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Determinants of the Current Use of Contraceptive Methods in Bangladesh

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In this study used the, 1989 Bangladesh Fertility Survey, the 1993-94 and the 1996-97 Bangladesh Demographic and Health Surveys (BDHS) to investigate the determinants of contraceptive use among the currently married women under 50 years of age. Bi-variate analysis were used to assess the differentials and multivariate analysis used to find the determinants of the current contraceptive use. The results indicate that improvement of the status of women, access to mass media and reduction of child mortality are important determinants of contraceptive use.

Key words: Contraceptive, determinants, logistic regression

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Introduction

Rising use of contraception is undoubtedly the main proximate determinants of the ongoing fertility decline in developing countries like Bangladesh (Bongaarts, 1996). Surveys conducted at the national level indicate a rising trend in the contraceptive prevalence rate. Between 1975 and 1999-2000, current use of contraceptive methods is increased by 7 folds from 7.7% in 1975 to 53.8% in 1999-2000 (BDHS, 1999-2000).

Several authors have argued that Bangladeshi couples are not likely to adopt contraception until they experience improvements in their socio-economic condition (Bryson *et al*., 1978). Social and economic development as well as more widely diffused family planning services will contribute to a higher level of contraceptive use. Various studies indicate that current use of contraceptive and acceptance of small family norm depends on a number of factors like education, place of residence, occupation and so on (Bisht *et al*., 1981; Ullah and Chakraborty, 1993). Simmon and Young (1996) observed that effort of family planning program and socioeconomic conditions exert both independent and joint effects on family size. For instance, educational attainment of the woman is generally considered to be a useful index of socioeconomic status as well as of the level of overall social sophistication and therefore, it is inversely related to the desire for additional children and positively related to the use of contraception. Similarly mobility of women outside the homestead creates opportunity to the impoverment of women and increases the social status of poor women and consequently their attitude towards family planning as well as contraceptive use (Sabir, 1994).

In addition, high in fant and child mortality is also an important determinant of contraceptive use in Bangladesh. At least one out of ten children dies before completing the first birth anniversary. Child survival appears to play a major role in the acceptance and continuation of contraception (Mabud, 1990). The aim of this study is to identify the factors influencing on the use of contraception during fertility transition in Bangladesh.

Materials and Methods

Source of Data: This study utilized the data derived from the 1989 Bangladesh Fertility Survey (BFS, 1989), the 1993-94 Bangladesh Demographic and Health survey (BDHS, 1993-94) and the 1996-97 Bangladesh Demographic and Health survey (BDHS, 1996-97). Almost similar sampling design was adopted in each survey. However, there is slight difference in sampling design among the 1989 BFS, the 1993-94 BDHS and the 1996-97 BDHS. In conducting the 1989 BFS, a two-stage probability sample design was used, at the first stage a sample of clusters was drawn. Each selected cluster was then mapped and all households were listed. At the second stage, a sample of households was selected within area. Thus, a total of 11729 households were selected, of which 11236 households successfully interviewed. From 11,236 households, a total of 12906 ever-married women under 50 years were identified as eligible for the individual interview. The 1993-94 BDHS was also nationally representative two-stage sample survey. A total of 9681 households were selected for the survey, of which 9174 were successfully interviewed. In these household 9900 women were identified as eligible for the individual interview and the interviews were completed for 9640 or 97% of these. The 1996-97 BDHS which was also nationally representative of two-stage sample survey that was selected from the Integrated Multi-purpose Master Sample (IMPS) maintained by the BDHS. Because of the primary sampling units in IMPS were selected with probability proportional to size from the 1991 census frame, the units for the BDHS were subselected from the IMPS with equal probability so as to retain the overall probability proportional to size. Thus, a total of 9099 households were selected, of which 8682 households successfully interviewed. Finally from these households, 9335 ever married women under 50 years were identified as eligible for the individual interview and interviews were completed for 9127 or 98% of them. The 1989 BFS was conducted by the NIPORT with the financial support from the World Bank while the two BDHSs namely 1993-94 and the 1996-97 were conducted by Mitra and Associates with technical support from Macro International, USA and NIPORT jointly. Both the Surveys were funded by the USAID, Dhaka.

Statistical Analysis: Logistic regression analysis is one of the most important multivariate analysis in which the outcome variable in logistic regression is binary or dichotomous. Many distribution functions have been proposed for use in the analysis of a dichotomous variable, Cox (1970) discussed some of these.

The logistic regression model can be used not only to identify risk factors but also predict the probability of success. The general logistic model expresses a qualitative dependent variable as a function of several independent variables, both qualitative and quantitative (Fox, 1984). Let Y_i denote the dependent variable for *ith* observation and $Y_i = 1$ if the *ith* individual is current contraceptive user and $Y_i = 0$ if *ith* individual is not current contraceptive user. Consider a collection of p independent variables which will be denoted by the vector $X' = (x_1, x_2, x_3, \ldots x_p)$ and the vector of the coefficients of X is $\beta' = (\beta_1, \beta_2, \beta_3, \ldots \beta_p)$. These variables are either qualitative or quantitative. For the moment let us assume that each of these variables is at least interval scaled. Let the conditional probability that the outcome is present be denoted by $Pr(Y_i = 1/X) = \pi(Y)$. Then the logit of the multiple logistic regression model is given by the equation

$$g(X) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots + \beta_p X_p \quad (1)$$

regression model is given by the equation

In which case

$$\pi(Y) = \frac{e^{g(X)}}{1 + e^{g(X)}} \quad (2)$$

$$Pr(Yi = 0/X) = 1 - \pi(Y) = \frac{1}{1 + e^{g(X)}} \quad (3)$$

Equation (2) and (3) lo ok complicated, however, the logarithm of the ratio of $\pi(Y)$ and $1-\pi(Y)$ which of $\pi(Y)$, turns out to be a simple linear function of X that is

$$\text{Logit } \pi(Y) = \log_e \frac{\pi(Y)}{1-\pi(Y)} = \beta' X \quad (4)$$

Which express the log odds of occurrence on an event (i.e. independent variable) as a linear function of the independent variables. The logit is thus the logarithm of the odds of success, that is, the logarithm of the ratio of the probability of using contraceptive to the probability of not using. It is also called the logit transformation of $\pi(Y)$ and equation (4) is a linear logistic model. It has several special properties; $\pi(Y)$ is bounded only between 0 and 1. If $\pi(Y) < 0.5$, logit $\pi(Y)$ is negative; while if $\pi(Y) > 0.5$, logit $\pi(Y)$ is positive.

Results and Discussion

The results of bi-variate analysis are presented in Table 1. The results suggested that the use of contraceptive methods are dir ectly associated with respondent's education, place of residence, work status, religion, electricity connection in the

Table 1: Percentage distribution of currently married women under 50 years of age currently using contraceptive methods by selected characteristics of the respondents

	1989 BFS		1993-94 BDHS		1996-97 BDHS	
Characteristics	% currently using contraceptive methods	Number of cases	% currently using contraceptive methods	Number of cases	% currently using contraceptive methods	Number of cases
Education						
None	27.5	7391	41.0	5093	45.8	4502
Primary	35.2	2420	45.5	2495	51.2	2333
Secondary+	49.2	1097	56.1	1392	56.0	1615
	$\chi^2_{(2)} = 229.30$*		$\chi^2_{(2)} = 102.68$*		$\chi^2_{(2)} = 53.37$*	
Residence						
Rural	30.1	10093	43.3	7969	47.60	7482
Urban	47.4	815	54.4	1013	62.1	968
	$\chi^2_{(1)} = 105.12$*		$\chi^2_{(1)} = 44.67$*		$\chi^2_{(1)} = 72.26$*	
Work status						
Not working	30.0	9643	42.8	7727	45.8	5445
Working	42.0	1265	55.5	1253	55.5	3005
	$\chi^2_{(1)} = 70.63$*		$\chi^2_{(1)} = 70.63$*		$\chi^2_{(1)} = 73.32$*	
Religion						
Non Muslim	37.7	1530	53.5	1100	57.6	901
Muslim	30.4	9377	43.3	7880	48.2	7549
	$\chi^2_{(1)} = 32.35$*		$\chi^2_{(1)} = 40.63$*		$\chi^2_{(1)} = 27.91$*	
Electricity connection in the household						
No	29.8	9413	43.3	7255	47.3	6330
Yes	41.8	1492	49.8	1724	55.5	2054
	$\chi^2_{(1)} = 87.80$*		$\chi^2_{(1)} = 29.32$*		$\chi^2_{(1)} = 41.97$*	
Ownership of agricultural land						
No	30.6	4568	43.7	3744	48.7	3427
Yes	32.0	6339	45.2	5234	49.6	5003
	$\chi^2_{(1)} = 2.50$*		$\chi^2_{(1)} = 20.70$*		$\chi^2_{(1)} = 0.59$*	
Ownership of radio						
No	28.7	8132	43.1	6458	46.8	5498
Yes	39.4	2775	48.4	2520	53.9	2946
	$\chi^2_{(1)} = 111.50$*		$\chi^2_{(1)} = 20.70$*		$\chi^2_{(1)} = 38.79$*	
Current age						
<30	26.1	6157	38.9	5239	43.1	4862
30+	38.3	4750	52.5	3741	57.5	3588
	$\chi^2_{(1)} = 183.65$*		$\chi^2_{(1)} = 161.78$*		$\chi^2_{(1)} = 170.85$*	
Whether watch TV every week						
No	29.7	9988	42.7	7386	45.9	6122
Yes	49.6	919	53.1	1594	58.3	2298
	$\chi^2_{(1)} = 154.15$*		$\chi^2_{(1)} = 56.96$*		$\chi^2_{(1)} = 102.64$*	
Previous children died						
Yes	31.2	4752	43.9	3281	48.4	2818
No	31.5	6156	45.0	5699	49.7	5632
	$\chi^2_{(1)} = 0.13$*		$\chi^2_{(1)} = 0.99$*		$\chi^2_{(1)} = 1.31$*	
Can move alone						
No	27.9	7547	39.6	40.05	48.0	6655
Yes	39.4	3361	52.3	53.19	53.8	1975
	$\chi^2_{(1)} = 100.57$*		$\chi^2_{(1)} = 243.47$*		$\chi^2_{(1)} = 18.98$*	
Membership of NGO						
No	NA	NA	42.7	7282	46.2	6597
Yes			52.6	1695	60.2	1848
			$\chi^2_{(1)} = 60.16$*		$\chi^2_{(1)} = 114.24$*	
Desire for additional children						
No	30.9	4866	50.8	4292	56.0	4151
Yes	17.3	4576	28.3	3375	34.0	3047
	$\chi^2_{(1)} = 238.57$*		$\chi^2_{(1)} = 397.80$*		$\chi^2_{(1)} = 342.32$*	
Number of living children						
≤2	80.4	4847	72.2	4178	68.6	4036
>2	14.7	4595	10.3	3489	8.8	3162
	$\chi^2_{(1)} = 4077.12$*		$\chi^2_{(1)} = 2956.39$*		$\chi^2_{(1)} = 2597.03$*	
Region						
Barisal	NA	NA	47.7	567	49.4	560
Chittagong	20.9	2662	29.3	2334	37.2	1710
Dhaka	31.5	3327	44.3	2756	49.8	2656
Khulna	35.3	2067	55.3	1145	61.9	1024
Rajshahi	38.3	2852	54.8	2178	58.6	2049
Sylhet	NA	NA	NA	NA	20.1	460
	$\chi^2_{(3)} = 213.25$*		$\chi^2_{(4)} = 369.09$*		$\chi^2_{(5)} = 633.36$*	
All	30.8	10907	44.6	8980	49.2	8450

* Significant at 5% level of significance , NA not applicable.

Table 2: Logistic regression of current use of contraceptive method on selected socio-economic and demographic factors among currently married women under 50 years of age for different period

	1989 BFS		1993-94 BDHS		1996-97 BDHS	
Variables	Coefficient	Odds ratio	Coefficient	Odds ratio	Coefficient	Odds ratio
Education (Non = 0,	0.54***	1.71	0.31***	1.36	0.26***	1.29
Primary = 1, Secondary + = 2)	1.07***	2.92	0.86***	2.37	0.54***	1.72
Residence (Rural = 0 Urban = 1)	0.42***	1.52	0.17*	1.18	0.38***	1.46
Currently working (No = 0, Yes = 1)	0.22**	1.24	0.19**	1.21	0.23***	1.26
Religion (Muslim = 0,						
Non-Muslim = 1)	0.19**	1.20	0.30***	1.35	0.23**	1.26
Electricity connection in						
the household (No = 0, Yes = 1)	0.13	1.13	0.15*	1.17	0.19**	1.20
Ownership agricultural						
land (No = 0, Yes = 1	0.14	1.16	0.09	1.10	0.06	1.06
Ownership of Radio (No = 0,						
Yes = 1)	0.33***	1.39	-0.00	1.00	0.10	1.11
Age (<30 = 0, 30+ = 1)	0.15*	1.16	0.13*	1.12	0.13*	1.14
Number of living Children						
(≤2 = 0, 2+ = 1)	0.21**	1.23	0.65***	1.92	0.23***	1.26
Whether watch TV every						
week (No = 0, Yes = 1)	0.21***	1.24	0.17*	1.18	0.25***	1.28
Previous child died						
(Yes = 0, No = 1)	0.25***	1.28	0.25***	1.28	0.19***	1.21
Can move alone						
(No = 0, Yes = 1)	0.22***	1.25	0.27***	1.31	0.15*	1.17
Involved with NGO						
(No = 0, Yes = 1)	N.A.	N.A.	0.12	1.13	0.26***	1.30
Desire for additional children						
(No = 0, Yes = 1)	-0.83***	0.44	-0.76***	0.47	-0.82***	0.44
Region (Chittagong = 0,	0.36***	1.44	0.64***	1.90	0.56***	1.75
Dhaka = 1, Khulna = 2,	0.52***	1.68	1.19***	3.28	1.14***	3.13
Rajshahi = 3, Barishal = 4,	0.70***	2.01	1.11***	3.04	0.98***	2.69
Sylhet = 5	.....	.....	0.69***	2.01	0.60***	1.83
	.....	.....	.....	.....	-0.52***	0.59
Constant	-2.11***	.....	-1.72***	.....	-1.22***	.....
Model chi-square	1008.67		1100.81		951.66	
Degrees of freedom	17		19		20	
Probability	0.00		0.00		0.00	

Reference category is in parenthesis; *P < 0.05, **P < 0.01, ***P < 0.001

household, access to mass media (ownership of radio, watch television every week), age, number of living children, mobility outside the homestead, involvement with NGO activities, desire for additional children and place of region. It was observed that use of contraceptive methods are higher among the women who are better educated, urban residents, currently employed, non-Muslims, who belong to the electrified households, watch television every week, move outside the homestead alone, involved with NGO activities and desire additional children. It was also observed that the contraceptive use rate is higher among the older women as compared to the younger and it is inversely related to the number of living children. Geographic regions also had a substantial effect on contraceptive use: a lower use rate was observed in Chittagong in 1989 and in 1993-94 whereas in 1996-97 contraceptive use rate was lowest in Sylhet.

The results of multivariate analysis has been presented in Table 2. As expected, respondent's education was positively associated with the current contraceptive use in each period. In other words, educated women are more likely to accept contraception than the uneducated women. For example, in 1989 women with primary education are about 1.7 times and with secondary or above education are about 2.9 times more likelyto practice contraception than women with no education. Several other authors have also found a positive relationship between female education and contraceptive use in Bangladesh (Khuda, 1996; Ullah and Chakraborty, 1993). A formal education may act as a catalyst for changes in values and behavior. Education provides alternatives to children in a number of ways because it affects indirectly on fertility by stimulating aspirations for high standards of living and increased investment in children. Moreover, Education may make women more receptive to new ideas such as family planning. The results showed that place of residence was also positively associated with the current contraceptive use in each period. The data suggested that urban women are more likely to use contraception than rural women. Urban areas in Bangladesh are often associated with, better access to medical care as well as family planning and other social services. Consequently, contraceptive use rates are expected to be higher in urban areas (Oni and McCarthy, 1986).

The women involved in these activities used contraceptives at a higher rate than those who are not involved in income generating activities. This is because, there is an incompatibility between female employment and the activities associated with early marriage and childbearing. Data in each period suggest that non–Muslims are more likely to practice contraceptive than Muslim women. This may be due to the

less favorable attitudes of the Muslims toward family planning. Electricity in the household seems to be positively associated with current contraceptive use in 1993-94 and in 1996-97. There is no straightforward explanation how contraceptive use is related with electricity.

However, the explanation may be that with the introduction of electricity in a locality there are many development programs may begin there. This may bring exposure and attitudinal change which may influence couples' to change their traditional outlook. With the communication network they may change their reproductive behavior. For example, 1% increase in electrification led to a 33% increase in the desired level of daughters education, a 10% increase in wives earning money outside the house, and a 10% increase in knowledge of family planning (Robinson, 1985).

The role of mass media in popularizing the family planning movement in developing countries is widely recognized. The age of the respondent is another important variable, in Bangladesh newly married couples do not adopt contraception until they have a child (Hossain, 2000), this is a cultural norm. Findings from the study show that current use of contraception was higher among the women of older age cohort (age 30+). The results in each period suggest that the families having larger number of living children used contraceptive at a higher rate. The results also demonstrate that child survival status is an important determinant of contraceptive use. Women who have no experience of child death used contraception more than those who experienced child loss. Taylor *et al.* (1976) are of the view that so long as parents do not expect that most of their children will survive, it is unreasonable to expect them to be interested in fertility reduction. Jain (1968) also reported that higher incidence of infant and child mortality led to a higher level of fertility. Experience with child mortality may motivate parents to have additional children either to 'replace' those who have already died or as an 'insurance' against expected deaths (Gopal and Chandra Mouli, 1981).

Among the other factors the status of women also depend on whether she can move outside the homestead alone. It enables a woman to cross several socio-cultural barriers to her status in the family as well as in the society. It is a evolvement of women's self-awareness, and ultimately women become more efficient in social interactions and participation. Ability to go outside the homestead was found to be positively associated with the current contraceptive use. Women who have autonomy to go outside the home are exposed to modern views such watching television, may participate national or local election and are likely to be contraceptive acceptors than those who do not go out side the home (Sabir, 1994).

The logistic coefficient suggests that membership of NGO is positively associated with the use of contraceptive methods in 1996-97. This may be explained that as a part of the group activities, the members meet in the group meeting to discuss various issues including need for contraceptive use, maternal and child health, consequences repeated pregnancies on the health of mother and the child, and consequences of large family on their living. Programs such as those of Grameen Bank and BRAC appear to have the potential, to contribute to women's reproductive health both by influencing social norms related to family planning by increasing their mobility, fostering extra familial social networks and strengthening women's bargaining power within the home by enhancing their economic roles (Amin *et al.*, 1996; Schuler *et al.*, 1992). It was observed that desire for additional children also plays an important role in the decision-making process concerning contraceptive use.

The results also showed that in 1989 contraceptive use rate was lower in Chittagong and higher in Rajshahi. The 1993-94 BDHS suggest that it was lower in Chittagong and higher in Khulna and Rajshahi. The 1996-97 BDHS indicated that contraceptive use rate was lower in Sylhet and higher in Khulna.

Therefore, the results of this survey concluded that, demographic impact on the contraceptive use will be small if majority of women use contraceptive methods after reaching 30 years and above. Since age at marriage is still low in Bangladesh, the contraceptive prevalence rate after 30 years above suggest that by that time majority of the women will be completed their desired family size. Child mortality motivates the women to have additional children and therefore, contraceptive prevalence rate is higher among the women who have no experience of child loss. Mass media also plays an important role in the acceptance of family planning methods.

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