

## Factors of Using Long Acting and Permanent Methods (LAPM) of Contraception: Bangladesh Perspective

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### Abstract

The Government of Bangladesh is very much aware of controlling excessive birth rate to maintain population problem. Though Bangladesh is owning self-sufficiency in many sectors, the increasing population is a great impediment for the development of the country. So, promoting different contraceptive methods is of much importance. This work aims at identifying the important determinants that affect the long-acting and permanent methods (LAPM) of contraception. Firstly, chi-square test of association is carried out for defining the correlates of LAPM of contraception using Bangladesh Demographic and Health Survey (BDHS), 2017-18 data. For estimating the effects of each controlled independent variables, data are further analyzed within a multivariate framework. To obtain consistent and efficient estimates of parameters of interest, multinomial logistic regression model is used in this work. The study finds several socio-economic and demographic variables having high impact on using LAPM. The study findings are properly discussed and recommendations are made accordingly for the policy makers.

**Keywords:** LAPM, BDHS, chi-square test, multinomial logistic regression model

### I. Introduction

The risk of maternal mortality during delivery brought on by numerous births and too little time between them can be reduced in part through family planning. The LAPM is a crucial component of family planning (FP), according to the FP movement. Unwanted pregnancies can have a negative impact on both mothers' and children health and welfare. The achievement of development objectives like Vision 2030<sup>1</sup> and the Sustainable Development Goals (SDGs)<sup>2</sup> might be hampered by high rates of unwanted births. The poor adoption of contraceptives, notably LAPM, among women who don't want to have any more children emphasizes the need of addressing family planning (FP) concerns, particularly the need to promote methods that are appropriate for their intended fertility. Women who desire to space their pregnancies out over extended periods of time might also benefit from LAPM. It prevents recurrent pregnancies in this demographic segment, which is particularly helpful for young, sexually active, unmarried women who want to defer having children<sup>3,4</sup>.

In Bangladesh, family planning is mostly dominated by the use of short-term methods<sup>5</sup>. LAPMs methods are cost effective, convenient, and effectively pregnancy preventive<sup>6</sup>. These methods provide long lasting contraceptive protection, which directly helps reach the national and international health goals. Women finish their families before they become 30. The benefit of using LAPM is that couples do not have to continue using pills, injectables, and condoms throughout their remaining 15-20 years of reproductive life, which has a risk of failure or early discontinuance or both, leading to a high incidence of menstrual regulation (MR) or

abortion. LAPM is one of the keys for reducing child and maternal mortality; which helps to achieve many MDG goals indirectly. So, it is necessary to detect out the determinants of LAPMs of contraception in Bangladesh.

Several papers are studied to examine the determinants of contraceptive use among Bangladeshi women of reproductive age. It is found that if LAPM use could have been increased, it would become better for Bangladesh<sup>7</sup>. Traditionally, Bangladeshi women are mostly dependent on short acting methods<sup>8,9</sup>. Risks of failure or early discontinuation is the main problem of short acting method, which results in unintended pregnancies or abortion<sup>10</sup>. The family planning (FP) workers are authorized to deliver only condom and pills<sup>11</sup>. Their visits have a very positive impact on using short term methods mainly, but this visit does not increase the rate of permanent method use. Previous study mentioned a number of factors such as fear of side effect, myths and misconceptions, lack of knowledge, opposition of partner, and others as the impediment of using LAPMs<sup>11</sup>. The effectiveness of family planning services is directly related to a person's acceptance of a contraceptive and their continued use of it, according to several studies<sup>12</sup>. A number of variables is found to influence the decision to alter contraceptive methods and the technique of choosing<sup>13</sup>. Individual features, previously used contraceptive techniques, understanding of methods, efficacy, accessibility, and side effects of contraception used are some of these variables. With the potential to lower reproduction rates through increasing use of contraceptives, improving the quality of family planning services is done with the

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intention of not just assisting family planning acceptors to attain their ideal level of personal health<sup>14</sup>.

The study aims to identify the factors that forces the use of LAPM in Bangladesh. Data are extracted from Bangladesh Demographic Health Survey (BDHS) 2017-18 for this purpose<sup>15</sup>. The bivariate analysis is used to inspect the measure of association between using LAPM and included covariates in this study. Multinomial Logistic Regression is applied in the dataset as the tool of multivariate analysis.

## II. Data and Variables

Data from Bangladesh Demographic and Health Survey (BDHS) 2017-2018 was used in this study for the analysis purpose<sup>15</sup>. BDHS is a nationally representative survey which highlights several key indicators related to maternal and child health. The study considered current contraceptive use as the outcome variable, which has three categories: No use, LAPM, and Others. A couple belongs to the category ‘no use’ if they are currently not using any contraception method. The category ‘LAPM’ is defined on using one of the followings: IUD, Implants, Female sterilizations, Male sterilizations. A couple belongs to the category ‘others’ if they use one of the followings: Pill, Injections, Diaphragm, Male condom, Periodic abstinence, Withdrawal, Other traditional, Prolonged abstinence, Prolonged abstinence, Female condom, Foam or jelly, Emergency contraception, Other modern method, Standard days method (SDM), Specific method 1, Specific method 2. Based on the previous studies, several characteristics are included as independent variables in this study. These are- Division (Barisal, Chittagong, Dhaka, Khulna, Rajshahi, Rangpur, Sylhet, Mymensingh), Place of residence (Urban, Rural), Women’s age (Less than 20 years, 20-30 years, above 30 years), Body Mass Index (<18.5, >=18.5), Women’s education (No education, Primary, Secondary, Higher), Religion (Muslim, non-Muslim), Wealth index (Rich, Middle, Poor), Number of living children (0-1, 2-3, 4 or more), Women’s working status (Yes, No), Heard family planning (Yes, No), Currently residing with partner (Yes, No), Husband’s education (No education, Primary, Secondary, Higher), Husband’s occupation (Agriculture related, Non-agriculture related, Service holder, Businessman, Others).

## III. Methodology

Data have been extracted from Bangladesh Demographic and Health Survey (BDHS, 2017-18). The profile of sample is analyzed through univariate analysis of the variables included in the study. The measures of association between

outcome variable and independent variables are assessed through chi-square test. The test statistic suggested by Karl Pearson is

$$\chi^2 = \sum_{i=1}^r \sum_{j=1}^c \frac{(n_{ij} - E_{ij})^2}{E_{ij}} \sim \chi^2_{(r-1)(c-1)} \text{ under } H_0.$$

This test is known as chi-square test for checking independence between two categorical variables<sup>16,17</sup>. Multinomial logistic regression model is applied to the dataset to explore the adjusted effect of covariates on dependent variable. Let  $\mathbf{y}$  be a  $N \times (J - 1)$  matrix where  $y_{ij}$  represents the observed counts of the  $j^{\text{th}}$  value of  $Z_i$  for each population and  $\boldsymbol{\pi}$  be a  $N \times (J - 1)$  matrix where  $\pi_{ij}$  is the probability of observing the  $j^{\text{th}}$  value of  $Z_i$  for any given observation in the  $i^{\text{th}}$  population. The multinomial logit regression model considering  $J^{\text{th}}$  category as baseline category can be written as

$$\log \left( \frac{\pi_{ij}}{\pi_{ij}} \right) = \log \left( \frac{\pi_{ij}}{1 - \sum_{j=1}^{J-1} \pi_{ij}} \right) = \sum_{k=0}^K x_{ik} \beta_{kj},$$

$$i = 1, 2, \dots, N; j = 1, 2, \dots, J - 1$$

where  $\mathbf{X}$  the  $N \times (K + 1)$  design matrix of independent variables and  $\boldsymbol{\beta}$  is  $(K + 1) \times (J - 1)$  matrix containing regression coefficients<sup>18,19</sup>.

If we solve it for  $\pi_{ij}$  we can have the multinomial logistic regression model as follows<sup>20</sup>

$$\pi_{ij} = \frac{e^{\sum_{k=0}^K x_{ik} \beta_{kj}}}{1 + \sum_{j=1}^{J-1} e^{\sum_{k=0}^K x_{ik} \beta_{kj}}}, \quad j < J.$$

## IV. Results

### Univariate Analysis

To summarize the basic characteristics of the variables included in this study, frequency distribution table is used as descriptive statistics since all the variables in this study are categorical.

Frequency distribution of the socio-economic and demographic variables included in this study from BDHS, 2017-18 data is shown in Table 1. For the variable current contraceptive use, it is found that only 8.5% of the respondents use LAPM as a means of current contraceptive use, while 54.2% of them use other short acting methods like pill, condom, LAM, injections etc. It is important to note that 37.3% women use no contraceptive methods.

**Table 1. Descriptive Statistics of the Selected Socio-economic and Demographic Variables for BDHS 2017-18 Data (n=18,588)**

<b>Variables</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Current contraceptive use</b>		
No use	6931	37.3
LAPM	1580	8.5
Others	10077	54.2
<b>Division</b>		
Barisal	1985	10.7
Chittagong	2670	14.4
Dhaka	2724	14.7
Khulna	2452	13.2
Mymensingh	2036	11.0
Rajshahi	2406	12.8
Rangpur	2325	12.5
Sylhet	1990	10.7
<b>Place of residence</b>		
Urban	6710	36.1
Rural	11878	63.9
<b>Women's age</b>		
Less than 20	1858	10.0
20-30	6718	36.1
30 or more	10012	53.9
<b>Body Mass Index</b>		
Less than 18.5	2173	11.7
18.5 or more	16415	88.3
<b>Women's education</b>		
No education	2761	14.9
Primary	5851	31.5
Secondary	7344	39.5
Higher	2632	14.1
<b>Religion</b>		
Non-Muslim	1856	10.0
Muslim	16732	90.0
<b>Wealth index</b>		
Poor	7077	38.1
Middle	3624	19.5
Rich	7887	42.4
<b>Number of living children</b>		
0-1	6115	32.9
2-3	9563	51.4
4 or more	2910	15.7
<b>Women's working status</b>		
No	9786	52.6
Yes	8802	47.4
<b>Heard family planning</b>		
No	15550	83.7
Yes	3038	16.3
<b>Currently residing with partner</b>		
Yes	15599	83.9
No	2989	16.1
<b>Husband's education</b>		
No education	3978	21.4
Primary	5853	31.5
Secondary	5502	29.6
Higher	3254	17.5
<b>Husband's occupation</b>		
Related to agriculture	4612	24.8
Related to non-agriculture	8445	45.4
Service holder	1130	6.1
Businessman	3932	21.2
Others	469	2.5

The respondents are uniformly distributed in the eight divisions. The highest percentage is observed for Dhaka division (14.7%). Most of the women in this study are from rural areas (63.9%). About half of the women belong to the age category 30 or more years, while 10% of them are in the category less than 20 years. A good percentage of women (88.3%) carry Body Mass Index greater than 18.5. 14.9% of the women have no education at all. 31.5% of them have primary education only. Most of the respondents (90%) are Muslim. The percentages of women belonging to poor, middle class, and rich family are 38.1, 19.5, and 42.4%, respectively. Almost half of the respondents have 2-3 living children. Only 32.9% of them have 0-1 living children, while this percentage is 15.7% for number of living children 4 or more. About half of the women in this study are working outside. A high percentage of women (83.7%) did not hear about family planning on radio, TV, or newspaper. Most of the women (83.9%) are currently residing with their partners. Husband's education has a similar percentage pattern to the women's education. 24.8% of the husband's occupation is agriculture related, while the percentage is 45.4% for non-agriculture related profession. 21.2% of them are businessman, and only 6.1% of them are service holder.

#### *Bivariate Analysis*

This study involves cross-tabulation and Chi-square test to measure the significance of the selected socio-economic and demographic variables on current contraceptive use of Bangladeshi women. Table 2 presents the frequency distribution of the selected socio-economic and demographic variables over the three categories of the current contraceptive use of Bangladeshi women along with the corresponding Chi-square test p-values. All the reported p-values except for body mass index are less than 0.001 implying that the selected variables have a significant association with current contraceptive use.

#### *Multivariate Analysis*

Table 3 shows the odds ratio along with their p-values from multinomial logistic regression model. The independent variables that have significant association with LAPM are considered in multivariate analysis. In multinomial

regression model, no use of any contraceptive method is considered as the base category in outcome variable. It is noticeable from Table 3 that there is a divisional variation in using LAPM. The odds ratio of using LAPM relative to no use is significantly higher for the divisions Dhaka, Khulna, Rajshahi, and Rangpur compared to that of Barisal. The women of Dhaka have 42.5% higher odds of using LAPM than the women in Barisal relative to no use of any contraceptive method. For using other methods of contraception, significant result is found for the Chittagong and Sylhet divisions only. The rural women have significantly lower odds of using LAPM or other methods than no use compared to the urban women. Rural women have 18.5% lower odds of using LAPM than no use compared to the urban women. Women's age is found to be insignificant in the model. The primary educated women have significantly 20% and 44.6% higher odds of using LAPM and other methods of contraception, respectively, than the no educated women. The Muslim women have significantly 49.1% and 25.4% lower odds of using LAPM and other methods of contraception, respectively, than the non-Muslim women. It is evident from Table 3 that the women from rich family have significantly 20.3% and 11.9% lower odds of using LAPM and other methods of contraception, respectively, than the women from poor family. Significantly higher odds of using LAPM and other methods of contraception is found for the mothers who have two or more living children compared to the mothers having no children or one living children. The working women have significantly 26% higher odds of using LAPM and other methods of contraception than the non-working women.

The women who have heard family planning in the radio, television, or in newspaper have significantly 26.9% and 20.6% higher odds of using LAPM and other methods of contraception, respectively, than the women who have not heard it. It is vivid from the analysis that the women who are not currently residing with their husbands have significantly 86.1% lower odds of using LAPM and other methods of contraception, respectively, than the women who are currently residing with their husbands. The analysis shows an opposite direction of odds ratio for husband's education compared to that in women's education. No mentionable result is found for husband's occupation.

**Table 2. Significance and Percentage Distribution of the Selected Socio-economic and Demographic Variables over Current Contraceptive Use for BDHS, 2017-18 Data**

Variable	Current contraceptive use			p-value
	No use	Others	LAPM	
<b>Division</b>				<0.001
Barisal	10.7%	11.1%	7.7%	
Chittagong	17.3%	12.9%	10.9%	
Dhaka	14.5%	14.8%	14.4%	
Khulna	12.3%	13.8%	13.2%	
Mymensingh	10.5%	11.4%	10.0%	
Rajshahi	12.0%	13.1%	16.1%	
Rangpur	10.2%	13.3%	17.7%	
Sylhet	12.5%	9.6%	10.1%	
<b>Place of residence</b>				<0.001
Urban	33.0%	38.6%	33.9%	
Rural	67.0%	61.4%	66.1%	
<b>Women's age</b>				<0.001
Less than 20	13.2%	9.0%	2.3%	
20-30	38.4%	37.0%	20.7%	
30 or more	48.4%	54.0%	77.0%	
<b>Body Mass Index</b>				0.071
Less than 18.5	12.4%	11.2%	11.8%	
18.5 or more	87.6%	88.8%	88.2%	
<b>Women's education</b>				<0.001
No education	15.2%	12.8%	26.6%	
Primary	29.2%	31.6%	40.8%	
Secondary	40.7%	40.6%	27.2%	
Higher	15.0%	14.9%	5.4%	
<b>Religion</b>				<0.001
Non-Muslim	7.8%	10.9%	13.9%	
Muslim	92.2%	89.1%	86.1%	
<b>Wealth index</b>				<0.001
Poor	35.5%	38.5%	46.9%	
Middle	20.6%	18.6%	20.3%	
Rich	43.9%	42.9%	32.8%	
<b>Number of living children</b>				<0.001
0-1	46.4%	27.3%	9.3%	
2-3	38.8%	58.3%	63.5%	
4 or more	14.8%	14.4%	27.2%	
<b>Women's working status</b>				<0.001
No	59.5%	49.5%	42.6%	
Yes	40.5%	50.5%	57.4%	
<b>Heard family planning</b>				<0.001
No	84.7%	82.5%	86.6%	
Yes	15.3%	17.5%	13.4%	
<b>Currently residing with partner</b>				<0.001
Yes	67.8%	93.7%	92.2%	
No	32.2%	6.3%	7.8%	
<b>Husband's education</b>				<0.001
No education	19.4%	20.5%	35.8%	
Primary	30.3%	31.9%	34.1%	
Secondary	32.8%	28.7%	21.1%	
Higher	17.4%	18.9%	9.1%	
<b>Husband's occupation</b>				<0.001
Related to agriculture	20.9%	26.2%	33.0%	
Related to non-agriculture	52.1%	41.6%	40.7%	
Service holder	5.7%	6.8%	3.1%	
Businessman	17.7%	23.7%	20.5%	
Others	3.5%	1.8%	2.7%	

**Table 3. Odds Ratio (OR) Obtained from Multinomial Logistic Regression Model Estimates of the Selected Socio-economic and Demographic Variables for Current Contraceptive Use from BDHS, 2017-18 Data along with p-value**

Covariates	LAPM		Others	
	OR	p-value	OR	p-value
<b>Division</b>				
Barisal	-	-	-	-
Chittagong	0.928	0.576	0.771	<0.001
Dhaka	1.425	0.007	0.932	0.327
Khulna	1.321	0.035	0.893	0.113
Mymensingh	1.135	0.356	0.904	0.169
Rajshahi	1.652	<0.001	0.904	0.162
Rangpur	1.857	<0.001	0.980	0.788
Sylhet	0.905	0.468	0.675	<0.001
<b>Place of residence</b>				
Urban	-	-	-	-
Rural	0.815	0.004	0.829	<0.001
<b>Women's age</b>				
Less than 20	-	-	-	-
20-30	1.155	0.460	0.783	<0.001
30 or more	1.414	0.086	0.559	<0.001
<b>Women's education</b>				
No education	-	-	-	-
Primary	1.200	0.024	1.446	<0.001
Secondary	1.000	0.997	1.701	<0.001
Higher	0.873	0.427	2.087	<0.001
<b>Religion</b>				
Non-Muslim	-	-	-	-
Muslim	0.509	<0.001	0.746	0.001
<b>Wealth index</b>				
Poor	-	-	-	-
Middle	0.917	0.286	0.886	0.014
Rich	0.797	0.008	0.881	0.011
<b>Number of living children</b>				
0-1	-	-	-	-
2-3	6.282	<0.001	3.473	<0.001
4 or more	6.420	<0.001	2.711	<0.001
<b>Women's working status</b>				
No	-	-	-	-
Yes	1.260	<0.001	1.260	<0.001
<b>Heard family planning</b>				
No	-	-	-	-
Yes	1.269	0.008	1.206	<0.001
<b>Currently residing with partner</b>				
Yes	-	-	-	-
No	0.139	<0.001	0.139	<0.001
<b>Husband's education</b>				
No education	-	-	-	-
Primary	0.800	0.004	0.950	0.312
Secondary	0.653	<0.001	0.921	0.150
Higher	0.666	0.005	1.035	0.655
<b>Husband's occupation</b>				
Related to agriculture	-	-	1.061	0.206
Related to non-agriculture	1.111	0.167	1.201	0.053
Service holder	1.138	0.513	1.174	0.003
Businessman	1.146	0.129	0.502	<0.001
Others	0.631	0.011	-	-

Baseline category: No use

## V. Discussion

The study identifies some factors that influences the use of current contraceptive use, especially long acting and permanent methods (LAPM), among the women of reproductive age in Bangladesh. To the best of our knowledge, it is the first study revealing the use of LAPM from BDHS 2017-18 data. In our sample, only 8.5% women uses LAPM as their current contraceptive methods, whereas 54.2% of them uses other contraceptive methods. It is remarkable that a high percentage of women (37.3%) are not using any kind of contraception method.

The study depicts that several demographic, and socio-economic variables are associated with using current contraceptive methods. The women from Barisal division possess lower use of LAPM but higher use of other methods of contraception compared to the women from other divisions. But a previous study found the northern part of Bangladesh to be less practiced area in the context of LAPM<sup>21</sup>. Place of residence is found to be significantly associated with the use of current contraceptive use. Rural women are less likely to use LAPM, as well as other contraceptive methods, which is also evident in a previous study<sup>22</sup>. The possible reason for this may be less awareness of rural people over family planning. Moreover, they are not extensively known to LAPM as a result of less media exposure. Also, they feel fear on the complications of modern contraceptive methods. The study finds evidence that young women aged 30 or more are more prone to use LAMP, and also other contraceptive methods, which is also reported in some other studies<sup>23,24</sup>. It is easy to understand that, women usually make their family before age 30 and thereafter rarely go for taking babies. So, use of LAPM is relevant to this age group. Whether a woman is Muslim or not determines the use of current contraception to a great extent. According to the study findings, Muslim women show less interest in using LAPM, so does to other methods. This result is also provident in a previous study on the use of LAPM<sup>25</sup>. The women who belong to poor family use LAPM or other contraceptive methods more promisingly than the women from middle or rich families. This result is also true for a previous study<sup>26</sup>.

The study finds evidence that if a woman has at least two living children, she has greater likelihood of adopting LAPM or other contraceptive methods, which is also reported by a past study<sup>27</sup>. This may occur because of the fact that they want to postpone taking more children through adopting current contraception methods. The working women are subject to using LAPM or other methods of contraception to a higher rate compared to the women who do not work outside. The study result expresses that hearing family planning on radio, TV, or

newspaper increases the use of LAPM or other contraceptive methods. The women who are not currently residing with their husband have lower possibility of using LAPM or other contraceptive methods.

## VI. Conclusion

The study identifies some factors that influences the use of current contraceptive use, especially long acting and permanent methods (LAPM), among the women of reproductive age in Bangladesh. To the best of our knowledge, it is the first study revealing the use of LAPM from BDHS 2017-18 data. The study findings bring some recommendations for the policy makers. Attempt should be taken to let the rural women know about LAPM. It is also necessary to inspire women to be media exposed. Woman education and women's working outside should be promoted. Finally, it is necessary to use the media, adult education, and school curricula to inspire people to cherish children regardless of their gender, to emphasize the advantages of small families. Monthly "one-day sessions" on LAPM could be conducted by obstetrician-gynecology consultants and Residential Medical Officers (RMO) at the Upazilla level.

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