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Examining Educational Disparities and Household Income Determinants in Pakistan: Evidence from Pslm 2019–2020

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Abstract

This study investigates the determinants and disparities in education across Pakistan, emphasizing regional, gender, and socioeconomic variations using data from the Pakistan Social and Living Standards Measurement (PSLM) Survey 2019–2020. The analysis identifies significant inequalities in educational access and expenditure among provinces and districts. Punjab and Sindh show higher educational spending, whereas Khyber Pakhtunkhwa and Baluchistan, especially their rural areas, lag behind. Findings reveal a persistent gender gap in literacy and school attendance, with male children outperforming female counterparts across all provinces. Urban districts exhibit greater educational expenditure and better schooling outcomes, underscoring a pronounced urban–rural divide. Regression results highlight that education expenditure, gender, employment status, health condition, and urban residence are key determinants of household income, suggesting that investments in education and health considerably enhance welfare. Overall, the study underscores the need for comprehensive policy measures to improve education quality, promote gender equality, and ensure equitable access to educational resources, particularly in marginalized regions, to reduce income inequality and foster sustainable economic growth in Pakistan.

Keywords: Educational inequality; Regional disparities; Socioeconomic determinants; Educational spending, Household, PSLM; Pakistan

Introduction

In recent economic literature, improving living standards and enhancing quality of life have become highly debated and widely discussed topics. It can be significantly improved by expanding access to quality education, which empowers individuals with skills, enhances employment opportunities, and promotes social mobility (Alam & Aslam, 2023). Education also fosters informed decision-making and inclusive economic participation, laying the foundation for long-term societal well-being. The global conversation on education has increasingly moved from focusing solely on children who are out of school to prioritizing equitable learning opportunities for all children. In addition to expanding access to education, there is an increasing emphasis on

ensuring that learning outcomes are equitable—unaffected by factors such as income level, gender, geographic location, ethnicity, and other personal circumstances (Peer, 2024). Moreover, many education systems around the world continue to struggle with issues of unequal access and significant disparities in student performance and academic outcomes (Hussain, 2024). Addressing these achievement gap needs a strong equity-focused approach to support historically underserved students, as disparities in educational outcomes can significantly limit their access to higher education and future employment opportunities. Scholars and advocacy groups supporting minority and disadvantaged communities are calling for greater equity in education, often through the implementation of affirmative action policies.

Pakistan faces a range of challenges, including terrorism, political instability, insecurity, natural disasters, and socio-cultural and religious disparities (Ali et al., 2024). These issues have had a profound impact on the country's education sector, which remains one of the most neglected areas of development. As of the end of 2024–25, the cumulative government spending (federal + provincial) on education declined sharply to just 0.8% of GDP, down from around 2% in 2018–19 (World Bank, 2024). As a result, the educational system in Pakistan is marked by inequality and inconsistent quality. The system comprises three distinct types of institutions—public schools, private schools, and religious (madrassa) schools—each offering varying levels and types of education, often reflecting the socio-economic status of the students they serve (Rehman, 2008). The national curriculum in Pakistan follows multiple patterns, with the version approved by the Federal Government primarily implemented in public sector schools. In contrast, private schools and madrassas have the autonomy to choose their own curricula (Sodhar and Rasool 2013). Furthermore, Islamic religious schools (madrassas) are divided into five major ideological groups, each selecting a curriculum aligned with its specific theological perspective.

Pakistan, ranked as the fifth most populous country in the world, also faces a significant challenge in education, with approximately 20.3 million school-age children not attending school—accounting for around 44% of this age group (World Bank, 2023). Pakistan faces significant socio-economic challenges stemming from its large population of out-of-school children and persistent disparities in learning outcomes. The World Bank's Pakistan Human Capital Review (2023)[1] highlights that weak socioeconomic indicators, alongside deficiencies in education and health, are largely linked to shortcomings in the country's education system and quality of learning.[1] In addition to this, regional disparities are a major challenge for less developed countries, as inequalities between regions can hinder national growth and development. Limited access to justice, quality education, healthcare, clean drinking water, adequate nutrition, and sufficient food often stems from these regional imbalances. Such disparities are particularly pronounced in countries where political influence and economic power are unequally distributed along lines of gender, religion, and wealth. Pakistan ranks second globally in terms of the number of out-of-school children, with around 25 million boys and girls aged 5 to 16 not attending school (Alif Ailaan Report, 2024).[2] Gender disparities further compound the challenge, as Pakistan lags behind most South Asian countries in female labour force participation. Government statistics show that only 18% of women participate in the labour market compared to 71% of men (Economic Survey of Pakistan, 2023). Regional inequalities, even within provinces, are also significant. For instance, while Punjab is among the more developed provinces, southern districts such as Rajanpur continue to lag far behind northern (Lahore, Gujranwala) and central regions

[1]Pakistan Human Capital Review: Building Capabilities Throughout Life (1st May, 2023) https://www.worldbank.org/en/region/sar/publication/pakistan-human-capital-review-building-capabilities-throughout-life

[2] Alif Ailaan District Education Ranking (2024), https://sdpi.org/alif-ailaan-district-education-ranking/project_detail

(Sargodha, Hafizabad). Sindh, on the other hand, remains the most disadvantaged province overall.

Identifying and understanding disparities is essential for formulating effective economic policies and taking targeted action against factors that hinder the country's growth and prosperity. Therefore, the main objective of this study is to examine the educational disparities across the provinces of Pakistan by analyzing various indicators such as education expenditure, literacy rates, and out-of-school children. The study focuses on comparing educational development among the four major provinces—Punjab, Sindh, Khyber Pakhtunkhwa, and Balochistan—highlighting both inter-provincial and intra-provincial inequalities. Through a combination of statistical data, charts, and figures, the study aims to uncover patterns and gaps in education provision and identify key areas that require policy attention. Second objective is analyzing determinants of household income, specifically how household educational expenditure correlated his annual income. The third objective is to put forward recommendations based on findings.

Literature Review

Pakistan ranks among the twelve countries with the lowest education expenditure globally, allocating only about 2.5% of its GDP to the sector (Aubusson & Watson, 1999; Hathaway, 2005; Rahman & Uddin, 2009). The country's education system is primarily divided into three types: public, private, and religious schools (Deeni Madrasas). Access to these institutions is largely influenced by socio-economic status. Religious schools typically cater to students from lower-income backgrounds, while public schools serve the middle class and private institutions are generally accessible to students from more affluent families (Rehman, 2005). Abbasi (2014) noted that while public sector schools in Pakistan often possess relatively good infrastructure, they suffer from a lack of quality education. In contrast, many private schools operate out of residential buildings rather than purpose-built campuses. Although private school teachers may hold academic qualifications, they frequently lack proper training and essential pedagogical skills required to ensure effective learning. Similarly, Saad (1980) criticized private school curricula for being imported from foreign systems, arguing that such content does not align with Pakistan's socio-cultural context, national needs, or developmental goals. Pakistan continues to struggle with a low literacy rate, placing it among the ranks of underdeveloped nations. Classrooms are often overcrowded, and students commonly rely on rote memorization rather than understanding, which hinders critical thinking and deep learning.

Saleem (2011) emphasized that education is a fundamental driver of social development and national progress. However, Pakistan's low literacy rate and the poor quality of education continue to hinder the country's advancement. In addition to these challenges, issues such as gender and regional disparities, inadequate teacher training, and rising unemployment further contribute to the stagnation of national growth (Memon, 2007). Mushtaq and Kayani (2013) highlighted the persistent shortcomings in teacher education and training in Pakistan, stressing that teachers should serve not only as sources of knowledge but also as facilitators of critical inquiry and exploration. They argue that Pakistan must align its educational system with global standards. Similarly, Khatoon (2014) pointed out the regulatory shortcomings in private education, where schools often lack proper infrastructure, including suitable buildings, recreational spaces, and co-curricular activity areas. These deficiencies reflect broader issues that require policy reform and strategic intervention.

Husnain (2005) argued that Pakistan's education system has traditionally focused on producing graduates in the arts and humanities, often neglecting technical and vocational education, which contributes to the growing problem of unemployment. The decline in technical job opportunities, largely due to privatization, along with the regional quota system and parental expectations,

further limits the effectiveness of the job market. Saeed (2007) compared the educational systems of Pakistan and the United Kingdom, noting significant differences in their compulsory education structures. The UK system is considerably more advanced in terms of pedagogy, infrastructure, and learning outcomes. Additionally, Rahman (2005) observed a contradiction among Pakistan's elite: while they publicly acknowledge the importance of the national language, their preference for English-medium education for their own children highlights a class-based divide in educational priorities.

In Pakistan, there is a noticeable lack of parental involvement in school affairs, and school administrations often perceive such involvement as having a negative impact (Nazir, 2010). Additionally, the education system faces structural and constitutional deficiencies, including limited freedom of expression and a lack of religious tolerance. Issues such as class segregation, widespread poverty, and growing radicalization are often attributed to the shortcomings of the educational framework. Abbasi (2014) argued that the existing education system in Pakistan contributes significantly to the development of an imbalanced society. Since education plays a vital role in shaping individual behavior and fostering responsible citizenship, the absence of quality education undermines efforts toward building a more equitable and progressive nation.

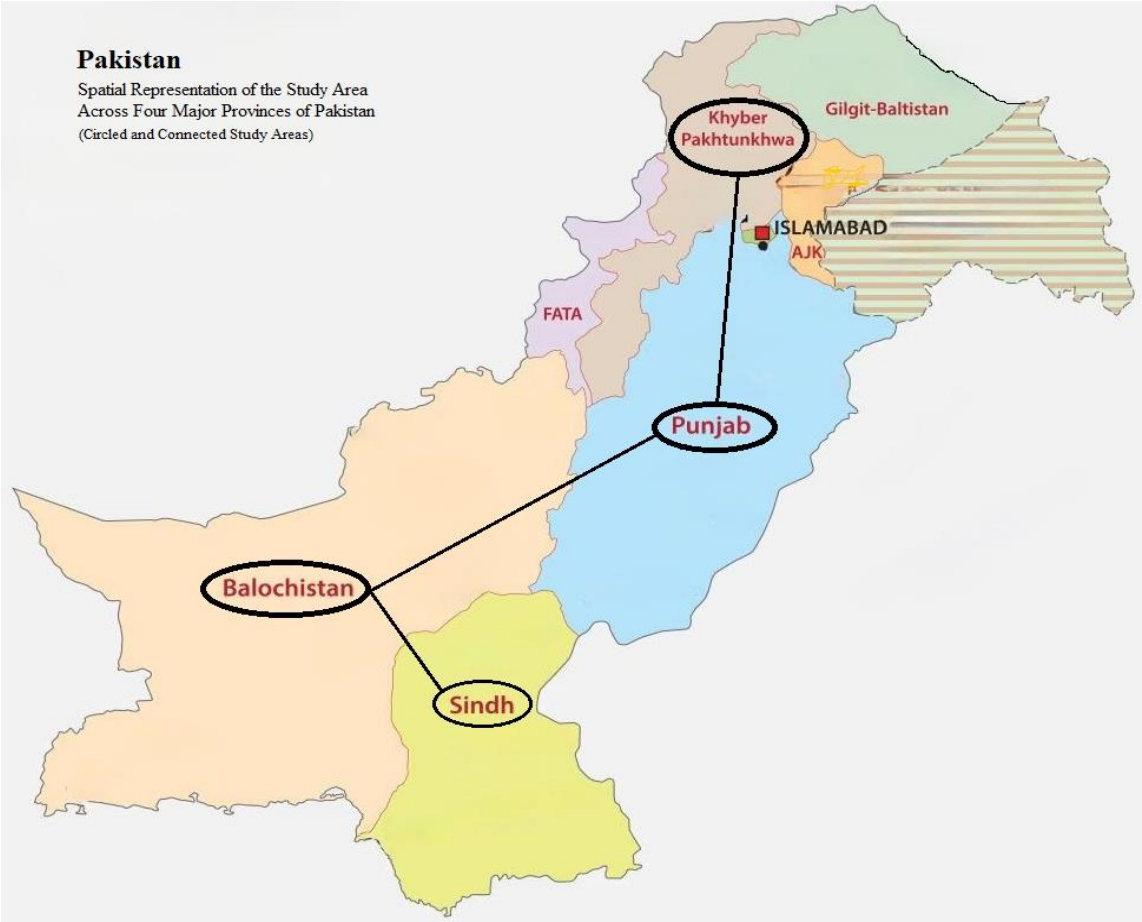
While numerous studies have explored education in Pakistan at the national level, there remains a significant gap in understanding provincial and district-level educational disparities using a comparative and econometric approach. Most existing literature tends to focus on aggregate indicators, often overlooking the intra-provincial differences that play a critical role in shaping educational outcomes. Additionally, limited empirical work has integrated multiple indicators—such as education expenditure, literacy rates, and out-of-school children—into a comprehensive framework for analyzing disparities across provinces. Moreover, district-level analysis, particularly within Khyber Pakhtunkhwa, remains underexplored, despite its potential to reveal localized inequalities and inform targeted policymaking. This study addresses these gaps by combining disaggregated statistical data with visual analysis (charts and figures) to provide a nuanced understanding of inter-provincial and intra-provincial educational inequalities, with a special focus on the spatial dimensions of access and outcomes reflected in the PSLM Survey 2019–20.

Material and Methods

Universe of the study

The universe of this study consists of all households in Pakistan as represented in the Pakistan Social and Living Standards Measurement (PSLM) Survey 2019–2020. This survey is conducted by Pakistan Bureau of Statistics to monitor key social and economic indicators across the country. The dataset includes households from all major provinces of Pakistan and from both rural and urban areas to ensure broad representation of the population. The survey employs a stratified sampling design, which ensures that different income groups, educational levels, and geographic areas are adequately represented. The universe as shown in figure 1 covers households with diverse socioeconomic, educational, and demographic characteristics. As a result, the universe of the study reflects the overall population structure of Pakistan. Using this comprehensive dataset enables the research to analyze educational disparities and the determinants of household income in a reliable and generalizable manner across the country.

Figure 1: Administrative Map of Pakistan Showing Circled and Connected Study Areas



Data and Econometric Model

This study adopts a quantitative research design, relying on secondary data from two rounds of the Pakistan Social and Living Standards Measurement (PSLM) Survey—2014–15 and 2019–20. The 2014–15 dataset is primarily used for comparative analysis, while the 2019–20 survey serves as the core dataset for analysis. The research covers all four provinces of Pakistan. The study population consists of respondents included in the PSLM 2019–20 survey, which was conducted across provinces to ensure the collection of reliable and representative data. The PSLM 2019–20 survey gathered extensive information on a range of social indicators used to assess poverty and development, including employment, education, health, demographics, household assets, welfare, and water and sanitation. The survey covered 6,500 blocks and collected data from approximately 195,000 households, offering valuable insights at both the district and provincial levels.

To identify the determinants of expenditures on education, this study utilized a multiple regression analysis using the Ordinary Least Squares (OLS) method. The OLS technique, first introduced by the German mathematician Carl Friedrich Gauss, is one of the most widely used and statistically robust estimation methods in econometrics. OLS estimators possess the desirable properties of being Best Linear Unbiased Estimators (BLUE), meaning they are unbiased and have the minimum variance among all linear and unbiased estimators, given the standard assumptions. Furthermore, the precision of the OLS estimators is evaluated through their standard errors, which

measure the reliability of the coefficient estimates. The overall explanatory power of the model is assessed using the coefficient of determination (R^2), which indicates the proportion of variation in the dependent variable explained by the independent variables. Given these desirable statistical properties and the method's efficiency in estimating linear relationships, OLS is deemed the most appropriate technique for examining the relationship between educational expenditure and their potential determinants. The empirical model for this study is specified as follows:

$$\mathbf{H.I = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \varepsilon_t} \quad \text{-------} \quad \mathbf{(1)}$$

The empirical model examines the factors influencing household income, The explanatory variables include:

H.I---------- Household Income in specific year
X_1 ------- Education expenditure by household
X_2 -------- the age of the household head
X_3 --------- Employment status
X_4 ------- Gender of the household head
X_5 -------- Household residence (Rural/Urban)
X_6 -------- Marital status (Divorced/unmarried/married/widow)
X_7 ------- Access to health care

Each of these variables is expected to play a significant role in determining the level of household income. The term ε denotes the error component, capturing the influence of unobserved or omitted factors that may also affect income but are not explicitly included in the model. The explanatory variables include the age of the household head, reflecting the total years lived; household income, and employment status, a binary variable distinguishing between employed and unemployed individuals. Household residence is represented as a dummy variable, where rural areas are coded as 0 and urban areas as 1. Marital status is categorized into four groups: married, unmarried, divorced, and widowed. Finally, healthcare status is classified into three categories—those using government hospitals, those using private hospitals, and those without access to healthcare facilities. All variables are derived from the PSLM 2020 dataset.

Validity of model assumptions

For validity of model assumptions and to ensure reliable model estimates it is of interest to test the hypothesis of normality, homoscedasticty and no multicollinarity in data set. Shapiro-Wilk test , Brush-Pagan and Variance inflation factors (VIF) tests were tried respectively for normality, hetroscedasticity and multicollinearity in the data set. Results are added in discussion section of the article.

Results and Discussions

This section presents a comprehensive description of the data and various statistical tools used to analyze education inequality across the provinces of Pakistan. Education is widely regarded as a key driver of social and economic development, both at the national and regional levels. However, Pakistan continues to lag behind its neighboring countries in terms of educational attainment. Therefore, this paper analyses various regions of Pakistan to identify the underlying factors contributing to the country's comparatively low levels of education and to highlight the regional disparities that hinder overall educational progress. Since its independence in 1947, Pakistan has made efforts to expand access to education, bring reforms like new curriculum, teachers training drives, revised assessment frameworks, expending public private partnerships and increasingly elaborate school monitoring regimes. These efforts and reforms rarely translated into learning

gains and meaningful outcomes. Financial resources and institutional capacity are considered main constraints in the development of a comprehensive education system. Similarly, their exist significant disparities across regions, gender and socioeconomic groups in education system around the country. Through National Education Policies of 1972, 1998, 2009 and 2010 improvement in literacy, school enrollment and reduction of inequality in access to education have been focused. Despite these initiatives, disparities remain existed in literacy rates, educational infrastructure and public investment etc. Gender disparities have also been an issue, with female literacy and school participation rates historically lower than those of males, particularly in rural areas around the country

Educational Level and Disparities Across Provinces

Figure 2 presents the percentage of educational attainment across the four provinces of Pakistan, based on data from the PSLM survey. The analysis focuses on different levels of education completed by households, including primary to high school, intermediate (FA/F.Sc), bachelor's (BA/B.Sc), master's, and doctoral (Ph.D.) levels, representing up to 18 years or more of education. The survey results indicate that Punjab has the highest percentage of households with primary to high school completion, standing at 78.18%. In contrast, Balochistan and Khyber Pakhtunkhwa show similar rates, with 73.94% and 73.62% respectively. Sindh, however, records the lowest percentage of primary to high school completion among the four provinces, highlighting regional disparities in educational attainment across Pakistan.

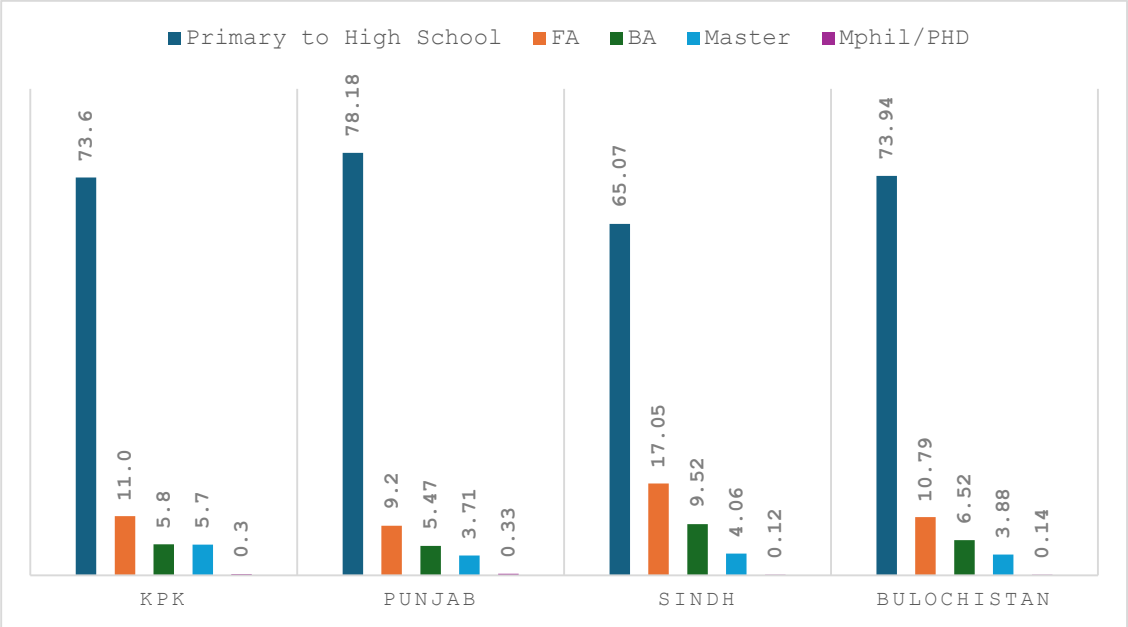


Figure 2. Education Level in Percent

At the intermediate (FA/F.Sc) level, Sindh records the highest percentage of educational attainment among the four provinces at 17.05%, followed by Khyber Pakhtunkhwa at 11%, Balochistan at 10.79%, and Punjab at 9.2%. Similarly, for 14 years of education (bachelor's level), Sindh again leads with 9.52%, followed by Balochistan (6.52%), Khyber Pakhtunkhwa (5.8%), and Punjab (5.47%). At the master's level, Khyber Pakhtunkhwa ranks highest with 5.7%, according to the PSLM 2019–20 survey, while Sindh follows with 4.06%, and Balochistan and Punjab record lower percentages. In contrast, for MPhil and PhD levels (18 years or above), Punjab has the highest proportion of households with advanced education at 3.3%, followed by Khyber Pakhtunkhwa, while Balochistan and Sindh rank third and fourth, respectively.

Enrolments of children and disparities

Figure 3 presents the percentage of school enrolment across the provinces of Pakistan based on the survey population. The results indicate that Balochistan has the highest proportion of children enrolled in government schools, at approximately 82.29%. Khyber Pakhtunkhwa follows with 72.05%, making it the second-highest in government school enrolment. Sindh ranks third, with 63.46% of students attending government schools, while Punjab records the lowest percentage among the four provinces, with 60.24% of students enrolled in government institutions.

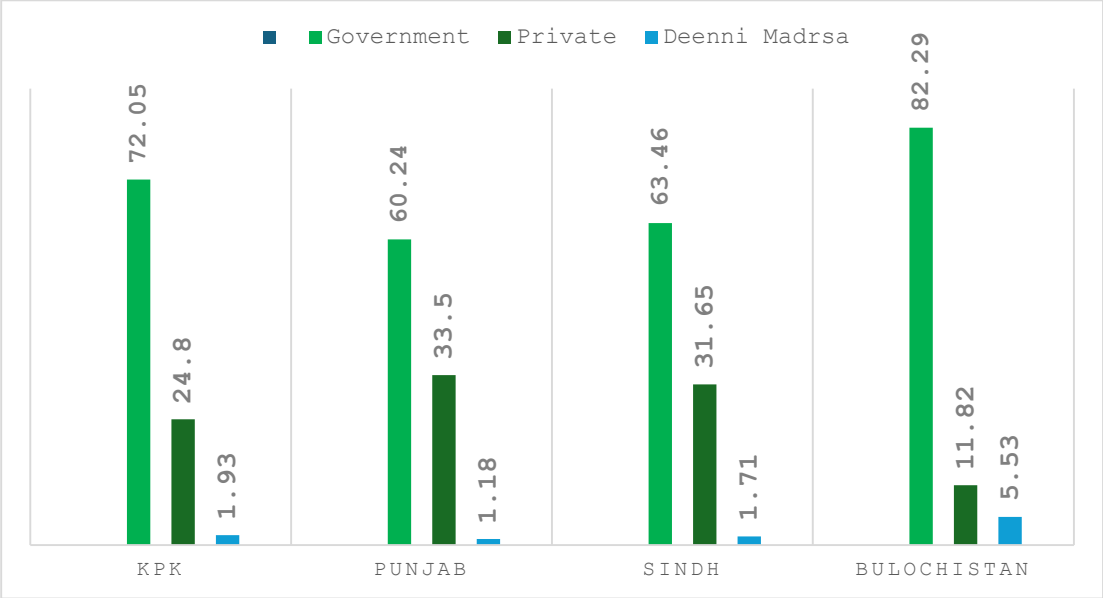


Figure 3. Enrolments in Type of School/ Institute %

Similarly, in private educational institutions, Punjab records the highest enrollment rate, with 33.5% of students attending private schools and colleges. Sindh ranks second, followed by Khyber Pakhtunkhwa, while Balochistan has the lowest proportion, with only 11.82% of students enrolled in private institutions. Moreover, Balochistan reports the highest percentage of students enrolled in Deeni Madrasas, at approximately 5.53%, followed by Khyber Pakhtunkhwa and Sindh. Punjab ranks last in this category, with only 1.71% of students attending religious schools.

Reasons for Leaving School across provinces in Pakistan

This section presents provincial statistics explaining the reasons why students drop out of school. The reasons are categorized into four main groups based on survey responses. The first major reason is the high cost of education, which makes it difficult for parents to afford school expenses. The second reason relates to limited accessibility, as many students face challenges in reaching schools that are located far from their homes. The third category includes students who leave school to assist their parents with household or labor-related work. Finally, the fourth reason is parental restrictions, where parents do not permit their children to attend school.

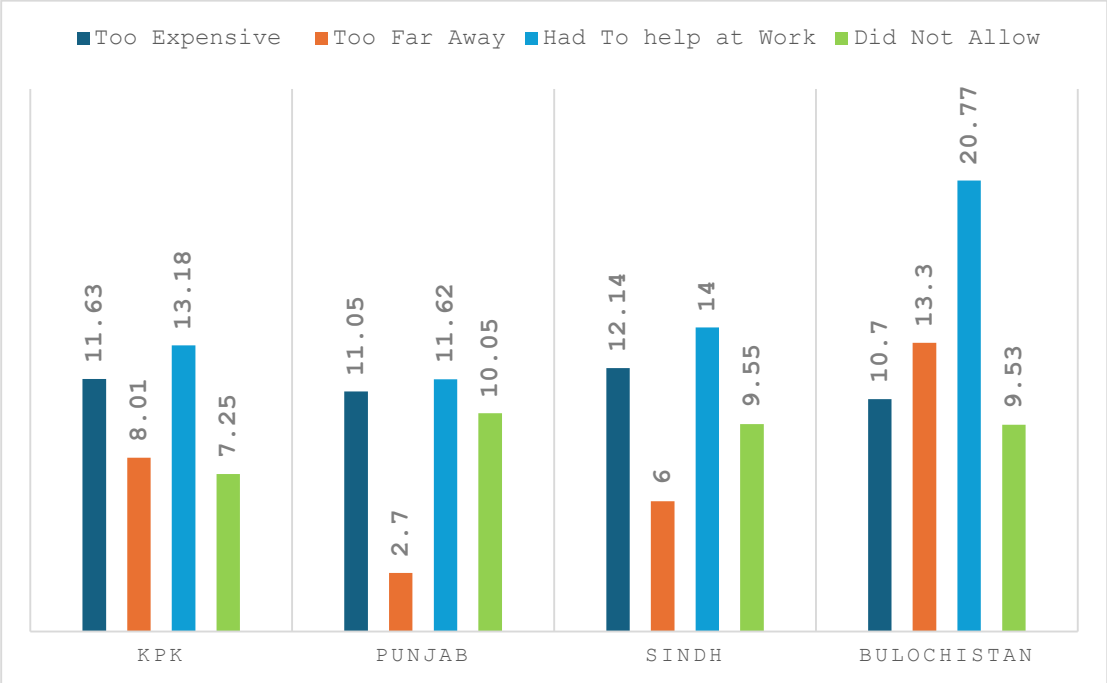


Figure 4. Reason Leaving School Across the Province

Figure 4 illustrates the percentage distribution of reasons why children do not attend school across the provinces of Pakistan. The results show that the most common reason—education being too expensive—is most prevalent in Sindh, where 12.14% of households report financial constraints as the main barrier to schooling. Khyber Pakhtunkhwa ranks second, with 11.63% of children unable to attend school due to high educational costs. Punjab follows closely with 11.05%, while Balochistan records the lowest percentage at 10.07%. These findings highlight the significant role of economic limitations in restricting access to education, particularly in lower-income regions.

In the category where distance to school is identified as the main reason for non-attendance, Balochistan records the highest percentage of children who do not attend school due to schools being too far from their homes. Khyber Pakhtunkhwa follows with 8.01% of children citing distance as a barrier to education. Similarly, in Sindh, 6% of children are unable to attend school for the same reason, while Punjab reports the lowest percentage, with only 2.7% of children not attending school due to the long distance from their homes. These results suggest that geographical accessibility remains a major challenge, particularly in rural and remote areas of Balochistan and Khyber Pakhtunkhwa.

The third category includes children who do not attend school because they work on daily wages or assist their parents with household or labor-related activities. Figure 4.6 shows that Balochistan has the highest percentage in this category, with 20% of children unable to attend school due to work-related responsibilities. Sindh follows with 14%, while Khyber Pakhtunkhwa ranks third at 13.18%. In Punjab, 11.62% of children leave school for similar reasons. These findings highlight that child labor and economic dependency on children's earnings remain significant barriers to education, particularly in economically disadvantaged regions.

The final category represents children who are not allowed by their parents to attend school. The results indicate that this reason is relatively consistent across most provinces, except for Khyber Pakhtunkhwa, where only 7.25% of children are restricted by their parents from going to school. In contrast, Punjab records the highest percentage at 10.05%, followed closely by Sindh at 9.55% and Balochistan at 9.53%. These figures suggest that parental attitudes and cultural factors continue to influence school attendance decisions in several regions of Pakistan.

Disparities in Education Expenditure across provinces

This section presents the average annual household expenditure on education across the provinces of Pakistan, highlighting regional differences in educational spending. Figure 5. illustrates that Punjab records the highest average expenditure on education, with households spending approximately Rs. 18,910 per year. Sindh follows, where households spend an average of Rs. 16,708 annually on education. These figures reflect the relatively higher investment in education in the more economically developed provinces, particularly Punjab and Sindh.

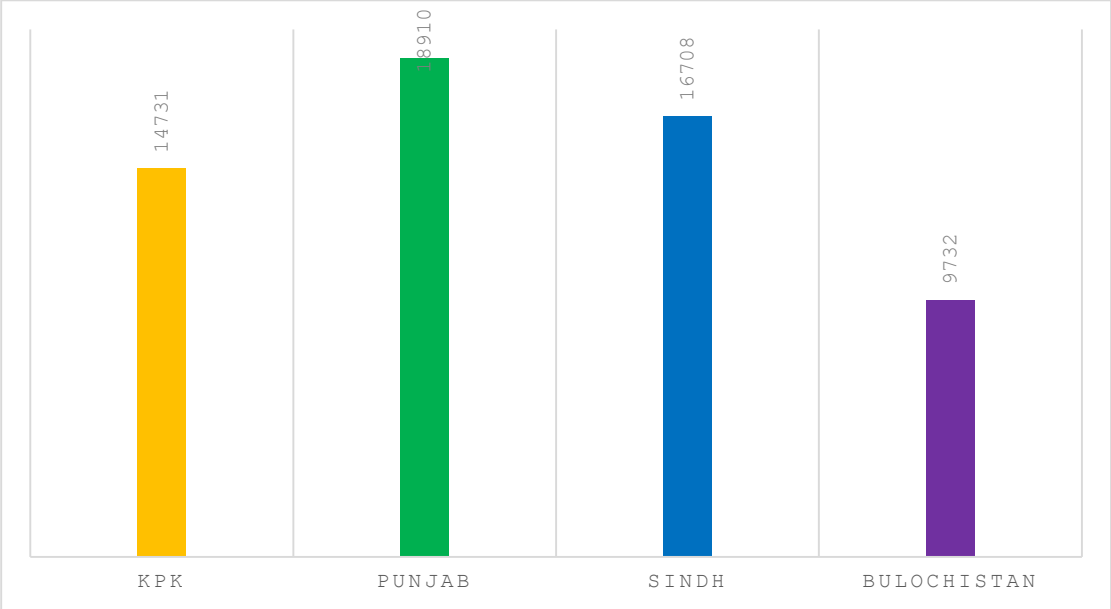


Figure 5. Average Expenditure on Education

Similarly, households in Khyber Pakhtunkhwa spend an average of Rs. 14,731 per year on their children's education, while Balochistan records the lowest average expenditure, with households spending only Rs. 9,732 annually. This disparity highlights significant regional differences in educational investment, reflecting both income variations and access to quality educational opportunities across provinces.

Disparities in Literacy rate across Provinces

Figure 6 highlights the gender-based literacy rates across Pakistan's four provinces, revealing notable disparities between males and females. The data indicate that Punjab, the country's most populous province, exhibits a significant gender gap, with a male literacy rate of 72% compared to a female literacy rate of only 57%. Similarly, in Sindh, male literacy stands at 68%, while female literacy is considerably lower at 47%. The province of Khyber Pakhtunkhwa also shows a pronounced difference, with 72% literacy among males and just 37% among females. Balochistan presents the widest gap, with male literacy at 61% and female literacy at a mere 29%. These figures underscore the persistent gender disparities in education across Pakistan and emphasize the urgent need for targeted policies and interventions to ensure equitable access to education for both men and women.

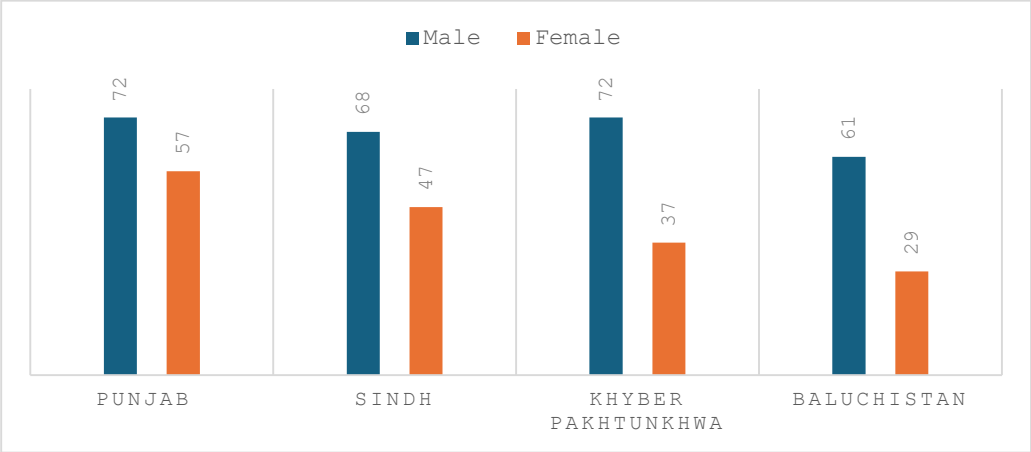


Figure 6. Literacy rate in of Four Provinces

Out of School Children in Provinces

According to the PSLM 2019–2020 survey, the data on out-of-school children across Pakistan's provinces reveal a concerning picture of educational inequality as given in figure 7. In Punjab, 22% of boys aged 5 to 15 are out of school, while the rate is higher for girls at 26%. The situation is more critical in Sindh, where 39% of boys and a significantly higher 51% of girls in the same age group are not attending school. In Khyber Pakhtunkhwa, 20% of boys are out of school, whereas the figure for girls is an alarming 40%. Balochistan faces the most severe challenge, with 38% of boys and a staggering 59% of girls aged 5 to 15 out of school. These statistics highlight deep-rooted gender and regional disparities in access to education, underscoring the urgent need for inclusive educational reforms and targeted interventions to ensure that all children, regardless of gender or location, have access to schooling.

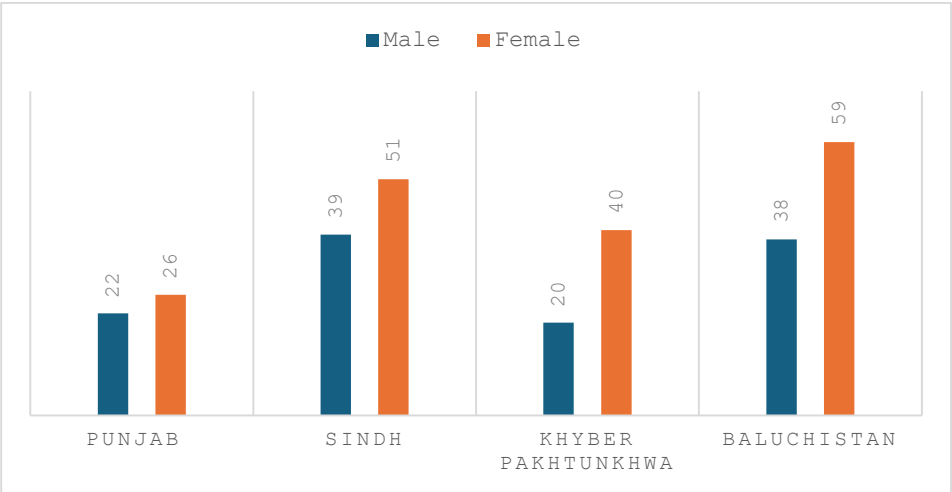


Figure 7. Out of School Children Age (5 to 15)

These indicators underscore the urgent need for targeted interventions and comprehensive policy measures to address the root causes of gender-based educational inequality in Pakistan. It is essential to ensure that all children, regardless of their gender or region, have equal access to quality education and learning opportunities. Reducing these disparities will be a crucial step toward achieving inclusive and sustainable educational development across the country.

Econometric Model Estimates

This section analyzes the determinants of household income levels in Pakistan using data from the Pakistan Social and Living Standards Measurement (PSLM) Survey 2019–20. The dependent variable is the annual household income, while the independent variables include education expenditure, age of the household head, employment status, gender, residence (urban/rural), and access to health facilities. The total number of observations in the analysis is 296. Table 1 presents the regression results, indicating that the R-squared value is 0.53, which implies that approximately 53% of the variation in household income is explained by the selected independent variables. In other words, these factors collectively provide a reasonably good explanation of income disparities among households in Pakistan.

Table 1. Linear Regression

Variable	Coefficient	t-Statistic	Significance Level
Education expenditures	1.97	3.69	*
Age of the Household	-0.0008	-0.18	****
Employment Status	-0.0488	-1.49	***
Gender	0.4464	2.33	*
Residence of the Household			
Urban	0.3431	1.66	***
Marital Status			
Divorced	-0.4504	-0.14	****
Unmarried	0.2637	0.57	****
Widow	-0.2094	-0.58	****
Access to Health facilities	0.0943	1.79	***
Constant	10.72	27.07	*
Number of observation = 296			
F(9, 286)	**= 4.25**		
Prob > F	**= 0.0000**		
R^2	**= 0.53**		

* Indicates Significant at 1 confidence level

** Indicates Significant at 5 % confidence Level

*** Indicates Significant at 10 % confidence Level

**** Indicates Insignificant, P value greater than 10 %

Model Estimation is Perform Through STATA. See Detail Results in Appendix

The regression analysis revealed an F-statistic value of 4.25, with a probability value less than 1%, indicating that the overall model is statistically significant and provides a good fit for the data. The results show that education expenditure has a positive and statistically significant relationship with household income. Specifically, a one-unit increase in education expenditure is associated with an increase of 1.97 in the household income level. The coefficient is statistically significant at the 1% level, highlighting the strong contribution of educational investment to income generation. Literature argued that societal and global advancement increasingly depends upon research, invention, innovation and adaptation; all of these are products of educated mind. Education is public good in developing countries and need Government involvement to function

effectively. This insufficient funding can be considered as one of the factors for Pakistan ranking in terms of Human Development Index. Descriptive and analytical methods need to be used to study the relationship between Public Education expenditure and Human Resource Development of Pakistan in order to realize its actual potential. The age of the household head shows a negative but statistically insignificant relationship with income, implying that age does not have a substantial effect on household education expenditure in this sample. The employment status variable is negatively related to household income and is statistically significant at the 10% level. This suggests that being unemployed is associated with lower educational expenditure level compared to employed households. The gender variable exhibits a positive and statistically significant relationship with income at the 1% level, implying that male-headed households tend to earn more than female-headed ones. Similarly, residence has a positive and significant effect on income. Households located in urban areas have, on average, 0.34 units higher income than those in rural areas, significant at the 10% level. The marital status of the household head shows a positive relationship for unmarried individuals and an inverse relationship for divorced or widowed individuals; however, these effects are statistically insignificant. Finally, access to health facilities shows a positive and significant relationship with income at the 10% level, indicating that healthier households tend to have higher income levels.

Diagnostic Tests Results and Multi-collinearity Test

Table 2. Variance Inflation Factor

Variables	VIF	1/VIF
Education Expenditure	1.01	0.985
Age of the Household	1.17	0.852
Employment Status	1.01	0.993
Gender	1.03	0.889
Residence	1.04	0.964
Marital Status		
Divorced	1.03	0.967
Unmarried	1.06	0.945
Widow	1.17	0.856
Health facilities	1.03	0.968
Mean VIF = 1.07		

After the model estimation we have test the regression for multi-co-linearity and heteroscedasticity. The table 2 shows the VIF factor for all coefficient showing that VIF value for all coefficients are less than 5 so we don't have multicollinearity problem.

Heteroscedasticity Test

To test for the presence of heteroscedasticity, the Breusch–Pagan test was employed. The null hypothesis (H_0) states that the variance of the residuals is constant (homoscedasticity), while the alternative hypothesis (H_1) suggests that the variance is not constant (heteroscedasticity). The test results indicate that the probability value is greater than the 5% level of significance, leading to non-rejection of the null hypothesis. Therefore, it is concluded that the model does not suffer from heteroscedasticity, and the assumption of constant variance is satisfied.

Heteroscedasticity Test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of log income
chi2(1) = 0.20
Prob > chi2 = 0.6569

Shapiro-Wilk W Test for Normality

The null hypothesis of the test is the data is normally distributed while the alternative hypothesis stated that the data is not normally distributed where normality test suggested that the errors of model is not normal and not equally distributed because probability value is less than 5 % level of significance so we reject the null hypothesis. The results are presented in the appendix.

Conclusion and Recommendations

This study examined the determinants and disparities in education across Pakistan, focusing on regional, gender, and socioeconomic differences using data from the Pakistan Social and Living Standards Measurement (PSLM) Survey 2019–2020. The analysis revealed significant inequalities in educational access and expenditure among provinces and districts. Punjab and Sindh demonstrated relatively higher educational spending, while Khyber Pakhtunkhwa and Baluchistan lagged behind, particularly in rural areas. The results also highlighted a persistent gender gap in literacy and school attendance, where male children consistently out-perform female children across all provinces. At the district level, urban regions displayed greater educational expenditure and better schooling outcomes compared to rural areas, emphasizing the urban–rural divide in access to quality education. The regression analysis further indicated that education expenditure, gender, employment status, health condition, and urban residence are key determinants of household income, showing that investments in education and health substantially enhance income levels and overall welfare.

Furthermore, the econometric diagnostic tests confirmed the robustness of the model, with no evidence of heteroscedasticity. The findings suggest that improving educational investment, promoting gender equality, and expanding access to health and employment opportunities are essential strategies for reducing income inequality and fostering sustainable economic growth. Therefore, Pakistan needs comprehensive policy interventions to enhance education quality and accessibility, particularly in marginalized and rural regions. Ensuring equal opportunities for girls and boys, increasing education funding, and strengthening institutional frameworks will not only uplift the education sector but also contribute significantly to the nation’s long-term social and economic development.

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