicates a negative association between education and the probability of a household having poor children educational attainment in Oyo state, Nigeria. As compared to the male-headed household (reference category), the likelihood of a household having poor children educational attainment reduces by 8% for the female-headed household.

The results indicate that rural-located household indicator has a positive association with the probability of a household having poor children educational attainment. In comparison to the household located in the urban area (reference category), the likelihood of a family having poor children education attainment increases by 3% for the rural-located household.

From the age indicators, it is shown that age indicators of the household head have a positive association with the probability of household having poor children educational attainment, irrespective of the age indicators employed. The effect is statistically significant for the family with (35 - 44 years old headed and 45 – 59 years old headed). Compared to household with (20 – 35 years old headed) reference category, it is found that the likelihood of a household having poor children educational attainment increases on average by 33%, 28% and 515% for (35 – 44 years old headed, 45 – 59 years old headed and 60 and above years old headed) respectively.

The household size indicators show to be positively associated with the probability of a household having poor children educational attainment, and the effect is statistically significant for (3 – 5 persons household and 9 and above persons household). Compared to the household with (1- 2 persons) reference category, the estimated results indicate that, the probability of household having poor children educational attainment increases by 17%, 15%, and 26% for (3 – 5 persons household, 6 – 8 persons household, and 9 and above persons household) respectively.

The result of the Wald chi-square test shows that educational level and other explanatory variables are jointly significant in determining the nature of the impact on the probability of a household having poor children educational attainment.

**5.3.5 Probit Regression Results and Interpretation of Results for H5**

In determining the sign nature and the significant level of the variables that influence the probability of household experiencing child mortality, the probit regression model was calculated. The explanatory variables employed are the educational attainment of individual household father, mother, household location, age of the household head and the number of the members in the household. The probit regression results from the variables used are shown in Table 5.41 below.

**Table 5.41: Probit results for (H5) displaying marginal effects of the father and mother highest level of education**

|  |
| --- |
|  **Dependent Variable**  |
|  | Child Mortality  |
| **Independent Variables**  | Logistic Marginal Effects  | Sig | Decision |
| **Father’s educational attainment**  |  |  |  |
| None\*  | - | - | - |
| Primary education | -0.091 | 0.223 | Not significant  |
| Secondary education | -0.231 | 0.003 | Significant\*\*\* |
| Tertiary education | -0.159 | 0.038 | Significant\* |
| **Mother’s educational attainment** |  |  |  |
| None\* |  |  |  |
| Primary education  | -0.034 | 0.639 | Not significant |
| Secondary education | -0.089 | 0.255 | Not significant |
| Tertiary education | -0.106 | 0.075 | Significant\* |
| **Location of the household**  |  |  |  |
| Urban\*  | - | - | - |
| Rural | 0.073 | 0.173 | Not significant |
| **Age of the household head**  |  |  |  |
| 20 – 34 years old\*  | - | - | - |
| 35 - 44 years old | 0.021 | 0.864 | Not significant |
| 45-59 years old  | 0.046 | 0.655 | Not significant |
| 60 and above years old  | 0.060 | 0.525 | Not significant |
| **Size of the household**  |  |  |  |
| 1 – 2 persons HH\* | - | - | - |
| 3 – 5 persons HH | -0.058 | 0.193 | Not significant |
| 6 – 8 persons HH | 0.047 | 0.562 | Not significant |
| 9 and above persons HH | 0.043 | 0.689 | Not significant |
| Wald Chi-square  | 18.88 | 0.1268 | Significant\* |
| LR (13)  | 21.74 |  |  |
| Prob. >  | 0.0595 |  |  |
| Log Likelihood | -72.934844 |  |  |
| Pseudo | 0.1297 |  |  |
| Observations | 186 |  |  |

Source: Computed from Stata statistics. \*Reference category.

\*\*\* Significant at 1%, \*\* Significant at 5%, \* Significant at 10%

Given the focus of this study, the computed probit regression above was calculated to have the understanding of the sign nature of the effect among the variables in the model for (H5), and the significant level of variables across the probit model was also calculated to determine the reliability and validity of each parameter.

**The Interpretation of the Sign of Parameter Estimates and Their Statistical Significance**

Irrespective of the measures of father educational attainment employed, the empirical findings confirm the prior expectation that education has a negative association with the probability of a household experiencing child mortality. The secondary and tertiary education levels of the father appear statistically significant. Holding other factors constant, as compared to none level of education of the father (reference category), a unit change on the household whose head is with tertiary education reduces the likelihood of household experiencing child mortality by 16%. One could conclude that the tertiary level of education of father is important in terms of reducing child mortality in the household, and this is in accord with Semba et al. (2008) that noted that the role of father's education lies on low social status and empowerment of mothers that possibly restrict the influence they have in making decision concerning child health.

 It may also be that the father engages in a more active role in some types of health decisions, for example, immunization decisions or participation decisions especially if they require to travel to a health clinic, and therefore, one will conclude that father's education has a higher association with participation decisions/health seeking behaviour, which obviously improves child health (Semba et al., 2008) and thus reduces child mortality.

The Tertiary education of the mother appears statistically significant for Oyo state household. In line with the prior expectation, the probability of a household experiencing child mortality reduces with all educational indicators of the mother. That is, all education indicators of the mother have a negative association with the likelihood of a family experiencing child mortality. These results indicate that education has child mortality reducing effect, the most significant impact is applied by the tertiary education of the mother.

Holding other factors constant, as compared to the none level of education of the mother (reference category), a unit change in the tertiary education of the mother reduces on average, the probability of household experiencing child mortality by 11%. These findings indicate that better-educated mother has an effective way to reduce unhealthy habits that could affect infant health even before they were born. This is because better-educated parents have better knowledge of harmful behaviours, such as the harmful effects of maternal smoking on infant and thus have the option to adopt good habits (Lindeboom, Llena-Nozal and Klauuww, 2009).

In addition, they use prenatal care more and also breastfeed more often which helps keep the baby healthy through supplying all necessary nutrients in the proper proportions to attain basic nutrition and even through protecting baby from illness like diarrhoea or stomach upset as well as constipation as breast milk is easily digested (Lindeboom, Llena-Nozal and Klauuww, 2009).

Mother's child care responsibility in the house (which is influenced by her education) is obviously larger than the father's role in child care in the house. This is because a mother engages in the day to day decisions on overall child's hygiene and nutritional intake. Hence, more effect of mother's education on the longer term measure of child health such as height and weight (Semba et al., 2008).

In general, more educated parents are able to adopt better child care practices or superior hygiene standards because education provides better knowledge about the true nature of health production or ability to respond to new knowledge more promptly (Grossman, 2005). Following good practices of hygiene promotes good health and avoids morbidity and mortality through preventing bacteria, viruses and illness such as diarrhoea (Mills and Cumming, 2016).

In developing countries, it is widely recognised that having few resources could be a key factor impeding access to health services that possibly translate into inferior child health and nutrition (Aslam and Kingdon, 2012). Education indeed can influence this through increasing access to skilled employment and thus higher earnings. Better-educated parents have a higher likelihood of being employed in skilled job with higher income, and these resources could be used to invest in health and cushion the impact of adverse shocks (Case, Lubotsky, and Paxson, 2002). Hence, one should expect reduction in child mortality.

Regarding the additional variable of rural location indicator, the estimated result indicates a positive association between rural location and the probability of a household experiencing child mortality in Oyo state, Nigeria. As compared to the urban location household (reference category), the likelihood of a family experiencing child mortality increases by 7% for the rural-located household.

From the age indicators, it is estimated that age indicators of the household head have a positive association with the probability of a household experiencing child mortality. Compared to household with (20 – 35 years old headed) reference category, it is found that the likelihood of a household experiencing child mortality increases on average by 2%, 5%, and 6% for (35 – 44 years old headed, 45 – 59 years old headed and 60 and above years old headed) respectively.

The results of household size indicators show both negative and positive association with the probability of household experiencing child mortality. Compared to a household with the number of (1 – 2 persons) reference category, it is found that the likelihood of a household experiencing child mortality reduces on average by 6% for (3 – 5 persons household). Whereas, as compared to a household with the number of (1 – 2 persons) reference category, it is found that the probability of a household experiencing child mortality increases on average by 5%, and 4% for household with the number of (6 – 8 persons, and 9 and above persons) respectively.

The result of the Wald chi-square test indicates that educational level and other explanatory variables are jointly significant in determining the nature of the impact on the likelihood of a household experiencing child mortality.

**5.4 Conclusions**

This chapter presents the estimate results from the probit regression model in determining the effect of education and other explanatory variables on the probability of a household being poor in (H1 – H5). The specific focus is on education for Oyo state household using the data collected from the Nigeria General Household Survey (GHS)-Panel wave 3 of 2015/2016 conducted by the National Bureau of Statistics (NBS). The total sample size for the study is 186 households.

For the focus of this study, the multicollinearity test was carried out to be sure about the isolation of the association between each independent variable and dependent variable in all the hypotheses and the results are shown in (Appendix 1 – Appendix 5). The results indicate for all the hypotheses that the variance inflation factors are less than (5). Therefore, multicollinearity is not an issue in the regression analysis.

Most of the household head education indicators appear statistically significant and are largely consistent with the prior expectation that education has a poverty-reducing effect on the probability of a household being poor.

The empirical findings of the father education confirm the prior expectation that education has a negative association with the probability of a household experiencing child mortality, irrespective of the educational attainment indicator employed, and the effect is statistically significant for the secondary and tertiary level of education of the father.

It is also found that the mother's education reduces the likelihood of a household experiencing child mortality. The greatest effect is shown for tertiary education and statistically significant.

Regarding the additional explanatory variables, some of them appear statistically significant and have a probability of being poor- reducing effect in Oyo state.

The Wald test result for all the hypotheses indicates that educational level and other explanatory variables are jointly significant in determining the nature of the impact on the probability of a household being poor.

**CHAPTER SIX: CONCLUSIONS**

**6.1 Introduction**

In investigating the effect of education on household poverty in Oyo state, Nigeria. The above chapter presents the results of the probit regression model and the interpretation of results.

Despite that, Nigeria’s Gross Domestic Product (GDP) per capita has risen through the years in terms of the nominal US dollars. For example, the Nominal GDP in Nigeria showed 2,028.2 bn in 2018, compared with 567.9 bn in 2000 (World Bank Group, 2019a).

Many of the population still faces poverty (United Nations, 2014), Nigeria ranked the third position out of the top five countries in the global extreme poor in 2010 with 8.9% share. In 2018, the Nigeria population living in extreme poverty represents 86.9 million Nigeria out of the estimated 180 million population (Kazeem, 2018).

Poverty in Nigeria is a multidimensional issue. The health performance indicator of the country showed a very poor outcome across the board. Nigeria's undernourished incidence indicates about 13% of the population in 2018 (World Bank Group, 2019b).

The estimated infant mortality of children under the age of one (1) represents 76 per 1000 live births (World Bank Group, 2019c), and the estimated infant mortality of children under the age of five (5) represents 120 per 1000 live births (World Bank Group, 2019 d).

Poor people in Nigeria featured with lower level of education, low-income level and few opportunities for lucrative jobs, low rate of employment due to lack of skills. Majority of the poor households in the country tends to have children with less education and limited access to social services and infrastructure (Adesanoye and Okunmadewa, 2007, Oshowole and Ugbechie, 2011, and Ayoade and Adeola, 2012).

Many of the poor people in the country depend on low yield jobs, such as subsistence farming or other informal sectors, such as trading as a means of securing the necessities of life (Yusuf, Adesanoye and Awotide, 2008).

Oyo state which is the state under study has its share of poverty incidence in the country. In the Nigeria poverty profile 2010 report, the population of the state living below US$1 per day poverty line amounted to 51.8% (National Bureau of Statistics, 2012).

Poor households in the state are featured by lower educational attainment (Adesanoye and Okunmadewa, 2007 and Oshowole and Ugbechie, 2011), low-income level and few opportunities for well-paid employment, children in these households are affected by high malnutrition, morbidity and mortality, low rate of employment, lack of money for children's education, difficult and poor access to good security, poor housing conditions (Ayoade and Adeola, 2012).

The state literacy rate in 2012 according to United Nations Educational, Scientific and Cultural Organization (2012) amounted to 52.9 %, indicating that Oyo state has a high rate of illiteracy of about 47.1%. The unemployment rate recorded 49% (Njong, 2013), and this suggests that a greater part of the state does not have means of getting income to secure the basic needs of life.

For these vital issues highlighted above, evaluating the effect of education on various dimensions of poverty in Oyo state, Nigeria is highly important.

This chapter is arranged as follows: Section 6.2 restates the main findings of the study briefly, section 6.3 summarises the contribution to knowledge, section 6.4 provides a set of policy recommendations based on the findings and section 6.5 recognises the study's limitations and area of further research.

**6.2 Summary of the Findings**

The main aim of this study stemmed down to five (5) hypotheses, hence the summary of the findings is done per hypothesis. These hypotheses are listed as follows: a) first, education is negatively associated with income poverty. That is, the higher the education level of the household head, the lower the probability of the household being income poor (H1); b) second, education is negatively associated with poor health conditions. In other words, the higher the level of education of household head, the lower the probability of him and his family having poor health conditions (H2); c) third, education is negatively associated with poor housing conditions. That is, the higher the education level of the household head, the lower the probability of the household living under poor housing conditions (H3); d) fourth, education is negatively associated with poor children educational attainment. That is, the higher the education level of the household head, the lower the probability of the household having poor children educational attainment (H4); lastly, education is negatively associated with child mortality. That is, the higher the level of education of parents, the lower the probability of household experiencing child mortality (H5).

The theoretical framework of education is reviewed to have enough understanding of how education can influence each dimension of poverty.

 **6.2.1 Hypothesis 1: Education is negatively associated with income poverty**

The results of (H1) confirm the prior expectation that education has a negative association with the probability of a household being income poor, irrespective of educational attainment indicator used. The effect is strongly significant for secondary and tertiary education of the household head.

These findings are in accordance with other studies that have been established in the literature (Apata et al., 2010, Ijaiya and Nuhu, 2011, Botha, 2010, Njong, 2010, Wanka, 2014, Geda et al., 2005, Okojie, 2002, Faux and Ntembe, 2013, and Lohxa, 2016).

Moreover, these results indicate that education imparts knowledge and skills, and transforms people into more valuable human capital. The skills and productive knowledge imparted through education enhances the productive capability of those who possess them and thus increase their earnings in their workplace (Schultz, 1961). Education provides economic returns in the form of higher incomes and employment opportunities. Better educated people have a higher chance of getting employment, being economically productive and thus receive higher earnings (Schultz, 1961, Becker, 1992, and Teal, 2001).

With respect to other additional explanatory variables, the female household headed is found to increases the probability of a household being income poor in Oyo state and this finding confirms the general expectation that women are more likely to be poor compared to their male counterparts due to gender differences in earnings in the labour market (Chant, 2011 and Anyanwu, 2014). This finding is consistent with (Casper, McLanahan and Girfinkel, 1994, Wright, 1993, Pressman, 1998, Pressman, 2002, Botha, 2010, Njong, 2010, Bastos et al., 2009, and Wanka, 2014).

The estimated results also show that rural-located household significantly increases the probability of a household being income poor in Oyo state, and finding agrees to study of Anyanwu (2010), Anyanwu (2014), Botha (2010), and Wanka (2014).

Age of the household head is found to increase the probability of a household being income poor in Oyo state, irrespective of the age groups indicator used, and the effect is statistically significant for age 60 and above years' old household head. These findings are consistent with Datt and Jollife (1999), Garza-Rodriguez (2002) and Gang, Sen and Yun (2002).

The estimated results show that household size indicator counterintuitive the generally expected sign, though only statistically significant for (9 and above persons household) in Oyo state. The household size is usually expected to have higher poverty risk as household size increases. However, the results do not appear to be in support of this. It is found that the probability of being income poor reduces as the household size increases in Oyo state.

Being married headed and unmarried headed is found to increase the probability of the household being income poor.

**6.2.2 Hypothesis 2: Education is negatively associated with poor health conditions**

The empirical findings of (H2) confirm the prior expectation that education is negatively associated with the probability of household having poor health conditions, irrespective of educational attainment indicator used.

The effect is strong and statistically significant for secondary and tertiary education of the household head.

These results are in support of the study of Diaz (2010) that predicts a positive association between education and health. Hence, the negative association between education and poor health conditions.

In addition, the findings indicate that better-educated individuals have better chances to access available jobs and thus receive higher earnings than their counterparts, hence have better opportunity to opt for a more comfortable and clean environment to reside (Feinstein, et al., 2005 and Diaz, 2010). In developing countries, the most impoverished areas have the serious problem of public health majorly because of dusted roads and non-treated waters, which obviously are a detriment to good health (Diaz, 2010).

Better-educated people have better information and knowledge about the combinations of input necessary for good health, hence have a better chance to opt for the appropriate diet needed to attain the proper level of nutrition (Grossman, 2005, and Cutler and Lleras-Muney, 2006). Likewise, better-educated individuals have better chances of being employed in higher paying salaries with less occupational hazards whereas lesser-educated people have higher probability of being employed in lower paying jobs with more occupational hazards that involve environmental and chemical exposures, such as asbestos, pesticides and poor working conditions which expose them to harm and fatality (Cubbin, LcClere and Smith, 2000).

Stress is also an occupational hazard that is associated with coronary heart diseases (Head, et al., 2002). Although all members of workforces are open to stress at work, the highest stress is found amongst members of the workforces with less education (Grzywacz et al., 2004, Almeida, 2005, and Almeida et al., 2005). This is because they are more likely to be opened to heavier workloads, higher job demands, increased physical activity, limited control, poor psychological work environments (World Health Organization, 2002 and Head et al, 2002).

With respect to other explanatory variables, the estimated result show that female-headed household has a significant and negative association with the likelihood of a family having poor health conditions in Oyo state.

The rural-located household indicator appears significantly and negatively associated with the probability of a household having poor health conditions compared to the urban-located family in Oyo state.

The estimated results show that age indicator is found to increase the likelihood of a household having poor health conditions in Oyo state, irrespective of the age groups indicator used in the study.

Household size according to the estimated results reduces the probability of household having poor health conditions in Oyo state, irrespective of the household size indicator employed in the study. The effect is larger for the household with (6 – 8 persons)

Being married and unmarried according to the estimated results is found to reduce the probability of a family having poor health conditions.

**6.2.3 Hypothesis 3: Education is negatively associated with poor housing conditions**

H3 results show that education has a significant and negative association with the likelihood of a household living under poor housing conditions, irrespective of the educational attainment indicator employed in the study.

Another remarkable finding is that the higher the level of education of the household head, the lower the probability of a household living under poor housing conditions and this suggests that better-educated people have higher chances to get employment with a higher paying salary that gives them access to choose a house with appropriate conditions.

Likewise, they have increased access to credit market because they have a higher chance to more effectively communicate with credit agencies in the view of the fact that they have understanding of financial transactions and records keeping, that increase the possibility of attaining credit, which creates better opportunity of possessing suitable housing conditions (Diaz, 2010).

Regarding other explanatory variables, the female-headed indicator result shows that the probability of a household living under poor housing conditions increases with female-headed in Oyo state.

The estimated results also show that the likelihood of a household residing under poor housing conditions significantly increases with household located in the rural area in Oyo state.

Age indicator results show that the probability of a household living under poor housing conditions decreases with the age indicator of (35 – 44 years and 60 + years) household head in Oyo state. Whereas, increases with the age indicator of (45 – 59 years) household head.

Household size indicator reduces the probability of a household residing under poor housing conditions, irrespective of the household size indicator used. Another notable finding is that the likelihood of a household living under poor housing conditions reduces as lower the number of members of the family.

Being married headed according to the estimated results is found to increase the probability of household having poor health conditions in Oyo state. Whereas, reduces with being unmarried headed in Oyo state.

**6.2.4 Hypothesis 4: Household head education is negatively associated with poor children educational attainment**

The empirical findings confirm the prior expectation that there is a negative association between household head education and the probability of a household having poor children educational attainment, irrespective of educational attainment used in the study. All the educational attainment effect is statistically significant.

Moreover, the results confirm that the higher the level of education of the household head, the lower the likelihood of a household having poor children educational attainment.

These findings are in support that educated parents have beliefs and expectation predicting their children higher educational attainment, but this is influenced by family income (Alexander, Entwisle and Bedinger, 1994).

For instance, more educated parents have beliefs and expectation that were closer to their children higher educational attainment because they have a better chance of being employed in a job with a higher salary that gives them the possibility of funding their children's education (Blanden, Gregg and Machin, 2002).

Better educated parents, get involved in the educational system on their children's behalf, for instance, reading to them at home as well as helping them with the school assignments (Davis-Kean, 2005). This, in turn, helps them to perform better in school and therefore they are inspired to follow additional years of education (Wanka, 2014), and a reduction in poor children educational attainment.

Regarding the other explanatory variables, the estimated results show that female-headed indicator is found to reduce the probability of a household having poor children educational attainment in Oyo state.

The estimated results also show that the likelihood of a household having poor children educational attainment increases with the rural-located household in Oyo state.

 For age indicator, the probability of a household having poor children educational attainment increases with the age of the household head in Oyo state, irrespective of the age indicator.

 Household size increases the probability of a household having poor children educational attainment in Oyo state, irrespective of the household indicator. The effect is statistically significant for household with members of (3 – 5 persons and 9 + persons).

**6.2.5 Hypothesis 5: Parents education is negatively associated with child mortality**

For H5 estimation, I have chosen to use both father and mother education to determine the household probability of experiencing child mortality because investments in child health require both parental money and responsibility and education influences these inputs, hence a reduction in child mortality.

The estimated results confirm the prior expectation that education reduces the probability of a household experiencing child mortality, irrespective of the educational attainment of father indicator used and statistically significant for secondary and tertiary education. The results also confirm that the higher the education of the father, the lower the likelihood of a household experiencing child mortality.

These findings are in accordance with the explanation of Semba et al. (2008) that the role of father's education lies on low social status and empowerment of mothers that possibly restrict the influence they have in making a decision regarding child health.

Alternatively, it may be that a father engages in a more active role in some types of health decisions, for instance, immunization decisions or participation decisions especially if they need to travel to health clinic, and therefore, one will conclude that a father's education has a higher association with participation decisions/health seeking behaviour, which apparently improves child health and thus child mortality (Semba et al., 2008).

The estimated results also show that the probability of a family experiencing child mortality reduces with mother education, irrespective of mother educational attainment indicator employed in the study for Oyo state. The effect is statistically significant for tertiary education of the mother in Oyo state.

These results confirm that the higher the level of education of the mother, the lower the probability of the household experiencing child mortality.

These findings indicate that better-educated mothers are better informed of the risk of the unhealthy behaviour, such as harmful effects of maternal smoking on infant health, which gives them better chance to effectively reduce the unhealthy habit that could affect infant health even before they were birthed (Lindeboom, Llena-Nozal and Klauuw, 2009).

Likewise, better-educated mothers use more prenatal care and breastfeed more, and these behaviours keep baby in good health (Lindeboom, Llena-Nozal and Klauw, 2009). Hence, reduce child mortality.

Living in a rural area tends to increase the likelihood of a household experiencing child mortality than in the urban location in Oyo state.

The age indicator for Oyo state is found to increase the probability of a household experiencing child mortality, irrespective of the age of the household head indicator used in the study.

Household size according to the estimated results show that the probability of a household experiencing child mortality reduces with household size indicator of (3 – 5 persons). Whereas, increases with household size indicator of (6 – 8 persons and 9 + persons) in Oyo state.

**6.3 Summary of the Contribution to Knowledge**

The main contributions of this thesis are summarised as follows:

Firstly, to the best of my knowledge, there is no study regarding the impact of education on various dimensions of poverty, including both monetary and non-monetary in Oyo state, Nigeria and also used the macro dataset of 2015/2016 Nigeria General Household Survey (GHS) in Oyo state, Nigeria.

Only a few studies which are Adetola and Olufemi (2012), Adetola (2014), and Ataguba, Fonta and Ichoku (2011) have evaluated the determinants of the non-monetary dimension of poverty in Nigeria. None of these studies has estimated the effect of education on poverty uni-dimensionally. They all have indicated poverty in an aggregated multi-dimensional index. Hence, this study contributes to knowledge by taking the method of evaluating the impact of education on each dimension of non-monetary poverty in Oyo state, Nigeria.

Following this method, this study is useful as it will give a better understanding to policymakers, the people of Oyo state, and Nigeria as a whole on the effect of education on each dimension of poverty. Hence, why education should be considered an important instrument for poverty reduction.

For this method also, this study identified the specific type of individuals that need special attention for educational policies since they obtained higher poverty to a given poverty indicator, for example, rural-located households and female households headed. Hence, the study contributes to knowledge.

Lastly, this study adds to knowledge by providing statistics including the percentage of poverty in both monetary and non-monetary measure of poverty in Oyo state. Therefore, the results are expected to be useful to policymakers as they will be aware of the share of the population that needs special attention for educational policies.

**6.4 Policy Recommendations**

Based on the empirical findings developed on the effect of education on various dimensions of poverty in this study, a set policy recommendation are proposed for Oyo state and Nigeria as a whole.

1. The estimated results provide that education has income poverty-reducing effect in Oyo state, irrespective of the level of education. Moreover, the estimate results confirm that the probability of a household being income poor reduces as the level of education increases and the decrease is strongly significant for tertiary education. Therefore, I recommend that investment in education as strictly necessary in the poverty reduction reforms, particularly in tertiary education. While funding education can be expensive, I suggest that investment in education, particularly tertiary education is implemented in the form of a student’s loan. With this, attainment of education imparts knowledge and skills and transforms people into more valuable human capital. The skills and productive knowledge imparted through education enhances the productive capability of those who possess them and thus increase their earnings in their workplace (Schultz, 1961). Consequently, increased earnings will help them to escape income poverty.
2. The estimated results also provide evidence that being female-headed increases the probability of a household being income poor, compared to male-headed. The most important reason for this is the larger responsibility of women in the household, especially the care of the young children, which tend to impede them in acquiring education. For instance, Table 5.35 shows that the share of female-headed with none level of education is higher compared to their male counterparts. People with less education are more likely to engage in lower paying jobs and thus earn lower salaries that opens them to higher income poverty risk. This said, reducing poverty may require increasing educational opportunities for women, particularly implementing in the form of childcare voucher and academic programs in Oyo state.
3. Location wise, the estimated results provide evidence that rural location increases the probability of a household being income poor compared to urban area. A potential reason is that rural location household faces higher income poverty risk as a result of fewer employment opportunities. Taking this conclusion into account, investment in education for rural location is desirable, but it is incapacitated on its own, due to fewer employment opportunities in the rural area. Hence, the creation of new jobs is required in order to have equal employment opportunity. For this purpose, the government should support activities that encourage employment creation. Amongst other are, improving or developing road system in the rural region, providing cheap loans so the people living in the rural area can open small-scale shop or industries, introducing job creation act as well as the effective rule of law.
4. The estimated results have documented a negative association between education and probability of a household having poor health conditions, irrespective of educational level used. Moreover, the indicator of tertiary education of the household head is found to be a strong significant predictor of the likelihood of a household having poor health conditions compared to the less educated household head. Therefore, investment in education is desirable as well as improving skills-based health education. With this, better-educated individuals acquire knowledge and information on attitudes and skills that support the adoption of healthy behaviours, such as choosing appropriate diet, less smoking, use of preventive care more, less drinking etc. Consequently, these habits will help to keep and improve their health and well-being.
5. To have comfortable and decent housing conditions, investment in education is also required, as the estimate results provide evidence that education reduces the likelihood of a family living under poor housing conditions, irrespective of educational attainment. The effect is significantly strong for tertiary education in Oyo state. Moreover, it is desirable for policymakers to bear in mind when developing and implementing educational policies for poverty reduction to take into account the inequalities so as to effectively target the most vulnerable groups. The rural-located household and female-headed household in Oyo state have a higher probability of living under poor housing conditions as the estimate results shown.
6. Given the estimate results for household head education and poor children educational attainment, it is found that a household probability of having poor children educational attainment is lower for higher educated household head, compared to none level education household head in Oyo state. Hence, I suggest an investment in education and I anticipate that economic returns in the form of higher earnings and employment opportunities associated with education will reduce the likelihood of a household having poor children educational attainment. With this, better new generations are guaranteed for Oyo state.
7. Finally, the estimated results show a decreasing effect of education on child mortality for both father and mother in Oyo state. This suggests that both father and mother education is essential in improving child health and reducing child mortality in Oyo state. Hence, investment in education is desirable as an important tool to fight child mortality. Additionally, it is desirable for policymakers to support activities that promote equal educational opportunities. With this, parents are allowed to complement each other and more effective in reducing child mortality in the household. The role of education in childcare is gender-based. Better-educated fathers are well knowledgeable of healthy behaviours and thus have the option to take the right health decisions, for instance, immunisation decisions and participation decisions, especially if travelling to the health clinic is required. Mothers with better education are also well informed of healthy behaviours and thus have the option to choose right habits, such as the use of preventive care more, breastfeeding more, good hygiene practices in daily life etc. that allow their children to have a healthier life, and thus reduce child mortality.

**6.5 Limitations for the Study and Area of Further Research**

I recognised two main limitations in this study, in which data availability and further research might be able to address.

Chief among these limitations is concerned with the possibility of endogeneity in the regression model.

For instance, the association between education and income poverty can be seen in two ways. Lack of education may lead to income poverty. Alternatively, insufficient financial resources can be an obstacle to attain education. Also, the lack of education may lead to poor health conditions. Alternatively, ill health and poor nutrition can deter school performance or attainment.

This said endogeneity is an issue. However, endogeneity is not controlled in this study as a result of unsuitable instrumental variables. Therefore, the direction of causality between education and poverty is unclear, and the estimated parameters cannot be accepted as entirely conclusive. For this reason, it is advisable in the future survey to add questions that will give a suitable set of instrumental variables. An example of such variable is the season of birth of individuals and proximity to the educational institution of individuals.

Finally, another issue relates to missing data, the actual sample size collected for Oyo state in the Nigeria General Household Survey (GHS)-Panel wave 3 of 2015/2016 conducted by the National Bureau of Statistics is 201 respondents.

However, the total sample size used for this study is 186 respondents as 15 households have missing data regarding education indicators, age indicators and children educational attainment.

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**APPENDICES**

Appendix 1: **Hypothesis 1 multicollinearity**

|  |  |  |
| --- | --- | --- |
| Independent Variables | VIF | 1/VIF |
| Married  | 4.25 | 0.235343 |
| 60 and above years old | 3.68 | 0.271663 |
| 45 – 59 years old  | 3.64 | 0.274699 |
| Female  | 3.09 | 0.323614 |
| 6 – 8 persons HH | 3.03 | 0.330246 |
| 3 – 5 persons HH | 2.81 | 0.356448 |
| Household head tertiary education  | 2.24 | 0.445990 |
| 9 and above persons HH | 2.24 | 0.446465 |
| Household head secondary education | 2.17 | 0.460303 |
| 35 – 44 years old  | 2.17 | 0.460418 |
| Unmarried  | 2.09 | 0.478005 |
| Household head primary education | 1.97 | 0.508287 |
| Rural location | 1.15 | 0.870262 |
| Mean VIF | 2.66 |  |

Source: computed from Stata statistics.

Appendix 2: **Hypothesis 2 multicollinearity**

|  |  |  |
| --- | --- | --- |
| Independent Variables | VIF | 1/VIF |
| Married  | 4.25 | 0.235343 |
| 60 and above years old | 3.68 | 0.271663 |
| 45 – 59 years old  | 3.64 | 0.274699 |
| Female  | 3.09 | 0.323614 |
| 6 – 8 persons HH | 3.03 | 0.330246 |
| 3 – 5 persons HH | 2.81 | 0.356448 |
| Household head tertiary education  | 2.24 | 0.445990 |
| 9 and above persons HH | 2.24 | 0.446465 |
| Household head secondary education | 2.17 | 0.460303 |
| 35 – 44 years old  | 2.17 | 0.460418 |
| Unmarried  | 2.09 | 0.478005 |
| Household head primary education | 1.97 | 0.508287 |
| Rural location | 1.15 | 0.870262 |
| Mean VIF | 2.66 |  |

Source: computed from Stata statistics.

Appendix 3: **Hypothesis 3 multicollinearity**

|  |  |  |
| --- | --- | --- |
| Independent Variables | VIF | 1/VIF |
| Married  | 4.25 | 0.235343 |
| 60 and above years old | 3.68 | 0.271663 |
| 45 – 59 years old  | 3.64 | 0.274699 |
| Female  | 3.09 | 0.323614 |
| 6 – 8 persons HH | 3.03 | 0.330246 |
| 3 – 5 persons HH | 2.81 | 0.356448 |
| Household head tertiary education  | 2.24 | 0.445990 |
| 9 and above persons HH | 2.24 | 0.446465 |
| Household head secondary education | 2.17 | 0.460303 |
| 35 – 44 years old  | 2.17 | 0.460418 |
| Unmarried  | 2.09 | 0.478005 |
| Household head primary education | 1.97 | 0.508287 |
| Rural location | 1.15 | 0.870262 |
| Mean VIF | 2.66 |  |

Source: computed from Stata statistics.

Appendix 4: **Hypothesis 4 multicollinearity**

|  |  |  |
| --- | --- | --- |
| Variables | VIF | 1/VIF |
| 60 and above years old  | 3.21 | 0.311891 |
| 45 – 59 years old  | 3.15 | 0.317031 |
| 6 – 8 persons HH  | 2.72 | 0.367578 |
| 3 – 5 persons HH | 2.61 | 0.383351 |
| Household head tertiary education  | 2.23 | 0.448100 |
| Household head secondary education  | 2.17 | 0.461573 |
| 9 and above persons HH  | 2.11 | 0.474488 |
| 35 – 44 years old  | 2.00 | 0.500047 |
| Household head primary education  | 1.96 | 0.509748 |
| Female  | 1.30 | 0.767293 |
| Rural location  | 1.14 | 0.880775 |
| Mean VIF | 2.24 |  |

Source: computed from Stata statistics.

Appendix 5: **Hypothesis 5 multicollinearity**

|  |  |  |
| --- | --- | --- |
| Variables | VIF | 1/VIF |
| 45 – 59 years old  | 3.19 | 0.313917 |
| 60 and above years old  | 3.03 | 0.330431 |
| 6 – 8 persons  | 2.77 | 0.361140 |
| 3 – 5 persons HH  | 2.76 | 0.362845 |
| Father tertiary education  | 2.40 | 0.416655 |
| Father secondary education  | 2.22 | 0.450463 |
| Father primary education  | 2.15 | 0.465712 |
| 9 and above persons HH | 2.07 | 0.482182 |
| 35 – 44 years old  | 2.07 | 0.482387 |
| Mother tertiary education  | 2.01 | 0.496693 |
| Mother secondary education | 1.92 | 0.520763 |
| Mother primary education  | 1.89 | 0.529071 |
| Rural location  | 1.11 | 0.904302 |
| Mean VIF | 2.28 |  |

Source: computed from Stata statistics.

Appendix 5: **Information on the General Household Survey (GHS)-Panel Wave 3 of 2015/2016.** The GHS-Panel wave 3 of 2015/2016 was conducted by the National Bureau of Statistics. It inquiries about household consumption and expenditure, household income, health conditions of the household, education of the members of the household, as well as socio-demographics (occupation, age, gender, region, marital status), household assets, housing conditions (including information about materials of walls and floors, lighting and cooking fuels, access to safe drinking water and sanitation) and information about school attendance of children five years old or older (World Bank, 2017).