

## Maternal and Fetal Outcomes of Adolescent Pregnancy in A Tertiary Care Hospital in Bangladesh

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### ABSTRACT

**Background:** Adolescent pregnancy remains a major public-health challenge in Bangladesh, contributing significantly to maternal and neonatal morbidity and mortality. Biological immaturity, poor nutrition, and limited access to healthcare exacerbate these risks. This study aimed to assess the maternal and fetal outcomes of adolescent pregnancy in a tertiary care hospital in Bangladesh.

**Methods:** A descriptive cross-sectional study was conducted among 76 adolescent mothers aged 13–19 years, admitted for delivery between July 2023 and June 2024. Data on socio-demographic characteristics, antenatal care, and maternal and neonatal outcomes were collected through structured questionnaires and hospital records. Analysis was performed using SPSS version 26, with associations tested using the Chi-square method.

**Results:** Most participants were aged 16–17 years (44.7%), resided in rural areas (59.2%), and belonged to low socioeconomic status (60.5%). Only 28.9% attended ≥4 antenatal visits, while anemia and hypertension occurred in 57.9% and 13.2% of cases, respectively. Vaginal delivery occurred in 60.5%, with perineal tears (15.8%), puerperal infections (10.5%), and postpartum hemorrhage (7.9%) as common complications. Low birth weight (<2.5 kg) was seen in 36.8% of neonates, preterm birth in 26.3%, and 23.7% required NICU admission. Younger adolescents (13–15 years) showed higher risks of adverse neonatal outcomes, though differences were not statistically significant.

**Conclusion:** The findings underscore that adolescent pregnancy, especially among socioeconomically disadvantaged groups, increases maternal and neonatal risks.

**Keywords:** Adolescent Pregnancy, Maternal Outcome, Neonatal Outcome, Anemia

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### I. INTRODUCTION

Adolescent pregnancy remains a significant public-health issue in Bangladesh, contributing to high maternal and neonatal morbidity and mortality. Globally, about 12 million girls aged 15–19 years give birth each year, most in low- and middle-income countries [1]. Bangladesh continues to have one of the highest adolescent fertility rates in South Asia, driven by early marriage, limited reproductive health knowledge, and low contraceptive use [2]. Biological immaturity is a key factor influencing adverse outcomes in adolescent pregnancies. Incomplete pelvic development, nutritional deficiencies, and anemia predispose adolescent mothers to complications such as obstructed labour, hypertensive disorders, and infection. A systematic review identified hypertensive disorders, prematurity, and low birth weight as the most frequent complications in this age group [3]. These biological risks are worsened by poor antenatal attendance and inadequate health-seeking behaviour, especially in low-resource settings where adolescents face stigma and restricted healthcare access. Limited autonomy, poverty, and lack of family support often prevent adolescents from accessing maternal health services, further aggravating pregnancy complications. Adolescent pregnancies are also linked to adverse fetal and neonatal outcomes. Studies have consistently reported higher rates of preterm birth, low birth weight, and perinatal asphyxia among infants of adolescent mothers [4–6]. Such infants are more likely to need neonatal intensive care unit (NICU) admission and face greater neonatal morbidity. They also have higher risks of growth retardation and developmental delays compared to infants of adult mothers. In Bangladesh, hospital-based data from tertiary centres reveal persistent trends of preterm delivery, low birth weight, and perinatal complications in adolescent deliveries [5,6]. These outcomes reflect the cumulative effects of biological vulnerability, maternal malnutrition, and inadequate healthcare during pregnancy. In tertiary-care hospitals, which function as referral centres for complicated pregnancies, the burden of adolescent pregnancy remains high. Institutional studies show that adolescent mothers experience higher rates of anemia, operative delivery, and preterm labour than older women [7,8]. The combination of immature anatomy and limited health literacy contributes to an increased risk of

obstructed labour and the subsequent need for cesarean section. Evidence also indicates that adolescent pregnancy contributes to increased neonatal and early childhood mortality, largely due to low birth weight and maternal malnutrition [9]. These findings underline the dual burden of biological vulnerability and socioeconomic disadvantage shaping maternal and fetal outcomes among adolescents in Bangladesh. Poor socioeconomic conditions, coupled with limited reproductive education, further compound the cycle of poor health outcomes and perpetuate intergenerational poverty. Despite numerous studies, substantial data gaps persist. Most existing research is retrospective and single-centre, often focusing solely on maternal or neonatal outcomes without integrating both. This fragmented evidence limits the ability to design effective, targeted interventions at tertiary-level facilities. A regional systematic review has highlighted the urgent need for more context-specific, hospital-based studies in South Asia to strengthen clinical and policy responses [10]. Addressing these gaps requires comprehensive research that simultaneously evaluates maternal and neonatal parameters in adolescent pregnancies, accounting for social, economic, and biological determinants. This study aims to assess the maternal and fetal outcomes of adolescent pregnancy in a tertiary care hospital in Bangladesh.

## II. METHODS

This descriptive cross-sectional study was conducted among 76 adolescent mothers admitted to tertiary care hospital in Bangladesh from July 2023 to June 2024. Participants were selected using a consecutive sampling technique. Adolescent mothers aged 13–19 years who delivered either vaginally or by cesarean section during the study period were included, while those with pre-existing chronic illnesses or incomplete medical records were excluded. Data were collected using a structured questionnaire and from hospital records, covering socio-demographic characteristics, obstetric history, antenatal care, and maternal and neonatal outcomes. Variables assessed included age, education, residence, socioeconomic status, gravidity, antenatal visits, anemia, hypertension, delivery mode, and neonatal outcomes such as birth weight, gestational age, Apgar score, and NICU admission. Hemoglobin levels <11 g/dL were classified as anemia, and preterm birth was defined as delivery before 37 completed weeks. Data were analyzed using SPSS version 26. Descriptive statistics (frequency and percentage) were used for categorical variables, and associations between maternal age and neonatal outcomes were examined using the Chi-square test, with  $p < 0.05$  considered statistically significant. Ethical approval was obtained from.....

## III. RESULTS

**Table 1:** Socio-Demographic Characteristics of Adolescent Mothers (N = 76)

Variable	Frequency (n)	Percentage (%)
<b>Age (years)</b>		
13–15	12	15.8
16–17	34	44.7
18–19	30	39.5
<b>Education Level</b>		
No formal education	18	23.7
Primary	28	36.8
Secondary	22	28.9
Higher secondary	8	10.5
<b>Residence</b>		
Urban	31	40.8
Rural	45	59.2
<b>Socioeconomic Status</b>		
Low	46	60.5
Middle	24	31.6
High	6	7.9

Most adolescent mothers were aged 16–17 years (44.7%) and lived in rural areas (59.2%). Education was limited, with 60.5% having primary or no formal schooling, and a majority (60.5%) belonged to low socioeconomic groups. [Table 1]

**Table 2:** Obstetric History and Antenatal Care (N = 76)

Variable	Frequency (n)	Percentage (%)
Gravidity		
Primigravida	62	81.6
Multigravida	14	18.4
Antenatal Care Visits		
None	18	23.7
1–3 visits	36	47.4
≥4 visits	22	28.9
Anemia (Hb <11 g/dL)	44	57.9
Hypertension in Pregnancy	10	13.2
Malpresentation	6	7.9

The majority were primigravida (81.6%). Less than one-third (28.9%) attended ≥4 antenatal visits, while 23.7% had none. Anemia was common (57.9%), and 13.2% developed hypertension. [Table 2]

**Table 3:** Maternal Delivery Outcomes (N = 76)

Outcome	Frequency (n)	Percentage (%)
Mode of Delivery		
Vaginal	46	60.5
Cesarean Section	30	39.5
Obstetric Complications		
Postpartum Hemorrhage	6	7.9
Perineal Tear	12	15.8
Puerperal Infection	8	10.5
Maternal ICU Admission	4	5.3
Maternal Mortality	1	1.3

Vaginal delivery occurred in 60.5% of cases. Maternal complications included perineal tears (15.8%), puerperal infections (10.5%), and postpartum hemorrhage (7.9%). ICU admission was required in 5.3%, with one maternal death reported. [Table 3]

**Table 4:** Neonatal Outcomes (N = 76)

Outcome	Frequency (n)	Percentage (%)
Birth Weight		
<2.5 kg	28	36.8
≥2.5 kg	48	63.2
Preterm Birth (<37 weeks)		
APGAR Score at 5 min	20	26.3
<7		
≥7	14	18.4
NICU Admission	62	81.6
Neonatal Mortality	18	23.7
Neonatal Mortality	3	3.9

Low birth weight (<2.5 kg) was seen in 36.8% of neonates, with preterm births in 26.3%. NICU admission was required in 23.7%, APGAR <7 in 18.4%, and neonatal mortality occurred in 3.9%. [Table 4]

**Table 5:** Fetal Outcomes by Maternal Age (N = 76)

Maternal Age (years)	LBW (<2.5 kg)	Preterm Birth	NICU Admission
13–15 (n=12)	6 (50.0%)	4 (33.3%)	5 (41.7%)
16–17 (n=34)	12 (35.3%)	10 (29.4%)	8 (23.5%)
18–19 (n=30)	10 (33.3%)	6 (20.0%)	5 (16.7%)
<b>p-value</b>	0.58	0.58	0.23

Younger adolescents (13–15 years) had the highest rates of low birth weight, preterm birth, and NICU admission. However, these differences were not statistically significant ( $p > 0.05$ ). [Table 5]

#### **IV. DISCUSSION**

In the present study, the majority of adolescent mothers were aged 16–17 years (44.7%), resided in rural areas (59.2%), and belonged to low socioeconomic groups (60.5%). Educational attainment was poor, with 60.5% having only primary or no formal education. A previous multicountry analysis reported that most adolescent pregnancies occur among rural and low-income groups, highlighting poverty and education as major determinants of early conception [11]. Another community-based study in Bangladesh found that 64% of adolescent mothers had only primary or no schooling, and 58% were from low-income families [12]. These findings collectively indicate that the pattern observed in the present study reflects persistent socioeconomic inequities that continue to drive adolescent pregnancy and its adverse consequences. Most participants in this study were primigravida (81.6%), with only 28.9% completing four or more antenatal visits and 23.7% receiving none. Anaemia was prevalent in 57.9% of the respondents, and 13.2% experienced hypertension. Previous research reported that only 27% of adolescent mothers achieved four antenatal visits, largely due to financial barriers and limited awareness [13]. This aligns with our results, underscoring the inadequate use of antenatal services by adolescent mothers. Similarly, anaemia rates of 50–60% have been documented in rural Bangladesh [14] and India [15], driven by poor dietary iron intake and insufficient supplementation. The slightly higher anaemia prevalence in this study may be explained by the nutritional vulnerability and limited access to healthcare among rural adolescents. In terms of delivery outcomes, 60.5% of mothers in this study delivered vaginally, while 39.5% underwent cesarean section. Obstetric complications included perineal tears (15.8%), puerperal infections (10.5%), and postpartum haemorrhage (7.9%), with one maternal death (1.3%). Prior studies in Bangladesh reported cesarean section rates of around 37% and postpartum complications in about 9% of adolescent mothers [16]. Other regional evidence indicated that adolescents experience higher rates of perineal injuries and puerperal infections than adult women [17]. Compared with these data, the higher complication rate in the present study suggests that anaemia, biological immaturity, and delayed care-seeking contribute substantially to poor obstetric outcomes among adolescents. Regarding neonatal outcomes, 36.8% of newborns in this study were of low birth weight ( $<2.5$  kg), 26.3% were preterm, and 23.7% required NICU admission. Similar studies in Bangladesh reported low-birth-weight and preterm rates of 34% and 22%, respectively [18]. A meta-analysis also showed that adolescent mothers had 1.4–1.6 times higher odds of preterm labour and low birth weight compared with adults [19]. Another global review found that adolescent pregnancy significantly increases the risk of fetal growth restriction and neonatal undernutrition [20]. The slightly higher rates observed in this study likely reflect the effects of anaemia, inadequate antenatal care, and limited access to obstetric support. When outcomes were stratified by maternal age, those aged 13–15 years had the highest rates of low birth weight (50%), preterm birth (33.3%), and NICU admission (41.7%), although these differences were not statistically significant. Earlier hospital-based research found that mothers below 16 years had nearly double the risk of preterm and low-birth-weight infants compared with older adolescents [21].

#### **Limitations of the Study**

The study was limited by its small sample size, single-center design, and reliance on hospital records, which may restrict generalizability and omit community-level factors influencing adolescent pregnancy outcomes.

#### **V. CONCLUSION**

Adolescent pregnancy is associated with high maternal and neonatal risks. These include anemia, inadequate antenatal care, obstetric complications, low birth weight, and preterm birth. Younger, rural, and socioeconomically disadvantaged adolescents are particularly vulnerable.

#### **VI. RECOMMENDATIONS**

Future research may include larger, multicenter samples, adopt longitudinal designs, and explore psychosocial and nutritional determinants to better understand and address the multifactorial causes and outcomes of adolescent pregnancy in Bangladesh.

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