Human capital development indicators and poverty reduction in Nigeria

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Abstract

The study determined the human capital development indicators and poverty reduction in Nigeria. The specific objectives were to: ascertain the impact of government education expenditure on poverty reduction in Nigeria and determine the impact of out-of-pocket health expenditure on poverty reduction in Nigeria. The research design was ex post-facto method. The variables consist of government education expenditure, government health expenditure, out-of-pocket health expenditure, poverty is poverty head count ratio and tertiary school enrolment rate for the period of 1990 to 2024 as defined in our model specification. All the variables were sourced from Central Bank of Nigeria's (CBN) statistical bulletin and World Bank Data indicator of the time scope. The pre-estimation statistics includes descriptive statistics, Correlation Matrix of the Variables, Augmented Dickey-Fuller Unit Root test statistic, Johansen Co-integration test. The estimation technique includes Dynamic ordinary least square (DOLS) while post-estimation technique involves Histogram Normality Test. The empirical results showed that government education expenditure has 62 percent positive and insignificant impact on poverty reduction (t-statistics; 1.157737; *p*-value; 0.0000 > Sig-value: 0.8766) and out-of-pocket health expenditure has 31 percent positive and significant impact on poverty reduction (t-statistics; 5.51927; *p*-value; 0.0000 > Sig-value: 0.005). The study recommended that Federal Ministry of Education, in collaboration with state governments, should implement scholarship programs that target low-income families. This can be accomplished by introducing transparent scholarship schemes that involve community-based organizations and educational institutions to identify deserving beneficiaries, ensuring that these opportunities are not monopolized by affluent individuals.

Keywords: Human Capital Development, Out-of-Pocket Health Expenditure, Poverty Reduction

1.1 Background of the study

Human capital development is widely acknowledged as a crucial factor in shaping a nation's economic growth and overall development (Ayodele, Taiwo, Umar & Akeem, (2024) [8]. It encompasses the accumulation of knowledge, skills, health, and other productive attributes that individuals acquire through education, training, and healthcare (Schultz, 1961). In the context of poverty reduction, human capital development plays a vital role in empowering individuals, improving their living standards, and fostering inclusive growth. The African continent faces diverse socioeconomic challenges, with poverty remaining a pressing issue for many African countries, where a significant proportion of the population lives below the poverty line (World Bank, 2020) [27]. Enhancing human capital development has the potential to serve as a powerful tool to combat poverty and promote sustainable development. By investing in education, healthcare, and skill-building, countries can empower their citizens, equip them with the necessary tools for economic participation, and create opportunities for upward mobility.

Education is a fundamental component of human capital development. It equips individuals with knowledge and skills necessary for economic productivity and social mobility. Quality education promotes cognitive development, critical thinking, and problem-solving abilities (World Bank, 2023) [28]. It also enhances individuals' employability and income-earning potential, contributing to poverty reduction (Amire & Tiamiyu, 2022) [5]. Additionally, education empowers individuals, enables them to participate in decision-making processes, and fosters a sense of self-worth and agency (World Bank, 2023) [28]. Improved access to quality education is thus crucial for human capital development and poverty reduction. Access to education remains a major challenge in many African countries. Factors such as limited infrastructure, inadequate resources, and socio-cultural barriers hinder individuals' ability to access and complete formal education (World Bank, 2023) [28]. Gender disparities in education further exacerbate these challenges, with girls and women facing greater barriers to education (World Bank, 2020) [27]. The lack of access to quality education perpetuates poverty cycles, as individuals without basic education struggle to secure stable employment and higher incomes (World Bank, 2020) [27].

Healthcare is another crucial aspect of human capital development. Accessible and quality healthcare services

contribute to a healthy and productive workforce. Good health is not only an intrinsic value but also an instrumental factor in economic development (World Health Organization, 2021) [27]. Individuals with good health are better able to engage in productive economic activities, earn higher incomes, and escape poverty (World Health Organization, 2021) [27]. Furthermore, investments in healthcare infrastructure, disease prevention, and treatment programs can alleviate the economic burden of healthcare expenses on individuals and households (Abdulganiyu. 2022) [2]. However, healthcare systems in many African countries face significant challenges. Limited resources, inadequate infrastructure, and high disease burdens hinder individuals' access to quality healthcare services (World Health Organization, 2021) [27]. The financial burden of healthcare expenses further deepens poverty levels in these countries (World Health Organization, 2021) [27]. Addressing these challenges and improving healthcare services are crucial for enhancing human capital development and reducing poverty.

Skills development is a vital aspect of human capital development that influences individuals' productivity and employability. It involves acquiring specific competencies, technical skills, and entrepreneurial abilities (Olubummo & Awe, 2023) [23]. Skills development enables individuals to participate effectively in the labor market, create jobs, and contribute to economic growth (World Bank, 2020) [27]. Moreover, skills development fosters innovation, adaptability, and resilience, which are essential for countries to thrive in an evolving global economy (Okiya & Wepukhulu, 2018) [21].

Government health expenditure is crucial as it helps in ensuring the well-being of the population, supports economic and social development (Ikpe, Agu & Okwor, (2023) [13]. In a country where government health expenditure is not adequately provided, people resolve to alternative options such as: Social Health Insurance (SHI) scheme, Out-of-pocket health expenditure (OOP), Corporate Health Programs (CHP), private individuals and organisations donation, orthodox medical health care services (Hilaire, Venant & Melain, 2023) [12]. Out-of-pocket health expenditure is a payment where individuals and families directly pay for healthcare services, medications, and treatments which are not covered by insurance or public programs (Rahman, Gasbarro & Alam, 2022). These costs can encompass a wide range of medical services and products, including consultations, hospitalizations, surgeries, prescription drugs, medical equipment, and various types of therapies or treatments (Shisoka & Wepukhulu, 2025) [25]. Bridging the skills gap and aligning skills development with labor market demands are essential for promoting human capital development and poverty reduction. However, studies on impact of human capital development indicators on poverty reduction in Nigeria are limited, re-evaluating these effects became imperative and is crucial for policymaking and implementation.

1.2 Statement of the problem

Human capital is a production element that can generate added values when inputted into the production process. The differences in the level of socio-economic development across the globe are attributed not so much to natural resource endowments, and the stock of physical capital, but to the quality and quantity of human resources (Ogunjobi, Awe, Ogunsakin & Oladipo, 2024) [20]. Mehta, (2024) [18], opined that human resources are a critical variable in the growth process, worthy of development and means to a reduction in the poverty level through productivity and the study stressed that human resources are not only means but, more importantly, the ends that must be served to achieve economic progress for poverty reduction in any developing country.

It was reported by Nigerian National Bureau of Statistics in 2020 that estimated figure of more than 90 million people are lurch in abject poverty. Meanwhile, a good number of policies and programmes have been carved out, both in emerging and developing countries to reduce the staggering poverty incidence among the citizens (Didiugwu, 2024) [9]. Globally, one of the redefined poverty reduction programmes introduced after Millennium Development Goals (MDGs) is Sustainable Development Goals (SDGs) in 2015 and saddled with 17 goals. Regrettably, little or no significant improvement has been recorded since inception and the effectiveness of the programme to successfully reduce poverty in developing countries has been questionable by the researchers and debatable in the literature. A cursory look at the programmes revealed that the ineffectiveness of it resulted from lack of political will to implement various polices and misplaced policies priority in developing country like Nigeria. Ogbaini and Amadi (2023) [19] stated emphatically that the focus of policies towards curbing poverty rate is not designed properly and most of it were carried out fraudulently which leads to counter-productivity.

The Human Development Report in 2019 reveals that Nigeria is one of the poorest among the poor countries in the world. Nigeria ranks 54th on the human poverty index (HPI) - making it the 20th poorest country in the world. It is also ranked 30th in the gender-related development index (GDI) while occupying the 40th position from below in its human development index (HD1), these report statistic have not significantly improved for the better to date. It is in line with the foregoing, that this study seeks to examine the impact of human capital development indicators on poverty reduction on the Nigerian economy.

1.3 Objectives of the study

The main objective of the study is to examine the human capital development indicators and poverty reduction in Nigeria. The specific objectives are to:

- Ascertain the impact of government education expenditure on poverty reduction in Nigeria.
- Determine the impact of out-of-pocket health expenditure on poverty reduction in Nigeria.

1.4 Research questions

This study seeks to provide answers to the following research questions:

- To what extent does government education expenditure impact on poverty reduction in Nigeria?
- To what extent does out-of-pocket health expenditure impact on poverty reduction in Nigeria?

1.5 Significance of the study

This study would be beneficial and relevant to governments, private sector companies, international organizations and educational institutions.

Governments: The outcome of study would encourage government to invest in education, healthcare, and infrastructure to enhance the nation's workforce quality, reduce poverty, and foster economic growth.

Private sector employers: The outcome of study would encourage private employers to formulate company policy that involves off-the-job-training and on-the-job training and professional development to enhance employee incentive and retention.

Educational and Technical Institutions: The outcome of study would encourage management of education institutions to use imprest fund in providing teaching materials that promote technical skills necessary for the modern job market.

2.1 Conceptual literature

2.1.1 Human capital development

Human capital development refers to the process of enhancing individuals' knowledge, skills, health, and other productive attributes through education, training, and healthcare (Aigbedion, 2021) [4]. Human capital refers to the abilities and skills of human resources and human capital development refers to the process of acquiring and increasing the number of persons who have the skills, education and experience which are critical for the economic growth of the country (Adekoya, 2018) [3].

Atake, (2018) [7] describes human capital as an important factor used in converting all resources to benefit mankind. Human capital development is strategic to the Socio-economic development of a nation and includes education, health, labour, employment and women's affairs. Investing in human capital development is therefore critical as it is targeted towards ensuring that the nation's human resources endowment is knowledgeable, skilled, productive, and healthy to enable the optimal exploitation of other resources to produce growth and development. In a nutshell, investment in human capital means expenditure on health, education, and social services in general but in a narrow sense, it is capable of measuring all expenditures on social services.

For this study, the two basic objectives of human capital development will be the centre of focus which are Education and Health. They are important ends in themselves. Health is central to well-being and education is essential for a satisfying and rewarding life: both are fundamental to the broader notion of expanding human capability that is at the heart of the meaning of development (Chikelu, 2026).

2.1.2 Poverty reduction

There is no consensus on a standard definition of poverty despite its universality and the enormous literature on it (Clement, Syden & Ronney, 2022). There are divergent views on its nature, how to determine whether it is rising or falling and the understanding of transition from being 'non-poor' into the poverty trap. According to Lawanson and Umar, (2021) [15], "poverty is general scarcity or the state of one who lacks a certain amount of material possessions or money." It is a concept with diverse aspects which includes social, economic, and political elements. Poverty has been described to either be temporary or extreme with relations to the concept of inequality.

Maku, Ajike and Chinedu, (2019) [17] asserts that poverty is the inability to get choices and opportunities, a violation of human dignity. It means a lack of basic capacity to participate effectively in society. To them, it means not having enough to feed and clothe a family, and not having a school or clinic to attend. 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 in marginal or fragile environments, without access to clean water or sanitation.

Poverty, according to the World Bank (2020) [27], is construed to be a deprivation in the personal well-being of individuals or a group of people. It comprises people with the inability to attain the necessary materials for living and survival resulting from their low incomes. Poverty is also stated to include elements of poor health conditions, low rate of literacy, inaccessibility to drinkable water and a safe environment, lack of adequate security, and lack of access to life-changing opportunities.

2.1.3 Linkages between government education expenditure and poverty reduction

Education can be referred to as change of bad orientation, development of good mindset, forming proper habits and acquiring skill that lead to both human and national development. Educational methods include storytelling, discussion, teaching, training, and directed research. Education is the process of acquiring knowledge, skills, beliefs, values and habits which teach one to be a real human being (Omede & Adamu, 2021) [24]. Education helps young people to be focused, independent and possess the ability to motivate themselves.

Abdalla and Norashidah, (2021) [1] submits that education is a guide to light in the path of our success. Therefore, where proper education is lacking, people tend to be wild and show no concern for the consequences of their actions. Education helps to alleviate poverty in a nation through exposure to opportunities and ability to identify ones potentials. Education helps people to acquire relevant skills and discover their talents and other hidden potentials in them. What makes an individual poor is when he or she does not know what he/she is capable of doing to make a living. Education exposes an individual to opportunities around him or her while the information at his/her disposal provides the empowerment. In line with a popular saying that 'knowledge is power', it also follows that knowledge is acquired through education and a knowledgeable person cannot be poor.

2.1.4 Linkages between out-of-pocket health expenditure and poverty reduction

In Nigeria, out-of-pocket spending still makes up more than 70% of total health expenditure, pushing millions into poverty every year. World Health Organization (WHO) estimates that globally over 150 million people incur catastrophic health expenditure while over 100 million are pushed into poverty due to OOP health payments. Most low- and middle-income countries (LMICs) including Nigeria are battling the problem of poverty. Financial protection ensures that households do not face financial hardship and become impoverished as a result of seeking healthcare. In an attempt to address the lack of financial risk protection, the Federal Government of Nigeria in 2005 kick-started the National Health Insurance Scheme (NHIS) with the aim of providing access to good healthcare services and also ensuring the protection of households from the financial burden of OOP health payments.

Over decade, evidence suggests that less than 5% of Nigerians mainly federal government workers are insured under this scheme.8 Also, less than 3% of the Nigerian population are under the private health insurance (PHI). 9 Over 90% of Nigerians pay OOP for healthcare and this is supported by both WHO and World Bank statistics. Households who live below the poverty line often do not use healthcare services when the need arises (Aregbeshola & Khan, 2018) [6]. OOP health payments are capable of making households incur catastrophic health expenditure and this can exacerbate the level of poverty. OOP health payments are regarded as catastrophic when healthcare expenditure affects the ability of a household to purchase essential non-medical goods and services.

2.2 Theoretical literature

2.2.1 Classical poverty theory

This theory was proposed by Lewis (1961) during his study on poverty in Mexico and Puerto Rico in 1961. Miller (1958); Rainwater (1966); Clark (1965); Liebow (1967) have also contributed to the evolution of the classical poverty theory. Classical poverty theorists argue that individuals are ultimately responsible for their own poverty. This theory proposes that poverty is caused by personal traits. It explains the cause of poverty in the traits of the poor themselves. The theory explains poverty in terms of the conditions under which the poor live: unemployment, underemployment, poor education, and poor health. The classical economic theorists provide a foundation for laissez-faire policies in trying to alleviate poverty. The theory has an advantage of using monetary units to measure poverty and the ease of designing policies in order to alleviate poverty. The theory also deals with the role of incentives on individual behavior and the relationship between income and productivity. The theory encompasses monetary aspects, the individual as opposed to the group, and the limited role played by the government. It also believes that poverty is often cyclic, in other words, successive generations of the same family remain poor.

This theory is criticized since it puts a lot of emphasis on an individual and downplays the role played by other external factors like the macroeconomic policies undertaken by the government. The other criticism is it perceives material means as the principal way to eradicate poverty.

2.2.2 Human capital theory

The proponents of this theory are Gary S. Becker in 1962 and Jacob Mincer in 1981. The theory argues that investment in human capital explains a large part in income differentials between different opportunities of employment. Human capital refers to any stock of knowledge or characteristics a worker has that contributes to his or her labor productivity. Human capital aims at improving an individual's working productivity. Investment in human capital involves both direct and indirect costs such as foregone earnings. Modern economists argue that education and health play a major role in improving human capital and as a result increase the economic outputs of a country (Becker, 1993). The theory postulates that investments in individuals can be seen through their economic value. This value can be measured in mathematical terms. Human capital can fall into sub-categories such as economic, social, cultural and symbolic capital. Economic capital is usually measured through an individual's labor productivity. Economic capital can be measured since one of its impacts is the ability to produce wages. Higher wages can be attributed to the acquisition of knowledge through education, training etc. Social and cultural capital involves the benefits an individual brings to the society. However, there's a challenge in measuring social, cultural, and symbolic capital. This represents the intrinsic value of human capital. All forms of human capital play a critical role since their existence and value can be experienced.

In practice, the theory is used to determine the value of training and education. It enables individuals to estimate the expected future benefits of investing in education. It also allows individuals to quantify the value of intangible assets such as health, education and social status.

The theory can be used in both planning and measurement utility. Welfare economics involves trading off current choices and their long-run benefits and implications. The theory enables one to make decisions between the opportunity costs of present situations and of future opportunities. The theory also helps with decisions in time allocation and the investments in health and social capital. Human capital can be maximized through investment in both physical and mental health.

The theory is subject to several criticisms; one amongst them is the unclear cause of a positive relationship between the individual´s qualifications and earnings. The critics argue that not even quality education is a determinant to high salary if the employee is on the external labor market. The theory is also criticized as putting less emphasis on the rationality of human behavior.

2.3 Empirical literature

Several studies abound on the relationship between human capital development and poverty reduction.

Ayodele; Taiwo; Umar & Akeem, (2024) [8] determined the effects of Human Capital Development on Poverty Reduction in Nigeria. Specifically, the study sought to explore unemployment, life expectancy, GDP per capita, infant mortality rate, and fertility rate on poverty reduction covering a period of 1990 to 2023. The method of data analysis were descriptive statistics, augmented Dickey-Fuller test statistic to check the unit root and regression analysis. The study finds that there are negative relationship between life expectancy, GDP per capita, Infant mortality rate and Poverty reduction (Unemployment) while fertility rate positively influenced poverty reduction (Unemployment). The study how ever conclude that improving human capital development (HCD) leads to decrease in poverty and to improve fertility rate of the Nigeria residents. Major policy implication is that to reduce poverty and ensure a considerable improved and better society, government at all levels should pay more attention to life expectancy, GDP per capital and Infant mortality rate of average Nigerians.

Didiugwu, (2024) [9] examined the impact of human capital development on poverty reduction in Nigeria. Specifically, the study sought to identify impact of total education expenditures, total health expenditures, poverty rate, out-of-pocket expenditures and inflation on poverty incidence covering the period 1981-20222. The sources of data were from Central Bank of Nigeria Statistical Bulletin 2020 and World Development indicators. The methodology adopted in the study is linear regression with the application of the Ordinary Least Squares (OLS) technique. Other diagnostic tests which include unit-root test, autocorrelation, and normality test were carried out in the study. The major findings of the study were that total education expenditures (TOEDXP) have a positive and insignificant contribution to poverty reduction in Nigeria, total health expenditures (TOHEXP) have a positive and insignificant contribution to poverty reduction in Nigeria, and out-of-pocket expenditures (OOPE) have a positive and insignificant contribution to poverty reduction in Nigeria. It is therefore the recommendation of the study that the government should also increase its expenditure on health and education. It is a fact that health is wealth and therefore, there is a need to provide a good environment, health facilities,

Ogunjobi, Awe, Ogunsakin and Oladipo, (2024) [20] examined the human capital, and economic growth in Africa. Data used were collected over the period between1987 and 2023 for 20 African countries. Panel data were analyzed using unit root test and auto-regressive distributed lag model for long run and short run effects. Analysis was carried out on the combined countries as well as countries grouped into Blocs of North Africa, West Africa, East Africa, Central Africa and Southern Africa respectively. The result of the analysis showed that School enrolment and government expenditure on health exert insignificant positive impact of real gross domestic product growth rate, while government expenditure on education exert significant negative impact of real gross domestic product growth for combined sample of Africa countries. The study recommended that Kenya government should start using various forms of sensitization at the elementary school level to discourage student dropout rates. This will increase school enrollment.

Amire & Tiamiyu, (2022) [5] examined the relationship between elements of human capital development and poverty alleviation in Nigeria, from 1981-2020. In specific terms, the effects of government expenditure on education, government expenditure on health, inequality and unemployment on poverty level, were examined. The paper makes use of time series data from secondary source, on Nigerian economy for the period 1981-2020, obtained primarily from the National Bureau of statistics and Central Bank of Nigeria (CBN, 2021) Bulletin. The method of data analysis was Robust Least Square Techniques. The empirical results showed that a percentage increase in expenditure on education will reduce poverty by 1%. 1% increase in unemployment approximately gives a 1% increase in poverty. a percentage decrease in inequality, on the average, reduces poverty by 0.64 %. This is indicative that bridging the inequality gap is robust in reducing the level and depth of poverty in Nigeria. The study recommended that government should invest more on education, health, skills acquisition and formulate policies that will reduce unemployment.

Okiya & Wepukhulu, (2018) [21] determined the effect of human capital development on poverty in Kenya. The study was guided by the following specific objectives: to ascertain the effect of health on poverty in Kenya; to establish the effect of education on poverty in Kenya and to determine the effect of access to water and sanitation on poverty in Kenya. Causal research design was used in this study. The study adopted a non-probabilistic sampling technique and in particular purposive sampling technique. The Inferential analysis used Ordinary Least Squares (OLS) Regression model in establishing the relationship between the dependent and independent variables. The study found prevalence of HIV, expected years of schooling and roads paved of total roads to be statistically significant but improved water source wasn't statistically significant at 5 percent level. The study also found negative correlation between poverty expected years of schooling, improved water source and roads paved of total roads and positive correlation between poverty and prevalence of HIV. The study recommends improvement in education outcomes with the aim of alleviating poverty in Kenya.

2.4 Gap in literature

There exist research gap between this study and past researches. The research gap covers subject gap, gap on geographical location of the study, gap on the variables and contents of the study, gap on literature and gap on methodology.

Subject gap: The subject matter of this work and some reviewed empirical studies have some differences. There are limited studies on human capital development indicators and poverty reduction in Nigeria over the period of 1990 - 2024. The study is geared to bridge the time gap in post covid-19 era.

Gap on geographical location of the study: This work covers was Nigeria. None of the past studies used combination of human capital development indicators and poverty reduction in Nigeria as mentioned and most of the past studies were done outside Nigeria.

Gap on the variables and contents of the study: The variables used in this study includes proxies for human capital development indicators namely: government education expenditure, government health expenditure, out-of-pocket health expenditure and tertiary school enrolment rate (for independent variable) while the following are proxy for poverty reduction namely: poverty head count ratio a proxy for poverty reduction (for dependent variable).

3.1 Methodology

The research design was ex post-facto method. The variables consist of government education expenditure, government health expenditure, out-of-pocket health expenditure, poverty is poverty head count ratio and tertiary school enrolment rate for the period of 1990 to 2024 as defined in our model specification. All the variables were sourced from Central Bank of Nigeria's (CBN) statistical bulletin and World Bank Data indicator of the time scope. The econometric software for the study was e-view version 9 because it is user- friendly software. The method of data analysis was divided into three phases namely: pre-estimation, estimation and post-estimation. The pre-estimation statistics includes descriptive statistics, Correlation Matrix of the Variables, Augmented Dickey-Fuller Unit Root test statistic, Johansen Co-integration test. The estimation technique includes Dynamic ordinary least square (DOLS) while post-estimation technique involves Histogram Normality Test.

3.2 Model specification for the study

POVERTY = f (POCKET, GEXP, GHEXP, TERTIARY) ……...…… (3.1)

Where, POVERTY is poverty head count ratio representing Percentage of population below $1.25 a day poverty line (%) as a proxy for poverty reduction, GEXP is government education expenditure, GHEXP is government health expenditure, POCKET is out-of-pocket health expenditure and TERTIARY is tertiary school enrolment rate (for independent variable). In a linear function, it is represented as follows:

$POVERTY = \beta_0 - \beta_1 POCKETt + \beta_2 GEXPt + \beta_3 GHEXPt + \beta_4$ tertiary $t + \mu t$……...(3.2)

Where: $\beta 0$ = Constant term, β_1 to β_4 = Regression coefficient, μt = Error Term and t is the period. To reduce the outliers among the variables, all variables will be expressed in logarithmic form.

$POVERTY = \beta_0 - \beta_1 LogPOCKETt - \beta_2 LogGEXPt\ \beta_3 - LogGHEXPt + \beta_4 TERTIARYt + \mu t$……... (3.3)

Where: $\beta 0$ = Constant term, β_1 to β_4 = Regression coefficient, Ut = Error Term and t is the period.

4.1 Descriptive statistics of the variables

	POVERTY	GEXP	GHEXP	POCKET	TERTIARY
Mean	35.38333	240905.1	807669.5	464673.6	7.658333
Median	36.65000	29142.60	14082.15	86602.05	8.350000
Maximum	45.70000	1548019.	4004319.	3991258.	11.10000
Minimum	22.90000	394.3000	223.9000	653.5000	3.400000
Std. Dev.	6.988255	463583.8	1477866.	817355.3	2.842873
Skewness	-0.374459	2.043250	1.463947	2.559559	-0.191644
Kurtosis	1.987214	5.618749	3.292880	10.65364	1.302106
Jarque-Bera	2.379921	35.33599	12.98752	127.1754	4.544629
Probability	0.304233	0.000000	0.001513	0.000000	0.103073
Sum	1273.800	8672582.	29076104	16728251	275.7000
Sum Sq. Dev.	1709.250	7.52E+12	7.64E+13	2.34E+13	282.8675
Observations	36	36	36	36	36

Source: Author's computation from E-view 9.

The table shows descriptive statistics of the variables. In the model established in the study, there is one dependent variable and four independent variables. The mean of poverty reduction (POVERTY) was 35.3833, the median was 36.6500, maximum was 45.7000, minimum was 22.9000 and sum of the variable was 1273.800 respectively. The mean of government education expenditure (GEXP) was 240905.1, the median was 29142.60, maximum was 1548019, minimum was 22.90000 and sum of the variable was 8672582.01 respectively. The mean of government health expenditure (GHEXP) was 807669.5, the median was 14082.15, maximum was 4004319, minimum was 223.9000 and sum of the variable was 290760104 respectively. The mean of out-of-pocket health expenditure (POCKET) was 464673.6, the median was 86602.05, maximum was 399.1258, minimum was 653.5000 and sum of the variable was 1672851 respectively. The mean of tertiary school enrolment rate (TERTIARY) was 7.658333, the median was 8.350000, maximum was 11.10000, minimum was 3.400000, and sum of the variable was 275.7000 respectively.

4.2 Unit root test using augmented dickey-fuller test

Table 4.1: Results of stationarity (unit root) test

Variables	Variables Full Meaning	ADF- Statistics	Critical Value	Lag Value	Remark
POVERTY	Poverty Incidence	-4.868711	5% level = -2.948404	0	1(0)
GEXP	Government Education Expenditure	-6.005849	5% level = -2.948404	0	1(1)
GHEXP	Government Health Expenditure	-8.910698	5% level = -2.948404	0	1(1)
POCKET	Out-of-pocket Health Expenditure	-3.596637	5% level = -2.948404	0	1(0)
TERTIARY	Tertiary school enrolment	-5.120232	5% level = -2.948404	0	1(1)

Source: Author's computation from E-view 9.

In the table 4.1, the variables that were tested with unit root are shown, the values for Augmented Dickey Fuller (ADF) statistics were presented, the lag level of each variable was identified. The Mackinnon critical values at 5% level of significant were pointed out. The order of integration of each variable was enumerated, and finally the stationarity position of each variable was also stated. The unit root test was based on the level of Augmented Dickey Fuller (ADF) statistics was stationary or not stationary on 5 percent significance level. When Augmented Dickey Fuller statistic is greater than Mackinnon 5 percent critical value in absolute term, it is concluded that the variable is stationary. The variable poverty reduction (POVERTY) passed through Unit Root analysis at level and lag 0, augmented dickey Fuller statistic was -4.868711 while the Mackinnon 5 percent critical value was -2.948404 hence it was stationary at level. The variable government education expenditure (GEXP) was stationary at first difference and lag 0; its augmented dickey Fuller statistic was -6.005849 while the Mackinnon 5 percent critical value was -2.951125. The variable government health expenditure (GHEXP) was stationary at first difference and lag 0; its augmented dickey Fuller statistic was -8.910698 while the Mackinnon 5 percent critical value was -2.951125. The variable out-of-pocket health expenditure (POCKET) was stationary at level and lag 0; its augmented dickey Fuller statistic was -3.596637 while the Mackinnon 5 percent critical value was -2.951125. The variable tertiary school enrolment rate was stationary at first difference and lag 0; its augmented dickey Fuller statistic was -5.120232 while the Mackinnon 5 percent critical value was -2.951125.

4.3 Johansen Co-integration test

Ho = There is no co-integration (no long run relationship among variable)

Table 4: Co-integration test results

Date: 03/10/26 Time: 12:37				
Sample (adjusted): 1992 2025				
Included observations: 34 after adjustments				
Trend assumption: Linear deterministic trend				
Series: POVERTY GEXP GHEXP POCKET TERTIARY				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace statistic	0.05 critical value	Prob.**
None *	0.951015	158.4175	69.81889	0.0000
At most 1 *	0.645711	55.86567	47.85613	0.0074
At most 2	0.364644	20.58581	29.79707	0.3840
At most 3	0.139329	5.164412	15.49471	0.7911
At most 4	0.001850	0.062949	3.841466	0.8019
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level				

Source: Author's computation from E-view 9.

* Denotes rejection of the hypothesis at the 0.05 level, **MacKinnon-Haug-Michelis (1999) *p*-values

The co-integration results in table 4.2.1 for the model (POVERTY, TERTIARY, GEXP, GHEXP and POCKET) reveals that both trace test and the Max-eigenvalue test indicates 2 co-integrating equation(s) at the 5 percent level of significance. We therefore reject the null hypothesis of there is no co-integration amongst the variables and accept the alternative hypothesis that states there is co-integration amongst the variables.

4.4 Estimation of regression model

Empirical results of the dynamic least square method

Dependent Variable: POVERTY				
Method: Dynamic Least Squares (DOLS)				
Date: 03/10/26 Time: 12:46				
Sample (adjusted): 1992 2024				
Included observations: 33 after adjustments				
Cointegrating equation deterministics: C				
Fixed leads and lags specification (lead=1, lag=1)				
Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
GEXP	0.626578	0.054121	1.157737	0.8766
GHEXP	0.111691	0.067437	1.656237	0.5210
POCKET	0.313307	0.056766	5.519279	0.0000
TERTIARY	0.280525	0.039392	7.121372	0.0000

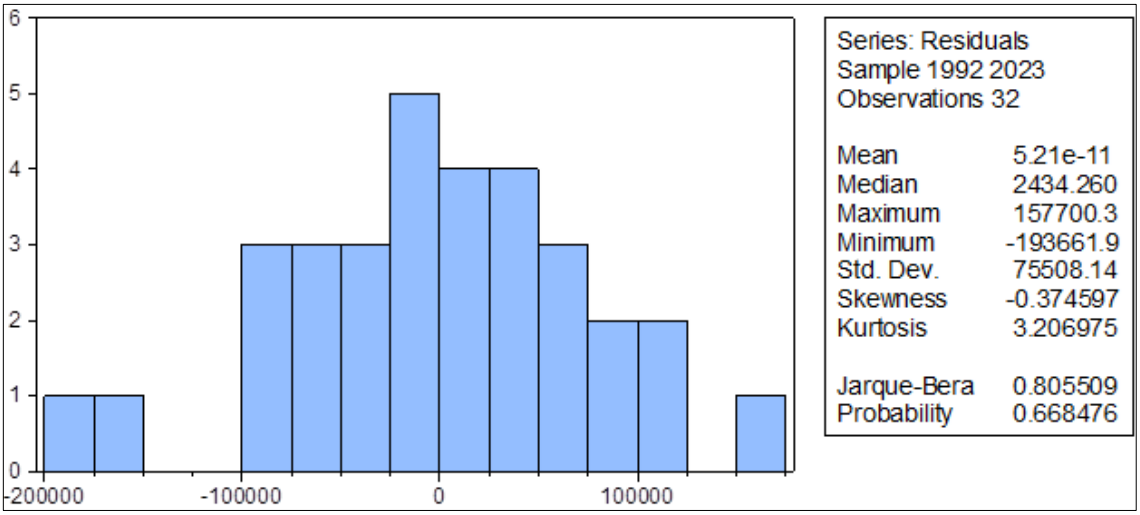
C	12.67079	14.62171	0.866574	0.3990
R-squared	0.787038	Mean dependent var		35.68182
Adjusted R-squared	0.574076	S.D. dependent var		6.604471
S.E. of regression	4.310268	Sum squared resid		297.2546
Long-run variance	41.46577	-		-

Source: Author's computation from E-view 9.

The Dynamic ordinary least square method (DOLS) was carried out to examine parameters estimates. In testing this hypothesis, government education expenditure (GEXP), government health expenditure (GHEXP), out-of-pocket health expenditure (POCKET) and tertiary school enrolment rate (TERTIARY) were regressed against poverty reduction (POVERTY). The result of the regression analysis represents the model for investigating impact of human capital development indicators on poverty reduction in Nigeria. The empirical result shows that the coefficient of out-of-pocket health expenditure (POCKET) has positive and significant impact on poverty reduction (POVERTY) (t-statistics; 5.51927; *p*-value; 0.0000 > Sig-value: 0.005). The empirical result shows that the coefficient of government education expenditure (GEXP) has positive and insignificant impact on poverty reduction (POVERTY) (t-statistics; 1.157737; P-value; 0.0000 > Sig-value: 0.8766). The empirical result shows that the coefficient of government health expenditure (GHEXP) has positive and insignificant impact on poverty reduction (POVERTY) (t-statistics; 1.65622; P-value; 0.5210 < Sig-value: 0.05). The empirical result shows that the coefficient of tertiary school enrolment rate (TERTIARY) has positive and significant impact on real gross domestic product (RGDP) (t-statistics; 7.121372; P-value; 0.0000 < Sig-value: 0.005).

4.5 Econometric/Second Order Test

4.5.1 Histogram Normality Test



Sources: E-view 9.0 version

The null hypothesis is that there are no skewness and Kurtosis in the model. We reject the null hypothesis because the Jarqua-Bera statistics (0.8055) is less than probability value (0.0.6684). We reject null hypothesis and accept the alternative that there are skewness and Kurtosis in the model. The skewness is normal because the value was -0.3745. The model of the study produced positive skewed distribution meaning that it has a long tail in the positive direction. The kurtosis was 3.2069 meaning that the degree of peakedness was high that normal value of three (3). This implies that the standardized residuals from the estimated model in the regression framework is not normally distributed, which is consistent with the OLS assumption.

4.6 Test of hypotheses

The results for the various hypotheses testing are presented in the section.

4.6.1 Test of hypothesis one

H_{01} Government education expenditure has no significant impact on poverty reduction in Nigeria

In testing this hypothesis, government education expenditure (GEXP) is regressed against poverty reduction (POVERTY). The empirical result shows that the coefficient of government education expenditure (GEXP) has positive and insignificant impact on poverty reduction (POVERTY) (t-statistics; 1.157737; *p*-value; 0.0000 > Sig-value: 0.8766).

Test of hypothesis two

H_{O2} Out-of-pocket health expenditure has no significant impact on poverty reduction in Nigeria

In testing this hypothesis, out-of-pocket health expenditure (POCKET) is regressed against poverty reduction (POVERTY). The empirical result shows that the coefficient of

out-of-pocket health expenditure (POCKET) has positive and significant impact on poverty reduction (POVERTY) (t-statistics; 5.51927; *p*-value; 0.0000 > Sig-value: 0.005).

4.7 Discussion of the results

4.7.1 Impact of government education expenditure on poverty reduction in Nigeria

It was observed from the hypothesis tested that government education expenditure has 62 percent positive and insignificant impact on poverty reduction (t-statistics; 1.157737; P-value; 0.0000 > Sig-value: 0.8766). A change in government education expenditure result 62 percent positive and direct impact on poverty reduction. The finding of this study was in line with study of Didiugwu, (2024) [9] that examined the impact of human capital development on poverty reduction in Nigeria. Specifically, the study sought to identify impact of total education expenditures, total health expenditures, poverty rate, out-of-pocket expenditures and inflation on poverty incidence covering the period 1981-20222. The methodology adopted in the study is linear regression with the application of the Ordinary Least Squares (OLS) technique. Other diagnostic tests which include unit-root test, autocorrelation, and normality test were carried out in the study. The major findings of the study were that total education expenditures (TOEDXP) have a positive and insignificant contribution to poverty reduction in Nigeria, total health expenditures (TOHEXP) have a positive and insignificant contribution to poverty reduction in Nigeria, and out-of-pocket expenditures (OOPE) have a positive and insignificant contribution to poverty reduction in Nigeria.

4.7.2 Impact of out-of-pocket health expenditure on poverty reduction in Nigeria

It was observed from the hypothesis tested that out-of-pocket health expenditure has 31 percent positive and significant impact on poverty reduction (t-statistics; 5.51927; P-value; 0.0000 > Sig-value: 0.005). A change in out-of-pocket health expenditure result 31 percent positive and direct impact on poverty reduction. The finding of this study was in line with study of Ayodele; Taiwo; Umar & Akeem, (2024) [8] that determined the effects of Human Capital Development on Poverty Reduction in Nigeria. Specifically, the study sought to explore unemployment, life expectancy, GDP per capita, infant mortality rate, and fertility rate on poverty reduction covering a period of 1990 to 2023. The method of data analysis were descriptive statistics, augmented Dickey-Fuller test statistic to check the unit root and regression analysis. The study finds that there is negative relationship between life expectancy, GDP per capita, Infant mortality rate and Poverty reduction (Unemployment) while fertility rate positively influenced poverty reduction (Unemployment). The study how ever concludes that improving human capital development (HCD) leads to decrease in poverty and to improve fertility rate of the Nigeria residents.

5.1 Summary of the findings

The following are the major findings of the study**:**

- The empirical result showed that government education expenditure has 62 percent positive and insignificant impact on poverty reduction (t-statistics; 1.157737; P-value; 0.0000 > Sig-value: 0.8766). A change in government education expenditure result 62 percent positive and direct impact on poverty reduction.
- The empirical result showed that out-of-pocket health expenditure has 31 percent positive and significant impact on poverty reduction (t-statistics; 5.51927; P-value; 0.0000 > Sig-value: 0.005). A change in out-of-pocket health expenditure result 31 percent positive and direct impact on poverty reduction.

5.2 Conclusion

This study concludes that there is positive and significant impact of human capital development indicators on poverty reduction in Nigeria. Government education expenditure has 62 percent positive and insignificant impact on poverty reduction while out-of-pocket health expenditure has 31 percent positive and significant impact on poverty reduction. By implication, the more government pursue human capital enhancing policies which possibly will result in higher productivity, increasing the economic growth, and hence contributes to the poverty reduction efforts in Nigeria.

The study also concluded that high level of out-of-pocket health spending in Nigeria poses a substantial financial burden on households, especially those with lower incomes and this burden is exacerbated by the fact that a considerable portion of the population lives below the poverty line. As individuals and families allocate a significant portion of their income to health expenses, this also contribute to a perpetuation of poverty cycles, hindering the ability of households to invest in education, housing, and other essential aspects of well-being.

5.3 Recommendations of the study

Based on the findings of this study, the following recommendations were made:

- Investment in education is critical to reducing poverty. The Federal Ministry of Education, in collaboration with state governments, should implement scholarship programs that target low-income families. This can be accomplished by introducing transparent scholarship schemes that involve community-based organizations and educational institutions to identify deserving beneficiaries, ensuring that these opportunities are not monopolized by affluent individuals. Scholars should prioritize merit and need, giving poor people better access to education and improving their socioeconomic standing in the long run.
- Policymakers in Nigeria needs strategic investments in healthcare infrastructure and the implementation of comprehensive health insurance schemes which can help mitigate the financial burden on households and foster a more inclusive and sustainable healthcare system. Also, government should design and implement health insurance programs that specifically target low-income individuals and families. These programs can subsidize or fully cover the cost of healthcare services, reducing the financial burden on the poor.

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