

# Maternal Factors Affecting Birth Weight of New Born Babies Born in Combined Military Hospital Dhaka

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## Abstract

**Introduction:** Low birth weight (LBW) is one of the pernicious outcomes of pregnancy. To recognize the factors contributing to LBW is therefore of vital significance. But due attention had not been paid to address the issue. This study was carried out to candle the light on maternal demographic and health services factors on birth weight of a newborn baby.

**Objective:** To depict the pattern of birth weight of newborn babies born at CMH Dhaka and to ascertain selected demographic (age, height) pattern and utilization of health service factors of the mothers.

**Materials and Methods:** This cross-sectional study was conducted at Combined Military Hospital (CMH) Dhaka from September to December 2011 among 110 respondents. Data were collected by interview using a semi-structured questionnaire and were checked, edited, coded, categorized, cleaned and analyzed by using SPSS version 16.

**Results:** Mothers' age ranged from 19 to 36 years. Highest 43.6% of mothers belonged to the 20-25 years age group. Teenage mothers were 15.5%. Mothers above 25 years of age gave birth to higher percentage of average weight babies (88.9%) and teenaged (<20 years) mothers gave birth to a higher percentage of LBW babies (17.7%). About 44.5% mothers belonged to height 150-155 cm. Short stature mothers with height 150 cm and below were 16.4% and produced more (33.3%) LBW babies. As the height of the mothers increases, the babies born with better birth weight. The result was statistically significant ( $p < 0.05$ ). All the mothers had antenatal check-up. Highest number of mothers had 4-6 visits. Rate of LBW babies were found highest (31.8%) among the mothers who had minimum number of visits (1-3 visits). Mothers with 7-9 visits had lowest number of LBW babies (4.3%). Proportion of higher birth weight babies (>3500 gm) increased as the number of visits increased. The result was statistically significant ( $p < .05$ ).

**Conclusion:** All these findings suggests that a substantial evidence of demographic factors like age of the mother during pregnancy and height of the mother and utilizing the health care facilities for antenatal care has an effect on birth weight. Ensuring

health care facilities and addressing demographic factors like age of women during marriage, condition can be improved.

**Key-words:** New born babies, Birth weight, Maternal factors, Antenatal care.

## Introduction

Birth weight of an infant is a very important determinant of chances to survival, healthy growth and development. That is why increasing attention is now given to birth weight distributions and especially to the frequency of low birth weight (LBW) as a general indicator of the health status of a population group. Each year 15.5 of all births or more than 20 million infants worldwide are born with LBW. More than 95% of LBW babies are born in developing countries<sup>1</sup>. On an individual basis, birth weight is an important predictor of health; so efforts must go into measuring it as accurately as possible. The smaller the baby, the less is the chance of survival<sup>1,2</sup>.

The epidemiology of LBW is still not well understood, but some identifiable interrelated conditions like maternal malnutrition, unregulated fertility, inadequate antenatal care and several other risk factors have raised the incidence to an alarming level. On the other hand, those mothers living in comparatively better socio-economic conditions could not come out of the problem<sup>3-5</sup>. The aim of this study is to determine the pattern of birth weight of newborns in Armed Forces population born at CMH Dhaka and at the same time to look for the maternal demographic pattern and utilization of health service factors related to this pregnancy outcome. The findings, discussion and recommendation of this study will definitely provide some clue which will definitely help in formulation of effective planning for improvement of birth weight and reduction in the incidence of LBW in the Armed Forces<sup>6,7</sup>. This study was conducted to assess the demographic factors of mothers and utilization of health services which affects the birth weight of babies born at CMH Dhaka.

## Materials and Methods

This cross-sectional study was carried out at CMH Dhaka from September to December 2011. The study population was all the entitled mothers who reported to CMH Dhaka for delivery and their newborn babies. A total of 110 babies and their mothers were

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selected purposively for the study. Mothers were interviewed face to face by using a semi structured questionnaire to collect data. Within 1 hour of birth, weights of the babies were taken. Data were analyzed according to the key variables by using SPSS version 16.

## Results

Mothers' age ranged from 19 to 36 years. Highest number of mothers 48(43.6%) belonged to the 20-25 years age group. Teenage mothers were 17(15.5%) and more than 30 years mothers were 9(8.2%). Majority 49(44.5%) of the mothers height was 150-155 cm. Short stature mothers with height 150 cm and below were 18(16.4%) and 11(10%) mothers height was >160 cm. Mothers having antenatal check-up status found highest number of mothers had 4-6 visits, 39(35.5%) followed by mothers having 10 visits and more 26(23.6%), 7-9 visits 23(20.9%) and 22 (20%) mothers paid minimum number (1-3 visits) of visits (Table-I).

Mothers of more than 25 years age gave birth to higher percentage having average weight babies (88.9%) and teenage mothers (20 years and below) gave birth to a higher percentage of LBW babies (17.7%). The age of mothers increased, the babies were born with higher birth weight. None of the babies weighing 3500 gm and above in the age group 20 years and below, which was 14.6% in 20-25 years, 16.7% in 25-30 years and 22.2% in 30 years and above age group. The result was not statistically significant ( $p > 0.05$ ). Height 150 cm and less, produced more (33.3%) LBW babies than those with height above 150 cm. The table also shows that as the height of the mothers increases, the babies born with better birth weight. Babies weighing 3-3.5 kg was 22.2% in height

group 150 cm and less, 53.1% in 150-155 cm, 56.3% in 150-160 cm height group. None of the babies weighing 3.5 kg and above was in the height group 150 cm and below but it was 54.5% in height more than 160 cm. The result was statistically significant ( $p < .05$ ). Rate of LBW babies were found highest (31.8%) among the mothers who had minimum number of visits (1-3 visits). Mothers with 7-9 visits had lowest number of LBW babies (4.3%). Proportion of higher birth weight babies (>3.5 kg) increased as the number of visits increased. For 1-3 visits it was 4.5%, 4-6 visits 5.1%, 7-9 visits 17.4% and for more than 10 visits it was 30.8%. The result was statistically significant ( $p < 0.05$ ) (Table-II).

**Table-I:** Distribution of mothers' by age, height and ante-natal checkup status(n=110)

Characteristics		Frequency	Percentage
Age (years)	≤ 20	17	15.5
	20-25	48	43.6
	25-30	36	32.7
	>30	9	8.2
	Mean ± SD = 25.1±4.1		
Height (cm)	≤ 150	18	16.4
	150-155	49	44.5
	155-160	32	29.1
	>160	11	10.0
	Mean ± SD = 154.8±4.2		
Number of Antenatal visit	1-3	22	20.0
	4-6	39	35.5
	7-9	23	20.9
	≥10	26	23.6

**Table-II:** Association of birth weight of baby with maternal age and height (n=110)

Characteristics		Birth weight in kg					Total	Statistics
		< 2.0	2.0-2.5	2.5-3.0	3.0-3.5	> 3.5		
Age (years)	≤ 20	2(11.8)	1(5.9)	4(23.5)	10(58.8)	0	17(100)	$\chi^2 = 11.907$ df = 12 p > 0.05
	20-25	2(4.2)	4(8.3)	15(31.3)	20(41.7)	7(14.6)	48(100)	
	25-30	0	4(11.1)	8(22.2)	18(50.0)	6(16.7)	36(100)	
	>30	0	1(11.1)	4(44.4)	2(22.2)	2(22.2)	9(100)	
	Total	4(3.6)	10(9.1)	31(28.2)	50(45.5)	15(13.6)	110(100)	
Height (cm)	≤ 150	2(11.1)	4(22.2)	8(44.4)	4(22.2)	0	18 100)	$\chi^2 = 35.173$ df = 12 p < 0.05
	150-155	1(2.0)	4(8.2)	12(24.5)	26(53.1)	6(12.2)	49(100)	
	155-160	0	1(3.1)	10(31.3)	18(56.3)	3(9.4)	32(100)	
	>160	1(9.1)	1(9.1)	1(9.1)	2(18.2)	6(54.5)	11(100)	
	Total	4(3.6)	10(9.1)	31(28.2)	50(45.5)	15(13.6)	110(100)	
Number of Antenatal visit	1-3	2(9.1)	5(22.7)	10(45.5)	4(18.2)	1(4.5)	22(100)	$\chi^2 = 29.986$ df = 12 p < 0.05
	4-6	0	3(7.7)	12(30.8)	22(56.4)	2(5.1)	39(100)	
	7-9	0	1(4.3)	5(21.7)	13(56.5)	4(17.4)	23(100)	
	≥10	2(7.7)	1(3.8)	4(15.4)	11(42.3)	8(30.8)	26(100)	
	Total	4(3.6)	10(9.1)	31(28.2)	50(45.5)	15(13.6)	110(100)	

## Discussion

This cross-sectional study was carried out on mothers who delivered their babies at CMH Dhaka to find out the demographic and health services mothers received during pregnancy that influence birth weight of newborn babies in Armed Forces. In this study age of the mother during pregnancy, mothers' height and ante-natal check-up were studied. The significance of birth weight is one of the most important determinant of infant mortality and morbidity is well documented in social and bio-medical research. Infants of LBW (i.e., less than 2500 gm), the risk of dying in the first year of life is about 20 times more than that of infants weighing 2500 gm or more<sup>1</sup>. For infants of very low birth weight (VLBW) (i.e., less than 1500 gm), the risk is considerably greater, about 90 times more than that of infants weighing 2500 gm or more<sup>5</sup>. In the present study 12.7% of the babies were LBW with birth weight less than 2500 gm and the mean birth weight was 2949.82 gm. According to WHO/UNICEF global estimates, the incidence of LBW in Bangladesh was 30% and in a study conducted by Bangladesh Bureau of Statistics (BBS), mean birth weight was 2632 gm<sup>6-8</sup>. This improvement in frequency and in mean birth weight is due to the better socio-economic conditions and health care facilities in Armed Forces Hospital and Child Welfare Clinics (CWC), higher literacy rate (100%), lower number of parity (mean 1.78)<sup>9,10</sup>.

Age of mother influences the weight of the baby. In this study maternal age was ranged from 19 to 36 years. Teenage mothers (20 years and below) were 17(15.5%) and gave birth to higher percentage (17.6%) of LBW babies. Teenage mothers have not completed their growth and yet to reach their own adult stature or organ size. So it is probable that nutrients divert for mothers own growth and may lead to intra-uterine growth retardation (IUGR). Mothers of 25-30 and above that age group had higher rate (88.9%) of average weight babies. The other age group (20-25 years) had also almost the same rate of average birth weight. Mean birth weight was found lowest (2767.7 gm) among age group 20 years and below and it increased with the age and highest (3056.6 gm) among 30 years and above age group of mothers. As the highest age of mothers were 36 years, so the effect of advanced maternal age (more than 36 years) could not be studied. Babies born to teenage mothers have been shown to be significantly lighter than those born to older mothers and weight of babies improved with increasing age of mothers in studies of Kramer MS<sup>11</sup> and Hughes K<sup>12</sup>. The researchers found that birth weight declined beyond an age of optimum reproductive efficiency. In Bangladesh it was found in a study by Begum MR<sup>4</sup> that birth weight was lowest in the age 15-19 years and rose up to 34 years, beyond which age no change was noted.

Maternal height has a positive effect on birth weight. Mothers with height 150 cm and less delivered more (33.3%) LBW babies than those with height above 150 cm. As the height of the mothers increased, the babies born with better birth weight. Babies weighing 3000-3500 gm was 22.2% in height group 150 cm and

below, 53.1% in 150-155 cm, 56.3% in 155-160 cm height. None of the babies weighing 3500 gm and above was in the height 150 cm and below but it was 54.5% in more than 160 cm. The result was statistically significant ( $p < .05$ ). Studies by Kramer MS<sup>11</sup> and Banje H<sup>13</sup> et al and Richard EB<sup>14</sup> has also shown similar positive effect of maternal height on birth weight. Ante-natal care has positive impact on birth weight through awareness on nutrition, diagnosis and timely treatment of complications related to pregnancy. In this study mothers with a few antenatal visits (1-3 visits), gave birth to more LBW babies (31.8%). On the other hand, mothers having regular ante-natal care delivered higher percentage of (92.1%) average weight babies. Proportion of higher birth weight babies (>3.5 kg) increased with the number of visits. Mothers with 1-3 visits it was 4.5%, 4-6 visits 5.1%, 7-9 visits 17.4% and for more than 10 visits it was 30.8% and the result was found statistically significant ( $p < .05$ ). Similar findings were reported in other studies done by Kramer MS<sup>11</sup> and Begum MR<sup>4</sup>.

## Conclusion

The study revealed most of the babies had average birth weight and about 13% were LBW babies. LBW babies were found more among the teenaged ( $\leq 20$  years) mothers; on the other hand, mothers with more than 20 years of age gave birth to higher percentage of average weight babies. As the age of mothers increased, they gave birth to more numbers of higher birth weight babies. So age of mothers influences birth weight. Maternal height was positively related to birth weight. Mean and higher birth weight increased with the increase of height of mothers. Maternal antenatal care also has a significant positive impact on birth weight. Majority of the mothers, who attended antenatal checkup regularly, gave birth to higher rate of average weight babies. All these study findings suggest that there exists significant evidence of association between maternal age, height and utilization of health care facilities and birth weight of new born babies. Efforts should be taken to reduce the number of LBW babies by increasing marital age of women and by ensuring adequate antenatal care.

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