



Low Birth Weight and Associated Factors of New Born in Selected Slum

Islam S¹, Jahan N², Zaman KS², Shafiq S², Mortaz R¹, Mortaz R¹, Kulsum U³, Ahmed MU^{4*}

¹Associate Professor, Department of Laboratory Medicine, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

²Assistant Professor, Department of Laboratory Medicine, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

³Associate Professor, Department of Fetomaternal Medicine, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

⁴Chief Medical Technologist, Department of Laboratory Medicine, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

*Corresponding author: Mesbah Uddin Ahmed, Chief Medical Technologist, Department of Laboratory Medicine, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh; E-mail: monoarmunna@yahoo.com

Received date: 1st April 2025; Accepted date: 20th May 2025; Published date: 10th June 2025

Abstract

Bangladesh is one of the least developing countries of the world where poverty, literacy, diseases and disaster is common phenomenon. Low birth weight (LBW) was the leading cause of neonatal and under-five mortality [1]. Understanding the causes of and circumstances of LBW neonatal and under-five death is necessary to achieve the Sustainable Development Goal 3, target 3.2, which aims to reduce neonatal mortality at 12 per 1,000 live births and under-5 mortality at 25 per 1,000 live births by 2030 [2]. However, various studies have found that LBW has a significant impact on neonatal and under-five mortality in countries such as Bangladesh [3]. Both biological and demographic factors affect birth weight in Bangladesh [4]. LBW is most often caused by being born before 37 weeks of pregnancy. Being born before the 37th week of pregnancy is the leading cause of LBW. Globally, more than 80% of new born babies die due to LBW [5-8]. Intensive care of these infants and prevention of low-birth-weight deliveries by proper antenatal monitoring, along birth control of maternal factors and pregnancy related problems, carry the potential for significant reduction of both mortality and morbidity of infants. To achieve this, it is also important to know the maternal causative factors and give attention to reduce the low birth weight of the babies. Birth weight is powerful predictor of neonatal growth and survival. Baby born with low birth weight begin their life immediately disadvantaged and face extremely poor survival rates. So low birth weight baby is the single most important determinants of its chances of survival, healthy growth and development. So, this study will show the association of low birth weight with some common maternal factors and will try to provide relevant information in respect to our context. In Bangladesh lack of relevant and reliable information are main reasons for which the health planners have paid little attention during pregnancy period. It may help in prevention programs rather than treatment of low-birth-weight babies born later. The information which would be obtained from this study could be utilized to undertake appropriate measures for policy making and strengthen Maternal and Child Health Care services.

Keywords: Pandemic; COVID-19; Coronavirus

Copyright: © 2025 Ahmed MU. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Introduction

Bangladesh is one of the least developing countries of the world where poverty, literacy, diseases and disaster is common phenomenon. Low birth weight (LBW) was the leading cause of neonatal and under-five mortality [1]. Understanding the causes of and circumstances of LBW neonatal and under-five death is

necessary to achieve the Sustainable Development Goal 3, target 3.2, which aims to reduce neonatal mortality at 12 per 1,000 live births and under-5 mortality at 25 per 1,000 live births by 2030 [2]. However, various studies have found that LBW has a significant impact on neonatal and under-five mortality in countries such as Bangladesh [3]. Both biological and demographic factors affect birth weight in Bangladesh [4]. LBW

is most often caused by being born before 37 weeks of pregnancy. Being born before the 37th week of pregnancy is the leading cause of LBW. Globally, more than 80% of new born babies die due to LBW [5-8]. Intensive care of these infants and prevention of low-birth-weight deliveries by proper antenatal monitoring, along birth control of maternal factors and pregnancy related problems, carry the potential for significant reduction of both mortality and morbidity of infants. To achieve this, it is also important to know the maternal causative factors and give attention to reduce the low birth weight of the babies. Birth weight is powerful predictor of neonatal growth and survival. Baby born with low birth weight begin their life immediately disadvantaged and face extremely poor survival rates. So low birth weight baby is the single most important determinants of its chances of survival, healthy growth and development. So, this study will show the association of low birth weight with some common maternal factors and will try to provide relevant information in respect to our context. In Bangladesh lack of relevant and reliable information are main reasons for which the health planners have paid little attention during pregnancy period. It may help in prevention programs rather than treatment of low-birth-weight babies born later. The information which would be obtained from this study could be utilized to undertake appropriate measures for policy making and strengthen Maternal and Child Health Care services.

Methods

This was a descriptive type of cross-sectional study to find out factors affecting birth weight of new born. The study period was 6 months. Target population was women of child-bearing age (15-49 years) who have delivered babies in Kalyanpur and Beltola slum. From the target population required number of sample women (320) was included in the study by using Z^2pq/d^2 formula. A purposive sampling technique used for the study. The quality of data ensured during data collection, data processing and analysis. Those who had given verbal consent were allowed in this study. Without consent no one was included in the study which was against Declaration of the World Medical Association in Geneva. The study was conducted simultaneously with other activities of the course in a constrain of time.

Results

This table shows that majority (38.5%) were 20-24 years. 28.3% were 25-29 years, 17.4% were 15-19 years. 13.3% were 30-34 years and 2.5% were 35-39 years. Majority (36.9%) of the mothers education level were secondary, 28.4% were graduate or above, 24.1% were primary and 8.1% were can sing only, 2.2% were illiterate and 0.3% were HSC. This table also shows that majority (46.3%) of the mothers were housewife, 37.5% were employee, 8.8% were teacher, 6.3% were student, 0.6% were doctor, businessman. Majority (36.6%) of the respondent's monthly income were 9000-13000 BDT.

Table 1: Distribution of the respondents according to socioeconomic condition.

Socio-economic status		
Age group in years	Frequency	Percentage
15-19	56	17.4
20-24	123	38.5
25-29	90	28.3
30-34	43	13.3
35-39	8	2.5
Education of mother		
Illiterate	7	2.2
Can sing only	26	8.1
Primary	77	24.1
Secondary	118	36.9
HSC	1	0.3
Graduate or above	91	28.4
Occupation		
Housewife	148	46.3
Student	20	6.3
Employee	120	37.5
Teacher	28	8.8
Business	2	0.6
Monthly family income in BDT		
<5000	7	2.2
5000-9000	50	15.6
9000-13000	117	36.6
13000-17000	64	20
17000-21000	44	13.8
21000-26000	19	5.9
26000-30000	10	3.1
>30000	9	2.8

This table shows that majority (43.8%) of the respondent's food habit during pregnancy was sufficient, 32.2% were insufficient, 13.1% were as before and 10.9% were less than normal.

Table 2: Food intake during pregnancy.

Food intake during pregnancy	Frequency	Percentage
Sufficient	140	43.8
Insufficient	103	32.2
Less than normal	35	10.9
As before	42	13.1
Total	320	100

This table shows that majority (53.4%) of the respondent's sleeping habit during pregnancy were as before, 35.6% were less than normal, 8.4% were more than normal and 2.5% were can't recall.

Table 3: Distribution of respondents according to sleep during pregnancy.

Sleep during pregnancy	Frequency	Percentage
More than normal	27	8.4
Less than normal	114	35.6
As before	171	53.4
Can't recall	8	2.5
Total	320	100

Majority (93.4%) of the pregnant women took iron tablets. Besides majority (79.4%) of the pregnant women consumed folic acid. In history of taking calcium tablets during pregnancy, majority (80.3%) of the pregnant women took calcium tablets.

Table 4: Distribution of respondents according to the history of taking iron, folic acid and calcium tablets during this pregnancy.

Iron Tablet	Frequency	Percentage
Yes	299	93.4
No	21	6.6
Folic Acid		
Yes	254	79.4
No	66	20.6
Calcium		
Yes	257	80.3
No	63	19.7

This table shows that the majority (63.1%) of the pregnant women's baby's weight was 2.5 – 3.9 kg, 9.1% of the pregnant women's baby's weight was ≥4.0 kg, 27.8% of the pregnant women's baby's weight was < 2.5 kg.

Table 5: Distribution of Mothers according to Baby's birth weight.

Baby's birth weight (kg)	Frequency	Percentage
Low	89	27.8
Normal	202	63.1
High	29	9.1
Total	320	100

Table shows 48.8% neonates birth weight (kg) were born to mothers whose age group was 20-24 years, 24.4% neonates birth weight (kg) were born to mothers whose age group was 25-29 years, On the other hand 12.2% neonates birth weight (kg) were born to mothers whose age group was 15-19 years, 7.3% neonates birth weight (kg) were born to mothers whose age group was 30-34 years and 35-39 years. Here p value is 0.025 which is lesser than customary 0.05.

Table 6: Association between maternal age & birth weight of baby.

Maternal Age (years)	Birth weight (kg)						Total
	< 2.5		2.5 – 3.9		≥ 4.0		
	n	%	n	%	n	%	
15-19	5	12.2	38	18.1	5	7.2	48
20-24	20	48.8	82	39	28	40.6	130

25-29	10	24.4	92	24.8	29	42	131
30-34	3	7.3	33	15.7	6	8.7	42
35-39	3	7.3	5	2.4	1	1.4	9
Total	41	100	210	100	69	100	320

Pearson Chi-Square	Value	df	Asymp. Sig. (2-sided)
	17.546	8	0.025

Table shows 51.2% neonates birth weight (kg) was born to mothers whose BMI was normal (19.8-26). 36.6% neonate's birth weight (kg) was born to mothers whose BMI was low (19.8). On the other hand 12.2% neonates birth weight (kg) were born to mothers whose BMI was high (26.1-29). That is the normal the maternal BMI, the lesser is the risk of producing LBW babies. The findings are statistically strongly significant.

Table 7: Association between maternal BMI & birth weight of baby

Maternal BMI	Birth weight (kg)					
	< 2.5		2.5-3.9		≥ 4.0	
	n	%	n	%	n	%
Low	15	36.6	69	32.9	5	7.2
Normal	21	51.2	130	61.9	51	73.9
Overweight	5	12.2	11	5.2	9	13
Obese	0	0	0	0	4	5.8
Total	41	100	210	100	69	100

Pearson Chi-Square	Value	df	Asymp. Sig. (2-sided)
	35.549	6	0.000

Discussion

Birth weight of new born is a public health importance because of the strong relationship between birth weight and infant mortality and morbidity. At low birth weight babies faced various problem and maternal factors related to low birth weight babies. To get accurate information about the factors influencing neonatal outcome a community-based study was needed which could reveal a real picture. However this study provided information of a hospital setting. BMI is usually used as a parameter for non-pregnant women. Neonatal wellbeing largely depends on its birth weight and other anthropometric easements. Therefore it is suggested that to assess the neonatal outcome of a term baby birth weight should be consider [9]. In this study an analysis of several factors influencing neonatal outcome was done. It showed that maternal age, height, weight, BMI had an influence on neonatal outcome. Various studies were conducted in many countries about the incidence and factors related with low birth weight. The major and lowest birth weights were reported for Asia.10 According to

the demographic and health survey, 30% low birth weight babies are born in Bangladesh, 21% in Nepal and 22% in Srilanka. This indicates the poorest condition of birth weight in Bangladesh among these countries. In the present study, LBW was found 19.5%, which is similar to the finding of Khanam study [10]. She found LBW 20.6% in a longitudinal anthropometric study of mother-infant pair from Dhaka. Hasin M (1991) showed similar finding [11]. According to a study, the highest prevalence of LBW in Chittagong (20.8%) followed by Sylhet (20.1%), Rajshahi (16.1%), Barisal (15.6%), Dhaka (15.6%), Khulna (15.1%), Rangpur (13.8%) while the lowest prevalence of LBW was found in Mymensingh (11.3%) [12]. But the percentage of LBW in the present study is not consistent with that of UNICEF as because the study is hospital based and the study population who sought medical care was restricted within the middle class and affluent society. In this study mean birth weight was found slightly higher than a previous study. Fatmi and Nessa (2001) found mean birth weight $2.5\text{kg} \pm 0.4$ in her study conducted in a hospital in Dhaka city [13]. The difference in birth weight with the other study could be due to better economic status of the sample population of the current study. Mothers who are economically solvent are conscious about their health, antenatal care and immunization. For this reason, they are able to give birth of babies of at least average weight. Although, in this study the birth weight was differed, because maternal nutritional status influence more on birth weight than other anthropometric measurements of the infant. In this study highest percentage of LBW babies were found among the teen-aged mothers and with the increase of maternal age birth weight of their babies increased. Several studies had found that a mother's education was a significant determinant of LBW [14-16]. No educated mothers are not more aware of their health and nutrition than educated mothers. Bangladesh's government should take the required steps to increase the literacy rate by incorporating a national education strategy and offering subsidies to women who live in the poorest families to attend school. Enhancing the education level will also diminish the prevalence of LBW. The study showed that proportion of LBW was observed among the mothers who have child bearing age, normal BMI. This indicates good health status of mothers significantly influence outcome of pregnancy. Present study also showed that the normal the maternal BMI, the greater is the tendency of producing normal birth weight babies. This study had some limitations. As the population of this study was taken from specialized groups, so maternal factors and pattern of birth weight of babies vary from general population and sample size and the findings could not be generalized for whole of the nation. As because the maternal factors determined after delivery so pre-delivery maternal factors and pregnancy related clinical complications could not identify accurately after delivery.

Conclusion

This study concluded that the most common age of the mother of low birth weight was 20-24 years. Most of them were in poor to

mid socio-economic condition. Practice of taking Iron, Folic acid and Calcium tablet was satisfactory. Finally, it was considered as a public health problem and the findings of present study will help as a guideline for future program of maternal and child health.

References

1. National Institute of Population Research and Training (NIPORT), Mitra and Associates, and ICF International. 2016. Bangladesh Demographic and Health Survey 2014. Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPORT, Mitra and Associates, and ICF International.
2. Sachs J, Kroll C, Lafortune G, Fuller G, Woelm F. Sustainable Development Report. Cambridge University Press. 2021
3. Yasmin S, Osrin D, Paul E, Costello A. Neonatal mortality of low-birth-weight infants in Bangladesh. *Bulletin of the World Health Organization*. 2001; 79: 608-14.
4. Khan JR, Islam MM, Awan N, Muurlink O. Analysis of low birth weight and its co-variants in Bangladesh based on a sub-sample from nationally representative survey. *BMC Pediatr*. 2018; 18(1):1-9.
5. Rasul HC. Hossain AM. Rahman SM. Low Birth Weight and Socioeconomic Status Bangladesh Medical. 1997; 30(1):8-10
6. Blencowe H, Cousens S, Oestergaard MZ, Chou D, Moller AB, Narwal R, et al. National, regional, and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: a systematic analysis and implications. *Lancet*. 2012; 379(9832): 2162-2172.
7. Blencowe H, Krusevec J, de Onis M, Black RE, An X, Stevens GA, et al. National, regional, and worldwide estimates of low birth weight in 2015, with trends from 2000: a systematic analysis. *Lancet Glob Health*. 2019; 7(7): 849-860.
8. Katz J, Lee AC, Kozuki N, Lawn JE, Cousens S, Blencowe H, et al. Mortality risk in preterm and small-for-gestational-age infants in low-income and middle-income countries: a pooled country analysis. *Lancet*. 2013; 382(9890):417-425.
9. Lawn JE, Blencowe H, Oza S, You D, Lee AC, Waiswa P, et al. Every Newborn: progress, priorities, and potential beyond survival. *Lancet*. 2014; 384(9938):189-205.
10. Nahar N, Afroza S, Hossain M, Incidence of Low Birth Weight in there Selected Communities of Bangladesh. *Bangladesh Med. Res. Counc. Bull*.1998;24(2):49-54
11. Khanam S, Islam NM, Kawser AC, Maternal and Socio-Economic Risk Factors Associated with Low Birth Weight, Bangladesh. *Journal of Child Health* 1995;19(4):112-116
12. Hasin M. Low Birth Weight in Kualalampur, Asia Oceania *J. of Obst. And Gynaecol*.1991; 17(2):135
13. Islam Pollob SMA, Abedin MM, Islam MT, Islam MM, Maniruzzaman M. Predicting risks of low birth weight in Bangladesh with machine learning. *PLoS One*.2022; 17(5):0267190.
14. Fatmi EL, Nessa N. Trends of Low Birth Weight and Pre-Term in Institutional Deliveries: Present and Past Status. *Bangladesh Journal of Child Health*, 2021; 259(1/2):9-12
15. Khan JR, Islam MM, Awan N, Muurlink O. Analysis of low birth weight and its co-variants in Bangladesh based on a sub-sample from nationally representative survey. *BMC Pediatr*. 2018; 18(1):1-9.

16. Khatun S, Rahman M. Socio-economic determinants of low birth weight in Bangladesh: a multivariate approach. Bangladesh Med Res Counc Bull. 2008; 34(3):81-6.
17. Rahman MS, Howlader T, Masud MS, Rahman ML. Association of low-birth-weight with malnutrition in children under five years in Bangladesh: do mother's education, socio-economic status, and birth interval matter?. PloS One. 2016; 11(6):0157814.