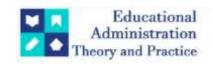
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Identifying Determinants of Higher Educational Attainment in India: Evidence From 75th Round NSSO Education Survey

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ABSTRACT

Publication: 20/12/2023

Submission: 20/06/2023 Education stands as a crucial element in shaping human resource development Acceptance: 07/07/2023 across social, cultural, technological, economic, and national realms. The quality of higher education is influenced by numerous factors impacting students' learning outcomes. Despite notable progress in India's higher education enrollment, disparities persist among different socio-economic groups. This study aimed to investigate socio-economic and demographic factors affecting the attainment of higher education among Indian youth aged 18-23. Using data from 75th round of NSSO Education survey-2018, the study employed binary logistic regression analysis to uncover the relationship between higher education and various socio-economic and demographic factors in India. Findings revealed that higher education is predominantly accessed by the more affluent strata of society, while marginalized groups face greater challenges in accessing it. The study emphasizes the necessity for targeted interventions such as free education, removing barriers to access, increasing government-supported educational institutions, offering scholarships, ensuring affordable internet access, and bolstering awareness campaigns, especially within disadvantaged segments of society.

> **Keywords:** Higher Education, Inequalities, NSSO Education Survey, Binary Logistic Regression

Introduction

Education serves as a fundamental pillar of human resource development, shaping societal, cultural, technological, economic, and national advancement (Upadhyay, 2022). Although global initiatives have made significant strides in promoting literacy and universal primary education (Kilag et al., 2023; Reddy, 2023), the crucial importance of higher education has often been marginalized, particularly in developing countries such as India (Mishra & Aithal, 2023). Every year, millions of children are compelled to abandon their education after completing secondary school (Donitsa-Schmidt & Ramot, 2020; Zhang & Bray, 2020), primarily due to financial hardships and various socio-economic challenges (Aina et al., 2022). However, higher education is crucial for multiple reasons, forming the bedrock of both individual and national progress (Marginson, 2024). Firstly, higher education is a critical driver of research and development (Chankseliani & McCowan, 2021), fostering innovation and enhancing a nation's technological capabilities (Abulibdeh et al., 2024). It enables countries to secure a competitive edge in the global arena, directly influencing their growth trajectories

(Marginson, 2022). Secondly, higher education plays a significant role in individual economic mobility, offering pathways to higher income and better employment opportunities. It not only uplifts individuals but also reduces income inequality within societies (Brown & James, 2020). Lastly, a well-educated and skilled workforce is a prerequisite for sustained economic growth, and addressing barriers to higher education is essential for nurturing such a labour force (Armeanu et al., 2018). Despite its undeniable importance, there remains a noticeable dearth of extensive, nationally representative studies exploring the determinants of higher education attainment in India, particularly among its youth. This study endeavours to bridge this gap by investigating the factors that influence higher educational attainments. Leveraging data from the National Sample Survey Office's (NSSO) Household Social Consumption: Education survey, the study focuses on individuals aged 18 to 23, analysing spatial variations and identifying key predictors influencing higher education. By unravelling these patterns, the present study aims to inform evidence-based policy decisions, fostering a more equitable and inclusive educational framework across the nation.

Methodology

Data Source

The data for this study was sourced from the National Sample Survey Office's (NSSO) 75th round of 'Household Social Consumption: Education' survey, which encompass both qualitative and quantitative dimensions of educational attainment and services utilized by household members. Qualitative data include literacy rates, educational levels, type of institutions attended, current attendance or enrollment status, receipt of free education, and reasons for non-enrollment or discontinuation. Quantitative data cover household expenditures on education, whether borne by the household, other households, or non-governmental institutions. The survey employs a stratified multi-stage sampling design, with Census villages and Urban Frame Survey (UFS) blocks as primary sampling units and households as ultimate sampling units. Sub-strata are formed based on population and affluence, and first-stage units are selected using Probability Proportional to Size with Replacement (PPSWR). The survey spans four sub-rounds from July 2017 to June 2018, offering a comprehensive assessment of educational engagement, expenditures, and various qualitative and quantitative aspects, including funding sources beyond government contributions. For this study, a subset of the data, comprising 37,820 individuals aged 18 to 23 years, was analysed.

Variable of interest and statistical Analysis

The primary outcome variable of this study was Higher Education, defined as any individual, aged 18 to 23 years, attending or attended any course after higher secondary that is twelve years of schooling. The study aimed to identify predictors of higher education using several demographics, socioeconomic, and spatial variables that were informed by previous literature (Jha & Kumar, 2017; Khan, 2022). Binary logistic regression analysis was employed to estimate likelihood of association between the predictors and higher education, expressed as odd ratios with 95% confidence intervals. Logistic regression involves creating a non-linear statistical model that explains the connection between a binary outcome (like yes/no) and a group of independent predictor variables, characterizing the relationship between them. A typical logistic regression function takes the form as follows

$$y = \frac{e^{(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p)}}{1 + e^{(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_p x_p)}}$$
 (i)

Where Y is the predicted variable which is higher education in our case, Xs are the covariates, β s the regression coefficients and e is the base of the natural logarithm. Stata 17 is used to analyse the data throughout the study.

Result and Discussion

Sample Characteristics

Table 1 provides a comprehensive overview of sample characteristics across various socio-economic and demographic variables. Approximately 20% of individuals received stipends, while 80% did not, highlighting limited access to financial support. The sample is predominantly male (61.9%) compared to females (38.1%). The average number of members in the households of participants are almost five, although significant variations persist. Hindus constitute the majority (78.2%), followed by Muslims (11.15%) and others (10.65%). In terms of social groups, OBC (40.76%) is the largest, followed by unreserved or other castes (35.99), SC (14.11%), and ST (9.13%). Majority of the students have internet access (61.08%) while almost 38.02% do not, reflecting a digital divide. The primary household occupation is self-employment (52.80%), with notable portions in regular wage/salary earnings (21.60%), followed by casual labour with 16.30% and other occupation with 9.29%. Wealth distribution is relatively even but not same across all quintiles. Almost 31.46% individuals belong to richest strata of the society, followed by poor with 23.19% and richer with 19.76%. The poorest (11.52) and poorer (14.07) constitutes around 25.57%. A majority reside in urban areas (45.54), and government or government-aided institutes cater to 62.93% of the population. Access to free education is minimal, as only 3,461 individuals benefit from it. These characteristics underline disparities in access to resources and highlight socio-economic challenges.

Table 1: Sample Characteristics				
Variables	N	Percentage (%)		
Stipend				
Yes	7,752	20.50		
No	30,068	79.50		
Gender				
Male	23,409	61.90		
Female	14,411	38.10		
Household size ^c (Mean, SD)	4.88	2.16		
Religion				
Hindu	29,575	78.20		
Muslim	4,217	11.15		
Others	4,028	10.65		
Social Group				
ST	3,454	9.13		
SC	5,338	14.11		
OBC	15,416	40.76		
Others	13,612	35.99		
Internet Connection				
Yes	23,099	61.08		
No	14,721	38.92		
Household occupation				
Self-employed	19,970	52.80		
Regular wage/ Salary earning	8,170	21.60		
Casual labour	6,166	16.30		
Others	3,514	9.29		
Wealth Status				
1 st quintile	4,357	11.52		
2 nd quintile	5,323	14.07		
3 rd quintile	8,771	23.19		
4 th quintile	7,472	19.76		
5 th quintile	11,89	31.46		
Place of Residence				
Rural	17,222	45.54		
Urban	20,598	54.46		
Free Education				
Yes	3,461	9.15		
No	34,359	90.85		
Institute type				
Govt./ Govt. Aided	23,802	62.93		
Govt. Not Aided/ Private	14,018	37.02		

Note: c in the superscript denotes continuous variable

Source: Compiled by authors

Spatial Variations in higher education across regions

According to 75th round of education survey conducted by NSSO, higher education was found to be prevalent among 10.86 percent of individuals aged 18 to 23 years, at a national level. The incidence of higher education across various regions in India has been presented in Figure 1. Higher education varied across different regions of India, with the Eastern region having the lowest incidence of 7.59 percent and the Northern region having the highest incidence of 15.91 percent. The South, West and the North-eastern region followed suit with 11.43 percent, 10.81 percent and 9.38 percent respectively.

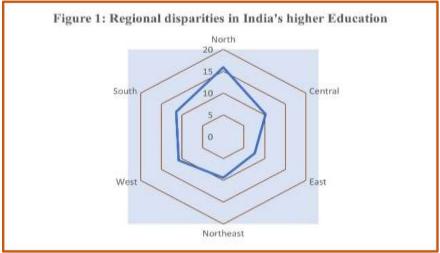
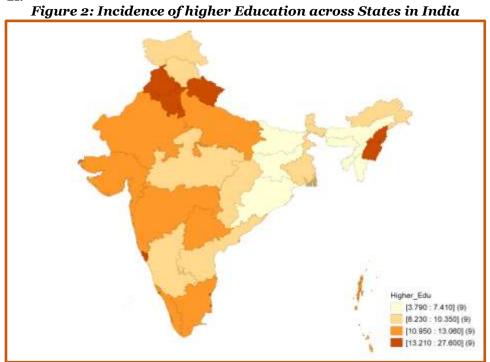


Figure 1: Prevalence of Higher Education in Different Regions of India

Source: Prepared by the authors

Incidence of higher Education across States in India

Further analysis revealed that there were substantial variations in the incidence of higher education across states in India. A detailed breakdown of these variations can be observed in Figure 2. Despite a varied picture among those with an education level of 12 or below, the scenario significantly shifts for those pursuing higher education. Figure 2 illustrates this shift, showcasing nine leading states - Chandigarh (27.6%), Delhi (25.07%), Puducherry (19.07%), Nagaland (18.26%), Uttarakhand (15.86%), Goa (15.23%), Manipur (14.46%), Haryana (13.86%), and Punjab (13.21%)—with the highest percentages of individuals aged 18-23 participating in or having attended higher education. Chandigarh tops the list with 27.6%. The subsequent set of states falls within the range of 13.06% to 10.95% for higher education, encompassing Maharashtra (13.06%), Uttar Pradesh (12.95%), Kerala (12.59%), Telangana (11.55%), Rajasthan (11.46%), Tamil Nadu (11.21%), Daman & Diu (11.02%), Gujarat (10.96%), and Andaman & Nicobar Islands (10.95%). Another cluster emerges with percentages ranging from 10.35% to 8.23% for higher education, consisting of West Bengal (10.35%), Himachal Pradesh (10.23%), Karnataka (10.09%), Jammu & Kashmir (10%), Madhya Pradesh (0.5%), Andhra Pradesh (8.61%), Arunachal Pradesh (8.38%), Chhattisgarh (8.33%), and Sikkim (8.23%). On the contrary, Dadra and Nagar Haveli (3.79%), Tripura (6.12%), Assam (6.12%), Meghalaya (6.12%), Bihar (6.48%), Jharkhand (6.48%), Odisha (7.07%), Mizoram (6.37%), and Lakshadweep (7.41%) exhibit the lowest rates of higher education, with Dadra & Nagar Haveli recording the lowest at 3.79%. This finding is aligned with the AISHE Report, 2020-21.



Source: Prepared by the authors

Determinants Associated with Higher education in India

To identify the factors that determines higher education in India, we estimated the binary logistic regression model using the following formula, and the regression result has been presented in table 1

$$y = \frac{e^{(\beta_1 \text{STP} + \beta_2 \text{GEN} + \beta_3 \text{HS} + \beta_4 \text{REL} + \beta_5 \text{SG} + \beta_6 \text{INT} + \beta_7 \text{OCCU} + \beta_8 \text{WS} + \beta_9 \text{SEC} + \beta_{10} \text{FE} + \beta_{11} \text{IT})}}{1 + e^{(\beta_1 \text{STP} + \beta_2 \text{GEN} + \beta_3 \text{HS} + \beta_4 \text{REL} + \beta_5 \text{SG} + \beta_6 \text{INT} + \beta_7 \text{OCCU} + \beta_8 \text{WS} + \beta_9 \text{SEC} + \beta_{10} \text{FE} + \beta_{11} \text{IT})}}$$
(1)

Here, STP represents stipend, GEN denotes the gender of the respondents, HS refers to the size of the household, REL stands for religion of the respondent, SG indicates the social group or caste of the respondent, INT represents the access to internet connection in the respondent's household, OCCU signifies the occupation of the household, WQ stands for wealth status or economic class that the respondent belongs to, SEC refers to the sector indicating the place of residence, FE stands for free education and IT represents the institution type. Table 1 displays the estimated Odds Ratios derived from the binary logistic regression model along with the z values utilized to ascertain the individual variables' impact on adolescent higher education. Prior to delving into the regression outcomes, it's crucial to acknowledge that the statistics presented by Log likelihood as (-11505293) determine the appropriateness of the regression model. The Log-likelihood Chi-Square ($X^2 = 133.64$; p<0.001) is notably significant at the 1% level, indicating that the model significantly outperformed the baseline in explaining higher education statistically.

Variables Adjusted Odds ratio [AOR] Z Value	Table 1: Regression Result: Binary Logistic Regression (n = 37820)				
Yes @					
No	Stipend				
No	Yes ®				
Gender Male® Female 1.42 318.91*** Household size 0.92 72.97*** Religion Hindu® Muslim 0.97*** 0.91*** Others 0.91*** Social Group Others® SC 0.79 1.34 125.76*** OBC 0.88 1-25.76*** OBC 0.88 Internet Connection Yes® No No 0.71 -290.87*** Household occupation Salaried / Regular Wage® Self-Employment 0.91 -44.27*** Casual Labour 0.91 -44.27*** Wealth Quintile Rich® Middle 1.02 14.30*** Poor 0.92 -52.40*** Place of Residence Rural® Urban 1.59 1.57 -244.60*** Institute type Aided® Not Aided 0.92 -64.34*** Log-Likelihod Linx 218.51***		0.78	-168.06***		
Male®	Gender	,			
Household size	Male®				
Household size	Female	1.42	318.91***		
Religion Hindu® Muslim O.97*** -18.73*** Others O.91*** -40.13*** Social Group Others® SC O.79 -125.27*** ST ST OBC O.88 -96.81*** Internet Connection Yes® No O.71 -290.87*** Household occupation Salaried / Regular Wage® Self-Employment O.93 -42.15*** Casual Labour O.91 -44.27*** Wealth Quintile Rich® Middle 1.02 14.30*** Poor Poor O.92 -52.40*** Place of Residence Rural® Urban Free Education No® Yes Institute type Aided® Not Aided O.92 -64.34*** Log-Likelihood LIR X² 133.64	Household size		72.97***		
Muslim 0.97*** -18.73*** Others 0.91*** -40.13*** Social Group 0 -125.27*** SC 0.79 -125.27*** ST 1.34 125.76*** OBC 0.88 -96.81*** Internet Connection -96.81*** Yes® -96.81*** No 0.71 -290.87*** Household occupation -290.87*** Salaried / Regular Wage® -42.15*** Self-Employment 0.93 -42.15*** Casual Labour 0.91 -44.27*** Other Employment 1.53 218.51*** Wealth Quintile	Religion	· ·	, ,,		
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Social Group Others® SC		0.91***			
Others® O.79 -125.27*** SC 0.79 -125.27*** ST 1.34 125.76*** OBC 0.88 -96.81*** Internet Connection -96.81*** Yes® -96.81*** No 0.71 -290.87*** Household occupation -290.87**** Salaried / Regular Wage® -290.87**** Self-Employment 0.93 -42.15**** Casual Labour 0.91 -44.27**** Other Employment 1.53 218.51**** Wealth Quintile 1.53 218.51**** Wealth Quintile 1.02 14.30**** Rich® 0.92 -52.40**** Poor 0.92 -52.40**** Pree Education 1.29 183.01*** Free Education 1.57 -244.60*** Institute type Aided® -64.34*** Institute type Aided® -11505293 LR X² 133.64	Social Group	, and the second	1 0		
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OBC 0.88 -96.81*** Internet Connection Yes® -96.81*** No 0.71 -290.87*** Household occupation -42.15*** Salaried / Regular Wage® -42.15*** Self-Employment 0.93 -42.15*** Casual Labour 0.91 -44.27*** Other Employment 1.53 218.51*** Wealth Quintile -8.6.8 -8.6.8 Middle 1.02 14.30*** Poor 0.92 -52.40*** Place of Residence -92 -52.40*** Rural® -99 183.01*** Tree Education -90 -244.60*** No® -92 -64.34*** Institute type -64.34*** Aided® -92 -64.34*** Not Aided -92 -64.34*** Log-Likelihood -11505293 -11505293 LR X² 133.64			125.76***		
Internet Connection Yes® No			-96.81***		
Yes® No 0.71 -290.87*** Household occupation 3alaried / Regular Wage® -42.15*** Self-Employment 0.93 -42.15*** Casual Labour 0.91 -44.27*** Other Employment 1.53 218.51*** Wealth Quintile 1.53 218.51*** Rich® 1.02 14.30*** Poor 0.92 -52.40*** Place of Residence 1.29 183.01*** Free Education No® 1.57 -244.60*** Institute type Aided® 0.92 -64.34*** Not Aided 0.92 -64.34*** Log-Likelihood -11505293 133.64	Internet Connection				
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Salaried / Regular Wage® 0.93 -42.15*** Self-Employment 0.91 -44.27*** Other Employment 1.53 218.51*** Wealth Quintile Rich® Middle 1.02 14.30*** Poor 0.92 -52.40*** Place of Residence Rural® 1.29 183.01*** Urban 1.29 183.01*** Free Education No® -244.60*** Yes 1.57 -244.60*** Institute type Aided® 0.92 -64.34*** Log-Likelihood -11505293 -11505293 LR X² 133.64 -133.64	Household occupation	,	,		
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Poor 0.92 -52.40*** Place of Residence	Middle	1.02	14.30***		
Place of Residence Rural® Urban 1.29 183.01*** Free Education No® Yes 1.57 -244.60*** Institute type Aided® Not Aided 0.92 -64.34*** Log-Likelihood -11505293 LR X² 133.64	Poor	0.92	-52.40***		
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Yes 1.57 -244.60*** Institute type	No®				
Institute type Aided® Not Aided 0.92 -64.34*** Log-Likelihood -11505293 LR X² 133.64		1.57	-244.60***		
Aided® 0.92 -64.34*** Log-Likelihood -11505293 LR X² 133.64	Institute type	<u> </u>			
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Log-Likelihood -11505293 LR X² 133.64		0.92	-64.34***		
LR X ² 133.64	Log-Likelihood				
Prob > LR 0.000***	LR X ²	133.64			
	Prob > LR	0.000***			

Note: ***, **, * represents 1%, 5% & 10% level of significance

Source: Computed by the authors

Table 1 presents the results of a binary logistic regression analysis examining the factors influencing higher education attainment in India. The availability of stipends or scholarships emerged as a pivotal factor, with the likelihood of pursuing higher education decreasing by 0.22 times in the absence of government-provided financial aid (AOR = 0.78). This finding aligns with the assertions of Ganem and Manasse (2011), emphasizing the instrumental role of scholarships in enhancing student success and underscoring its pivotal contribution to overall educational advancement. Moreover, in line with earlier research studies, the probability of females seeking higher education was 0.42 times greater compared to males (AOR = 1.42), corroborating findings by Berry (2011) and Saadat et al. (2022), reflecting societal changes where families increasingly value education for daughters as a result of government schemes and means to access different government incentives to improve their future prospects. Furthermore, household size displayed a negative association with higher education, where larger family sizes were linked to reduced chances of accessing higher education, supporting concepts presented by Corak (2003), emphasizing the substantial impact of family size on post-secondary involvement. This implies that resource constraints in larger families can limit educational opportunities, highlighting the need for policies aim at awareness regarding family planning. Religious affiliation also emerged as a significant determinant, with Muslims exhibiting a lower likelihood of attaining higher education compared to Hindus (AOR = 0.97), while individuals from other religions like Christian, Sikh, Jain, and other religious groups displayed a higher probability (AOR = 0.91), echoing results from Mir and Pramanik (2017) highlighting disparities within social and religious groups. This indicates socio-economic disadvantages faced by these communities, suggesting the need for inclusive educational policies that address these disparities. Similarly, Scheduled Castes (SC) have lower odds (AOR = 0.79) and Other Backward Classes (OBC) also have lower odds (AOR = 0.88) compared to the other castes, while Scheduled Tribes (ST) have higher odds (AOR = 1.34). This suggests varying levels of access to higher education among different social groups, with STs possibly benefiting from targeted affirmative action policies (AISHE, 2021; Sahoo & Acharya, 2019). It reflects the ongoing impact of India's caste system on educational opportunities. The absence of internet connectivity in households reduced the probability of higher education by 0.29 times (AOR = 0.71), consistent with the findings of Bragg et al. (2018), who highlighted the positive impact of using the internet for academic purposes on academic achievement. This underscores the importance of digital access in modern education, particularly in rural areas where internet penetration is lower, affecting students' ability to engage with educational resources. Compared to salaried or regular wage employment, self-employed individuals (AOR = 0.93) and casual labourers (AOR = 0.91) have lower odds, while those in other forms of employment have higher odds (AOR = 1.53). This highlights the economic stability provided by salaried jobs in supporting higher education, indicating the importance of stable employment in educational attainment (Galiani & Weinschelbaum, 2012). Middle-class individuals are slightly more likely (AOR = 1.02), while poorer individuals are less likely (AOR = 0.92) to pursue higher education compared to the rich. Economic status remains a critical factor in educational attainment (Rodríguez-Hernández et al., 2020), reflecting the financial barriers faced by lower-income families in accessing higher education. Urban residents' better access to higher education compared to their rural counterparts calls for improved educational infrastructure in rural areas. This concurs with the observations of Herskovic and Silva (2024), regarding the urban-centric nature of higher education institutions in India. Furthermore, the provision of free education by the government significantly amplified the likelihood of attaining higher education by 0.57 (AOR =1.57). times, while the absence of government grants to respondent institutions reduced this probability by 0.08 times (AOR=0.92). This finding aligns with the study by Hill and Chalaux (2011), emphasizing the importance of government aid in addressing graduate education concerns and fostering educational reform opportunities.

Conclusion and Policy Suggestions

The results of the regression analysis reveal several key factors influencing higher education attainment in India, reflecting the complex socio-economic landscape. Financial support, as indicated by the significant impact of stipends, plays a crucial role in enabling students to pursue higher education. Without such support, many students are unable to afford the costs associated with higher education, underscoring the importance of expanding scholarship programs and stipends. To address this, policies should focus on increasing the availability of scholarships, stipends, and financial aid programs to support economically disadvantaged students. Gender dynamics also show a positive trend, with females having higher odds of attaining higher education compared to males. This indicates progress towards gender equality, though continued efforts are needed to sustain and enhance this trend. Policies that promote gender equality in education through targeted programs and initiatives can help further this progress. Household size negatively impacts higher education attainment, suggesting that larger families might struggle to allocate sufficient resources for education. This calls for policies aim at raising awareness regarding family planning measures. The analysis also highlights disparities among religious and social groups. Muslims and individuals from other religions, as well as Scheduled Castes (SC) and Other Backward Classes (OBC), face lower odds of attaining higher education compared to their counterparts. This underscores the need for inclusive educational policies that address these disparities and promote equitable access to education for all communities. Intervention aiming at provide additional support to minorities and marginalised classes are required to bridge that gap. Access to the internet is another critical factor, with a lack of internet connection significantly reducing the odds of higher education

attainment. This points to the importance of improving digital infrastructure, especially in rural areas, to ensure that all students have access to online educational resources. Policies should focus on investing in internet connectivity and digital infrastructure improvements, particularly in rural areas. Economic stability, indicated by household occupation and wealth quintile, also plays a significant role. Students from salaried or regular wage-earning families and wealthier households are more likely to pursue higher education, highlighting the financial barriers faced by poorer families. Policies should aim to support economic stability for families through job creation and financial support programs. Urban residents have better access to higher education compared to their rural counterparts, reflecting the urban-rural divide in educational opportunities. This calls for improved educational infrastructure and resources in rural areas. Policies that enhance educational infrastructure and resources in rural areas can help bridge this urban-rural divide. The availability of free education significantly increases the odds of higher education attainment, indicating that cost-free educational initiatives can alleviate financial burdens and make higher education more accessible. Expanding initiatives that provide free or subsidized education can help alleviate these financial burdens. Finally, students attending aided institutions are more likely to pursue higher education, emphasizing the importance of government support in making education attainable. Continued and increased government support for aided institutions can make higher education more accessible to students from all backgrounds. Implementing these policy suggestions can help address the multifaceted barriers to higher education in India, promoting a more equitable and inclusive educational system.

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