Bangladesh Med J. 2025 Sept; 54(3)
DOI: https://doi.org/10.3329/bmj.v54i3.90475

Original Article

Preterm Delivery and Low Birth Weight: A Study on Teenage Mothers in Bangladesh

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Abstract

Despite legal restrictions on early marriage, teenage pregnancy remains highly prevalent in Bangladesh and is associated with adverse maternal and neonatal outcomes. Low birth weight (LBW) and preterm birth are major contributors to neonatal morbidity and mortality. This study aimed to determine the proportion of preterm delivery and LBW among teenage mothers and to describe associated sociodemographic and obstetric factors. This cross-sectional study was conducted from June 2021 to March 2024 in the Department of Obstetrics and Gynecology at Dhaka Medical College Hospital. A total of 85 pregnant adolescents aged 16–19 years were enrolled using predefined criteria. Data were collected using a semi-structured questionnaire that covered sociodemographic characteristics, reproductive history, obstetric complications, and neonatal outcomes. Preterm birth was defined as delivery before 37 completed weeks, and LBW as birth weight <2.5 kg. The mean age of participants was 18.38 ± 0.64 years, with more than half aged ≤18 years. The majority resided in rural areas (92.9%), and 41.2% had discontinued formal education, indicating notable socioeconomic vulnerability. Early marriage and low socioeconomic status were common, with the majority belonging to lower-income households and being economically dependent. Oligohydramnios was the most frequent obstetric complication (10.6%), followed by other conditions, including pregnancy-induced hypertension and reduced fetal movements. Live births accounted for 88.2% of outcomes. LBW was observed in 24.0% of neonates, while preterm delivery occurred in 10.7% of cases. Cesarean section was the predominant mode of delivery (62.7%), reflecting the high-risk nature of adolescent pregnancies. Teenage pregnancy in Bangladesh is associated with a considerable burden of adverse neonatal outcomes, particularly LBW and preterm birth, alongside high rates of obstetric complications and cesarean delivery. These findings highlight the need for strengthening adolescent-friendly reproductive health services, improving access to timely and adequate antenatal care, and addressing underlying socioeconomic determinants to reduce risks in this vulnerable population.

Keywords: *Teenage pregnancy, low birth weight, preterm birth, adolescent, Bangladesh, cesarean section*

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INTRODUCTION

Teenage pregnancy, defined as conception between ages 13-19 years, remains a global health challenge with profound implications for maternal and neonatal outcomes.[1,2] Adolescence is a transitional stage marked by biological, psychological, and social changes requiring specialized healthcare[3-7]. Globally, approximately 21 million pregnancies and 12 million live births occur annually among girls aged 15-19 years, disproportionately concentrated in low- and middle-income countries[2,4,5]. Bangladesh, with one of the world's highest adolescent birth rates, exemplifies this burden.[1]

In Bangladesh, marriage before the age of eighteen years is legally prohibited.[19] Despite this, early marriage persists due to multiple factors, including educational status, occupation, religious influences, geographic location, family pressure, dowry practices, social norms, poverty, and concerns related to safety and security.[20-23] National survey data indicate that adolescent childbearing prevalence was 30.8% in BDHS 2014 and 27.6% in BDHS 2017–18, suggesting that nearly one in four women gives birth during adolescence.[24] Adolescent pregnancy is associated with adverse maternal and neonatal outcomes.[3]

Adolescent pregnancy is considered high-risk due to increased maternal complications such as obstructed labor, hypertensive disorders, anemia, postpartum hemorrhage, and higher rates of cesarean delivery[7,12]. Neonatal risks include low birth weight (LBW) and preterm birth, both of which are major contributors to neonatal morbidity and mortality.[14, 15] LBW infants (<2500 g) are more vulnerable

to infections and long-term developmental impairments,[15] while preterm neonates (<37 completed weeks of gestation) often require specialized neonatal care.[14]

Socioeconomic disadvantage further compounds these risks. In the present study, more than half of the participants reported a monthly household income of <30,000 BDT, and 41.2% had discontinued formal education. Limited contraceptive use (74.1% non-users) and a considerable proportion of unplanned pregnancies (21.2%) reflect gaps in reproductive health awareness and service utilization. These findings are consistent with the targets of Sustainable Development Goal (SDG) 3.7, which emphasizes universal access to sexual and reproductive healthcare services.[16]

Previous studies from Bangladesh,[25] Iran,[26] Malaysia,[27] and Cameroon[28] have consistently reported adverse pregnancy outcomes among adolescent mothers, including LBW, preterm birth, and obstetric complications. Systematic reviews and meta-analyses further indicate that adolescent mothers have a significantly higher prevalence of LBW and an increased risk of preterm delivery compared to adult mothers.[33, 34] Several biological and social determinants contribute to these outcomes, including physiological immaturity,[35] inadequate maternal nutrition,[36] psychosocial stress,[39] and insufficient antenatal care utilization.[38]

Given the persistently high adolescent birth rate in Bangladesh and the relative scarcity of hospital-based clinical data, this study aimed to determine the proportion of low birth weight and preterm delivery among teenage mothers, and to examine their association with key sociodemographic and obstetric factors.

MATERIALS AND METHODS

This study was a hospital-based cross-sectional investigation carried out from June 2021 to March 2024 within the Department of Obstetrics and Gynecology at Dhaka Medical College Hospital in Bangladesh. A total of 85 pregnant women, either admitted for delivery or attending antenatal care at the study location, were selected based on the selection criteria. The study included pregnant women aged between 16 and 19 years who consented to participate. Exclusions were made for patients with twin pregnancies, those with known medical or surgical issues before pregnancy, and individuals with incomplete medical records. A pre-designed structured questionnaire was utilized to gather data from the participants. Information regarding sociodemographic and economic characteristics (age, residence, educational level, and economic status) as well as clinical data, including maternal outcomes such as mode of delivery (normal vaginal and C-section), abortion, and intrauterine death (IUD), was documented. Obstetrical complications, including postpartum hemorrhage (PPH), pre-eclampsia, and premature rupture of membranes (PROM), were also recorded. Fetal outcomes such as birth weight (low birth weight and normal), maturity (preterm and term), sex of the baby, and fetal distress were noted. Preterm delivery was defined as deliveries occurring before 37 weeks of gestation, while low birth weight was classified as a weight below 2.5 kilograms at birth. Ethical approval for the study was granted by the ethical review committee of Dhaka Medical College, and informed written consent was obtained from all participants.

Statistical analysis: The data analysis was performed using the Statistical Package for the Social Sciences (SPSS). Continuous variables were summarized as mean ± standard deviation (SD), while categorical variables (preterm delivery, low birth weight) were presented as frequency (n) and percentage**.**

RESULTS

Table I shows the demographic and economic distribution of participants; specifically, 46 (54.1%) were aged 18 years or younger, while 39 (45.9%) were older than 18 years. Additionally, 79 (92.9%) lived in rural areas, and 41.2% were school dropouts. In terms of family income, 46 (54.1%) of the participants reported a monthly household income of less than 30,000 BDT, whereas 39 (45.9%) had an income of 30,000 BDT or more.

Table I: Distribution of the participants according to demographic and economic profile (N=85)

Demographic profile		Frequency	Percentage
Age (years)	≤18 years	46	54.1
	>18 years	39	45.9
	Mean ± SD	18.38 ± 0.64	
Residence	Urban	6	7.1
	Rural	79	92.9
Dropout	Yes	35	41.2
from school	No	50	58.8
Family income	< 30000 BDT	46	54.1
	≥ 30000 BDT	39	45.9

Data presented as frequency (%)

Table II details the distribution of participants according to their reproductive and contraceptive backgrounds; 68 (80.0%) participants entered marriage at the age of 19, whereas 17 (20.0%) did so prior to 19 years. Concerning

menarche, 65 (76.5%) participants reached it at 15 years or later, while 20 (23.5%) did so before the age of 15. Moreover, 22 (25.9%) had utilized contraceptives prior to conception, compared to 63 (74.1%) who had not. A total of 67 (78.8%) participants reported their pregnancies as planned, while 18 (21.2%) were categorized as unplanned.

Table II: Distribution of the participants according to reproductive and contraceptive history (N=85)

Reproductive and contraceptive history		Frequency	Percentage (%)
Age at marriage (years)			
	<19 years	17	20.0
	19 years	68	80.0
Age of menarche			
	<15 years	20	23.5
	≥ 15 years	65	76.5
Use of a contraceptive before conception			
	Yes	22	25.9
	No	63	74.1
Planned pregnancy			
	Yes	67	78.8
	No	18	21.2

Table III contains the distribution of the participants according to maternal and fetal complications. Oligohydramnios was identified in 9 (10.6%) of participants, followed by reduced fetal movements in 6 (7.1%). Pregnancy-induced hypertension, intra-uterine growth restriction, and perineal tear were each observed in 2 (2.4%) participants. Other complications, including polyhydramnios, fetal distress, postpartum hemorrhage, prolonged labor, and premature rupture of membranes, were each reported in 1 (1.2%) of participants.

Table III: Distribution of the participants according to maternal and fetal complications (multiple responses)

Maternal complication	Frequency	Percentage
Oligohydramnios	9	10.6
Polyhydramnios	1	1.2
Fetal distress	1	1.2
Intra-uterine growth restriction	2	2.4
Less fetal movement	6	7.1
Pregnancy-induced hypertension	2	2.4
Postpartum hemorrhage	1	1.2
Prolonged labor	1	1.2
Premature rupture of the membrane	1	1.2
Perineal tear	2	2.4

Table IV provides an outline of the obstetric outcomes among the study participants; with respect to obstetric outcomes, 75 (88.2%) were live births, followed by 6 (7.1%) abortions, 3 (3.5%) intrauterine fetal death, and 1 (1.2%) molar pregnancy.

Table IV: Obstetric outcomes of the study participants (N=85)

Obstetric outcome	Frequency	Percentage
Abortion	6	7.1
Intrauterine death	3	3.5
Molar pregnancy	1	1.2
Live birth	75	88.2

Figure 1 displays the distribution of the mode of delivery. Cesarean section was 62.7%, and normal vaginal delivery was 37.3% (Figure 1 A & B). Among the delivered baby 48% were male and female were 52%.

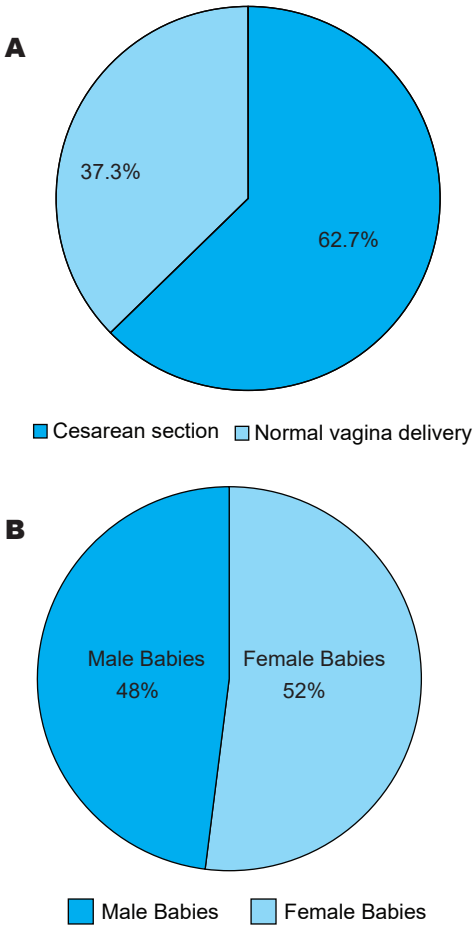

Figure 1 A&B: Distribution of Mode of Delivery (N=75)

Figure 2 illustrates the low birth weight status of neonates; regarding birth weight, 18 (24.0%) neonates had low birth weight, whereas 57 (76.0%) had normal birth weight.

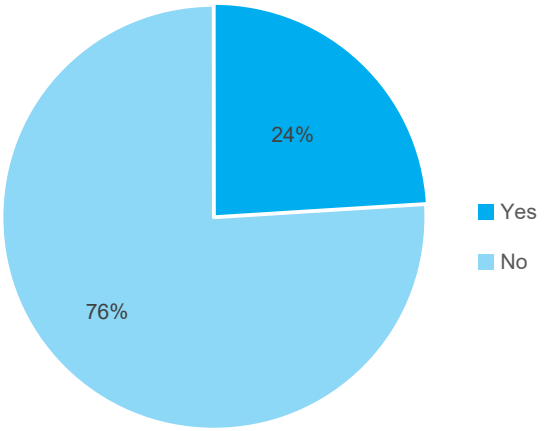

Figure 2: Low birth weight status of neonates (N=75)

Figure 3 illustrates the distribution of deliveries based on gestational age at birth; within the participant group, the majority of deliveries were term, totaling 66 (88.0%), whereas 8 (10.7%) were classified as preterm and 1 (1.3%) as postdated.

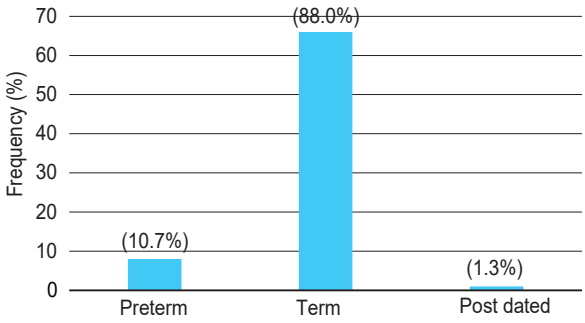

Figure 3: Distribution of deliveries according to gestational age at birth (N=75)

DISCUSSION

This study highlights the persistent burden of teenage pregnancy in Bangladesh, with substantial maternal and neonatal complications. A considerable proportion of teenage pregnancies in this cohort resulted in adverse neonatal outcomes, particularly low birth weight (LBW) and preterm delivery, which is consistent with findings from previous global and regional studies.[7, 12]

The mean age of the participants was 18.38 ± 0.64 years, with more than half aged ≤18 years, reflecting early initiation of childbearing. Similar age distributions have been reported in Bangladesh by Munira et al.,[25] as well as in studies from Iran[26] and Malaysia.[27] The majority of teenage mothers were from rural areas (92.9%), a substantial proportion had discontinued formal education (41.2%), and most belonged to lower-income households with economic dependency. Similar socioeconomic patterns have been consistently reported in low- and middle-income settings, where adolescent pregnancy is strongly associated with poverty, limited education, and restricted access to reproductive health services.[20-24,28] The Bangladesh Demographic and Health Survey also highlights that early childbearing is more prevalent among rural, less-educated, and economically disadvantaged populations.[28] Comparable findings from studies in Iran and Malaysia further demonstrate that low educational attainment and poor socioeconomic conditions are key determinants of teenage pregnancy and its complications[26, 27]. These factors may indirectly increase the risk of LBW and preterm birth by limiting access to adequate nutrition, delaying initiation of antenatal care, and reducing healthcare utilization.[37, 38]

A wide range of obstetric complications was observed in this study. Oligohydramnios was the most common, followed by reduced fetal movements. Other complications included pregnancy-induced hypertension, intrauterine growth restriction (IUGR), perineal tear, polyhydramnios, fetal distress, postpartum hemorrhage, prolonged labor, and premature rupture of membranes. Additionally, adverse outcomes such as abortion (7.1%), intrauterine fetal death (3.5%), and molar pregnancy (1.2%) were documented. These findings are comparable to those reported in Bangladesh[25] and Cameroon,[28] indicating a consistent pattern of increased obstetric risk among adolescent mothers.

Despite nearly 90% of pregnancies resulting in live births, neonatal complications remained prominent. The cesarean section rate in this study was notably high (62.7%), far exceeding the World Health Organization recommended range of 10–15%.[29] This elevated rate likely reflects the high-risk classification of teenage pregnancies and the increased frequency of obstetric complications necessitating surgical intervention.

The prevalence of LBW in this study was 24%, underscoring its significance as a major neonatal outcome among teenage mothers. Comparable findings have been reported in various settings, including Ethiopia (17.5%),[34] Malaysia (19.3%),[27] and Iran (13.3%).[26] A systematic review further demonstrated that adolescent mothers have

a significantly higher likelihood of delivering LBW infants compared to adult mothers.[33] The increased risk of LBW is multifactorial, involving biological immaturity,[35] inadequate maternal nutrition,[36] low socioeconomic status, and insufficient antenatal care.[38] Adolescents are still undergoing physical growth, which may result in competition for nutrients between the mother and fetus, thereby restricting intrauterine growth. In the present study, IUGR was observed in 2.4% of cases, further supporting this biological mechanism.

Preterm birth was also a significant outcome in this study, affecting more than 10% of deliveries. This is consistent with findings from Malaysia (9.0%),[27] although higher rates have been reported in Iran (17%).[26] A systematic review reported a 23% increased risk of preterm birth among adolescent mothers compared to adults[33]. Several factors may contribute to this increased risk, including delayed initiation of antenatal care and fewer antenatal visits, which limit early detection and management of pregnancy-related complications such as hypertension, oligohydramnios, and IUGR.[38]

Adolescents are more likely to experience stress, stigma, unintended pregnancy, and limited social support. These factors may activate neuroendocrine pathways involving cortisol and inflammatory mediators, which can promote cervical ripening and uterine contractility, thereby increasing the risk of preterm labor.[39],[40]

Importantly, this study demonstrates that adverse outcomes are more strongly associated with modifiable factors such as inadequate antenatal care and socioeconomic disadvantage than with maternal age alone. This observation is supported by large cohort studies and WHO multicountry analyses, which emphasize that the risks associated with adolescent pregnancy are largely mediated by contextual and healthcare-related factors rather than age itself.[11, 12] From a public health perspective, the persistence of early marriage remains a key driver of adolescent pregnancy in Bangladesh.[19-22]

LIMITATIONS OF THE STUDY

This study was conducted at a tertiary-care hospital with a relatively small sample size, which might not represent the whole country scenario and may not be fully generalized. Cross-sectional design precludes assessment of causal relationships between sociodemographic or clinical factors and adverse pregnancy outcomes. Information on some variables, including contraceptive use and pregnancy planning, was self-reported and thus subject to recall and social desirability bias. In addition, data on maternal nutritional status, body mass index, micronutrient levels, timing and adequacy of antenatal care visits were not comprehensively captured, which may have influenced the observed rates of LBW and preterm birth. Finally, the study did not include a comparison group of adult mothers, restricting the ability to directly quantify excess risk attributable to teenage pregnancy.

CONCLUSION

Teenage pregnancy remains an important public health concern in Bangladesh and continues to be associated with substantial obstetric and neonatal morbidity. In this hospital-based study, a considerable proportion of adolescent mothers experienced complications such as oligohydramnios and pregnancy-induced hypertension, while nearly one-quarter of neonates had low birth weight and more than one-tenth were born preterm. The high rate of cesarean delivery further underscores the clinical complexity of managing adolescent pregnancies in tertiary-care settings. Larger multicenter or community-based prospective studies incorporating adult comparison groups and detailed assessments of nutritional and antenatal factors are warranted to further clarify determinants of poor pregnancy outcomes and guide policy and clinical practice in Bangladesh. Addressing this issue requires comprehensive, multisectoral interventions, including improving female education, strengthening legal enforcement against child marriage, and enhancing access to reproductive health services.

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