



## Relationship between adequate antenatal care and newborn birth weight among Bangladeshi women

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### ABSTRACT

Maternal and infant morbidity and mortality are major issues in developing countries including Bangladesh. Evidences have shown that adequate prenatal care is required in order to promote healthy behavioral patterns and also to reduce the incidence of maternal and infant morbidity and mortality. This descriptive correlational study aimed to examine the relationship between adequate prenatal care and newborn birth weight among Bangladeshi women. It was hypothesized that mothers' who received adequate antenatal care would have significant association with normal birth weight. The data were collected using interviewer-administered questionnaires including: personal data form and the adequacy of antenatal care utilization questionnaires. The technique of purposive sampling method was applied to recruit 110 mothers who gave birth at tertiary level hospital in Bangladesh. The data were analyzed using descriptive and inferential statistical tools. The Chi-square result indicated that there was significant association (Chi-square=45.02;  $p < 0.000$ ) between women with adequate antenatal care and newborn birth weight. In conclusion, based on the finding low birth weight can be effectively prevented by adequate prenatal care in its current situation in Bangladesh. Enhance adequacy of prenatal care will require among women in order to reduce or prevent low birth weight and contextually incorporated strategy to promote optimal level of women's reproductive health not only during pregnancy, but it should be given emphasis over the life course. Thus, hospital administrators could use the findings of this research study to expand policy and strategy to ensure adequate antenatal care among Bangladeshi women in order to enhance newborn birth weight.

### INTRODUCTION

Prenatal care is a preventive health service with the goal of providing regular check-ups by the health care provider, in order to prevent possible health problems of the mother and the fetus throughout the term of the pregnancy. Adequate prenatal care is considered to be one of the important national goals in the Healthy People by 2020 program (Savage et al., 2015). The World Health Organization (WHO) defined prenatal care as pregnancy-related care provided by a health worker, either in a prenatal clinic or at the domicile. Prenatal care should address both the medical and psychosocial and requirements of a pregnant woman in the perspective of the health care delivery system and the surrounding culture (WHO, 1996). The concept of the adequacy of prenatal care services is acknowledged as an essential stage in the life of pregnant women

(Alves et al., 2015). In pregnancy, adequate prenatal care is required in order to promote healthy behavioral patterns and also to reduce the incidence of preterm births, low birth weight (LBW) babies, still births as well as some major causes of the illnesses of newborn babies (Adane et al., 2014). In addition, adequate antenatal care is also concerned generally with early recognition, diagnosis, prevention, and treatment of pregnancy related complications. Prenatal care services include tetanus immunization, syphilis screening and treatment of malaria prophylaxis, HIV information and testing, education about nutrition and management; and monitoring for possible complications (Mrisho et al., 2009). Antenatal care is a priority program for all the Southeast Asia Regional countries, including Bangladesh, a developing country, where maternal mortality continues to be a major problem (WHO, 2002).

It is found that; the incidence of low birth weight (LBW) is higher among the mother with inadequate antenatal care compared to those who obtain adequate antenatal care. LBW, defined more weighing less than 2500gm at birth, is a leading causes of neonatal morbidity and mortality. Low birth weight is one of the most serious challenges in child health in both developed and developing countries (Bhimwal et al., 2017). The proportion of low birth weight infant in developing countries is around 20-30 percent or even higher (Sousa et al., 2017). Antenatal care is globally accepted and commonly understood to have a beneficial impact on pregnancy outcome (Chuku, 2008). More than two decades, adequate prenatal care has become recognized as the crucial public health intervention for preventing LBW (Lu et al., 2009). Despite this importance there is very limited study conducted on adequate antenatal care and newborn birth weight among postpartum mothers in Bangladesh. Therefore, this study may have some important outcome which will help to detect the actual problem related to implementation of adequate antenatal care services

## **MATERIALS AND METHODS**

### **Design**

A descriptive correlational design was used to examine the relationship between newborn birth weight and adequate antenatal care.

### **Sample and setting**

The target population was estimated to be about 3123 pregnant women who were admitted in SSMC&MH Dhaka, Bangladesh. The total sample was set at 110. Participants were purposively selected if they were: postpartum mother aged between 15 – 49 years, admitted in tertiary level hospital at SSMCH&MH, Dhaka, willing to participate in the study as well as have enough time to spend for the interview for the study; the participants should have well communication skills in terms of express idea of experience without any hesitation. Non postpartum mother, mothers who were not admitted at SSMCH&MH, Dhaka, having any complications such as excessive bleeding, Eclampsia, and not willing to

participate in the study also was excluded from the study. The hospital was selected for research setting because it is a government teaching hospital at tertiary level and majority of the pregnant women in Dhaka were admitted at this hospital for the purpose of giving birth.

### **Measurements**

Two instruments were used to collect data. 1) The Personal Data Form, 2) the adequacy of antenatal care utilization questionnaires. The questionnaires were developed by the principal investigator (PI) to obtain participants' sociodemographic information and antenatal care information and newborn birth weight information. This included mother's age, educational level, family yearly income, mother's working status, and newborn birth weight. The Personal Data Form consisted of 13 items and adequacy of antenatal utilization questionnaires consisted of 15 items.

### **Ethical considerations**

This study was approved by the Research Ethics Committee, of National Institute of Preventive and Social Medicine in Bangladesh and the director of the SSMC & MH of Bangladesh. All mothers were informed regarding the aims of the study, the handling of confidentiality and anonymity issues, and their right to withdraw from the study at any time without any consequences of their health care service, and all participants signed on the consent form prior to data collection.

### **Data Collection**

After getting approval the Research Ethics Committee of National Institute of Preventive and Social Medicine in Bangladesh and the director of the SSMC & MH of Bangladesh, one hundred ten post partum mothers were recruited for the study. A pilot study was conducted with 20 pregnant women of one tertiary level hospital. The Cronbach's Alpha coefficient of the questionnaire was .88. Before starting the data collection, each woman was given an explanation of the research objectives and then asked to sign the consent form if they were willing to participate in this study. After receiving their consent, the researcher asked the mother to response to the questionnaires. The process took about 30-35 minutes.

## Data analysis

Data were analyzed using descriptive statistics, and Chi-square test (SPSS version 13.0). Descriptive statistics were used to describe the demographic and obstetrical characteristics of the postpartum women. The relationship between adequate antenatal care and newborn birth weight was performed using the using the Chi-square statistics.

## RESULTS AND DISCUSSION

A total of 110 postpartum mother completed questionnaires from the selected hospital. The mean age of the participants was 21.98 years (SD = 4.16), ranging from 15-35 years. Most of them were Muslim (80.0%); and hold a secondary education (45.45%) followed by primary education (20.0%). Almost all of them were housewives (89.08%). Most of their spouses were private services (38.18%) with very small amount of income. Majority of them (74.54%) had monthly family income less than 10,000 BD Taka (around 125.00US\$) with the mean family income of 9568.18 BD Taka (around 120.96 US\$) (Table 1).

Table 1  
Demographic characteristics of participants (n=110)

Characteristics	Frequency	Percentage
Age (Years); (Mean =21.98, SD=4.16, Range = 15-35)		
<20	35	31.80
20-30	67	61.00
>30	8	7.30
Religion		
Islam	88	80.0
Hindu	22	20.0
Level of education		
Illiterate	19	17.28
Primary	22	20.00
Secondary	50	45.45
Higher Secondary and above	19	17.27
Occupational status of women		
Housewife	98	89.08
School teacher	12	10.92

spouse		
Private service	42	38.18
Business	36	32.72
Day labor	32	29.10
Monthly family income (BD Taka*) (Mean =9568.18, SD=7778.61 Range = 2,000-30,000)		
<10,000	82	74.54
10,000-20,000	16	14.55
>20,000	12	10.91

\* Note: (Approximately 80 BD Taka equals to 1 US\$)

Antenatal care was categorized into two levels that are adequate and inadequate antenatal care. The findings showed that many of them received inadequate (0-3 visits) antenatal care visits (52.72%) whereas, only (47.28%) received adequate (4 and more visits) antenatal care visits during their pregnancy. As regards birth weight of the new born babies, the mean were 2.70kg (SD=.50), ranging from 2-4.5 kg. Highest percentage of the newborn babies were in the weight group 2.5kg- 3.5 kg (40.9%) followed by <2.5 kg (30.9%) and >3.5kg (28.2%) (Table 2).

Table 2  
Frequency and percentage of antenatal care and new born birth weight (n=110)

Number of antenatal visits	Frequency	Percentage
Category of antenatal care		
Adequate antenatal care	58	52.72
Inadequate antenatal care	52	47.28
Newborn babies' birth weight		
<2.5 kg	34	30.91
2.5kg- 3.5 kg	45	40.91
>3.5kg	31	28.18

The relationship between exposed and not exposed to ANC by the respondents and birth weight of their newborn babies. Data analysis indicated that the low birth weight was found to be high among the mother of not exposed to antenatal care (79.49%). There was significant association (Chi-square = 45.02; p <0.000) between mother with adequate antenatal care and newborn birth weight (Table 3).

Table 3  
Relationship between adequate ANC and newborn birth weight (n= 110).

Received and not received adequate ANC	Weight of newborn baby						Total
	< 2.5kg		2.5-3.5kg		>3.5kg		
	No	%	No	%	No	%	
Yes	8	11.27	47	66.20	16	22.53	71
No	31	79.49	8	20.51	0	.00	39
Total	39	35.45	55	50	16	14.55	110

Chi- square = 45.02; P <0.000

The results of this study have shown that the mean age of the participants was 21.98 years (SD = 4.16), ranging from 15-35 years. Most of them were Muslim (80.0%); and hold a secondary education (45.45%) followed by primary education (20.0%). Almost all of them were housewives (89.08%). Most of their spouses were private services (38.18%) with very small amount of income. Above half of them (74.54%) had monthly family income less than 10,000 BD Taka (around 125.00US\$) with the mean family income of 9568.18 BD Taka (around 120.96 US\$) (Table 1).

Antenatal care is a preventive health service with the goal of providing regular check-ups by the health care provider, in order to prevent possible health problems of the mother and the fetus throughout the term of the pregnancy (Savage et al., 2015). Despite its importance during pregnancy, the amount of mothers' who are attended antenatal care visits by skilled attendants continues to remain near to the ground in Bangladesh. The results of this study have shown that most of the mother received inadequate (0-3 visits) antenatal care visits (52.72%). However only (47.28%) received adequate (4 and more visits) antenatal care visits during their pregnancy. This finding is higher than the findings with those in previous studies conducted in Ethiopia (33.00%) (Muchie, 2017) and in Ghana (34.6%) (Saaka et al., 2016) that women received adequate number of prenatal care. However, this finding is lower than the findings in studies done in Benin (59.56%) (Dansou et al., 2017) and in Myanmar (57.1%) (Soe et al., 2015).

The possible explanations are this small proportion of women's received adequate number of antenatal

care might be; due to the household workload and child care have declined their consideration to their antenatal care as well as health status. In addition, amongst the other factors that decrease the adequate number of antenatal care of women are: not recognize their pregnancy early, lack of knowledge about necessities of antenatal care. In addition, the financial burden might be an important issue for all the mothers since most of the mothers' reported their monthly family income less than 10,000 BD Taka (Table 1). Therefore, pregnant women and relatives need to attend the counseling session about an importance of antenatal care and they take necessary actions related to their adequate number of antenatal care recommended by World Health Organization.

Normal birth weight was found to be statistically very highly significant association between mothers' with adequate ANC (Chi- square = 45.02; P <0 .000). The findings of this study were congruence with the finding of previous studies. Previous studies have found that there were significant relationship between number of antenatal visits and birth weight (OR=1.78, p <0.5) in Brazil (da Fonseca et al., 2014) and in Zimbabwe (OR-1.3, p <0.5) (Yaya et al., 2017). They found that mothers' who had more than four ANC visits had higher odds of their newborn's birth weight than those with less than four visits. The possible explanations are knowledge and responsiveness of the mother about antenatal care might be higher among literates mother who may be better in receiving information and have to enhance communication pattern when compared to those who are illiterates. In addition, monthly family income of the women also related to newborn low birth weight. The proportion of LBW among women of low economic class was higher

when compared to those in high economic status. Therefore this study reveals that the knowledge of mothers is not satisfactory about antenatal care and prevention of low birth weight.

## CONCLUSION

From the study findings, it may be concluded that mothers who were exposed to antenatal care had normal birth weight. Information about necessity of antenatal care is needed to prevent low birth weight, as well as measures in terms of poverty, illiteracy; women's education and nutritional intervention are needed.

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