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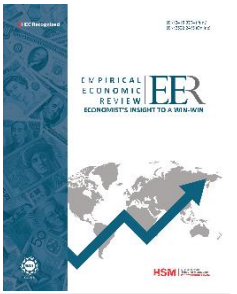

Title:	**Schooling for the Urban Poor: Insights from Urban Slums of Islamabad, Pakistan**
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Schooling for the Urban Poor: Insights from Urban Slums of Islamabad, Pakistan

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Abstract

Child schooling is a cornerstone of human capital formation, fostering economic growth, social mobility, and empowerment. It reduces inequality, enhances health outcomes, and promotes social cohesion across generations. The current study aimed to investigate the economic and demographic determinants of child schooling and gender educational disparity among slum dwellers in Islamabad, Pakistan. Despite the constitutional guarantee of free primary education, slum children remain highly disadvantaged due to poverty, poor living conditions, and administrative barriers. Primary survey data was collected from 423 households across 52 legal and illegal slums of Islamabad, targeting children aged 4–18 years to account for delayed enrollment and slow progression. Empirical results revealed that approximately 32% of school-age children are out of school, with a pronounced gender gap as female children are disproportionately excluded. Household income, expenditures, mother's education, and the age of children significantly influence enrollment, while slum-specific factors, such as illegality of residence, frequent displacement, and discriminatory practices by schools and authorities emerge as critical barriers. The findings highlighted that while economic variables drive enrollment decisions, slum-related constraints strongly affect school choice and continuation. The study concluded that integrated policies addressing poverty, documentation barriers, and discrimination are necessary, alongside targeted interventions to improve access and quality of education in urban slums.

***Keywords*:** child schooling, educational inequality, gender disparity, Probit model, role of CDA, urban slums

Introduction

Child schooling has long been recognized as a pivotal driver of human

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capital formation, economic growth, and social mobility. Beyond its direct role in improving future income and occupational opportunities, education serves as a crucial instrument of empowerment, inequality reduction, and civic engagement. Furthermore, it contributes to enhanced health outcomes, fosters social cohesion, and supports the intergenerational transfer of skills and opportunities. In this sense, education is not only a private investment but also a public good with wide-ranging societal returns. Yet, in many developing countries, access to education remains highly uneven. A significant proportion of children are either excluded from schooling altogether or enrolled in institutions plagued by inadequate infrastructure and poor teaching quality (Khandker et al., 1994). This persistent educational deficit threatens both immediate welfare and long-term economic prospects, particularly for marginalized communities.

The issue of universal child schooling is embedded in the broader global agenda of the United Nations Sustainable Development Goals (SDG-4), which calls for inclusive, equitable, and quality education for all children. However, progress towards this goal remains uneven in urban areas of developing countries, where marginalized populations particularly those in slums are excluded from mainstream policy frameworks. In Pakistan, nearly 60% of the urban population is estimated to reside in slums (Bryant, 1993), with these settlements characterized by inadequate infrastructure, insecure tenure, and limited access to government services. Educational exclusion in such environments reinforces cycles of poverty, depriving children of the opportunities needed for upward mobility.

The socioeconomic realities of slum households further exacerbate the challenges of child schooling. Poor housing, overcrowding, inadequate sanitation, and limited access to clean water hinder both school attendance and the ability to study at home. Children in such environments face greater exposure to health risks, reducing their ability to perform in school. Rapid urbanization and migration into cities compound the problem, as demand for schooling facilities consistently outpaces government provision. Research identifies a range of determinants of child schooling, including parental education, household income, family size, and gender norms (King et al., 1986; Hamid, 1993). Gender disparities remain acute in slum contexts, where girls face additional barriers due to cultural attitudes and security concerns. Moreover, intrahousehold decision-making dynamics often create misalignments between parental choices and children's

educational aspirations (Bursztyn & Coffman, 2012).

Even when children are enrolled, systemic failings in the quality of education significantly limit outcomes. Schools in slum areas often suffer from high student-to-teacher ratios, insufficient infrastructure, and inadequate resources. Banerji (2000) highlights that the exclusion of slum children from effective education is not solely an outcome of household poverty but also of institutional shortcomings. Similarly, it was argued that without significant investment in infrastructure, the efforts of governments and Non-government Organizations (NGOs) cannot adequately address the problem. Distance to schools, opportunity costs of attending schools, and affordability issues further discourage families from prioritizing education.

Against this backdrop, Pakistan's rapid urbanization intensifies the challenge. The country's urban population has grown from 17% in 1951 to nearly 39% in 2015, with projections suggesting that half of the population would reside in cities by 2030 (Shaikh, 2019). Yet this expansion has been accompanied by a proliferation of slums, or *katchi abadis*, where state provision of education and services is highly constrained. Islamabad, despite being a planned capital, is no exception. Thousands of slums are concentrated within the city, housing tens of thousands of residents in precarious conditions. Attempts at resettlement, such as the demolition of the I-11 slum in 2015, have met with limited success (Sattar & Zhang, 2017). This reflects the persistence of demand for centrally-located housing and the inadequacy of relocation policies.

This study contributed to the literature by using primary survey data collected directly from the slums of Islamabad to analyze the determinants of child schooling in an urban slum context. While much of the existing literature in Pakistan focuses on rural-urban divides or relies on secondary datasets, few studies have employed first-hand household-level information from urban informal settlements. The novelty of this study lies in its micro-level examination of how household characteristics, gender dynamics, and structural constraints intersect to shape educational outcomes in slums' contexts often overlooked in policy design.

They provide evidence that three or more siblings in a family decreased the enrollment of both sexes irrespective of whether they are residing in rural or urban areas. Freitas et al. (2020) introduced an Internet of Things (IoT) architecture of predicting dropout through machine learning (ML)

techniques. Vaarma and Li (2024) applied ML methods to make predictions of dropouts in higher education in Finland. Other contributions in this direction can be seen in Osemwegie et al. (2023), Kemper et al. (2020), and Niyogisubizo et al. (2022). Although, out-of-school children have been studied extensively, the vast majority of the studies tend to offer a theoretical outline or empirical research using simple econometric models without necessarily taking into account the hierarchical nature of the data. Conclusions on aggregate data are usually misleading.

Besides, an in-depth examination of various variables influencing out-of-school children is hardly represented in the literature with regard to Pakistan. In a bid to eliminate all these, the current study re-examined the out-of-school problem with the help of both fixed and random effects models to explain the hierarchical structure evident in the survey data. In this regard, the primary contribution of the study is as follows: 1) The study assumed relatively-developed statistical models to examine the determinants of child schooling in slums. 2) The overall data and depending on the gender were studied in detail. The strength of this study lies in its localized evidence base, which allows for a nuanced understanding of the barriers faced by slum dwellers in accessing education. By focusing on Islamabad, the research provided insights that are directly relevant to urban policymakers, given the city's status as both a rapidly-urbanizing metropolis and a microcosm of Pakistan's broader challenges of migration and informal settlement growth. Furthermore, the use of household-level survey data enables a detailed analysis of demographic, socioeconomic, and institutional factors, offering a more grounded perspective than aggregate-level studies.

However, the study also carries certain limitations. Firstly, being restricted to slums within Islamabad, the findings may not be fully generalizable to other urban centers in Pakistan, where socioeconomic and cultural dynamics may differ. Secondly, while the survey captures key household and schooling variables, it does not fully account for institutional quality indicators, such as teacher absenteeism or curriculum relevance, which are also critical for educational outcomes. Finally, as a cross-sectional survey, the study cannot establish long-term causal relationships between household conditions and schooling trajectories.

In summary, the intertwined challenges of urbanization, slum proliferation, and child schooling represent a pressing developmental

concern. Education remains essential for economic growth, social cohesion, and intergenerational mobility, yet rapid urbanization and inadequate planning have left millions of children in slums excluded from its benefits. This study underscores the urgent need for integrated policies that expand educational access, upgrade slum infrastructure, and incorporate marginalized communities into urban planning. Without such targeted interventions, the promise of child education as a pathway to development would remain unrealized for the most vulnerable segments of society.

Literature Review

Child schooling constitutes one of the most critical household decisions, often shaped by intra-household agency conflicts between parents and children. While parents typically exercise authority over educational decisions during childhood, children's own preferences may not align, creating a form of moral hazard in household decision-making (Bursztyn & Coffman, 2012). Understanding this dynamic requires unpacking the "black box" of household behavior, particularly the intersection of economic constraints, parental aspirations, and institutional limitations. Education decisions in slums are especially complex since households must balance immediate survival needs against long-term human capital investment, a trade-off that embodies both intergenerational mobility and vulnerability traps.

According to Banerji (2000), the exclusion of many slum children from schools is less attributable to household economic constraints and more to the inefficiencies of the schooling system. In particular, supply-side limitations, such as poor infrastructure, high student-to-school ratios, and difficulties in physically accessing schools disproportionately affect slum communities (Handa et al., 2004; Motriam & Osberg, 2008). It was further noted that the lack of essential educational infrastructure weakens the effectiveness of both NGO initiatives and government interventions. Distant schools, flooding, urban violence, and child labor reinforce these barriers. Consequently, the persistence of slum settlements requires targeted, slum-specific policy interventions rather than demolition or displacement strategies.

They offer evidence that having three or more siblings in a family reduced the enrollment of both the sexes regardless of their living conditions (rural or urban). Freitas et al. (2020) presented an Internet of Things (IoT)

infrastructure of machine learning to predict dropout. Vaarma and Li (2024) applied machine learning methods to make predictions of dropouts in higher education in Finland. Other contributions in this direction can be seen in Osemwegie et al. (2023), Kemper et al. (2020), and Niyogisubizo et al. (2022). Despite the extensive literature available on the out-of-school kids, most of the studies have tended to provide a theoretical summary or the primary research through the use of simple econometric models without necessarily considering that it is hierarchical data. Conclusions done on aggregate data are not generally accurate.

Nevertheless, restricting the explanation of low enrollment to supply-side constraints is insufficient. Demand-side determinants, particularly household economic resources, parental education, and preferences also play a pivotal role in shaping schooling outcomes (Bhatty, 1998). Burney and Irfan (1991) demonstrated that child education decisions are influenced not only by income but also by parental human capital, employment status, and broader family characteristics. This resonates with earlier findings showing that rural households consistently lag urban ones in educational investments, underscoring how spatial and socio-economic disparities compound inequities (Burney & Irfan, 1995; Duraisamy, 1992; Hamid, 1993; King et al., 1986; Sathar et al., 1988).

Parental education, household size, birth order, and demographic attributes, such as the age and gender of both the child and household head exert measurable influence on schooling decisions. These factors shape both enrollment and progression, as well as contribute to persistent gender disparities. The gender gap in schooling is particularly pronounced in rural areas, where discriminatory norms intersect with poverty to exacerbate educational inequalities (Mughisa, 2006; Olaniyan,2011; Siddiqui et al., 2007; Walque, 2005). Research from Ghana highlights that how parental qualities influence children's schooling, albeit with heterogeneous effects across age groups (Iddrisu et al., 2014). Additional evidence suggests that household income, asset ownership, and female headship are important determinants of child schooling outcomes (Acar et al., 2016; Iddrisu et al., 2017; Mahmood et al., 2017; Ogundari & Abdulai, 2014).

Child labor represents one of the most significant barriers to education. Jamal (2014) and Gurmu and Etana (2013) identified poverty as the primary driver of child labor, with strong negative implications for schooling. This relationship reflects both household survival strategies and structural

inequalities in labor markets. Importantly, women's empowerment emerges as a key determinant of schooling, as empowered mothers are more likely to prioritize children's education. Child labor, whether economic work or household chores, significantly undermines school enrollment, with effects varying by gender and country context (Putnick & Bornstein, 2015). Thus, banning child labor alone is insufficient; policy responses must target the underlying socio-economic drivers of child labor, particularly poverty and lack of employment security (Murad & Kalam, 2013).

Urban poverty, compounded by rapid rural-to-urban migration, further constrains access to education. Slum households often face bureaucratic hurdles in school admissions, which discourages parents from enrolling their children. Sattar and Zhang (2017) argue that raising parental awareness and simplifying admission procedures could improve access. Effective policy design, however, requires accurate identification of out-of-school children and recognition of the specific characteristics that place them at risk of exclusion (Hattori, 2014). External shocks, such as conflict or displacement, exacerbate these vulnerabilities by discouraging parents from prioritizing education (Ullah et al., 2017).

The cost of schooling is another decisive demand-side factor. For households with multiple-school-age children, the cumulative cost of tuition, uniforms, examinations, and materials poses a considerable financial burden. Even where primary education is nominally subsidized, indirect and hidden costs remain significant. In India, incentive programs, such as scholarships, stipends, free meals, and subsidized housing have provided partial relief but are insufficient to fully offset the barriers faced by the poorest households (Quang, 2012). Cameron (2011), through the "zones of exclusion" framework, highlights how slum dwellers' lack of wealth, political voice, and social capital perpetuates their marginalization from mainstream educational opportunities.

In summary, child schooling decisions in slum contexts are shaped by an intricate interaction of demand- and supply-side factors. While infrastructure deficiencies and limited school access play a role, economic hardships, parental characteristics, gender norms, and child labor collectively reinforce educational exclusion. Addressing these challenges requires an integrated policy framework that goes beyond simplistic supply interventions to include poverty alleviation, women's empowerment, reduction of schooling costs, and improved governance of slum settlements.

Without such targeted interventions, intergenerational cycles of poverty and educational deprivation in slums would persist, undermining broader human capital development goals.

Materials and Methods

Theoretical Framework for Child Schooling

Child schooling has been considered as a product, and its demand has been derived from the famous household production model by Becker-Lewis (Becker & Lewis, 1973). This framework can be utilized to identify the reduced form schooling demand equation elaborated in equation 1.

$$ES_i = \mathrm{F}\,(\mathrm{P}_M,\ \mathrm{P}_C,\ \mathrm{I}_H,\ \mathrm{I}_{Yi},\ A_e,\quad _M,\quad _F) \tag{1}$$

Equation 1 represents the reduced demand for enrollment status, it depends upon (P_M, P_C), the market purchased input prices and composite consumption prices, I_H, I_{Yi}, household income and child income, individual endowment and school environment A_e, and lastly on awareness and preferences of parents ($_M$, $_F$). Awareness and preferences of the parents show that they are well-informed about cost and benefit related to children and are rational in their preferences for child schooling. Final econometric model can be represented as:

$$ES_i \text{ probability } [Enrol = 1] = \alpha_0 + \alpha_1 DEMO_i + \alpha_2 ECO_i + \alpha_3 PR_i + \alpha_4 G_i + \varepsilon_i \tag{2}$$

In this framework, $DEMO_i$ captures child-related and household-level demographic characteristics, while ECO_i reflects the set of economic indicators, such as household assets, poverty status, per capita income, as well as the employment, education, occupation, and earnings of the household head and parents. The term PR_i denotes the direct and indirect costs associated with child schooling, and G_i encompasses additional factors including parental preferences, awareness, slum-related conditions, and school distance. Finally, α represents the coefficients and $\varepsilon_i$indicates the error term.

Data

Islamabad, the federal territory of Pakistan, was selected as the study area since nearly 60% of its population resides in slums despite the availability of public health and education facilities. According to UN-Habitat (2019), there are 52 squatter settlements in Islamabad with over

100,000 people and 16,000 households, of which 11 are legal and 41 remain illegal (Shah, 2016). Based on the 2017 census, Islamabad's total population was 1,014,825, with around 66% living in urban areas (Unicef, 2020). The study targeted all slum dwellers, with children aged 4–18 as the focus for schooling decisions, extending the school-going age beyond the official 4–16 years due to delayed entry and slow progression in slums. For health analysis, all slum residents regardless of age or gender were included. Using random sampling, the required sample size was 375 households but 500 were initially planned to account for refusals and incomplete responses. The final sample comprised 423 households, ensuring a 95% confidence level and a 5% margin of error.

Construction of Variables

The study's results are based on selected variables, including economic, demographic, and slum dweller preferences and awareness levels presented in Table 1 in appendix. Decisions for child schooling demand are multidimensional and influenced by economic, demographic, and preferences.

Descriptive Statistics Related to Child Schooling

Data derived from primary surveys illustrates the educational circumstances of children in slums. Data was gathered from household heads, focusing on children's education, however, decisions were made by parents or household heads.

Table 1

Distribution of Enrolled and Out of School Children

Enrolment status of children	Enrolled	Out of school	Total
Total number of children	632 (68%)	294 (32%)	926
Male children	331 (71%)	135 (29%)	468
Female children	301 (66%)	157 (34%)	458
Gender gap	5%	-5%	

Data collection from these places was also a responsibility to be managed. Tables 2 presents the data on children's enrolment status and gender segregation in school enrollment. Out of 926 children aged 4 to 18, 632 were enrolled. Among the enrolled, 331 were male and 301 were female pupils.

The data in Table 2 suggests that individuals exhibited a considerable inclination to invest more in male child schooling while investing in female child schooling. The gender gap indicates that boys were 5% more likely to attend school, while girls had a 5% higher probability of being out of school. Data indicates that about 30% of school-age children were not attending school, either due to never being registered or having dropped out. Table 3 indicates that over 99% of household heads reported bearing the educational expenditures of their children independently, while 71% stated that they were unable to pay their children's school fees in the previous year.

Table 2

Distribution of Descriptive Statistics of Household Head's Issues

Factors	Frequency	
	Yes	No
Did you have to pay the educational expenses out of pocket?	354 (99%)	5 (1%)
Did you fail to pay fees of any of your children last year?	272 (71.96%)	106 (28.04%)
Did you ever borrow money to pay for any type of education fee for child?	260 (68.78%)	118 (31.22%)
Have you ever sold personal items to pay tuition, fees, uniforms and stationery?	86 (22.87%)	290 (77.13%)
Was there any time when you thought that you couldn't continue the education of our children?	273 (72.80%)	102 (27.20%)
Does school administration deal with your children differently?	361 (94%)	16 (6%)
Did you face any problem while admitting your child in school as a slum resident?	231 (61.44%)	145 (38.56%)
In your opinion can education pay relatively more in future?	373 (99%)	4 (1%)
In your opinion education is important for child?	374 (99%)	3(1%)

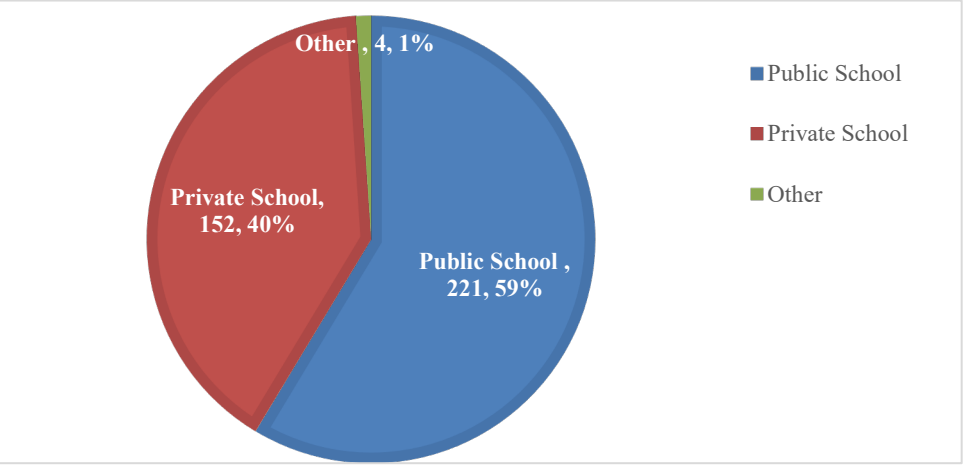
Of the 71%, 69% indicated that they needed to borrow funds to cover their educational expenditures. Furthermore, individuals tend to favor

borrowing over-selling personal or home items to cover expenses, with only 22% indicating that they resorted to selling personal items to manage their financial obligations. A total of 73% of 423 respondents indicated that it was challenging for slum inhabitants to sustain their children's education, contemplating its discontinuation in the previous year.

Upon inquiry regarding discrimination by the school administration and educators, 94% of slum inhabitants indicated experiencing discrimination from the school administration. Furthermore, 62% of the total reported instances of prejudice occurred during the entrance of their children to school due to stringent regulations and documentation challenges. When queried about their awareness level, 99% acknowledged the significance of education and recognized its substantial future benefits. Households were responsible for covering educational fees, which could influence their decisions; yet they recognized the significance of education. Figure 1 illustrates that their decision may diverge from their real choices in the absence of financial and paperwork limitations. A total of 59% of the overall sample expressed a preference for government schools, despite their children not being enrolled in such institutions.

Figure 1

Distribution of School Choice for Children with no Financial Constraints



This outcome diverges from the preferences identified in the current literature, as public schools are typically not favored over private schools when financial constraints are absent. The rationale for this unequivocal

preference for government schools may stem from the perception that urban schools possess superior quality and can rival private institutions at low expense.

Results

The current study employed the Probit model due to the binary character of the dependent variable. In this case, the enrolment status of children serves as the dependent variable, assuming values of "0" and "1" so, rendering the regular least square approach unsuitable. Table 3 illustrates the marginal effects derived from the Probit regression analysis. Additionally, data for both the total sample and the gender-disaggregated samples has been reported in same tables. The likelihood ratio χ^2 value is 192.19, with a probability of 0.000. This indicates that the utilized model is statistically significant and provides a superior explanation of variation compared to the model without predators.

Table 3

Child Schooling Decision (Marginal Effects)

Child's No School enrolment	Overall sample		Male children		Female children	
	Dy/dx	Std.Err	Dy/dx	Std.Err	Dy/dx	Std.Err
Male	-.077**	.032				
Household expenditures in log form	-.29***	.080	-.32***	.108	-.277**	.123
Father labor force participation	.136**	.064	.089	.099	.149	.094
Father is self employed	-.17***	.058	-.149*	.085	-.189**	.084
Father is employed in informal sector	-.18***	.062	-.115	.096	-.23***	.084
Father is employed in formal sector	-.139**	.065	-.139	.092	-.138	.094
Father education	-.037	.036	-.017	.049	-.069	.052
Mother education	-.062*	.038	-.046	.054	-.090*	.053
Residential status	-.22***	.053	-.29***	.070	-.18**	.082
Perception about CDA role	-.012	.034	-.021	.047	.003	.052
Discrimination in school	-.021	.035	-.029	.049	.00057	.052
Electricity connection	.072*	.043	.064	.058	.065	.064
Age of the child	-.24***	.024	-.25***	.035	-.22***	.034
Child age square	.010***	.001	.011***	.001	.01***	.001
Gender of the HH	.066	.055	.142*	.081	-.028	.079
Household size	.0203*	.010	.047***	.014	-.011	.016

Child's No School enrolment	Overall sample		Male children		Female children	
	Dy/dx	Std.Err	Dy/dx	Std.Err	Dy/dx	Std.Err
Child belong to age group 4-10	-.21***	.069	-.242**	.094	-.197**	.099
Household-head health condition	.065*	.039	-.005	.051	.126**	.057

Note. The parameter estimates are significant at 1%, 5%, and 10% levels of significance marked with ***, **, and *, respectively.

Furthermore, the model employed in this study converges by the fourth iteration, demonstrating its robustness. The analysis of the estimation results commences with an examination of household behavior via economic variables. Literature has demonstrated that economic position is the primary determinant in decision-making. In the current study, household expenditure was utilized as a proxy for the family's economic state. To regulate expenditure fluctuations, a log of total expenditure was employed. The primary data utilized in the new study robustly corroborates the traditional function of economic variables.

Discussion

Household expenditures significantly influence all three samples, indicating that a 1% increase in expenditure decreases the chances of a child being out of enrollment by 29.5% in the entire sample, 32% for boys, and 27.7% for their counterparts. The negative sign can be rationalized, as expenditures serve as a proxy for income; an increase in income leads to heightened expenditures, including those for schooling, via boosting child enrolment. The beneficial influence of household economic status, encompassing income and expenditures, is robustly corroborated by literature.

Expenditures are contingent upon the income of household members. The employment situation of the family head favorably influences the child's educational choices by providing autonomy to select enrolment and school type. The job status of the family head, typically the father in most instances, yields unexpected results regarding slum data, as it positively correlates with the likelihood of being out of school. This outcome can be substantiated as the employment status of the head does not encompass all dimensions of economic standing.

Individuals residing in slums predominantly occupy low-paying employment. This hinders their ability to invest in their children's education.

To enhance comprehension of job status, the occupation type of the family head should be examined concurrently. The occupation of fathers is classified into various categories, including self-employment and employment in both the informal and formal sectors, using inactive household heads as the reference category. An analysis of paternal occupation indicates that the likelihood of transitioning from the base category to included occupation types consistently lowers the possibility of children being out of school. Furthermore, children from homes with self-employed heads are more likely to attend school, exhibiting a 17% reduced likelihood of being out of school overall, 17% among boys (although small), and 19% for girls. Self-employed households can presumably allocate their labor force according to their needs and potentially earn more to control expenses.

The employment status of the household head is statistically significant in both the overall and female samples if he is self-employed. A similar tendency is observed with the employment of households in the informal economy. If the household head is employed in the informal sector, children in that household are 18% less likely to be out of school, while girls have a 23% reduced likelihood of being out of school. The likelihood of children remaining out of school diminishes by 14% for all when the household head is engaged in the formal sector. All three occupational groups of household heads are significant in all three regressions for both the total sample and the female children sample. Nevertheless, occupation inadequately elucidates the decision-making process for boys' education.

Occupational categories were established based on the responses of slum inhabitants, and analogous associations are corroborated by existing literature. Economic variables, such as employment and occupational status of the household, are regarded as the primary determinants in the analysis of child education. The findings robustly endorse the hypothesis that economic status correlates positively with child education and negatively with school absenteeism. The insignificance of the household head's occupation on males' education stems from the premise that parents generally prioritize sending their male offspring to school, regardless of their economic status or profession, viewing it as a pathway to a brighter future.

The examination of demographic characteristics indicates that the child's gender is significantly impactful, with boys being 7% less likely to

be out of school compared to girls. The sign and significant level of the child's gender coefficient indicate the existence of gender discrimination against females in developing countries. Empirical evidence corroborates the conventional perspective that girls are less inclined to pursue education due to inadequate economic conditions, cultural norms, and a conservative mindset, in addition to the unfavorable security environment that hinders their ability to attend school.

This outcome offers an alternative viewpoint compared to the findings of Khan and Irfan (1986) and Sathar and Qazi (1988), which suggest that low economic status renders boys' education an opportunity cost due to the potential revenues lost from child labor. Empirical findings indicate that slum residents possess the maturity to prioritize future gains over current income. The discourse on the significance of parental and household head's education in a child's education posits that children of qualified parents have less probability of no enrollment as compared to those with uneducated mothers or fathers. According to the current study, the slum data demonstrated a similar link, with the coefficient sign (albeit minor) of the family head's education aligning with the established literature (Duraisamy, 1992).

The mother's education substantially reinforces the concept of educated parents and their educated children. It considerably decreases the likelihood of children not attending school in both the general and female samples, however, it is an inconsequential impact on boys' education. The term "sign" is significantly correlated with the known concept of a favorable relationship between educated mothers and their educated children. The education of a mother enhances her empowerment in decision-making and fosters her economic independence. The current study incorporated several slum-specific factors, as the residential status of slum dwellers is a significant factor. Inhabitants of slums occupy acquired land unlawfully, with many renting their residences and paying rental fees to landlords who are also illegally present. Although no one possesses legal occupancy in slums, individuals who have independently acquired land make distinct educational choices for their children compared to slum dwellers who are renting (Gueye et al., 2018).

Residential occupancy reduces the likelihood of children being out of school by 22% overall, 29% for male children, and 18% for female children. Residential status is pertinent to overall and male data but irrelevant to the

schooling decisions of female children. A further issue peculiar to slums is the public's opinion of municipal policymaking. When surveyed regarding the function of CDA, nearly 80% of respondents indicated that CDA is not fulfilling its responsibilities adequately. The variable concerning perceptions of CDA performance is minor in the study; yet, the relationship is negative, reducing the likelihood of children being out of school. The rationale may encompass the apprehension regarding slum clearance and relocation policies of the CDA; possessing a personal residence enables them to circumvent numerous relocations.

Residents of slums encounter discrimination in the enrolment of their children in schools, as well as subsequently from school administration and educators, due to their residential status. A dummy variable is provided to indicate whether individuals experience discrimination during the school admission process for their child. The regression results indicate a negative, albeit statistically negligible effect on children's decisions to remain out of school. In public schools, children from slums are rejected due to insufficient accommodating capacity and the absence of proper domicile or birth papers. Furthermore, insufficient income constitutes an obstacle to enrolment in private schools. Residential accommodation significantly influences the decision of a child's education. Households with power connections indicate that slum inhabitants possess improved living conditions and exhibit a diminished propensity for schooling.

Electricity connections in slums are expensive, necessitating higher earnings for residents, which may exacerbate the incidence of child labor. The presence of an electricity connection elevates the likelihood of school absenteeism by 7% across all three samples, with the variable being significant just in the overall sample. The child's age is a crucial factor that is inversely correlated with the likelihood of being out of school. Older children are less likely to be out of school. The inclusion of a dummy variable on child characteristics corroborates the findings, indicating that children aged 4-10 are more likely to be out of school. In future, he/she may enroll due to parental desire for late entry or the absence of a school (Iddrisu et al., 2017).

The age variable in this study contradicts the conclusion reached by Mughisa (2006) that an increase in a child's age diminishes the likelihood of admission. Empirical evidence indicates that a 1% increase in age decreases the likelihood of being out of school by 23% for children aged 4-

18. The probability reduction rate is 25% for male children and 22% for female children, with the variable demonstrating strong significance across all three regressions. The same observation was noted for the dummy variable used in the regression for the age groups 4-10 and 11-18, with minor variations in the amount of effect. The gender of the household head is relevant in the analysis of children in slums, and accounts for the variations in decision-making regarding boys' education. Male children from female-headed families are 14% more likely to be out of school compared to those from male-headed families.

The outcome corroborates the findings of Acar et al. (2016) and Iddrisu et al. (2017) that male children of female-headed households are compelled to engage in child labor for financial support. In traditional Pakistani families, the leadership of the family is assigned to females in the event of a male head's death or prolonged absence. Furthermore, the coefficient of female headship, although statistically insignificant, indicates that daughters from female-headed households are more likely to attend school, thereby emphasizing the gender disparity, as the likelihood of remaining out of school is greater for males than for females in these families (Mahmood et al., 2017; Ogundari & Abdulai, 2014). The size of the household shows a positively significant correlation with the likelihood of a child being out of school in both the overall and male samples. It is highly significant with considerable magnitude for the male children sample, while it is negligible for the female sample.

Theory posits that as family size expands, educational expenses intensify, thereby elevating the likelihood of male children being out of school. Furthermore, male children are tasked with the supplementary responsibility of alleviating the financial load via child labor (Rodriguez & Aravena, 1991). As family size increases, the probability indicates that boys are 47% more likely to be out of school. The unexpected aspect is the inverse correlation between family size and the number of female children who are out of school. Literature corroborates the relationship; female children are perceived as optimal unpaid assistance at home. This may result in a decrease in the average workload as family size increases, hence reducing their likelihood of being out of school.

Conclusion

Slums, which make up almost 60% of urban populations in Pakistan,

have been a growing issue due to inadequate policy formulation and lack of proper up-gradation. The current study aimed to understand the determinants of child schooling and healthcare demand decisions for slum dwellers, focusing on two tiers: enrollment status and school type selection. The findings showed that conventional determinants, such as demographic variables, income, expenditures, household-head occupation, and mother education show similar trends for slum inhabitants. However, father education and employment status do not affect their child schooling decisions. The study also highlighted the importance of slum-related variables in decision-making, as they explain a wide variety of variations in child enrollment and school choice.

Ownership of houses, even illegal ones, reduces fear of displacement and allows slum dwellers to decide their children's education and school choice. Discriminated behavior by capital development authorities significantly affects their decision-making, forcing them to choose private schools despite their poor economic status. The study found that almost 90% of slums in Islamabad are illegal, with residents living in poorly-constructed houses lacking access to clean water, sanitation, electricity, and gas. Poverty, unemployment, low literacy, and poor living conditions dominate their lives, further restricting children's education. About 32% of school-age children are out of school, despite the extension of the official school-going age to 18 years. Gender disparities are evident, with a larger proportion of girls excluded from schooling.

Parents generally prefer government schools; however, many slum children remain out of school due to economic hardships and administrative barriers linked to the illegality of their settlements. The high costs of even low-quality private schooling in Islamabad make it difficult for slum families to afford education, often forcing them to borrow money or sell belongings. Discrimination by school administration and teachers against slum children due to their socioeconomic status and illegal residency further discourages enrollment.

Empirical results confirmed that child enrollment is strongly influenced by demographic and economic factors. Age and gender of both the household head and the child matter, with older children more likely to attend school. Conventional determinants, such as household income, expenditures, occupation of the household head, and mother's education play an important role in schooling decisions, consistent with broader

literature. However, some variables, such as father's education and parental employment status do not show significant effects in the slum context, diverging from general findings.

Importantly, slum-specific factors uniquely affect schooling decisions. Illegal residency status leads to documentation problems, preventing otherwise eligible children from enrolling. Frequent relocation further disrupts education continuity. Housing stability, even in illegal settlements, improves enrollment likelihood by reducing mobility and allowing children to stay in one school for longer.

Overall, the study highlighted that while economic and demographic determinants of schooling in slums mirror broader trends, slum-related constraints, such as illegality, instability, and discrimination uniquely shape education outcomes. These findings justify the need for targeted research and policies that address the structural barriers faced by slum dwellers, rather than relying solely on conventional educational frameworks.

Study Limitations

The current study has few limitations about data and variables, as published or secondary data is not available for slums in Pakistan.

Author Contribution

Saira Habib: conceptualization, formal analysis, software, resources, investigation, writing-original draft. **Muhammad Jamil:** validation, supervision, writing - review &editing. **Eatzaz Ahmed:** conceptualization, supervision, methodology, validation.

Conflict of Interest

The authors of the manuscript have no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

Data Availability Statement

Data supporting the findings of this study will be made available by the corresponding author upon request.

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