

Factors Associated with Socio-economic Condition of “New Born Child and Mother Care of Bangladesh”.

Md. Murad Hossain¹, Md. Rana Ahmed², Md. Zahid Hasan³ and Sabrina Rahaman⁴

^{1,3,4} Department of Statistics, Faculty of Science, Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj-8100, Bangladesh.

(¹Sadid.shimul@gmail.com, ³zahid1680@gmail.com, ⁴sabrinarahaman.ju.7@gmail.com)

²Department of Statistics, student of M.Sc. , Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj-8100, Bangladesh.

(²ranastat1994@gmail.com)

Abstract : Bangladesh has one of the world's highest rates of low birth weight of new born child and mother care. This should be seen as an emerging challenge as the new born child and mother care will have special needs and require different care-giving services. Since Bangladesh does not have a social welfare system there will be competition for inadequate resources specially health and medical services. The purpose of the study is to identify the risk factors of health and economic problems of pregnant women in our society are faced and also about their newborns health care. To reduce the vulnerability so the family members should take proper attention and besides that Government and other organization should need to take proper steps.

Keywords: new born child, pregnant mother care, socio-economic factor, Bangladesh.

1. BACKGROUND OF THE STUDY

1.1 INTRODUCTION

Motherhood is a unique time in a mother's life. She is on the threshold between being a child and a mother. Pregnancy, birth and motherhood are an environment that respects women without jeopardizing their health. The enabling environment for safe motherhood and childbirth depends on the care and attention. Pregnancy is a miraculous process. It is a time when a woman should make every effort to turn into her body and the body wishes the support to her surroundings. Pregnancy is the most nutritionally demanding time of a woman's life. Woman's body needs enough nutrients every day to support the growth of her body. Pregnant women need more calories and essential nutrients than other women. If the nourishment needed for babies developing tissues and organs is inadequate. Mother plays an extremely significant role in nurturing a newborn. Mothers should have to strong financially and in educationally to take good care of their babies and also family.

Under 5 child mortality between 1990 and 2011, under 5 mortality decreased from 151/1000 to 53/1000 live births (LBs). The infant mortality rate fell less rapidly from 87/1000 to 43/1000 LBs over the last 18 years. Mortality declines are associated with improved coverage of effective interventions to prevent or treat the most important causes of child mortality and with improvements in socioeconomic conditions. Moreover, Bangladesh has seen reduced disparities in under 5 mortality between urban-rural areas and across different regions of the country. And maternal mortality between 1990 and 2010, maternal mortality in Bangladesh decreased from 574/100 000 to 194/100 000 LBs. The decline is associated with a reduced total fertility rate (from 5 births per woman in 1990, to 2 in 2011) and with increased skilled delivery attendance (from 5% in 1991

to 32% in 2011). The rapid development of the private sector, have also contributed to reducing maternal mortality [1].The situation is worse in developing countries like Bangladesh. Every hour 3 women die due to pregnancy or childbirth complications. The national average age of marriage for girls is 15 with first delivery at 18. Over 90% of women give birth at home at the hands of untrained attendants 50% of women are considered to be at nutritional risk leading to under development of birth canals, anemia and more. In this study we try to show the conditions of mothers economical and health care with their newborns on the perspective to our country [2].

A sample of 8 first time mothers, who had babies of between 6-12 months of age, were interviewed on their experience of becoming a mother. The following eight themes emerged from the analysis: 1. being with others, 2. Developing a relationship with the baby, 3. Living in time, 4. The unknown, 5. Life is different, 6. Challenging expectations, 7. Motherhood identity and 8. Difficult times. The analysis showed that becoming a mother was a complex transition where mothers experienced challenges in all four dimensions of existence namely the physical, social, personal and spiritual dimensions. Findings also showed that motherhood was an ontological experience, where mothers became aware of aspects of their existence, such as their freedom, choice and responsibility and also their mortality [3].Caesarean delivery rate in Bangladesh has been increased rapidly, from 4% in 2004 to 23% in 2014. Caesarean sections (CS) cause severe complications and bring about bad consequences in maternal and child health. However, the factors responsible for the increased CS rates in Bangladesh and how the decision of CSs are made is not well understood [4].Low birth weight 1s a major cause of infant mortality and IS considered as a sensitive index of nation's health and development. The frequency of infants weighing 2500 gms

or less at birth has for long served as one of the important indicators of quality of reproductive performance. The incidence of LBW continues to be high in India, particularly it down to below 10 percent by the year 2000 under Health for All by Year 2000. To find out the current status of incidence of LBW and associated maternal health factors delivered newborns [5]. In countries affected by a high prevalence of under nutrition, many malnourished adolescent girls and women give birth to babies that are born thin and stunted. These low birth weight (LBW) infants grow poorly and fail to thrive in subsequent years and, if they are girls, become malnourished mothers themselves (ACC/SCN, 2000). In this way, under nutrition is handed down from one generation to the next. Low birth weight, defined as a birth weight <2,500 g, is also linked with diet-related diseases in adulthood such as diabetes, coronary heart disease and hypertension. These consequences take a toll on the lives and productivity of communities as well as placing heavy burdens on overstretched health systems [6].

Newborn care and breastfeeding practices are important to reduce neonatal morbidity and mortality for every country. Newborn care practices are related with some demographic and socioeconomic characteristics. In Bangladesh still seventy-one percent of births are delivered at home. Health facility is also increasing day by day and that factors are related with safe newborn care practices. This study used data structured from BDHS, 2011 where number of children 3290 who born last three years preceding the survey. This study focuses mother's education has positive and significant impact on safe newborn care practices. There are also some factors region, wealth index, assistance at delivery, place of residence and birth order that have significant impact on safe newborn care practices [7]. Bangladesh has improved substantially over the years, the low birth weight (LBW) rate is still pretty high. The principal focus of this study was to ascertain the significant determinants for LBW. One hundred and eight LBW babies were compared with 357 normal birth weight babies. Mother's age, education, occupation, yearly income, gravid status, gestational age at first visit, number of antenatal care visit attended, quality of antenatal care received and pre-delivery body mass index had significantly associated with the incidence of LBW [8]. Babies with a birth weight of less than 2500 gms, irrespective of the period of their gestation are termed as Low Birth Weight (LBW) babies¹. In India 30-35% babies are LBW and more than half of these LBW newborns are full term babies². LBW being one of the global indicators of community health, it is imperative that periodic monitoring be undertaken to evaluate the impact of preventive health services. The present study was designed to find out the effect of various socio-economic and maternal factors on the birth weight of institutionally delivered newborns [9]. The influencing factors on infant and child mortality of suburban and rural areas in Bangladesh. Primary data have been used to examine the differential patterns of infant and child mortality. A multivariate technique is employed to

investigate the effects of those variables both socioeconomic and demographic on infant and child mortality. The study results reveal that several socioeconomic, demographic and health related variables effect on infant and child mortality [10].

Birth weight status improved with better Chronic Energy Deficiency (CED) levels. Birth weight adjusted for CED status, had no significant association with food supplementation. In this study, the basic findings were food supplementation could not increase birth-weight significantly as other effects contributed to improve birth weight were removed. As fully supplemented CED III mothers gave birth almost same weighted babies in comparison to the babies of CED I mothers; the recovery from the probability of being less weighted than the current status might be considered as a potential effect of food supplementation [11]. Birth size is an important gauge of fetal and neonatal health. Birth size measurements were collected within 72 h of life for 16 290 live born, singleton infants in rural Bangladesh from 2004 to 2007. Gestational age was calculated based on the date of last menstrual period. Newborns were classified as small-for-gestational age (SGA) based on a birth weight below the 10th percentile for gestational age, using three sets of US reference data [12]. The role of mothers' nutritional status and socio-biological aspects in determining the birth weight of their most recent child. Methods they used data from the second Indian National Family Health Survey conducted in 1998–1999. Mothers' nutritional status is the most important determinant of newborn children's birth weight. Safe drinking water, use of antenatal care and iron deficient anaemia were also significant contributors to low birth weight. Mothers' BMI impact is more pervasive across India than the impact of other factors on birth weight [13].

Our paper is more essential from the others project because we collect above whole categorical information of new born child and mother care of pregnancy depend on married with respect to time, the correlation between two variables is pregnant mother age and her husband age, also correlation between how much time you spent for doing household works (hrs.) and how much times you feed your child daily. And find the significant association between just before you got pregnant how much did you weight with age, how much milk you drank, how much water you drank every day, how much time you spent for doing household works, how many hours you slept daily. So finally we said that our project is the universal set of the other project for the factors associated with socio-economic condition of "New born child and mother care of Bangladesh.

2. METHODOLOGY

2.1 Introduction

A previously planned methodology is for the successful condition of the study. Without well planned methodology it is not possible to accomplish the study precisely and

accurately. So, a well-defined methodology is always followed in the study.

2.2 Study Population, Technique and Sample Size Determination Sampling.

This study has discovered that there are basic, underlying and immediate causes that act at various levels of society and which contribute to the occurrence of women's early pregnancy and complications in Gopalganj and Khulna districts. We use the sampling technique of non-probability sampling method in purposive sampling of judgment sampling. We collect the data about 75 early pregnancy women.

2.3 Sources of data

There are several ways of collecting the appropriate data, which differ considerably in context of money costs, time and other resources at the disposal of the researcher. In practical situation, our research will be based on primary data. Because the sources of primary data is available, and easy to collect, does not carry bias, more flexible, reliable and interpretation is better. Survey and questionnaire techniques are used for data collection.

2.4 Data Processing

The collected data from the primary source were coded and tabulated manually. The computer software SPSS, Microsoft Excel and R are applied for the purpose of analysis of these data.

2.5 Data Entry and Analysis

Coded information was entered into the computer to analyse the data. Package program such as SPSS and Microsoft Excel were used. The purpose of data analysis was to provide answers to research objectives being studied. In analysis we used frequency distribution, correlation, model selection criteria (R^2 , Adjusted R^2 (\bar{R}^2), Akaike information criterion (AIC), Schwarz information criterion (SIC)), Multiple regression analysis.

2.6 Multiple regression analysis

Multiple regression analysis is employed to identify the factors that influence the expenditure of our study area. Multiple regression analysis permits the measurement of the degree of relationship between a dependent variable and two or more independent variables considered simultaneously.

Let us consider the multiple regression equation as

$$Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + u_i \quad (1)$$

Under the assumption of the classical regression model, it follows that, on taking the conditional expectation of Y on the both sides of (1), we obtain

$$E(Y_i | X_{2i}, X_{3i}) = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} \quad (2)$$

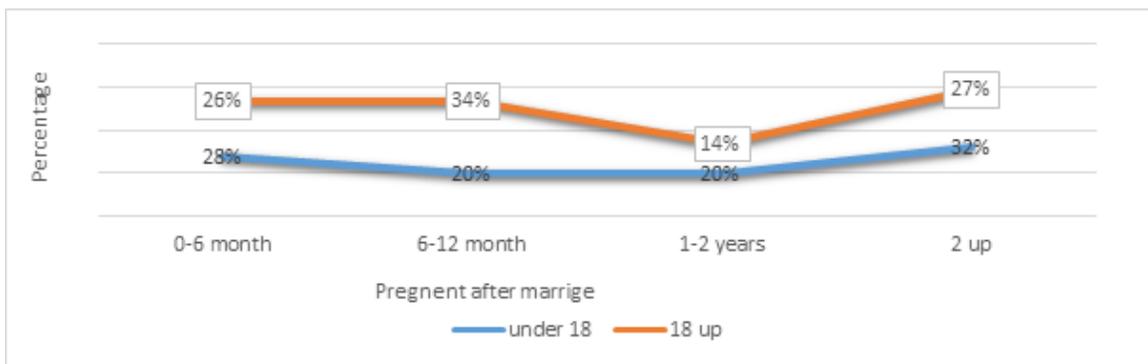
In words, (2) gives the conditional mean or expected value of Y conditional upon the given or fixed values of X_2 and X_3 . Therefore, as in the two variable case, multiple regression analysis is regression analysis conditional upon the fixed values of the regressors, and we obtain the average or mean value of Y or the mean response of Y for the given values of the regressors.

3. RESULTS AND ANALYSIS

3.1 Pregnancy depend on married with respect to time.

The Motherhood is a unique time in a mother's life. It's an exciting because of the newness of experience, but it is also a time of great uncertainty. Pregnancy, birth and motherhood are an environment that respects women without jeopardizing their health. Pregnancy is the most nutritionally demanding time of a woman's life. Woman's body needs enough nutrients every day to support the growth of her body.

Figure (3.1): pregnant after marriage and marriage time
 Married under 18, those women pregnant after marriage 0-6 months are 28%, 6-12 months are 20%, 1-2 years are 20%, 2 up are 32%. Married 18 up, those women pregnant after marriage 0-6 months are 26%, 6-12 months are 34%, 1-2 years are 14%, 2 up are 27%.



3.2 To take care her child and doing household works

Every family has some limitation to take care a new born. A new born fosterage not only his mother but also others. If a mother can proper time to take care her child, only then her child growth will be better. Now we would show that the

relationship between take care her new born child and consume time for doing household works

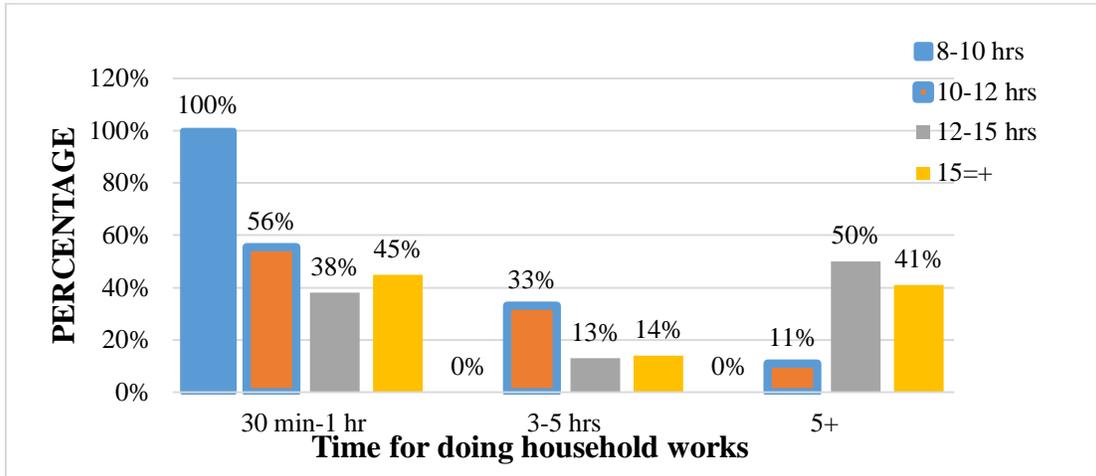


Figure 4.5: take care her child and doing household works

We get from the above figure, the number of 2 women doing household works (30 min-1 hr.) together with taking care her baby (8-10 hr.) and have percentage 100% again the number of 5 women doing household works (30 min-1 hr.) together with taking her baby (10-12 hrs.) and have percentage 56%, 3 women doing household works (30 min-1 hrs.) together with taking care her baby (12-15 hrs.) and have percent 38% and also 25 women doing household works (30 min-1 hr.) together with taking her baby (15+) and have percentage 45%. The number of 3 women doing household works (3-5 hr.) together with taking care her baby (10-12 hr.) and have percentage 33%, again number of 1 women doing household works (3-5 hr.) together with taking care her baby (12-15 hr.) and have percentage 13% and also the number of 8 women doing household works (3-5 hr.) together with taking care her baby (15 +) and have percentage 14%. The number of 1 women doing household works (5+ hr.) together

with taking care her baby (10-12 hr.) and have percentage 11%, again number of 4 women doing household works (5+ hr.) together with taking care her baby (12-15 hr.) and have percentage 50% and also again number of 23 women doing household works (5+ hr.) together with taking care her baby (15 +) and have percentage 41%.

3.3 Time for doing household works and works and role of family.

A family make an important role to take care her child .A new born child will be growth properly ,when every member in a family make an important role not only her mother. When a family member done maximum work of her family then mother can get necessary time for nursing her new born. If a mother can get huge time to take care her new born then a new born health will be better. Now we describe the relationship between role of family and doing house hold works –

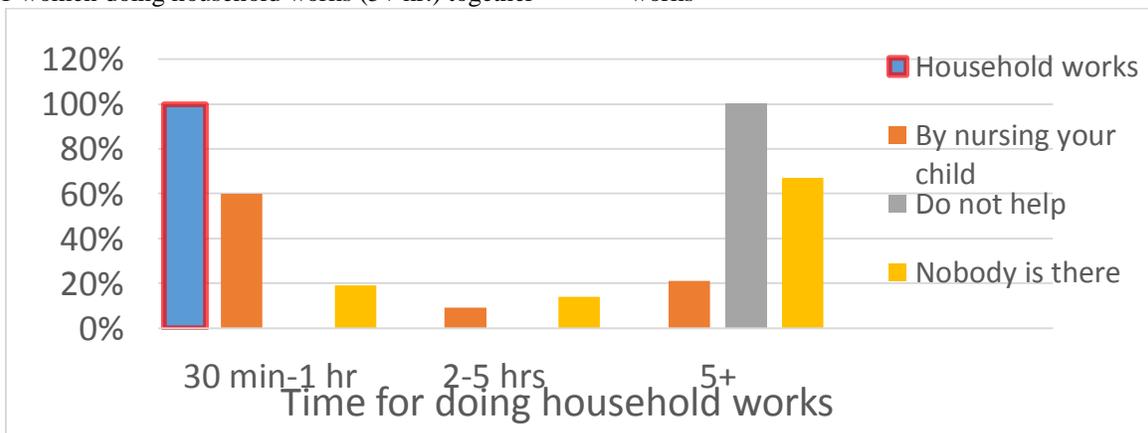


Figure 3.3 : Time for doing household work with respect to role of family

We get from the above figure, the number of 3 women doing household works (30 min-1 hr.), where her family doing 100% Household works, the number of 28 women doing household works (30 min-1 hrs.) where her family member

doing help 60% for nursing her baby and 4 women doing household works (30 min-1 hr.) where 19% nobody is there for helping her. The number of 9 women doing household works (2-5 hrs.) where her family member doing help 9% for nursing her baby and 3 women doing household works (2-

5hrs) where 14% nobody is there for helping her. Also we have , The number of 10 women doing household works (5+ hrs.) where her family member doing help 21% for nursing her baby,4 women doing household works(5+hrs) where 100% no need help and 14 women doing household works (2-5 hrs.) where 67% nobody is there for helping her.

3.4 Label of education of women.

At first remember the great speech of napoleon “give me an educated mother; I give you an educated nation”. So an educated mother keeps an important role in our society to make an education nation. No we show the education label of the mothers in the following table-

Table 1: Frequency of education Level

Level of education	Frequency	percent
Illiterate	4	5.3
Elementary	21	27.6
Junior high	23	30.3
Secondary	12	15.8
Higher secondary	9	11.8
Graduation	6	7.9
Total	75	100

From the frequency table 1, we have the frequency value for the level of education where number of 4 women is Illiterate, 21 women are Elementary, 23 women are Junior high, 12 women are secondary, 9 women are higher secondary and 6 women are graduation

3.5 Woman occupation

A family status must be depending on the women occupation. Women make an important part in her family. Actually there is no way to avoid the role of women occupation in our family and nation.

Table 2: Occupation of Women

woman occupation	Frequency	Percent
Housewife	71	94.7
Service Holder	4	5.3
Total	75	100

From this table we see that 94.7% women are housewife and also 5.3% women are service holder.

3.6 Cross tabulation of woman responses.

Now a day the numbers of caesarean have been increasing rapidly. Doctors suggested them to do scissor. Also most of the families took decision for that they didn’t want to take any risk .There has been arisen a positive sight in our study that women become aware about their health in pregnancy time as balance dieting, monthly checking up.

Table 3: Frequency of Doctors suggested women to use scissor

	Cross ponding answer	Frequency	Percent
Did anyone give advice to do scissor	Yes	73	93.3
	No	2	2.7
In pregnancy time did you eat balance diet	Yes	55	73.4
	No	20	26.6
Did you visit your Doctor for check up every month	Yes	54	72.0
	No	21	28.0

We see that from the table 3 about 93.3 percentage of woman get advice to do scissor and percentage 2.6 women does not take advice from anyone. Above the information we get, 55 women eat balance diet in pregnancy time and have 73.4%, 20 women do not eat balance diet in pregnancy time have 26.6% in total 75 women. Also we get information from the above observation,54 women visit her doctor for check up every month and have 72%,21 women did not visit her doctor for check up every month and have 28%.

3.7 The correlation between two variables is your age and her husband age.

If we estimate the correlation between two variables is your age and her husband age we get the following table-

Table 4: Correlation of Wife age and Husband Age

	Your age	Husband age
Your age	1	.655
Husband age	.655	1

We get r=0.655, thus we say that the correlation is perfect positive correlation between your age and her husband age. Therefore we easily say that those women age are generally larger as possible as her husband age are larger, similarly those women age are smaller as possible as her husband age are smaller.

3.8 Correlation between doing house hold works time and feeding her child daily.

Correlation between how much time you spent for doing household works (hrs.) and how much times you feed your child daily-

Table 5: Correlation between doing house hold works time and feeding her chid daily

	How much time you spent for doing household works (hrs.)?	How many times you feed your child daily
How much time you spent for doing household works (hrs.)?	1	-0.113
How many times you feed your child daily?	-0.113	1

We get $r = -0.113$, thus we say that the correlation is negative correlation between how much time you spent for doing household works (hrs.) and how many times you feed your child daily. Therefore we say, those women spend much time for doing household works as a regard to spend more generally short time for feed your child daily. And similarly get the alternative.

3.9 Model selection:

Some model selection criteria like R^2 , Adjusted- R^2 , AIC (Akaike Information criteria), SIC (Schwarz Information

Table 6: Model selection criteria

Model	RSS	R^2	\bar{R}^2	AIC	SIC
1	3645.256	.173	.138	52.65	57.77
2	3626.894	.177	.130	53.80	60.88
3	3626.065	.177	.117	55.25	64.48

From the table, it is found that the 1st model is the best model since the value of \bar{R}^2 is largest and AIC, SIC are minimum. We also see that the value of \bar{R}^2 are slightly differ in the above three model. In this view, to avoid the multicollinearity problem the 1st model is selected as the best one.

Since the values of R^2 and adjusted- R^2 (\bar{R}^2) are very small the significance test of the parameters of the selected model is needed to find whether these R^2 and \bar{R}^2 values are statistically significant or not.

3.10 Multiple Regression Analysis of the selected model:

The selected model 1: $BPW = \beta_0 + \beta_1 YA + \beta_2 DHW + \beta_3 MSD + U$

Where,

A= your age

BPW=Just before you got pregnant, how much did you weight

DHW=How much time you spent for doing household

Criteria) are used to find the best model among the following model:

MODEL 1: $BPW = \beta_0 + \beta_1 YA + \beta_2 DHW + \beta_3 MSD + U$

MODEL 2: $BPW = \beta_0 + \beta_1 YA + \beta_2 HMD + \beta_3 DHW +$

$\beta_4 MSD + U$

MODEL 3: $BPW = \beta_0 + \beta_1 YA + \beta_2 HMD + \beta_3 HWD +$

$\beta_4 DHW + \beta_5 MSD + U$

Where,

YA= your age

BPW=Just before you got pregnant, how much did you weight

HMD=How much milk you drank

HWD=How much water you drank every day

DHW=How much time you spent for doing household works

MSD=How many hours you slept daily

U=Random error component

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ Are the parameters of the model.

works

MSD=How many hours you slept daily

U=Random error component

$\beta_1, \beta_2, \beta_3$, Are the parameters of the model.

The parameters of the above model are estimated by applying the SPSS computer package

Program as follows:

Table 7: The Estimated Coefficients for the model

Regression	Coefficients
CNOSTANT	$\beta_0 = 43.845$
YA	$\beta_1 = 5.37$
DHW	$\beta_2 = -1.099$
MSD	$\beta_3 = -1.299$

Hence the fitted regression model becomes-

$BPW = 43.845 + 5.37YA - 1.099DHW - 1.299MSD + U$

Now to test the significance of the regression coefficients the hypotheses are set as-

$$H_0: \beta_1 = \beta_2 = \beta_3 = 0$$

The appropriate test statistic is-

$$F = \frac{MSR}{MSE}$$

Which follows F-distribution with degrees of freedom under null hypotheses.

The value of the statistic can be calculated from the following ANOVA table at 5% level of significance for two tail test:

Table 8: ANOVA (Predictors: (Constant), YA, DHW, MSD
 Dependent Variable: BPW)

Sources of variation	Sum of Squares	df	Mean Square	F	Sig
Regression	760.531	3	253.510	4.938	.004
Residual	3645.256	71	51.342		
Total	4405.787	74			

From the above ANOVA table, the calculated value of the statistic is $F_{cal}=4.938$.

But its tabulated value at 5% level of significance is $F_{5\%,5,74} = 2.37$. As the calculated value is greater than the tabulated value at 5% level of significance, we reject the null hypotheses. That is, the coefficient is not zero and hence the required model is significant.

4. CONCLUSION

The result of the study indicates that the recent status of mothers, looking at the situation of mothers since 1990 women are more concern about education, health and their families. But early marriages still continue. This study has discovered that there are basic, underlying and immediate causes that act at various levels of society and which contribute to the occurrence of women's early pregnancy and complications in Gopalganj and Khulna districts. The correlation between two variable of woman age and her husband age we get $r=0.655$, thus we say that the correlation is perfect positive correlation between woman age and her husband age. Also we get $r=-0.113$, thus we say that the correlation is negative correlation between how much time you spent for doing household works (hrs.) and how much times you feed your child daily. There is a need for urgent interventions to prevent and mitigate the problems that mothers face in pregnancy time and after giving birth of the newborns in the districts by addressing all the identified factors.

REFERENCES:

[1] Bangladesh world health organization "Success factor of woman's and child's health care".
 [2] MATERNAL HEALTH IN BANGLADESH: AT A GLANCE (<http://www.hopeforbangladesh.org/our-projects/maternal-health/>).

[3] How Becoming a Mother involves a Confrontation with Existence: "An Existential-Phenomenological exploration of the experience of early motherhood".
 [4] FACTORS AFFECTING THE INCREASED RATES OF CAESAREAN SECTION IN BANGLADESH (52nd International Course in Health Development/Master of Public Health (ICHD/MPH)).
 [5] Indian Journal of Community Medicine conduct a study on "MATERNAL HEALTH AND LOW BIRTH WEIGHT AMONG INSTITUTIONAL DELIVERIE".
 [6] National L Low B Birth W Weight S Survey of Bangladesh, 2003-2004.
 [7] Insights Nutr Metabol 2017 conduct a study on "Newborn care and breastfeeding practices in Bangladesh".
 [8] Bangladesh Med Res Council Bull 2008 "Socio-economic determinants of low birth weight in Bangladesh": A multivariate approach.
 [9] Indian Journal of Community Medicine Vol. 30, No. 4, October-December, 2005 conduct a study on "Risk Factors Associated with Low Birth Weight in Newborns".
 [10] The journal human Ecology on "Factors Influencing Infant and Child Mortality: A Case Study of Rajshahi District, Bangladesh".
 [11] Bangladesh Medical Research Council Bulletin (2011) "Birth weight of the babies delivered by chronic energy deficient mothers in National Nutrition Program (NNP) intervention area".
 [12] Matern Child Nutr. 2015 Oct study on "Low-birth weight rates higher among Bangladeshi neonates measured during active birth surveillance compared to national survey data"
 [13] "Nutritional Status of Mothers and Low Birth Weight in India".