

The Impact of Poverty on Academic Achievement: A Study on the Students of Begum Rokeya University, Rangpur

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Abstract— This study investigates the perceptions of students of the effects of poverty on academic achievement in Begum Rokeya University, Rangpur. It attempted to investigate what happens to a student's performance at University when he/she comes from a poor family background. Data was collected from the students of Begum Rokeya University, Rangpur area that the researcher had selected. In this study qualitative and quantitative methods were used. Data was collected through questionnaires. The chi square method and the logistic regression are used to find the results of the study. The research findings proved that poverty has negative effects on poor students' academic achievement. Tuition, scholarship and parent's education level also affect the students' academic achievement.

Keywords—Poverty, Education, Scholarship, Tuition, Logistic regression

I. INTRODUCTION

Poverty in Bangladesh have declined remarkably since the early-2000s, as result decades of accelerated economic growth. The remarkable progress in poverty alleviation has been recognized by international institutions^[1]. According to the World Bank, Bangladesh's poverty rate fell from 82% in 1972, to 18.5% in 2010, to 13.8% in 2016, as measured by the percentage of people living below the international extreme poverty line^[2].

A Child that goes to school on an empty stomach will not concentrate well at school resulting in poor academic achievement. Poverty comes along with its associated multitude of difficulties to children and their families. Poverty-stricken families cannot provide basic needs like food, clothing, shelter and sufficient light^[14]. The lack of these basic needs due to poverty may restrict the expression of genetic talent to learners and leads to under-achievement. Their thinking ability and intellectual capacity is affected due to unbalanced diet or no food at all^[15]. According to May (2000:33), a child who experiences poverty is exposed to the risk of impaired physical and mental development. But even if the child suffers no permanent physical damage, he or she is clearly at a disadvantage. Some children from poor households are kept out of school to help at home; others take the burden of poverty to school with them. If children are hungry, they cannot concentrate properly at school. Poverty is about not having enough money to meet basic needs including

food, clothing and shelter. However, poverty is more, much more than just not having enough money. The World Bank Organization describes poverty in this way: "Poverty is hunger. Poverty is lack of shelter. Poverty is being sick and not being able to see a doctor. Poverty is not having access to school and not knowing how to read. Poverty is not having a job, is fear for the future, living one day at a time. Poverty has many faces, changing from place to place and across time, and has been described in many ways. Most often, poverty is a situation people want to escape. So poverty is a call to action -- for the poor and the wealthy alike -- a call to change the world so that many more may have enough to eat, adequate shelter, access to education and health, protection from violence, and a voice in what happens in their communities."

In addition to a lack of money, poverty is about not being able to participate in recreational activities; not being able to send children on a day trip with their schoolmates or to a birthday party; not being able to pay for medications for an illness. These are all costs of being poor. Those people who are barely able to pay for food and shelter simply can't consider these other expenses. When people are excluded within a society, when they are not well educated and when they have a higher incidence of illness, there are negative consequences for society. We all pay the price for poverty. The increased cost on the health system, the justice system and other systems that provide supports to those living in poverty has an impact on our economy. While much progress has been made in measuring and analyzing poverty, the World Bank Organization is doing more work to identify indicators for the other dimensions of poverty. This work includes identifying social indicators to track education, health, access to services, vulnerability, and social exclusion. There is no one cause of poverty, and the results of it are different in every case. Poverty varies considerably depending on the situation. Feeling poor in Canada is different from living in poverty in Russia or Zimbabwe. The differences between rich and poor within the borders of a country can also be great.

Despite the many definitions, one thing is certain; poverty is a complex societal issue. No matter how poverty is defined, it can be agreed that it is an issue that requires everyone's attention. It is important that all members of our society work

together to provide the opportunities for all our members to reach their full potential. It helps all of us to help one another.

II. OBJECTIVES OF THE STUDY

The purpose of the study is to investigate the effect of poverty on the student's academic performance in Begum Rokeya University, Rangpur. The study is to find out whether students of nation can really be affected with any economic standard of the nation. The study also tries to find out the extent of which any community standard of living can affect the student's education in that community. This study will also provide possible suggestion, in enhancing or improving the student's academic performance by bringing out strategies to alleviate poverty. The specific objectives of conducting this study:

- ✓ To find out the impact of poverty on academic achievement of Begum Rokeya University students.
- ✓ To identify other factors affect negatively on students educational outcomes.
- ✓ To investigate poor parents' general perceptions of their poor family backgrounds in relation to their children's performance.

III. DATA SOURCE AND SAMPLING PROCEDURE

For measuring the impact of poverty on academic achievement we have mainly used primary data of size 200 collected from Begum Rokeya University, Rangpur. For this study the sample size was determined using the following formula

$$n = \frac{Nz^2pq}{Nd^2 + z^2pq}$$

Where,

n = desired sample size

z = standard normal deviate usually set at 1.96, which corresponds to the 95% confidence level.

p = assumed proportion in the target population estimated to have a particular characteristics.

q = 1- p

d = allowable maximum error in estimating population proportion.

In our study, the population size is known, N = 6000. Suppose that the proportion of poverty, p = 0.60. Thus, q = 0.40. Also suppose that the allowable maximum error in estimating population proportion, d = 0.0666. Since at 95% confidence level, z = 1.96, the desired sample size is –

$$n = \frac{6000 \times 1.96^2 \times 0.60 \times 0.40}{6000 \times 0.0666^2 + 1.96^2 \times 0.60 \times 0.40} = 200$$

We use multi-stage cluster sampling for this study to select our respondents. Firstly, we select Begum Rokeya University. The university consists of six academic faculties. From the

faculties we take four faculties using simple random sampling. Our obtained faculties are

- 1) Faculty of Arts
- 2) Faculty of Business Studies
- 3) Faculty of Social Sciences and
- 4) Faculty of Science

The faculties are classified into departments. The Faculty of Arts consists of three departments, Faculty of Social Sciences has six departments and the other two Faculties consist of four departments. From each Faculty we take two departments by using the simple random sampling. The selected departments from the Faculty of Arts are Bangla & History and Archeology. From Faculty of Business studies the obtained departments are Management Studies & Finance and Banking. The departments Economics and Political Science from the Faculty of Social Science and from Faculty of Science Physics and Statistics departments are obtained. Each department also consists of 5 batches, 4 in honors program and 1 in master's program. Here we classify the batches in honors program according to academic year, i.e. 1st year, 2nd year, 3rd year and 4th year. From each department we take one batch by the simple random sampling. Each batch comprises 60 students. Finally since the complete sampling frame of the batches is known, we take a sample of 25 students from the selected batches using the simple random sampling.

IV. METHODOLOGY

For analyzing the data both bivariate and multivariate techniques have used in this study. The Pearson Chi-Square test has used for bivariate analysis and for the multivariate analysis the logistic regression has used. Both techniques are described briefly in below. In this study, statistical analysis has been carried out using IBM SPSS 21.

4.1 Chi-square test

A chi-squared (χ^2) test, is any statistical hypothesis test wherein the sampling distribution of the test statistic is a chi-squared distribution when the null hypothesis is true. A chi-squared test can be used to attempt rejection of the null hypothesis that the data are independent. It is also used to determine whether there is a significant difference between the expected frequencies and the observed frequencies in one or more categories. Recall that we can summarize two categorical variables within a two-way table, also called an $r \times c$ contingency table, where r = number of rows, c = number of columns. Our question of interest is "Are the two variables independent?" This question is set up using the following hypothesis statements:

Null Hypothesis: The two categorical variables are independent.

Alternative Hypothesis: The two categorical variables are dependent.

The chi-square test statistic is calculated by using the formula:

$$\chi^2 = \sum \frac{(O - E)^2}{E} = \sum \frac{O^2}{E} - n$$

Where, *O* represents the observed frequency. *E* is the expected frequency under the null hypothesis and computed by:

$$E = \frac{\text{Row total} \times \text{Column total}}{\text{Sample size}}$$

We will compare the value of the test statistic to the critical value of χ_{α}^2 with degree of freedom = $(r - 1)(c - 1)$, and reject the null hypothesis if $\chi^2 > \chi_{\alpha}^2$.

4.2 Logistic Regression

Logistic regression analysis is appropriate when the dependent variable is dichotomous (binary). Like all regression analyses, the logistic regression is a predictive analysis. Logistic regression is used to describe data and to explain the relationship between one dependent binary variable and one or more nominal, ordinal, interval or ratio-level independent variables. It enables us to determine which of our independent variables have statistically significant effect on the dependent variable of interest^[3]. The goal of logistic regression is to find the best fitting (yet biologically reasonable) model to describe the relationship between the dichotomous characteristic of interest (dependent variable) and a set of independent (predictor or explanatory) variables. Logistic regression generates the coefficients (and its standard errors and significance levels) of a formula to predict a logit transformation of the probability of presence of the characteristic of interest:

$$\text{logit}(p) = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_kX_k$$

Where, *p* is the probability of presence of the characteristic of interest. The logit transformation is defined as the logged odds:

$$\begin{aligned} \text{odds} &= \frac{p}{1 - p} \\ &= \frac{\text{probability of presence of characteristics}}{\text{probability of absence of characteristics}} \end{aligned}$$

And

$$\text{logit}(p) = \ln\left(\frac{p}{1 - p}\right)$$

We can also define odds of the dependent variable equaling a case (given some linear combination *x* of the predictors) as follows:

$$\text{odds} = e^{\beta_0 + \beta_1x}$$

For a continuous independent variable the odds ratio can be defined as:

$$OR = \frac{\text{odds}(x + 1)}{\text{odds}(x)} = \frac{\left(\frac{F(x+1)}{1 - F(x+1)}\right)}{\left(\frac{F(x)}{1 - F(x)}\right)} = \frac{e^{\beta_0 + \beta_1(x+1)}}{e^{\beta_0 + \beta_1x}} = e^{\beta_1}$$

This exponential relationship provides an interpretation for β_1 : The odds multiply by e^{β_1} for every 1-unit increase in *x*. The coefficients in the logistic regression model tell us how much the logit changes based on the values of the independent variables.

V. RESULTS AND DISCUSSION

In this study Academic result is used as the dependent variable. It is classified into three category as below satisfactory, good and excellent. Table 1 shows the cross tabulation of Academic result and economic status of respondents family. It indicates that 24.5% make a result below satisfactory, 60% make good result and 15.5% make excellent result. Among the poor students 19.5% make below satisfactory result, 10% make good and 2.5% make excellent result.

Table 2 shows the results of chi- square test. From table 2 we can see that among the explanatory variables Gender of respondents, Religion, Fathers educational status, Mothers educational status, Economic status of respondents family, Either earn Money from tuition or any other job, Either get any Scholarship have significant effect on dependent variable Academic result.

Table 1: Cross tabulation of Academic result and economic status of respondents family

		Academic result			Total (%)
		Below satisfactory (%)	Good (%)	Excellent (%)	
Economic status of respondents family	Poor	19.5	10	2.5	32
	Middle class	14.5	36.5	13	64
	Rich	0	4	0	4
Total (%)		24.5	60	15.5	100

Table 2: Significancy in Chi-square test procedure

Variable	χ^2 value	df	P-Value
Gender of respondents	16.009	2	0.000
Religion	12.119	4	0.016
Marital status of respondents	0.809	2	0.667
Fathers educational status	19.549	6	0.003
Mothers educational status	28.438	6	0.000
Economic status of respondents family	11.251	4	0.024
Either earn Money from tuition or any other job	0.254	2	0.031
Either get any Scholarship	6.131	2	0.047

Table 3 shows the results of logistic regression analysis. Since the dependent variable academic result has three categories therefore we have used multinomial logistic regression instead of binary logistic regression. From table 3 we can see that 6 variables appear as significant predictor among 8 independent variables. They are: Gender of respondents, Fathers

educational status, Mothers educational status, Economic status of respondents family, either earn money from tuition or any other job, either get any Scholarship. The results of logistic regression analysis present the estimate of the logistic regression coefficient (β), p-value, odds ratio and 95% confidence interval for the odds ratio. We can see that the variable Gender of respondents is come out as a significant factor of dependent variable academic result. Its odds ratio is 5.993 with 95% confidence interval(1.692, 21.230. This indicates that there is 5.993 times greater chance of making a result below satisfactory for male students considering female students as reference category. Fathers' educational status is also a significant factor which odds ratios are 10.829, 6.520 and 7.857. These indicate that there are 10.829 times, 6.520 times and 7.857 times greater chance of making a below satisfactory result for those students whose fathers are Illiterate, educated up to primary level and secondary level considering higher education as the reference category. Mothers' educational status is come out as a significant factor of academic result. Its odds ratios are 1.250, 0.289 and 0.064. This means that there are 1.250 times greater chance, 0.289 times and 0.064 times less chance of making a below satisfactory result for the students whose mothers are Illiterate, educated up to primary level and secondary level considering higher education as the reference category. The values of odds ratio of another significant factor economic status of respondents' family are 7.388 and 2.153. These values indicate that there are 7.388 times and 2.153 times greater chance of making a result below satisfactory for poor and middle class students considering rich students as reference category. The variable either earn money from tuition or any other job is come out as a significant factor of the dependent variable academic result. Its odds ratios indicate that there is 1.439 times greater chance of making a below satisfactory result for the students who earn money from tuition or any other job considering the students who do not earn money from tuition or any other job as the reference category. Another significant variable is either get any scholarship which odds ratio is 0.354 with 95% confidence (0.012, 2.402). It indicates that there is 0.354 times less chance of making a below satisfactory result for the students who get scholarship than that of the students who do not get scholarship. That is there is a tendency to make good or excellent result for the students who get scholarship.

Table 3: Results of the logistic regression analysis for the below satisfactory group in academic result*

Variable	β	P-value	Odds ratio	95% CI for Odds ratio	
				Lower	Upper
Gender of respondents					
Male	1.794	0.006	5.993	1.692	21.230
Female (ref)					
Religion					
Islam	1.150	1.000	3.157	1.036	7.258

Hinduism	0.238	1.000	1.269	0.457	6.591
Others (ref)					
Marital status of respondents					
Married	1.029	0.230	2.797	0.521	15.007
Unmarried (ref)					
Fathers educational status					
Illiterate	2.382	0.048	10.829	0.836	140.244
Primary	1.875	0.028	6.520	0.790	53.840
Secondary	2.061	0.034	7.857	1.173	52.628
Higher educated (ref)					
Mothers educational status					
Illiterate	1.830	0.041	1.250	0.222	4.734
Primary	-1.277	0.023	0.279	0.035	2.242
Secondary	-0.025	0.047	0.064	0.001	2.127
Higher educated (ref)					
Economic status of respondents family					
Poor	2.000	0.013	7.388	1.530	35.676
Middle class	0.767	0.000	2.153	0.214	4.254
Rich (ref)					
Either earn Money from tuition or any other job					
Yes	2.823	0.019	1.439	0.125	2.542
No (ref)					
Either get any Scholarship					
Yes	1.039	0.028	0.354	0.012	2.402
No (ref)					

ref = reference category * reference category of dependent variable (academic result) is excellent.

VI. LIMITATIONS OF THE STUDY

This study covered the poverty level and its effect on the performance of the students of Begum Rokeya University, Rangpur. The limitations of this study are pointed out in the following:

- i. **Financial constraint-** Insufficient fund tends to impede the efficiency of the researcher in sourcing for the relevant materials, literature or information and in the process of data collection (Internet, questionnaire and interview)
- ii. **Sample size constraint-** In this research small sample size is used for the time and financial constraint for conducting research to represent the whole population.

VII. CONCLUSION

The study found that although there are many factors affecting the academic achievement, poverty is one of the important affecting factors. From the results of the study we can see that there is a significant impact of poverty on academic

achievement. That is there is a tendency of making below satisfactory result for the students of poor family and good or excellent result for the students of middle class or rich family. To continue academic expenses the students have to earn money from tuition or any other job which affect their academic result. Many students agree that scholarship is helpful to carry their study. But only a few number of students get scholarship from different organization. The study also found that there is a significant impact of parent's educational status on their children's academic achievement. That is there is a tendency of making a result below satisfactory for the students of relatively lower educated parents and excellent result for the students of higher educated parents. The single best way to improve academic achievement is to improve the home background of the students by addressing the question of illiteracy on parents and providing employment. If the family background of the students is sound, academic performance of the students will definitely improve. Therefore we recommend that parents should fully support all scholastic activities and emotionally encourage their child, praise the child and assist the child to overcome his/her weaknesses.

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