

# Exploring the Determinants of Secondary School Enrolment Among Minority Girls: A Logistic Regression Approach

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## Abstract

*This study investigates the determinants of secondary school enrolment among Muslim girls through a logistic regression approach. The analysis draws on household level, socio-economic, and parental characteristics to understand factors shaping school participation. Results reveal that parental education, household income, and supportive socio-cultural attitudes substantially increase the probability of girls' enrolment in secondary education. Conversely, early marriage expectations, domestic responsibilities, and gendered divisions of labor reduce the likelihood of continued schooling. The findings underscore the complex interplay of economic and cultural constraints in shaping educational opportunities. By identifying these determinants, the study provides valuable evidence for policymakers and educators to design context specific strategies that enhance girls' access to and retention in secondary education within Muslim communities.*

**Keywords:** Enrollment, Muslim, Girls, Regression, Logit

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## INTRODUCTION

This study examines enrolment in secondary education with a particular focus on the determinants of enrolment among Muslim girls. It begins by outlining enrolment patterns and household level factors, such as parental education, that influence access to schooling. The study employs a logit model to analyze the relationship between these determinants and enrolment outcomes, thereby offering a systematic framework for understanding the barriers and enablers of secondary education participation among Muslim girls. In educational research, enrolment refers to the process through which individuals register for formal learning opportunities across different levels of education, including preschool, primary, secondary, higher, and vocational training. As a key indicator of the reach of an education system, enrolment reflects the extent to which populations can access available opportunities and is often linked with compulsory education policies established by governments. Higher enrolment rates typically signify broader educational access, while disparities highlight persistent structural and cultural inequalities. Enrolment can further be differentiated into full-time and part-time participation, as well as in person and online modalities, reflecting the growing diversification of education delivery. Enrolment patterns are shaped by a range of socioeconomic, cultural, and institutional factors. Household income, parental education, cultural attitudes, geographical distance, and the availability of qualified teachers collectively influence whether students, particularly girls, can pursue secondary schooling. For policymakers, enrolment statistics serve as a vital instrument for planning resource allocation, developing infrastructure, and formulating interventions to address educational disparities. International organizations such as UNESCO underscore the importance of improving enrolment rates, especially in developing contexts, as a means of promoting education as both a fundamental right and a driver of social development.

## REVIEW OF LITERATURE

Studies on school enrollment highlight the influence of economic, social, and cultural factors. In Indonesia, (Deolalikar, 1993) found higher returns to schooling for males, reinforcing gender disparities

in enrollment. Similarly, in the Philippines, (DeGraff and Bilborrow, 2003) showed that children's schooling often competes with household labor demands, limiting attendance. Cultural and religious contexts also shape access. (Greenberg, 2004) reported that Muslim girls in Mandatory Jerusalem faced restricted opportunities due to social norms, while (Andrabi et al. 2006) showed that in Pakistan, madrasa enrollment was less dominant than often assumed, with most children still attending mainstream schools. Policy interventions play a critical role in expanding access. The Universal Secondary Education policy in Uganda increased enrollments but raised concerns about quality and sustainability (Pallegedara & Yamano, 2011). In India, efforts to expand secondary education have improved access, though inequalities and resource constraints persist (Lewin, 2011). Studies in Odisha show that Muslim girls face high dropout rates due to poverty, early marriage, and cultural barriers (Imran & Behera, 2023). Analysis of secondary education further highlights disparities in transition, dropout, and retention, especially across gender and rural-urban contexts (Imran, Behera & Chinara, 2023). At the national level, participation in secondary and higher education has improved, but gaps for disadvantaged groups, particularly girls, persist (Imran, Begum & Behera, 2024). Studies show that girls' education continues to face barriers shaped by gender norms and social contexts. In rural Pakistan, education often reinforces traditional roles despite expanding opportunities (Khurshid, 2016). In West Bengal, high dropout and low grade completion among girls are linked to household and economic pressures (Sengupta & Guha, 2002). Broader analyses highlight persistent inequalities in access and transitions to secondary schooling across South Asia and Sub-Saharan Africa (Lewin & Little, 2011). Earlier assessments of India's secondary education also pointed to structural challenges (Kabir, 1955). In Afghanistan, restrictive social conditions under radical religious rule further constrained women's education (Noury & Speciale, 2016).

## RESEARCH METHODOLOGY

The present study is based on primary data. A pilot survey was first conducted with fifty respondents to pre-test the interview schedule, and subsequent modifications were incorporated to ensure its suitability for the main investigation. A multi stage sampling design was adopted to obtain a representative sample of the study population (Cochran, 1977). In the first stage, two districts Cuttack and Bhadrak were purposively selected from the thirty districts of Odisha, on the basis of their relative proportions of Muslim population. In the subsequent stage, 271 households were surveyed, comprising 132 households from Cuttack and 139 from Bhadrak. To investigate the determinants of dropout at the secondary education level, the study employed a logistic regression model. Logistic regression is widely used for modeling dichotomous outcomes, as it allows for the estimation of the probability of an event as a function of multiple explanatory variables (Hosmer & Lemeshow, 2000; Menard, 2010). In this study, the dependent variable was defined as a binary indicator enrolled versus not enrolled. Explanatory variables included both continuous and categorical factors. The logit link function was applied to analyze these relationships, given its suitability for binary response models.

### The Model is as follows:

$$Y_i = \beta_0 + \sum_{i=1}^n \beta_i X_i + u_i$$

So, the logit model is specified as follows

$$L_i = \log(P_i / 1 - P_i) = \beta_1 + \beta_2 X_i + u_i$$

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \beta_4 X_{4i} + \beta_5 X_{5i} + \beta_6 X_{6i} + \beta_7 X_{7i} + \beta_8 X_{8i} + \beta_9 X_{9i} + \beta_{10} X_{10i} + u_i$$

The selection and construction of the desired dependent and covariates are dealt with in the data preparation process. A binary dependent variable, Access to credit (Y), was introduced in this study.

$$Y_i = \begin{cases} 1, & \text{Enrollment in School} \\ 0, & \text{Not Enrollment in School} \end{cases}$$

$X_1$  = Family Size / Size of Households (No. of Individuals in Households)

$X_2$  = Expected Domesticity (1 for Yes and 0 for No)

$X_3$  = Occupation of Father (1 for Farming and other allied activities 0 for Government job and Private job)

$X_4$  = School Distance (in km)

$X_5$  = Father's Education (in years)

$X_6$  = Economic Category (1 for APL and 0 for BPL)

$X_7$  = Motivation towards Education (1 for Yes and 0 for No)

$X_8$  = Parent's Support (1 for Yes and 0 for No)

$X_9$ = Income of the Households (in Rupees)  
 $X_{10}$ = Mother's Education (in years)

## DATA ANALYSIS

### Districts Wise Distribution of Households

**Table 1. District-wise distribution of Sample Households**

Name of the District	No. of Samples	%age
Bhadrak	139	51.3
Cuttack	132	48.7

Source: Primary Data.

Data on the distribution of samples throughout the various administrative levels in the Bhadrak and Cuttack districts are presented in the table that has been supplied. The samples are organized into groups according to their respective locations, with the total number of samples and the %age associated with each group being specified. At the level of the district, the samples come from Bhadrak and Cuttack in nearly equal proportions, with 51.3 % (139 samples) coming from Bhadrak and 48.7 % (132 samples) coming from Cuttack (Table 1).

### Mother's Education and Enrolment Status

A mother's education is an important aspect of the all-round development of the family and more particularly the education of children which is explained in table 2.

The provided cross-tabulation table illustrates the relationship between the education level of mothers and the enrolment status of their children. The table categorizes mothers' education into five levels: primary education, upper primary education, secondary education, higher secondary education, and graduation. From the table, it is evident that children whose mothers have completed primary education have a high enrolment rate of 75 %. This trend continues with upper primary and secondary education levels, where 62.1 % and 67.6 % of children are enrolled, respectively. However, an interesting shift occurs with mothers who have higher secondary education and graduation. Despite having higher educational attainment, these groups have higher %ages of children not enrolled in school, with 48.1 % not enrolled for higher secondary and 66.6 % not enrolled for graduation. The total figures across all education levels show that 60.5 % of children are enrolled, while 39.4 % are not enrolled (Table 2).

**Table 2. Mother's Education Wise Enrolment Status of Children**

Enrolment Status Mother's Education	Enrolment Status	
	Not Enrolled in %age	Enrolled in %age
Primary Education	25	75
Upper Primary Education	37.9	62.1
Secondary Education	32.4	67.6
Higher Secondary Education	48.1	51.9
Graduation	66.6	33.4
Total	39.4	60.5

Source: Primary Data.

This data suggests a complex relationship where higher maternal education does not consistently correspond to higher child enrolment rates, particularly at the higher secondary and graduation levels, indicating potential socio-economic factors or other barriers impacting school enrolment.

### Father's Education and Enrolment Status

The cross-tabulation table provides an analysis of students' enrolment status based on the educational attainment of their fathers. The table is divided into two primary columns representing the enrolment status "Not Enrolled" and "Enrolled" each expressed in %age

**Table 3. Father's Education Wise Enrolment Status of Children**

Enrolment Status	Enrolment Status
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Father's Education	Not Enrolled in %age	Enrolled in %age
Primary Education	50	50
Upper Primary Education	37.8	62.2
Secondary Education	36.4	63.6
Higher Secondary Education	51.1	48.9
Graduation	37.5	62.5
Total	39.4	60.6

Source: Primary Data.

Table 3 shows the fathers with primary education, 50 % of the students are not enrolled and 50 % are enrolled. When the fathers have upper primary education, 37.8 % of the students are not enrolled, while 62.2 % are enrolled. For secondary education, the %ages of not enrolled and enrolled are 36.4 % and 63.6 % respectively. Among fathers with higher secondary education, 51.1 % of the students are not enrolled and 48.9 % are enrolled. Lastly, for fathers who have completed graduation, 37.5 % of the students are not enrolled while 62.5 % are enrolled. Overall, the table shows that 39.4 % of the students are not enrolled and 60.6 % enrolled. This data indicates a general trend where higher educational attainment of fathers is associated with a higher %age of enrolled students, except for those with higher secondary education, where the %age of non-enrolled students is slightly higher than those enrolled.

#### Father's Occupation and Enrolment Status

**Table 4. Cross-tabulation between Father's Occupation and Enrolment Status**

Enrolment Status Father's Occupation	Enrolment Status	
	Not Enrolled in %age	Enrolled in %age
Private Job	36.5	63.5
Business	42.1	57.9
Farming	44.2	55.8
Wage Earner	35.2	64.8
Total	39.5	60.5 164

Source: Primary Data.

The table presents a cross-tabulation of children's enrolment status in school, categorized by their fathers' occupations. It provides the %age of children not enrolled and enrolled in school for each occupational category. For fathers with private jobs, 36.5 % of their children are not enrolled in school, while 63.5 % are enrolled. In families where the father is a businessman, 42.1 % of children are not enrolled, and 57.9 % are enrolled. Among fathers engaged in farming, 44.2 % of children are not enrolled, with a majority of 55.8 % enrolled. Lastly, in households where the father is a wage earner, 35.2 % of children are not enrolled, while 64.8 % are enrolled (Table 4).

Aggregating the data across all occupational categories, the total %ages show that 39.5 % of children are not enrolled in school, while 60.5 % are enrolled. This summary indicates that overall, a higher proportion of children are enrolled in school compared to those who are not, with variations depending on the father's occupation. Fathers working as wage earners and those in private jobs have a relatively higher percentage of their children enrolled in school, compared to those involved in farming and business.

#### Monthly Income of the HHs and Enrolment Status

**Table 5. Cross-tabulation between Monthly Income of the HHs and Enrolment Status**

Enrolment Status Income of The HHs	Enrolment Status	
	Not Enrolled in %age	Enrolled in %age
0 to 3000	47.2	52.8
3000 to 6000	41.7	58.3
6000 to 9000	34.4	65.6
Total	39.5	60.5

Source: Primary Data.

The table provides a cross tabulation of household income and the enrolment status of individuals within those households. The data is presented in terms of %ages for different income brackets.

For households with an income between 0 and 3000, 47.2 % are not enrolled, which corresponds to 26 students, while 52.8 % are enrolled, translating to 29 students. In the income bracket of 3000 to 6000, 41.7 % are not enrolled, equating to 38 students, whereas 58.3 % enrolled, which includes 53 students. For households earning between 6000 and 9000, the %age of non-enrolled individuals drops to 34.4 %, corresponding to 43 students, and the %age of enrolled individuals increases to 65.6 %, representing 82 students. Overall, across all income groups, 39.5 % of students are not enrolled, while 60.5 % are enrolled (Table 5).

**Table 6. Determinants of Enrolment in Secondary Education**

SL.N O	Variables	Coefficient	Odds Ratio (Probability)	P values (Significance)
1	Family Size	-.252*	.287	.012
2	Expected Domestically	-.695*	.499	.033
3	Occupation of Father	-.148	.863	.656
4	School Distance	-.935**	.393	.000
5	Father's Education	.065	1.093	.751
6	Mother's Education	.240	1.178	.154
7	Economic Category	2.509**	12.287	.000
8	Motivation Towards Education	2.204**	9.065	.002
9	Parent's Support	2.789**	16.267	.000
10	Income of HHs	-.505*	.603	.038
Cox & Snell R <sup>2</sup> = 0.462				
Nagelkerke R <sup>2</sup> = 0.556				

Note: \*\* indicates significance at 1 % level, and \* significant at 5 % level

Source: Authors' Own Estimation

Table 6 depicts the variables that affect enrolment into secondary education in sample areas. It can be seen that the father's education, the mother's education, economic category, motivation towards education, and parent's support, are the explanatory variables that are positively associated with enrolment in secondary education, while family size of households, expected domesticity, occupation of father, school distance, income of the HHs is negatively related.

The result from the model portrays that the number of people living in a household or the size of a family has a statistically significant and inverse relationship with the number of students enrolled in secondary schools. The odds ratio of 0.287 depicts that an increase in family size will reduce the probability of children enrolment into different educational levels. This is because larger families often have fewer available financial resources, which can make it challenging to finance the costs associated with secondary education, such as tuition fees, book costs, and uniform costs. Enrolment numbers may be affected by this financial constraint. It may be impossible for low-income families to afford to send all their children to secondary school without compromising on other necessities or giving up the possibility of earning money through child employment. The opportunity cost may play a role in the choice of whether to enroll children in secondary education, particularly in households with several children. Parents of children in larger families may have varying perspectives on the value of schooling. Especially if parents have a bigger number of children to provide for, they may have a mindset that makes them believe that education is less feasible or necessary for every child.

Another independent variable that has a negative and statistically significant influence on the proportion of females who register in secondary school is their expected level of domesticity. There may be more of an emphasis on conventional gender roles in some conservative or traditional societies. In these groups, it is common for girls to be expected to prioritize home responsibilities over education. These cultural ideas have the potential to create barriers to girls' participation in and completion of secondary education. In many cases, the significance of economic factors cannot be overstated. When families are struggling to make ends meet, they may put more emphasis on the education of their sons rather than their daughters. Alternatively, they may require their daughters to help generate revenue by working, which makes it harder for them to attend school. There is a wide range of possible meanings that can be derived from religious writings. Although some religions urge their followers to pursue knowledge, different scholars

have different ideas regarding the scope of this obligation. According to some readings, girls should put more emphasis on their religious education than on their academic education. We found that for every unit of expected domesticity, there is 0.499 times decline in the number of girls who register in secondary education. This information was gleaned from the determinants (Table 6).

The further away the school was located from the home, the less likely it was that girls would enroll in secondary education. This finding was statistically significant at the 1 % level. The likelihood of girls enrolling in secondary schools drops by 0.393 times for every additional km that separates them from their schools. This is due to the presence of cultural and religious beliefs that restrict the mobility of girls and women in more conservative communities. These communities include communities in the Middle East. Concerns about their girls' modesty and safety may cause families to be apprehensive about sending their daughters to schools that are located a significant distance away. When girls' schools are located a significant distance from their homes, the decision to enroll them in secondary education may be influenced by religious standards and traditional gender roles. This is especially the case in countries where education is not universally accessible. If a girl is prevented from helping out around the house because she is required to attend school, there is a chance that her family may experience a loss of money. This might be a factor in whether or not their parents choose to enroll them in a school that is located further away. If a family has limited financial resources, they may choose to prioritize the education of their sons over the education of their daughters. This might result in lower enrolment rates for girls in secondary education, particularly if the school is located in a remote area. The availability of infrastructure, such as roads and transit facilities, as well as the quality of such infrastructure, can have a considerable impact on the accessibility of schools. Families can be hesitant to send their daughters to secondary education institutions if the schools are located at a great distance from their home and there is insufficient or unsafe transportation. Inadequate facilities may also contribute to greater rates of educational abandonment among female students.

The occupation of a father is another independent variable that affects a girl's decision to enroll in secondary education. Although this variable has a negative correlation with enrolment status, this finding has no bearing on the statistical significance of the dependent variables. In a similar vein, the education level of one's parents, such as that of one's father or one's mother, is favorably associated with a girl's decision to enroll in secondary education; nevertheless, these variables are similarly statistically insignificant in comparison to independent variables.

A favorable and statistically significant (at the 1 % level) link exists between the economic category and the probability that girls enrolled in secondary education. Being a member of an APL category household makes one more likely to enroll in school than being a member of a BPL category household does. The ratio is 12.287 to 1. When a family is living in poverty, it can be difficult to pay education related costs like school fees, uniforms, and books for their children. Regardless of the religious affiliation of the girl, the inability to afford an education is a barrier that prevents her from attending school. Girls are frequently subjected to the expectation that they would assist with duties around the house or seek employment to contribute financially to their families. It is common for females to bear a disproportionate share of the burden of the opportunity cost of education, particularly in economically poor households.

The importance of motivation cannot be overstated in the field of education. In this study, we concluded that a good attitude towards education is a statistically and positively important factor in girls' enrolment in secondary schools. If girls were more motivated to enroll in school, the result would be 9.065 times the current rate. Self-motivated girls are more likely to recognize the transformative impact of education. Girls who are driven are more likely to pursue school as a means to achieve knowledge, skills, and independence for themselves. Girls who are motivated almost always have certain goals in mind for their foreseeable future. They may have aspirations of obtaining a higher education or pursuing particular careers, which may motivate them to enroll in secondary education despite the obstacles posed by society. Girls are more likely to be motivated to enroll in secondary education if they have an understanding of the long-term benefits of education, such as greater socio-economic position and improved health. A community that places a high value on education and is driven to succeed might produce an atmosphere that is encouraging to young women. When a society as a whole recognizes the importance of educating girls, it makes it much simpler for individual girls to enroll in school and continue their education. The presence of educated and accomplished women who are role models within the community might be motivational for young women. Girls receive a greater incentive to enroll in school and perform well there when they

observe other girls their age who have achieved success as a result of their education. Self motivated girls defy the traditional conventions that may restrict the educational opportunities available to them. They are more prone to question preconceptions and push against traditional roles allocated to women in society, which leads to them pursuing education because of these tendencies. Self-motivated individuals can argue for changes in the attitudes of society. It is much more probable that girls and their families will advocate for changes in policy and societal shifts that favor girls' education when the girls and their families are motivated.

Without the assistance of parents, getting an education is impossible. Therefore, this is a very significant issue to consider. Based on the table, we were able to determine that parental support has a statistically significant and favorable relationship with a girl's decision to enroll in secondary education. When one unit of parental support increases, it leads to a rise that is 16.267 times greater in the number of girls enrolling in secondary schools. The development of an optimistic outlook on learning is one way in which parents can inspire and motivate their daughters. They should emphasize the significance of learning new things and growing as individuals. Parents are in the best position to assist their daughters in striking a balance between conventional schooling and religious education. To accomplish this goal, coordination may need to take place with various religious authorities or community centers. The goal is to guarantee that religious studies are incorporated into the entire educational plan. It is important to have open channels of contact with both teachers and administration at your school. Participating in your child's educational experiences demonstrates to them that you are enthusiastic about and invested in their education. You should have reasonable expectations for your daughter's academic accomplishment, and you should encourage her as she works towards fulfilling those expectations. In addition to this, emphasize to her the significance of education to her future. Parents, especially women, have the potential to serve as influential models for their children. A parent or other adult figure can have a substantial impact on a child's perspective of education by providing examples of how they place value on education.

The household income is another factor that influences the enrolment of Muslim girls in my research location. An increase of one unit in the HHs income decreases enrolment by a factor of .038. The reason behind this is that education is highly valued in my study location. Parents might consider it enough if their daughters receive an Islamic education. Enrolment in my field of study is not driven by income. Lastly from the above model, we found that the explained variation in the dependent variable based on our model ranges from 46.2 % to 55.6 %, as shown by the Cox and Snell  $R^2$  or Nagelkerke  $R^2$ .

## CONCLUSION

The study identifies multiple determinants influencing girls' enrolment in secondary education in the study region, with economic hardship emerging as a critical constraint, as households below the poverty line struggle to bear education-related expenses, leading to lower enrolment rates. Cultural and religious norms, particularly in Muslim-majority communities, further restrict girls' mobility and access to schooling, while distance to school poses additional challenges due to parental concerns over safety and modesty. Beyond these structural and cultural barriers, individual and familial factors such as self-motivation and parental support play a decisive role in shaping educational outcomes, enabling some girls to overcome existing constraints. Institutional factors, including the presence of qualified and supportive teachers and adequate school staffing, also foster a positive learning environment that enhances enrolment and retention. Collectively, these findings highlight the need for comprehensive interventions that address economic, social, and institutional barriers through targeted financial assistance, community awareness initiatives, and investments in educational infrastructure, particularly in disadvantaged and culturally conservative contexts, to strengthen girls' access to and participation in secondary education.

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