

The Measurement of Education and Poverty: An Analysis of Pakistani Society Muhammad Ali Panhyar*¹, Abdul Hameed Kamal², Muhammad Bakhsh Lolai³

¹* Assistant Professor, Aisha Bawany Government College No.2 Karachi, Sindh, Pakistan.

²Ph.D. Scholar, Pakistan Studies, Islamia University, Bahawalpur, Punjab, Pakistan.

³Lecturer, People's Nursing School, LUMHS Jamshoro, Sindh, Pakistan.

Corresponding author: alipanhyar@gmail.com

Keywords: Education, Poverty, Pakistan, Literacy Rate, Human Capital, Economic Growth, Socioeconomic Development

DOI No:

<https://doi.org/10.56976/jsom.v4i2.230>

Education and poverty are deeply interconnected in Pakistan, a country that continues to struggle with widespread poverty and low literacy rates. This study explores the relationship between education and poverty by assessing key indicators, methodologies, and estimation techniques to measure both phenomena. Education is a fundamental driver of economic growth and poverty alleviation; however, Pakistan faces numerous challenges, including inadequate funding, gender disparities, and socio-economic barriers that hinder access to quality education. This paper utilizes various measurement tools such as the Human Development Index (HDI), Multidimensional Poverty Index (MPI), and Gross Enrollment Ratio (GER) to analyze the interplay between education and poverty. A thorough literature review presents global perspectives and Pakistan-specific challenges, highlighting how educational attainment can significantly reduce poverty levels. The research employs both qualitative and quantitative methods, drawing data from national and international sources, and applies econometric modeling to evaluate the impact of education on poverty reduction. Findings suggest that targeted policies such as increased educational funding, vocational training programs, and female education incentives can drastically improve the socio-economic conditions of marginalized communities. The study concludes with policy recommendations for the Pakistani government and international stakeholders to implement sustainable solutions for poverty eradication through educational reforms.

1. Introduction

Education and poverty are two critical challenges in the development discourse of Pakistan. While education is often seen as a tool for social and economic development, poverty remains a major barrier to accessing quality education (Shakeel et al. 2024). Pakistan, with a population exceeding 240 million, struggles with a low literacy rate, high dropout rates, gender disparities, and inadequate educational infrastructure. The country ranks among the lowest in global educational indices, reflecting systemic issues that contribute to the vicious cycle of poverty (Sharif & Khan, 2023).

Education plays a fundamental role in driving economic growth and social transformation. Theories of human capital development emphasize that investments in education lead to enhanced labor productivity, higher wages, and improved living standards. In Pakistan, however, limited access to education exacerbates income inequality and restricts social mobility (Saleem & Shabbir, 2021). The majority of children from impoverished families either do not attend school or drop out due to financial constraints. Additionally, public expenditure on education remains low, hovering around 2% of GDP, which is significantly below the UNESCO-recommended level of 4-6%.

Poverty in Pakistan is a multi-dimensional issue that extends beyond income deprivation. The United Nations Development Programme (UNDP) utilizes the Multidimensional Poverty Index (MPI) to assess poverty levels, incorporating indicators such as health, education, and living standards. As per the latest estimates, nearly 39% of Pakistan's population lives below the poverty line, with higher concentrations in rural areas. Factors such as unemployment, inflation, and lack of social security contribute to persistent poverty levels. Education is both a cause and consequence of poverty, as impoverished families are unable to invest in their children's schooling, thereby perpetuating intergenerational poverty (Tauheed & Nasir, 2020).

The relationship between education and poverty is well-established in economic literature. Studies suggest that an increase in educational attainment leads to higher employment opportunities and improved earnings (Khan & Ali, 2019). In Pakistan, however, structural inequalities hinder this relationship. The education system is divided into multiple tiers, with elite private schools providing high-quality education while government schools often lack basic facilities, qualified teachers, and teaching materials. The disparity in educational quality means that children from poor households receive substandard education, limiting their future prospects (Saboor et al. 2018).

Furthermore, gender disparities in education further exacerbate poverty. Female literacy rates in Pakistan are significantly lower than those of males, particularly in rural areas where cultural norms and economic constraints prevent girls from attending school. The Pakistan Social and Living Standards Measurement (PSLM) survey highlights that female literacy in rural areas is below 45%, compared to 75% in urban centers (Ahmed & Wahab, 2017). Investing in female

education has proven to be one of the most effective ways to break the cycle of poverty, as educated women contribute to household income, improved health outcomes, and better child education.

Many low-income families cannot afford school fees, uniforms, and books, forcing children to work instead of attending school. A significant percentage of schools, especially in rural areas, lack basic facilities such as electricity, clean drinking water, and sanitation. The curriculum in public schools is outdated, and teacher absenteeism remains a major issue (Naveed & Ali, 2016). Furthermore, the examination system focuses on rote memorization rather than critical thinking and skill development. In certain regions, particularly in conflict-prone areas such as Baluchistan and Khyber Pakhtunkhwa, security concerns discourage school attendance, especially for girls. Cultural and social norms often prevent girls from receiving an education, particularly in conservative communities where early marriages are common. Frequent changes in education policies and inadequate government commitment hinder long-term progress in the education sector. The Government of Pakistan has launched several initiatives to improve educational access and reduce poverty (Rani et al. 2023). A poverty alleviation initiative that provides financial support to underprivileged families, including stipends for children's education.

A framework aimed at increasing enrollment rates, improving literacy, and enhancing the quality of education. Provides financial aid to low-income families, indirectly supporting children's education. Focus on increasing teacher training and upgrading school infrastructure in Punjab, the most populous province. Programs designed to equip youth with marketable skills, improving employability and reducing poverty (Naveed & Zulifiquar, 2022). Despite these efforts, progress remains slow due to implementation challenges, corruption, and inadequate resource allocation. Pakistan must adopt a more integrated approach, aligning educational reforms with broader socio-economic policies to achieve sustainable poverty reduction (Saboor & Sadiq, 2016).

1.1 Significance of the Study

This study is crucial as it provides empirical insights into the relationship between education and poverty in Pakistan. By measuring key indicators such as literacy rates, school enrollment, and income levels, the research highlights the extent to which education influences economic mobility. Additionally, the study will help policymakers design targeted interventions to improve education access for marginalized communities.

1.2 Research Objectives

1. To analyze the relationship between education and poverty in Pakistan.
2. To examine the impact of education on income levels and employment opportunities.
3. To assess the effectiveness of government policies in promoting education and reducing poverty.
4. To identify key barriers that hinder educational access and propose viable solutions.

2. Literature Review

The relationship between education and poverty has been widely studied in economic, sociological, and policy research. Education is recognized as a crucial tool for economic development and social mobility, while poverty remains a key obstacle to accessing quality education. This section reviews key theories, empirical studies, and case studies that explore the measurement of education and poverty, with a focus on Pakistan's context. Saboor and Munir (2018), argue that investments in education increase individual productivity and contribute to economic growth. Education enhances cognitive skills, technical knowledge, and problem-solving abilities, which lead to better job opportunities and higher earnings. In Pakistan, low public investment in education limits human capital development, preventing economic upgradation of poor communities.

Khan and Ali (2019) argue that poverty is not just a lack of income but also a deprivation of capabilities such as education, health, and access to resources. In this framework, education is a key capability that enables individuals to participate in economic and social life. The Multidimensional Poverty Index (MPI) aligns with this approach by including education as a key determinant of well-being. (Anwar & Qureshi, 2016) highlighted that education contributes to economic growth by fostering innovation, entrepreneurship, and labor market efficiency. Empirical studies show that countries with high literacy rates and better educational systems achieve faster economic development. Pakistan, however, lags in this regard due to issues such as poor quality of education, gender disparities, and a weak technical education system (Malik & Nazli, 2015). Zafar and Khan (2018) told that primary education plays a significant role in poverty reduction in rural areas. They estimated that an additional year of schooling increases earnings by an average of 10% globally (Farooq & Ahmed, 2022). They showed that parental education has a strong impact on children's school enrollment in developing countries (Shahbaz & Aamir, 2016). These studies provide strong evidence that investment in education leads to economic benefits, particularly in low-income countries (Iqbal & Nawaz, 2019).

South Asia, including Pakistan, faces significant challenges in achieving universal education due to poverty, gender inequality, and inadequate infrastructure (Khan & Ali, 2020). It is analyzed the impact of parental education on child literacy in Pakistan and found that maternal education significantly influences children's educational outcomes (Hussain & Sheikh, 2017). It was showed that poverty levels in rural Pakistan are strongly linked to lack of access to secondary education, particularly for girls (Ahmed & Wahab, 2018). They highlighted that vocational education improves employability in Pakistan, yet remains underfunded and underutilized (Rehman & Khan, 2021). They found that higher education levels correspond to better employment opportunities in Pakistan's labor market (Nasir & Nazli, 2019).

Kakar et al. (2016) estimated that households with an educated head experience lower poverty rate compared to those where the head of the family has no formal education. He used panel data analysis to show that literacy rate improvements directly contribute to GDP growth and poverty alleviation in Pakistan (Jamal, 2017). Pakistan's public expenditure on education remains

around 2% of GDP, one of the lowest in South Asia. Studies by UNESCO (2022) indicate that this low investment limits school infrastructure, teacher training, and curriculum development, exacerbating educational inequalities (Ali & Zhuang, 2020). (Haq & Bhatti, 2019) highlighted that female literacy in Pakistan remains below 50% in rural areas due to cultural barriers, economic constraints, and early marriages. They found that urban literacy rates in Pakistan are nearly 30% higher than rural literacy rates due to better school infrastructure and teacher availability (Saboor & Sadiq, 2016).

2.1 Summary of Literature Gaps and Research Contribution

Despite extensive research on education and poverty in Pakistan, gaps remain in understanding the effectiveness of government interventions and their long-term impact.

- **Limited research on vocational education:** While technical education is essential for job creation, few studies explore its role in Pakistan's poverty reduction.
- **Lack of gender-focused studies:** Existing studies highlight gender disparities but do not provide detailed policy recommendations.
- **Regional variations in education and poverty:** There is insufficient data on provincial disparities, particularly in conflict-affected

3. Methodology

3.1 Measurement Tools for Education and Poverty in Pakistan

To effectively analyze education and poverty in Pakistan, several indicators and methodologies are used:

3.1 Education Measurement Indicators

- **Gross Enrollment Ratio (GER):** Measures the total number of students enrolled in a specific education level.
- **Net Enrollment Rate (NER):** Represents the percentage of children within the official age group enrolled in school.
- **Adult Literacy Rate:** Measures the percentage of people aged 15 and above who can read and write.

3.2 Poverty Measurement Tools

- **Multidimensional Poverty Index (MPI):** Developed by UNDP, this index measures poverty based on education, health, and living standards.
- **Headcount Poverty Ratio (HPR):** The percentage of the population living below the national poverty line.
- **Gini Coefficient:** Measures income inequality, which affects access to education.

3.3 Research Design

This study employs a mixed-methods approach, combining quantitative data analysis with qualitative insights. The primary aim is to assess the relationship between education and poverty in Pakistan, utilizing both macro-level national data and micro-level household surveys. The

methodology is designed to answer the research questions by estimating the effect of education on income and poverty, examining the barriers to education, and assessing the effectiveness of policy interventions.

3.4 Data Sources

Data for this study is sourced from multiple national and international databases:

- Pakistan Bureau of Statistics (PBS)
- Pakistan Social and Living Standards Measurement (PSLM) **Survey**
- World Bank's World Development Indicators (WDI)
- United Nations Development Programme (UNDP) Multidimensional Poverty Index (MPI) reports
- Human Development Index (HDI) data from UNESCO

These sources provide comprehensive data on education indicators (literacy rates, school enrollment, etc.), poverty levels (income, multidimensional poverty), and demographic characteristics of Pakistan's population.

3.5 Variables

The study considers the following key variables:

3.5.1 Dependent Variable

- Poverty level, measured through the **Multidimensional Poverty Index (MPI)**, which combines education, health, and living standards.
- Income level, assessed via household income data from the **PSLM survey**.

3.5.2 Independent Variables

3.6 Education Level: This is measured using the literacy rate, school enrollment ratios, and the proportion of people with primary, secondary, or higher education.

Gender: Proportion of educated females and males, as gender inequality in education is a major concern in Pakistan.

Geography: Urban vs. rural comparison of educational access and poverty rates.

Household Characteristics: Data on family income, parental education levels, and employment status.

3.7 Estimation Techniques

Two key estimation techniques are used:

4. Descriptive Statistics

To understand the general trends in education and poverty, descriptive statistics are calculated for key variables. These include means, medians, standard deviations, and distributions for education levels, income, and poverty rates across different demographics.

4.1 Econometric Model (Multiple Regression Analysis)

A multiple regression analysis is employed to assess the relationship between education and poverty, controlling for other variables such as gender, location (urban vs. rural), and household characteristics. The regression model can be specified as:

$$\text{Poverty}_i = \beta_0 + \beta_1 \text{Education}_i + \beta_2 \text{Gender}_i + \beta_3 \text{Location}_i + \beta_4 \text{HouseholdCharacteristics}_i + \epsilon_i$$

Where:

- Poverty_i = is the poverty level for individual i ,
- Education_i = represents the educational attainment of individual i ,
- Gender_i = captures the gender disparity,
- Location_i = accounts for urban vs. rural disparities,

This model helps to estimate the impact of education on reducing poverty, controlling for other factors such as household income, gender, and location.

4.2 Estimation Results

The results of the regression analysis are shown in the table below, which illustrates the relationship between education and poverty levels in Pakistan. The model is as shown below:

Table No 1: Multiple Regression Analysis - Impact of Education on Poverty in Pakistan

Variable	Coefficient Estimate	Standard Error	t-Statistic	p-value
Intercept (β_0 / β_0)	0.245	0.022	11.18	0.000
Education Level (β_1 / β_1)	-0.067	0.015	-4.47	0.000
Gender (β_2 / β_2)	-0.045	0.012	-3.75	0.000
Urban (β_3 / β_3)	-0.038	0.010	-3.80	0.000
Household Income (β_4 / β_4)	-0.055	0.019	-2.89	0.004
Parental Education (β_5 / β_5)	-0.091	0.025	-3.64	0.000

- **R-squared** = 0.74 (indicating a good model fit)
- **Adjusted R-squared** = 0.73

4.3 Interpretation of Results

1. **Education Level:** The negative coefficient for education ($\beta_1 = -0.067$) suggests that higher educational attainment is associated with a decrease in poverty levels. This confirms that as individuals or households achieve higher levels of education, their likelihood of being in poverty diminishes. The effect is statistically significant with a p-value of 0.000.

2. **Gender:** The coefficient for gender ($\beta_2 = -0.045$) indicates that gender disparities in education have a significant impact on poverty levels. Lower educational attainment among females contributes to higher poverty rates.
3. **Urban vs. Rural:** The urban coefficient ($\beta_3 = -0.038$) shows that living in urban areas significantly reduces poverty, as urban households have greater access to education, jobs, and resources compared to rural households.
4. **Household Income:** The coefficient for household income ($\beta_4 = -0.055$) suggests that families with higher incomes are less likely to be impoverished, and this is linked to better educational opportunities for their children.
5. **Parental Education:** The coefficient for parental education ($\beta_5 = -0.091$) reveals the strong influence of parents' educational attainment on the likelihood of children staying in school and escaping poverty.

Table No 2: Descriptive Statistics - Education and Poverty Indicators

Indicator	Mean	Median	Standard Deviation	Min	Max
Literacy Rate (Overall)	62.3%	60.0%	12.5%	45%	75%
Female Literacy Rate	50.5%	48.0%	15.3%	35%	65%
Primary School Enrollment	83.2%	80.0%	10.7%	60%	95%
Secondary School Enrollment	61.4%	59.0%	13.6%	40%	85%
Poverty Headcount Ratio	39.0%	37.5%	8.2%	30%	55%

5. Conclusion

This study has demonstrated a significant and negative relationship between education and poverty in Pakistan. Educational attainment is a key factor in reducing poverty, with higher levels of education leading to better economic outcomes. Gender disparities, rural-urban divides, and parental education levels also play crucial roles in determining educational access and poverty levels. Pakistan's education system faces many challenges, including inadequate funding, poor infrastructure, and gender inequalities. These issues disproportionately affect marginalized communities, further exacerbating the poverty cycle. However, targeted interventions in education, particularly for girls and rural populations, can have a transformative effect on reducing poverty.

5.1 Policy Recommendations

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

1. **Increased Investment in Education:** The government should allocate a larger share of GDP to education, particularly for rural and marginalized areas. Investments in school

infrastructure, teacher training, and educational resources are essential to improving educational quality.

2. **Gender-Specific Programs:** Policies should aim to increase female school enrollment, including conditional cash transfers and scholarships, particularly in rural areas. Empowering women through education will reduce poverty and promote gender equality.
3. **Vocational and Technical Education:** Expanding technical and vocational education programs will improve employability and income generation, particularly in rural and semi-urban areas.
4. **Targeted Poverty Reduction Programs:** The Ehsaas Program and other social protection schemes should incorporate education-based conditional transfers, ensuring that families invest in their children's education in exchange for financial support.
5. **Strengthening Parental Engagement:** Increasing parental involvement in education, particularly through awareness campaigns and community programs, can enhance children's educational outcomes and reduce poverty.

By addressing these issues, Pakistan can improve educational outcomes and reduce poverty, fostering long-term socio-economic development.

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