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Income Dynamics and Educational Outcomes of Children in the Informal Sector: Evidence from Tangail, Bangladesh

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ABSTRACT

This study examines the impact of parental income on children's education in the informal sector of Tangail Sadar Upazila, Bangladesh. Data were collected from 162 households through a structured questionnaire survey conducted in July 2022. The United Nations (2005) recommended formula was applied to determine the sample size, and households were selected using random sampling techniques. Findings indicate that parental income has a significant positive effect on children's educational outcomes. In households with monthly incomes below Tk. 8,000, only 28.6% of children are enrolled in school, 71.4% are out of school, and 81.6% are engaged in income-generating activities. In the Tk. 8,000–13,000 income range, 84.6% of children are enrolled, 15.4% are out of school, and 30% participate in income-generating work. All children from households earning above Tk. 13,000 are enrolled in school, with no involvement in paid work. Income changes also strongly influence education: when income increased, 95.4% of children were enrolled, while only 33.3% were enrolled when income declined. A Chi-Square test confirms a statistically significant relationship between parental income change and children's education (χ^2 (2,384) = 131.881, p < .000), with Cramer's V = 0.58 indicating a strong effect. Parental perceptions reveal that 72.8% value education for overcoming poverty and improving life prospects, while 14.2% cite high costs as a barrier, and 13% consider extended schooling unnecessary. The study concludes that parental income is a critical determinant of children's educational attainment in the informal sector and recommends policies to expand affordable education, provide income support to low-income households, and strengthen vocational training to break the cycle of poverty.

JEL Classifications: I24, J13, D31, J24
Keywords: Parental Income, Children's Education, Informal Sector, Child Labour, Educational Inequality, Household Income Dynamics.

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BACKGROUND OF THE STUDY

Informal Sector and Labour Market Characteristics

The informal sector encompasses activities that evade tax regulations and remain unreported to financial authorities. Broadly, the informal economy comprises all forms of informal employment, which refers to work performed without formal contracts and, consequently, not covered by labour legislation, social protection, or worker benefits. This includes employment within informal, small-scale, unregistered, or unincorporated enterprises, as well as self-employment and wage labour in informal jobs (Chen, 2006). The concept of informality is heterogeneous, as it encompasses diverse forms of economic activity and labour arrangements (Cunningham et al., 2001). Employment opportunities within this sector are often accessible to individuals with limited education or skills, yet they are typically characterized by precarious conditions, including physically demanding, hazardous, and low-quality work (Wijayaningtyas et al., 2022).

Globally, 64% of informal workers are engaged in self-employment, while 36% are employed as wage earners. According to International Labour Organization (ILO) estimates, 61.2% of global employment was informal in 2018, with 51.9% of workers engaged in informal enterprises, 6.7% in the formal sector, and 2.5% in household employment (ILO, 2018). In Bangladesh, the informal sector constitutes a dominant share of the labour market, employing 85.1% of the national workforce, or approximately 51.7 million individuals (BBS, 2020). This proportion has declined slightly over time, from 87.5% in 2010 to 86.2% in 2015 and 2016. Notable gender disparities are evident, with 91.8% of women engaged in informal employment compared to 82.1% of men. Location-specific differences are also pronounced: 77.3% of urban workers (13.1 million) and 88.1% of rural workers (38.6 million) are employed informally. Agriculture remains particularly reliant on informal labour, with 95.4% of workers engaged in informal roles (BBS, 2020). Beyond employment, the informal sector contributes substantially to the economy, accounting for 43% of Bangladesh's GDP (ADB, 2012). Nevertheless, it is marked by income instability, rendering households financially vulnerable and exposing workers to significant economic insecurity (Wijayaningtyas and Lukiyanto, 2018). Informal workers, on average, possess lower educational attainment and earn relatively lower incomes, which limits opportunities for upward mobility.

Importantly, the economic insecurity associated with informal employment extends beyond the immediate labour market and has profound implications for the intergenerational transmission of disadvantage. Household income instability, a defining feature of informal sector participation, directly affects the ability of families to invest in their children's education and future opportunities.

Parental Income, Education, and Child Outcomes

The implications of informality extend to intergenerational outcomes, particularly in relation to education. Parental socioeconomic status strongly influences children's educational attainment. Families with higher financial resources are more likely to provide favourable learning environments and supplementary resources, such as private tutoring, which enhance academic performance (Li and Qiu, 2018). Stable income allows for consistent investment in

children's education, while households experiencing income volatility often make sporadic and uncertain educational investments, thereby negatively impacting child development (Hill et al., 2013).

Empirical evidence highlights that parental income significantly predicts children's academic success and future earnings; children from high-income households are more likely to pursue higher education and secure greater lifetime earnings than those from low-income households (Bloome et al., 2018). Moreover, the long-term trajectory of family income and parental expectations regarding future economic stability shape children's educational outcomes (Gross, 1993). Cognitive skills among adolescents, which are positively correlated with parental socioeconomic status, not only support academic achievement but also serve as protective factors against stress and violence, contributing to better mental health outcomes (Nyarko et al., 2020). High levels of parental education and socioeconomic resources are also associated with the development of advanced cognitive skills, such as problem-solving, initiative-taking, and impulse control (Dubow et al., 2009).

Conversely, income reductions hinder children's educational access, as demonstrated by findings that a 10% rise in family income increases college enrolment by 1–1.4 percentage points (Acemoglu and Pischke, 2001). Persistent declines in household income significantly compromise educational opportunities, thereby reducing long-term earnings potential. Financial barriers, such as difficulties covering tuition fees, uniforms, and textbooks, are particularly acute among families dependent on informal sector income, often preventing regular school attendance and constraining children's development. Furthermore, adverse childhood experiences, which are often exacerbated by financial hardship, exert long-lasting effects on health and social outcomes in adulthood (Pearce et al., 2019).

Taken together, the dominance of informal employment in Bangladesh and its associated income instability significantly constrain families' ability to invest in their children's education. The resulting disparities in educational attainment reinforce cycles of poverty and limit long-term socioeconomic mobility. Thus, the persistence of informality not only shapes labour market outcomes but also perpetuates intergenerational inequality, highlighting the urgent need for policies that expand social protection, stabilize household incomes, and enhance access to quality education for children from informal sector households.

Objectives of the study

In light of the dominant role of the informal sector in Bangladesh's labour market and its associated challenges of income instability, precarious employment, and limited upward mobility, this study seeks to explore the intergenerational implications of informality on education. Given that household income volatility within the informal sector directly constrains families' capacity to make consistent educational investments, understanding the linkage between parental income and children's educational attainment becomes crucial. At the same time, beyond financial resources, the extent to which parents value and prioritize education significantly shapes children's learning opportunities and future prospects. Accordingly, this study is guided by two specific objectives.

Firstly, to examine the relationship between parental income and children's educational attainment in the informal sector.

Secondly, to assess the extent to which parents recognize and value the importance of their children's education.

These objectives are consistent with the broader concern that the persistence of informality perpetuates cycles of socioeconomic inequality through its direct and indirect impact on children's educational outcomes.

LITERATURE REVIEW

Although education offers individuals high payoffs in the long term, scientific research has continuously reiterated that children raised in impoverished conditions achieve less schooling. Limited financial resources, unstable family income, and lack of parental support often constrain their exposure to effective education. These disparities sustain intergenerational inequality by hindering human capital growth and downward socioeconomic mobility. Using data from the UK Labour Force Survey, Chevalier et al. (2013) demonstrate a strong association between early school leaving, parental education, and paternal income. OLS estimate shows that income has rather minor effects. Utilization of simultaneous modelling reveals that it is permanent income rather than regular income which is important to influence the child education. Noble et al. (2015) conducted a comprehensive study involving a batch of one thousand and ninety nine typically developing individuals aged between 3t o 20 years, examining how socioeconomic status, particularly income, impacts brain surface area. The findings revealed a logarithmic relationship between income and brain surface area. Importantly, children originated from lower-income groups exhibited proportionally greater anomalies in brain surface area in response to small variations in income compared to those from higher-income households. Studies show that how much money a family makes can affect their children's future income. For example, children from rich families are more likely to make more money when they get older than children from poorer families (Shea, 2000). In addition, the connection between how much sons and fathers make is strong. According to Solon (1992) and Zimmerman (1992) the connection is about 0.4. Parental income is a good indicator of how well children will do, even after parental education and other measurable qualities are considered (Corcoran et al., 1992; Hill and Duncan, 1987; and others). Parental income is important for children's abilities. But it is more important for children with less educated fathers. However, random changes in income do not play as important role in most families (Shea, 2000).

Through the mediating effects of parents' views and behaviours, Davis-Kean (2005) examined how socioeconomic status (SES) influences children's academic achievement in an indirect manner. The study examined 868 kids between the ages of 8 and 12 who were almost evenly distributed in terms of gender, using data from a cross-sectional nationwide study (436 girls and 433 males). Using structural equation modelling, the study found that parental attitudes and behaviours indirectly influence children's schooling achievement through the mediating effects of socioeconomic factors. Based on the classical liberal theory of equal opportunity and social Darwinism and employing descriptive research design, Andrew et al. (2014) found that there was an insignificant but negative correlation between

the parents' occupation and their ability to fund their children's education. Although they found a significant and positive correlation between formal education levels of parents and access to education for their children.

The way poverty affects children's development may vary depending on when it occurs in childhood and adolescence. Early childhood is a key time for the brain to establish fundamentally important neuronal functions and structures that will impact future cognitive, social, emotional, and health consequences, according to emerging data from studies on humans and animals (Sapolsky, 2004). Whether income augmentation of poor parents improves the life and years of schooling of their children, the study of Duncan et al. (2014) found positive feedback. The study concludes that the children whose families experience income augmentation, performs better in school and takes the challenge of completing more years of schooling. Yeung et al. (2002) used PSID data of 753 children to examine impacts of income level vs income instability on children's development. They examined test scores achievement and index of behavioural problem connecting through funding and family process pathways. They found that a significant portion of the association between children's W-J scores and family income can be explained by the family's ability to invest in providing a supportive learning environment for children; whereas maternal emotional distress and parenting practices are the most important mediators of the family income-children's BPI scores association. Parents usually think that child care is an important way to help their children learn and interact with other kids (Chaudry et al., 2011). But parents who do not make a lot of money often have jobs that are tough and not stable, and these jobs do not pay much. Because of this, they have less power to make sure children are well taken care of. So their children are more likely to stay at home without an adult or go to day-care that is not high quality (Heinrich, 2014). There is also more research that shows that families who have less money can have negative effects on their children.

Literature shows many variables other than income to impact education, development, cognitive and other socio-economic outcomes. Gershoff et al. (2007) expanded this understanding by incorporating material hardship into models assessing income's impact on child development, revealing distinct pathways through which income and material hardship influence cognitive and social-emotional outcomes via parental stress and investment. These findings underscore the importance of addressing both financial and material hardships in developing policies aimed at enhancing child development outcomes.

Some recent research focuses on the important role of parental time in children's cognitive and social development. Kornrich and Furstenberg (2013) found that the time and quality that parents spend with their offspring are critical for cognitive and social skills. The literature has indicated that the mechanism of parental time allocation can have direct effect on important outcomes, such as school outcomes and socio-emotional skills. Additionally, the difference between the time and quality parents spend with their children can bring to the unequal formation of human capital, further contributes to intergeneration mobility. Li and Zhong (2024) found that when fathers allocate their time more equally across the different stages of child development, inequalities in both cognitive and health outcomes by adolescence can be greatly reduced. Their study reported a 22 percent decline in cognitive disparities and a 49 percent decline in health disparities. This highlights the crucial role of

paternal involvement in influencing inequalities in children's human capital development. In parallel, prior research shows that need-based financial aid plays an important role in improving college persistence and degree completion for students from low-income backgrounds. An experiment was done in 13 public universities in Wisconsin. It showed that giving more grant aid can help more people finish a bachelor's degree in 4 years. It greatly reduced income inequality in colleges and universities (Goldrick-Rab et al., 2016).

While parental income is a significant determinant of children's educational success, a comprehensive understanding necessitates considering a range of interrelated factors, including parental education, beliefs, behaviours, as well as school and teacher quality. Regarding Bangladesh, the existing literature has little support on how income from the informal sector affects child education. This particular study connects these variables of interest for the case of the Tangail district of Bangladesh through a primary data survey from 162 household heads.

METHODOLOGY

Method of the Study

To achieve the objectives of the study, data were collected from 162 households engaged in the informal sector in Tangail Sadar Upazila using a structured questionnaire. The research relied entirely on primary data, obtained through face-to-face interviews conducted in July 2022.

Sample Size

The formula recommended by the United Nations (2008) in Designing Household Survey Samples: Practical Guidelines was used to determine the sample size for conducting the primary research for household surveys (United Nations Statistics Division, 2005). Random sampling was used to select 162 informal sector households whose household heads were interviewed. Data was checked for accuracy, tabulated and analysed using descriptive statistics. Results are presented using figures and diagrams. The following formula is used to determine the sample size:

$$n_h = (z^2)\ (\alpha)\ (1-\alpha)\ (d)\ (h)/\ (t)\ (\beta)\ (e^2) \qquad (1)$$

The explanation of the parameters shown in equation 1 is given in Table 1.

TABLE 1. EXPLANATION OF THE PARAMETERS IN EQUATION 1

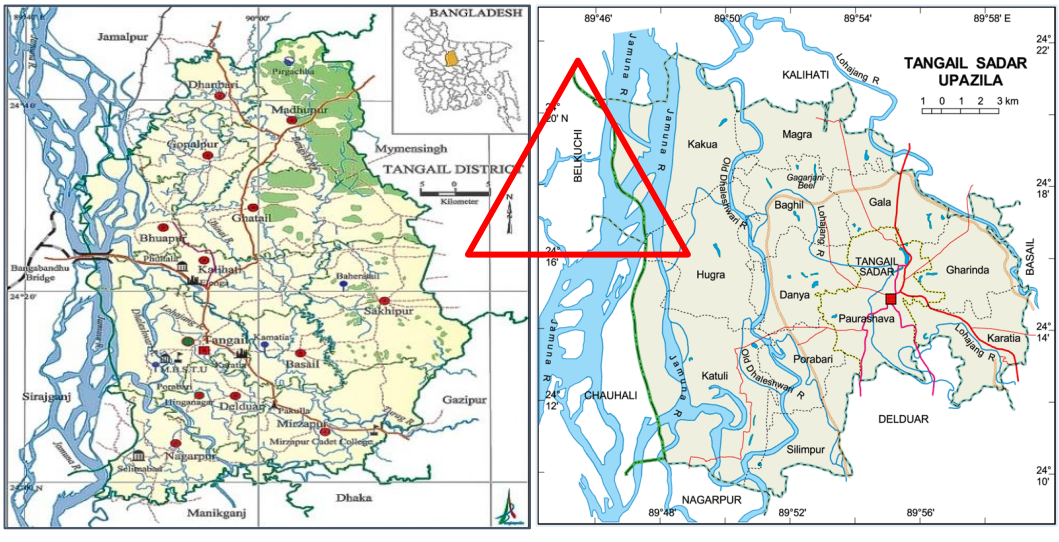
Name of the Parameter	Explanation
n_h	Represents the sample size of households selected for the survey
z	Refers to the desired confidence level
α	Denotes the estimated value of a key indicator to be measured in the survey
d	Represents the sample design effect.

h	Serves as a multiplier to account for the anticipated non-response rate.
t	Indicates the proportion of the total population represented by the target population, upon which the parameter α is based.
β	Refers to the average household size, i.e., the number of persons per household.
e	Denotes the margin of error.

Stratified random sampling was done, where Tangail Sadar Upazila was stratified into six strata. For each stratum, 27 households working in the informal sector were randomly chosen for a total of 162, as the sample size. The reason for the selection of the study area was the presence of a sufficient number of respondents and comfortable communication despite differences in places. The map of the selected areas is shown in Fig. 1.

Study Location

FIGURE 1. MAP OF TANGAIL DISTRICT (LEFT PANEL), MAP OF TANGAIL SADAR UPAZILA (RIGHT PANEL)



RESULTS AND FINDINGS

Occupation and Livelihood of Informal Sector Households

The surveyed households are engaged in diverse occupations within the informal sector, including rickshaw pulling, driving (pickup and auto), street vending, hawking, day labor, tailoring, construction work, carpentry, weaving, restaurant work, electrical services, vehicle mechanics, barbering, laundry services, shop-keeping, appliance repair, computer typing, mobile phone repair, craftwork, and farming.

Monthly Income and Educational Expenditure

Table 2 shows the distribution of household monthly income alongside average household expenditure on children's education. Among the 162 household heads, 24 (14.8%) earn less than Tk. 8,000 per month, with all spending less than Tk. 1,500 on education. The majority, 125 (77.2%), earn between Tk. 8,000 and Tk. 13,000, of which 108 (86.4%) spend less than Tk. 1,500, while 17 (13.6%) spend between Tk. 1,500 and Tk. 3,000. Only 9 households (5.6%) earn between Tk. 13,000 and Tk. 18,000, with most (66.7%) spending Tk. 1,500–3,000. Finally, 4 households (2.5%) report incomes above Tk. 18,000, all of whom spend over Tk. 3,000 on education.

TABLE 2. MONTHLY INCOME AND EDUCATIONAL EXPENDITURE

		Monthly average expenditure on children's education per household head (BDT)			
		Less than 1500	Between 1500 and 3000	More than 3000	Total
Monthly Income Range (BDT)	Less than 8000	24	0	0	24
	Between 8000 and 13000	108	17	0	125
	Between 13000 and 18000	1	6	2	9
	More than 18000	0	0	4	4
Total		133	23	6	162

Source: Author's Calculation

Parental Income and Children's Enrolment

Table 3 reveals that among 384 children aged 4–24 in surveyed households, 276 (72%) are currently studying, while 108 (28%) are not engaged in education. In families earning below Tk. 8,000, only 28.6% of children are enrolled, compared to 84.6% in families earning Tk. 8,000–13,000. Enrolment reaches 100% for children from households earning more than Tk. 13,000.

TABLE 3. PARENTAL INCOME AND CHILDREN'S ENROLLMENT

		Not Studying	Studying	Total
Parental income range (BDT)	Less than 8000	70	28	98
	Between 8000 and 13000	38	209	247
	Between 13000 and 18000	0	25	25
	More than 18000	0	14	14
Total		108	276	384

Source: Author's Calculation

Parental Income and Children's Work Participation

Table 4 reveals that children from low-income households are heavily involved in income-generating activities. Among the 98 children in households earning less than Tk. 8,000, 81.6% participate in such activities. This proportion declines to 30% among children from households earning Tk. 8,000–13,000, and no children are involved in paid work in households with incomes above Tk. 13,000.

TABLE 4. PARENTAL INCOME AND CHILDREN'S WORK PARTICIPATION

		Involvement of children in income-generating activities		Total
		Not Involve	Involve	
Parental income range (BDT)	Less than 8000	18	80	98
	Between 8000 and 13000	173	74	247
	Between 13000 and 18000	25	0	25
	More than 18000	14	0	14
Total		230	154	384

Source: Author's Calculation

Parental Income and Access to Tutoring

Table 5 indicates sharp inequalities in access to private tuition. In households earning below Tk. 8,000, no children receive extra coaching. In the Tk. 8,000–13,000 range, 24.3% of children benefit from tuition. The share rises sharply in households earning Tk. 13,000–18,000 (72%) and above Tk. 18,000 (71.5%).

TABLE 5. PARENTAL INCOME AND ACCESS TO TUTORING

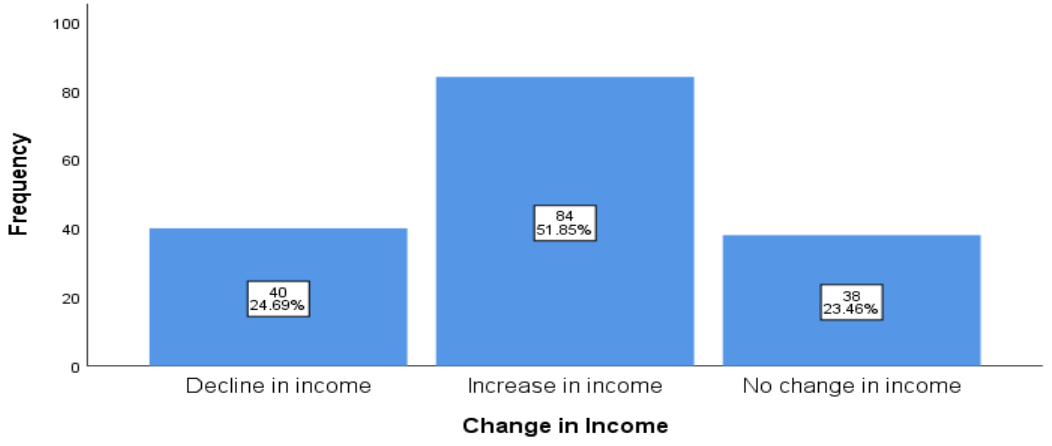
		Extra tuition or coaching classes		Total
		May not able to get	May able to get	
Parental income range (BDT)	Less than 8000	98	0	98
	Between 8000 and 13000	187	60	247
	Between 13000 and 18000	7	18	25
	More than 18000	4	10	14
Total		296	88	384

Source: Author's Calculation

Change in Household Income

Among surveyed households, 84 (51.9%) reported an increase in income in recent years, 40 (24.7%) reported a decline, and 38 (23.5%) reported no significant change (Figure 2).

FIGURE 2. CHANGE IN INCOME OF HOUSEHOLD HEADS



Source: Author's Calculation

Parental Income Dynamics and Educational Outcomes

We define income dynamics as the directional change in household income over time, capturing whether parental income has increased, decreased, or remained unchanged in recent years. This variable reflects short-term fluctuations in household economic conditions—particularly relevant for informal sector workers whose earnings are often unstable.

The measurement was conducted using self-reported retrospective data from household heads, collected through survey questions such as:

"Has your household income increased, decreased, or remained the same compared to the last three years?"

Income changes strongly affect children's education.

- **Increased Income:** Among 166 children whose parents' incomes increased, 95.4% are enrolled, with only 6.0% involved in paid work. Roughly half (51.8%) access extra tuition (Table 6).
- **Declined Income:** Among 114 children in households with declining income, only 33.3% are enrolled, while 66.7% are out of school. Notably, 89.5% of non-enrolled children are engaged in income-generating activities (Table 7)

TABLE 6. PARENTAL INCOME DYNAMICS AND EDUCATIONAL OUTCOMES (INCREASED INCOME CASE)

		Not Studying	Studying	Total
Parental income range (BDT)	Between 8000 and 13000	8	127	135
	Between 13000 and 18000	0	25	25
	More than 18000	0	14	14
Total		8	166	174

Source: Author's Calculation

TABLE 7. PARENTAL INCOME DYNAMICS AND EDUCATIONAL OUTCOMES (DECREASED INCOME CASE)

		Not Studying	Studying	Total
Parental income range (BDT)	Less than 8000	70	28	98
	Between 8000 to 13000	6	10	16
Total		76	38	114

Source: Author's Calculation

Statistical Association

A Chi-Square test of independence confirms a strong and significant relationship between parental income change and children's education (χ^2 (2,384) = 131.881, p < .000). Cramer's V = 0.58 indicates a large effect size.

Parental Perceptions of Education

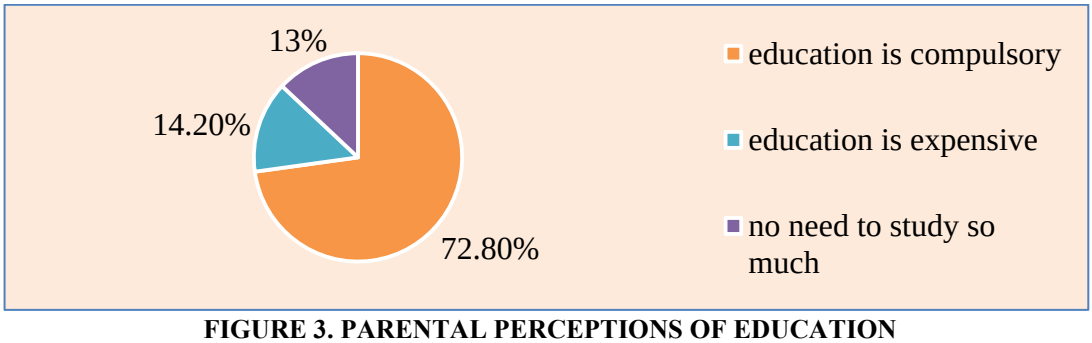


FIGURE 3. PARENTAL PERCEPTIONS OF EDUCATION

Source: Field Survey (2022)

Survey responses suggest that 72.8% of parents' view education as vital for escaping poverty, achieving a better quality of life, and attaining respect in society. Conversely, 14.2% cite high educational costs as a barrier, while 13% believe prolonged study is unnecessary, preferring children to work after a certain age (figure 3).

CONCLUSION

This study has examined the impact of parental income on the education of children in the informal sector of Tangail Sadar Upazila. Using household- and child-level data, the findings show that income is a major determinant of school enrolment, educational spending, and children's involvement in income-generating activities. The results reveal sharp differences in educational outcomes across income groups. In households earning less than Tk. 8,000 per month, only 28.6% of children are currently enrolled in school, while 71.4% remain outside the education system. Many of these children are also engaged in income-generating work, with 81.6% contributing to household earnings. By contrast, in households with monthly incomes between Tk. 8,000 and Tk. 13,000, school enrolment increases to 84.6%, and the proportion of children working falls to 30%. The most positive outcomes are seen in families earning above Tk. 13,000, where 100% of children are enrolled and none are involved in paid work. The study also shows how changes in household income affect education. Where household heads reported rising incomes, 95.4% of children were enrolled in school, and only a small fraction (6.0%) were involved in income-generating activities. Furthermore, about half of these children had access to private tutoring. However, in households experiencing a decline in income, only 33.3% of children were enrolled in school, while 66.7% were out of school. Among those not studying, nearly 90% were engaged in income-generating work. These results highlight the vulnerability of children's education to income shocks. A Chi-Square test confirmed a statistically significant relationship between changes in parental income and children's education, with a strong effect size. This provides robust evidence that income dynamics directly shape educational opportunities in the informal sector. The study also explored parents' perceptions of education. A majority (72.8%) emphasized that education is essential for overcoming poverty, improving quality of life, and ensuring future social respect. However, 14.2% considered education too expensive, while 13% felt prolonged study was unnecessary, preferring children to work after a certain age. In conclusion, parental income strongly influences children's schooling outcomes in the informal sector. Low income not only reduces enrolment but also increases child labour and limits access to additional educational support. Rising income, on the other hand, significantly improves enrolment, reduces work participation, and expands access to tutoring. These findings underscore the importance of addressing income inequality to ensure better educational opportunities for children in the informal sector.

POLICY RECOMMENDATIONS

To improve educational outcomes for children in the informal sector, particularly from low-income households, the following measures are recommended:

1. Expand access to affordable and quality education through targeted subsidies, fee waivers, and provision of educational materials.
2. Introduce income support programs for low-income households to reduce financial barriers and enable greater investment in children's education.
3. Enhance vocational training opportunities for older children in the informal sector, equipping them with practical skills for better employment and upward mobility.

4. Promote partnerships with NGOs, community organizations, and local businesses to expand support networks for children's education.
5. Strengthen data collection and monitoring systems to track the educational progress of children in the informal sector and inform evidence-based policy interventions.

LIMITATIONS OF THE STUDY

Despite its contributions, this study has several limitations that should be acknowledged. First, the age range of children (4–24 years) included in the sample is relatively broad, encompassing multiple stages of social, emotional, and cognitive development—from early childhood to young adulthood. These age groups experience different family, school, and work environments, and therefore, applying a uniform questionnaire across all ages may limit the precision of responses and could introduce measurement bias. Future studies may consider narrowing the age range or analysing separate subgroups (e.g., 4–9, 10–14, 15–19, and 20–24 years) to capture stage-specific variations more accurately.

Second, while the inclusion of access to private tutoring added valuable insight into educational inequality, the present study did not explore in depth the underlying causes of tutoring disparities, such as differences in household income, parental attitudes toward education, or the local availability of tutors across socioeconomic strata. These factors could provide a richer understanding of educational investment behaviours and should be examined in future research.

Third, the study's analysis of children's work participation does not distinguish between hazardous and non-hazardous work, nor between part-time and full-time engagement. Such distinctions are important for assessing the severity and implications of child labour, particularly within informal sector households. Expanding this dimension would strengthen the policy relevance of future analyses.

Finally, the study does not explicitly address gender-based differences in educational and labour outcomes among children in informal-sector households. Since boys and girls may experience different social expectations and economic pressures, future research could incorporate gender-disaggregated analyses to better capture these dynamics and enhance the understanding of intra-household inequality.

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