

Women's Education and Employment: Matlab Experience

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There should be policies that would promote formal education among women and provide them with off-farm employment opportunities

The potential of education for opening up new life opportunities for both men and women was one of the themes repeatedly brought out during the 1994 International Conference on Population and Development (ICPD) as being especially important for accelerating the process of development. Increased opportunities for people to obtain an education, as advocated by the ICPD Programme of Action, will produce a beneficial impact on the socio-demographic condition of individual households in societies as well as the population at large. The availability of such opportunities for females is most important where there has been discrimination against females with regard to education. The extent to which females get an education in practice and similarly the extent to which they are encouraged in a society to avail themselves of the opportunity to obtain an education in the first place depends on a set of complex mechanisms. This observation applies not only to education but also to the status of women within the family and society at large -- in short, all the factors which contribute to the fundamental process of empowerment of women.

The question of how women's schooling influences socio-demographic conditions of a household in particular and a community or society in general has been crucial in the analysis of demographic change and the evaluation of health and the economics of a population. An extensive literature review reveals that maternal education is a highly consistent household-level predictor of reduced fertility and infant and child mortality, even when other socio-economic factors are controlled (Caldwell, 1982 and 1986; Cleland and Ginneken, 1988; Ware, 1984; LeVine and others, 1991). Researchers agree that the direct impact of women's schooling may account for as much as half of the observed effect (Cochrane and others, 1980; Mensch and others, 1985) with the remaining half being attributed to socio-economic advantages (Joshi, 1994). However, LeVine and others (1991) argue that no research could adequately identify the intervening pathways or processes through which they are connected within any particular population.

In this study on a rural area of Bangladesh, we did not attempt to examine in detail the pathways of education because of a lack of relevant information; instead, we designed our research to assess educational differentials in a broad range of socio-economic and demographic characteristics among women aged 15 to 49 years who were currently married at the time of a baseline survey in Matlab. Specifically, we first looked at educational differentials by some selected socio-economic and demographic activities, using widely accepted statistical tests. These differentials were looked into in respect of the eligibility criteria of the Bangladesh Rural Advancement Committee (BRAC).¹ Women's employment, an important economic activity, was then more closely assessed at different levels of education after controlling for the effects of some important and significant factors. These steps would provide quantitative evidence from these communities in light of the socio-demographic conditions that form the context of the women's lives.

Materials and methods

Background of the survey

The baseline survey data collected by the BRAC-ICDDR,B (International Centre for Diarrhoeal Disease Research, Bangladesh) joint research project in Matlab have been used in the analysis. In the course of its normal expansion, BRAC decided to start its Rural Development Programme (RDP) in Matlab in 1992. Meanwhile, ICDDR,B had already been maintaining a demographic surveillance system (DSS) there for more than 25 years. The long presence of ICDDR,B in Matlab and the new initiative by BRAC provided an opportunity to collaborate on a study of the impact of economic and social development on the health and well-being of the community. More importantly, it offered an occasion to understand the mechanisms of social change through which the impact of BRAC programmes could be explained. In order to assess the impact of the RDP at the macro level, benchmark information on relevant indicators would be required. Accordingly, this baseline survey was organized with the objective of recording the status of selected indicators as they existed before RDP intervention.

Data and methods

The baseline survey was conducted in 60 villages covering 11,343 households in Matlab. For the analysis, a total of 9,853 currently married women (aged less than 50 years) comprised the sample. We then decomposed them into two groups: a BRAC-eligible group comprising 6,144 respondents, and a BRAC-noneligible group comprising 3,543 respondents.

The initial analysis included calculation of some basic statistics such as means and standard deviations, and the construction of bivariate tables to examine the possible relationships between the selected independent variables and the women's schooling according to BRAC eligibility. Proper test criteria (t, F or X²) were then used to test for statistical significance. Finally a logistic regression analysis was employed taking "currently employed" as the dependent variable.

Results

Table 1 shows selected characteristics of the BRAC-eligible and non-eligible samples. In Matlab, the average BRAC-eligible mother was found to be 31.6 years old, to have attended school for only one year, currently to have three living children but who would like to have had at least one child less than that. The average number of children desired, 2.3, was below the mean (3.2) of living children, indicating that fertility limitation was not well practised among this sample. The mean amount of loans extended to them was higher than their mean amount of savings. The BRAC-noneligible sample, on the other hand, was virtually identical with the eligible sample with regard to the number of living children and desired children, but they had a higher level of schooling and were slightly older. However, this group of women had a higher level of savings than the value of loans that they had taken out (their mean amount of savings was higher than the mean amount of loans), which was contrary to the finding for BRAC-eligible women. This was expected because the BRAC-noneligible sample was, by operational definition, better off than the BRAC-eligible sample in terms of socio-economic status (Khan and others, 1993).

Table 1: Selected socio-demographic characteristics of women by BRAC eligibility, Matlab, 1992

Variables	BRAC-eligible (N=6,144)		BRAC-noneligible (N=3,543)		Test statistic
	Mean	S.D. **	Mean	S.D. **	
Age (years)	31.6	8.0	32.4	8.5	t = -4.50 *
Women's schooling (years)	1.0	2.1	3.1	3.4	t = -37.28 *
Number of living children	3.2	2.0	3.5	2.2	t = -4.55 *
Number of children desired	2.3	1.2	2.3	1.1	t = -1.56
Amount of savings (in taka)	21.25	335.05	105.23	820.27	t = -7.07 *
Amount of loan (in taka)	51.63	391.53	64.49	586.63	t = -1.29

Note: * p<0.01; ** S.D. = standard deviation.

Table 2 shows differentials of selected socio-economic and demographic characteristics by level of schooling for the BRAC-eligible sample. The BRAC-eligible mothers with more schooling were younger and had fewer living children, but at the time of the survey said they wanted more children than did the non-eligible sample. The highest proportion of contraceptive use corresponded to respondents with 1-5 years of schooling, whereas the lowest level of use was observed for those with over six years of schooling. The reason may be that women having a higher education were younger and they had fewer living children and therefore wanted more children. As a result, they were not practising contraception as much as those in the other group.

A higher proportion of women with more schooling had savings; also, the mean amount of savings was significantly higher than for those with less schooling. Women with increased years of schooling were currently employed (except for a sudden drop noted for those with 1-5 years of education); we also found more husbands living with their wives if they had less education. Usually women with higher levels of schooling marry relatively "highly educated" men; these husbands often have to go to urban areas for better jobs thus leaving behind their wives, often in their usual rural place of residence (Cleland and Ginneken, 1988). This results in a smaller proportion of husbands living with wives having a higher education. Another important indicator is the washing of hands after defecation; women with higher levels of education were found to do so, washing their hands hygienically, a practice that reflects their awareness about personal hygiene, which is a result of education.

Table 2: Selected characteristics of BRAC-eligible women by their education, Matlab, 1992

Variables	Women's schooling			Test statistic
	No education (N=4,799)	1-5 years (N=1,085)	6+ years (N=260)	
Mean age (years)	32.3	29.7	27.2	F(2,6141)=90.65 **
Mean number of living children	3.4	2.9	1.7	F(2,6141)=75.2 **
Mean number of children desired	2.3	2.4	2.2	F(2,6141)=3.8 *

Practising contraception	46.3	52.0	44.4	X2(2)=11.0 **
Want more children	39.5	48.4	61.5	X2(2)=71.4 **
Percentage having taken out a loan	4.8	4.9	3.5	X2(2)=1.0
Mean amount of loan (in taka)	52.73	53.23	24.65	F(2,6141)=0.6
Percentage having savings	0.8	2.2	4.2	X2(2)=39.0 **
Mean amount of savings (in taka)	8.61	44.93	155.77	F(2,6141)=27.3 **
Percentage currently employed	4.0	1.9	5.0	X2(2)=12.1 **
Husband living with wife	92.5	88.0	80.8	X2(2)=58.2 **
Wash hands after defecation	57.0	61.4	71.5	X2(2)=26.1 **

Notes: * p<0.05, ** p<0.01.

Table 3 shows that, like the BRAC-eligible sample in table 2, there is not much difference in the pattern of differentials by schooling in the selected factors. However, it can be noticed that the use of contraceptives shows an upward trend corresponding to the level of schooling, even though there exists an extensive intervention. Another important finding is that these women had higher amounts of savings and loans than the BRAC- eligible women had. This situation indicates that BRAC-noneligible women were economically better off and more active than BRAC-eligible women and this is best expressed when the effect of their education is controlled in the analysis.

Table 3: Selected characteristics of BRAC-noneligible women by their education, Matlab, 1992

Variables	Women's schooling			Test statistic
	No education (N=1,675)	1-5 years (N=1,086)	6+ years (N=782)	
Mean age (years)	34.3	32.1	28.7	F(2,3540)=123.9 **
Mean number of living children	3.9	3.5	2.4	F(2,3540)=136.8 **
Mean number of children desired	2.3	2.3	2.2	F(2,3540)=2.9
Practising contraception	42.8	43.5	49.1	X2(2)=8.0 *
Want more children	33.2	39.0	52.6	X2(2)=83.9 **
Percentage having loan	4.5	3.6	2.4	X2(2)=6.7 *
Mean amount of loan (in taka)	60.92	46.28	97.43	F(2,3540)=1.8
Percentage having savings	1.1	2.0	8.8	X2(2)=113.2 **
Mean amount of savings (in taka)	18.19	56.61	359.17	F(2,3540)=50.2 **
Percentage currently employed	1.3	1.4	7.7	X2(2)=91.8 **
Husband living with wife	84.8	81.5	77.0	X2(2)=22.7 **
Wash hands after defecation	56.5	62.5	77.9	X2(2)=104.5 **

Notes: * p<0.05, ** p<0.01

Multivariate analysis

BRAC emphasizes the involvement of poor women in economic activities; thus, it has a strong credit programme targeted especially towards these women. BRAC also undertakes an education programme for its target population. With this as a backdrop, we hypothesized that women with higher levels of education would be more likely to be employed. The bivariate analysis for both eligible and non-eligible women has shown this trend, although the proportion of economically active women is small. In order to assess the net effect of education on employment, we undertook a multivariate analysis controlling for the influence of other socio-economic and demographic characteristics. Current employment was defined by a dichotomous variable, i.e. whether or not the woman was engaged in any wage-earning activity at the time of survey. All of the selected variables were included in the initial model for both BRAC-eligible and non-eligible samples.

The multivariate approach used was logistic regression fitting the following model:

$$\ln [p/(1-p)] = a + Eb_{ixi}$$

where p is the probability of a woman being employed, a, bi values are estimated regression coefficients, and xi values are the background characteristics. We estimated the models using the SPSS statistical software package and an indicator-variable coding scheme in the analysis. The reference category of the categorical variables was selected so that it had the highest frequency.

The regression coefficients for the eligible sample are displayed in table 4. Among the significant variables, women's education shows a rather different picture than expected. Women with 1-5 years of schooling were significantly less likely (by about 50 per cent) to be involved in wage-earning activities than those with no schooling. BRAC-eligible women with no education were found to be the poorest of the poor, having to go outside the home and work for money just to be able to merely survive. So the likelihood of being employed (and being mobile) was higher for them compared with women having 1-5 years of schooling. However, if they had more than six years of education, they were about 1.6 times more likely to do any job than those with no education, although this finding is not statistically significant. The same situation has been depicted in our bivariate results. Having savings and loans are again two variables that are important for women's employment. Alternatively we could say that, because women are currently employed and hence involved in economic activities, they possess savings and have taken out loans.

Table 5 describes the same situation for BRAC-noneligible women. In this regard, education is positively associated with employment: the higher the level of education, the more likely that the woman will be employed. In this model, all selected variables turned out to be significant except "area". Only "husband living with wife" had a negative effect on employment, describing about 50 per cent of women who were less likely to be employed if their husbands did not live with them as opposed to those whose husbands did live with them.

Table 4: Logit coefficients and odds ratios of the model of current employment for BRAC-eligible women, Matlab, 1992

Variable	Coefficients	St. error	Odds ratio
Constant	-5.85	0.46	-
Age	0.06 * * *	0.01	1.06
Women's education			
No education (R)	0.00	-	1.00
1-5 yrs.	-0.68 * * *	0.24	0.51
6+ yrs.	0.44	0.31	1.55
Living children			
0-1	0.40	0.29	1.49
2-4	0.65 * * *	0.18	1.92
5 +(R)	0.00	-	1.00
Religion			
Muslim (R)	0.00	-	1.00
Non-Muslim	0.01	0.20	1.01
Husband living with wife			
No	-0.39	0.29	0.68
Yes (R)	0.00	-	1.00
Having taken out a loan			
No (R)	0.00	-	1.00
Yes	0.88 * * *	0.22	2.42
Having savings			
No (R)	0.00	-	1.00
Yes	1.31 * * *	0.40	3.69
Area			
BRAC village (R)	0.00	-	1.00
Non-BRAC village	0.28 *	0.14	1.32

Notes: * p<0.10, ** p<0.05, *** p<0.01; R = reference category.

Table 5: Logit coefficients and odds ratios of the model of current employment for BRAC-

Variable	Coefficients	St. error	Odds ratio
Constant	-7.70	0.87	-
Age	0.07 * * *	0.02	1.07
Women's education			
No education (R)	0.00	-	1.00
1-5 yrs.	0.21	0.35	1.23
6+ yrs.	1.86 * * *	0.29	6.45
Living children			
0-1	0.90 *	0.48	2.45
2-4	1.01 * * *	0.33	2.74
5 + (R)	0.00	-	1.00
Religion			
Muslim (R)	0.00	-	1.00
Non-Muslim	0.64 * *	0.31	1.90
Husband living with wife			
No	-0.70 * *	0.35	0.50
Yes (R)	0.00	-	1.00
Having taken out a loan			
No (R)	0.00	-	1.00
Yes	2.20 * * *	0.34	9.03
Having savings			
No (R)	0.00	-	1.00
Yes	2.25 * * *	0.29	9.52
Area			
BRAC village (R)	0.00	-	1.00
Non-BRAC village	-0.23	0.25	0.79

Notes: * p<0.10, ** p<0.05, *** p<0.01; R = reference category.

In both of these models, age and number of living children emerged as being positively and significantly associated with employment. Women having 2-4 living children were the group most likely to be employed as opposed to women having five or more children. The religion of women was found to be important in explaining their education only in the case of the non-eligible sample. According to the model, non-Muslim women were about twice as likely as Muslim women to be employed. Usually in rural settings, Muslim women with better socio-economic status do not do any wage-generating work but confine themselves to performing household tasks. However, the non-eligible women's employment factor is better explained by the selected explanatory variables.

It is important to know estimated probabilities that women with particular characteristics will be employed. We estimated these probabilities only for those indicators that emerged as being statistically significant in the model. A selection of such probabilities is given in table 6 for the BRAC- eligible sample and in table 7 for the non-eligible sample.

For the BRAC-eligible sample, there is no substantial difference in the range of probabilities, from 0.40 to 0.01, and the highest probability that a woman would be employed is small. This finding indicates that there are other characteristics of eligible women that would need to be explored and included in the analysis in order to determine increased probability of being employed. For women aged 31.6 years, having 2-4 living children, currently having savings and having taken out loans and residing in non-BRAC villages, the estimated probabilities corresponding to different levels of education show that 1-5 years of schooling exerts the least contribution on employment. However, the effect of more than six years of schooling increases the probability of employment by about 10 per cent (from 0.403 to 0.303) when compared with that of no education and by about 22 per cent (from 0.403 to 0.180) when compared with 1-5 years of education.

Table 6: Estimated probabilities * of current employment generated from logit model for BRAC-eligible women, Matlab, 1992

Characteristics	Probabilities
Age 31.6 years; 6+ years of schooling; having 2-4 living children; currently having loans and savings; and residing in non-BRAC village	0.403
Age 31.6 years; 1-5 years of schooling; 5+ living children currently having no loans or savings; and residing in BRAC village	0.010
Effect of education for women aged 31.6 years, having 2-4 living children, currently having savings and having taken out a loans, and residing in non-BRAC villages:	
No education	0.303
1-5 years	0.180
6+ years	0.403

Notes: * $p = \exp(x + EB_{ixi}) / [1 + \exp(x + EB_{ixi})]$.

Table 7: Estimated probabilities * of current employment generated from logit model for BRAC-noneligible women, Matlab, 1992

Characteristics	Probabilities
Age 32.4 years; 6+ years of schooling; having 2-4 living children; husband living with wife; and currently having savings and having taken out a loan	0.926
Age 32.4 years; no schooling; 5+ living children; Muslim husband not living with wife; and currently having taken out no loan and having no savings	0.002
Effect of education for non-muslim women aged 32.4 years, having 2-4 living children, husband living with them, and currently having savings and having taken out a loan:	
No education	0.661
1-5 years	0.706
6+ years	0.926

Notes: * $p = \exp(x+EB_{ixi}) / [1 + \exp(x+EB_{ixi})]$

For BRAC-noneligible women, there was a wide range from 0.926 to 0.002, but perhaps the most interesting effects were those associated with women's schooling. For the optimum group of socio-demographic characteristics, i.e. women aged 32.4 years, having 2-4 living children, husband being present, and currently having taken out loans and possessing savings, the effect of education is positive. The effect of more than six years of schooling increases the probability of employment by about 27 per cent (from 0.926 to 0.661), while 1-5 years of schooling increases that probability by about 22 per cent. This indicates that higher levels of education have a demonstrable effect on women's employment when other characteristics are held constant. The accompanying figure illustrates the situation graphically. It is obvious that the non-eligible respondents at all educational levels have higher probabilities of employment than the eligible respondents.

Discussion and conclusion

The study demonstrates that as expected women's education has a considerable influence on their socio-demographic aspects of life. Both bivariate and multivariate analyses reflect this notion for BRAC-eligible and non-eligible samples. The results of this study reveal that generally women's education has had a similar impact for both of the BRAC samples corresponding to their different levels of education. Mothers with some schooling have a wider knowledge of the outside world than mothers who have none (LeVine and others, 1991). It is noteworthy that educated mothers are more aware of beneficial health practices and hygiene (Cleland and Ginneken, 1988) and they put more emphasis on cleanliness than do uneducated mothers (Lindenbaum and others, 1985). Besides, it was also observed that women's education could change their attitudes and outlook quite markedly. Mandelbaum (1974:54-55) has given a descriptive account of the effect of education on Indian women:

An educated woman is usually less closely confined, physically and psychologically, with her husband's family and its narrow familial concerns than is the woman who is brought into their home as an uneducated girl She is more likely to feel that she can do something about the condition of pregnancies in close succession or conceiving during her later reproductive years. Her horizons of information are wider, if only by being able to read a newspaper; her network of communication is likely to be broader, if only to school friends beyond the confines of household and kin.

The impact of women's education on employment is quite substantial. The multivariate results suggest that if a woman

is educated, she is more likely to be employed outside the home and this likelihood increases with the increase in level of education, particularly for non-eligible women. However, the analysis was unable to incorporate variables for the BRAC-eligible sample which should have been significant in the regression model and thus have increased the estimated probabilities of being employed outside the home. Therefore, further exploration of explanatory variables is required for future research. For the BRAC-noneligible sample, however, significant variables in the model were able to produce a substantial effect on employment, as displayed by the estimated probabilities.

The basic education that women receive can have a variety of positive influences in the home. These range from improvement in time allocation and better health and consumer behaviour to an attitude that is more supportive of family entrepreneurial activities and the education of children. Where the culture allows female participation in employment outside the home, the provision for basic education can have at least as dramatic an effect on the productivity of women as it does on that of men (Cleland, 1990). The educational effectiveness issue is of vital importance since these women are often engaged in small-scale enterprises (e.g. tourist crafts, herding, weaving and so on) that provide a cash contribution to the family's subsistence income (Windham and Chapman, 1990).

This study thus contains several clear policy implications. Providing greater educational opportunities typically leads to lower fertility by giving individuals greater access to information, participation in modern sectors, and new attitudes and values conducive to national development. In this regard, female education has a much larger effect than male education. Therefore, policies should be formulated that would extend opportunities beyond primary education to the secondary and higher levels of education for females. Bulatao (1984) argues that a sustained commitment to improving educational opportunities over a period of time and the provision of more than minimal education are needed if fertility is to be reduced through this approach. Furthermore, mothers' secondary level of education is associated with their children's likelihood of entering secondary school regardless of urban or rural residence, or the family's economic status (Knodel and Wongsith, 1989). On the other hand, the mechanism of change in the level of fertility also works along the lines that women's engagement in the job market contributes to their marriage delay and increased contraceptive use. Female participation in more formalized activities, which is facilitated by an increase in female educational levels, has a significant negative effect on fertility, resulting from increased use of contraception.

However, the impact of female education may be greatly reduced if it appears to lead nowhere (Ware, 1981). Around the world, education systems seem to be geared to preparing people for scarce civil service positions in towns and cities; in such a setting, a rural woman with some level of education would feel that she has no realistic opportunities in the village to fulfil her goals and aspirations. While it is also clear that there are not enough jobs even in big cities to absorb all the graduates of the national school system, nevertheless, there should be policies that would promote formal education among women and provide them with employment opportunities, especially in countries like Bangladesh, in the area of off-farm activities. Once they become active in income-earning activities and contribute to the economic betterment of their families, their involvement in such activities will in turn lead to socio-economic, health and demographic improvements of the population through intrinsic pathways.

Footnote

1. BRAC-eligible respondents are defined as those who were from a household possessing a land area of less than half an acre and at least one member from that household had sold his/her manual labour for at least 100 days in the one year prior to the survey.

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