



Obstetric Complications and Adverse Birth Outcomes among Adolescent and Adult Pregnant Women in Dhaka, Bangladesh

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Authors' contributions

This work was carried out in collaboration among all authors. Authors IJ and EA designed the study. Authors EA and ZAS managed the statistical analysis. Authors IJ, RR and FSB wrote the first draft of the manuscript. Authors IJ and TI did the literature work. All authors read and approved the final manuscript.

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ABSTRACT

Background and Objective: The current study aimed to determine the association of maternal age and obstetric complications and adverse birth outcomes among the adolescent and adult pregnant women.

Methods: A cross-sectional study was conducted involving about 150 pregnant women (75 adolescent and 75 adult) who were purposively selected from three maternity centers of Dhaka city.

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All of them were primigravida experiencing their third trimester of pregnancy. They were interviewed twice (first visit during third trimester and second visit after delivery) with a semi-structured questionnaire. Statistical analysis was done by IBM SPSS Statistics version 20.0. Adjusted odds ratios were achieved by conducting binomial logistic regression analysis.

Results: The mean age of the adolescent pregnant girls and adult pregnant women were 16.54 ± 2.38 and 25.23 ± 5.67 years of age, respectively. It was explored that adolescent pregnant girls had higher risks for anemia, preeclampsia, eclampsia, severe fever, jaundice, abnormal position of the baby and urinary problems during gestation. On the contrary, they were observed with lower risks for gestational diabetes, excessive bleeding and leakage of amniotic fluid during pregnancy. During delivery, adolescent group had higher risks for excessive bleeding and placental abruption. Findings of the study also showed that pregnant adolescents had higher risks of various adverse birth outcomes like preterm delivery, still birth, small for gestational age (SGA), very low birth weight (LBW), and low birth weight (LBW).

Conclusion: Adolescent pregnancy in Dhaka city had augmented the risk of obstetric complications during pregnancy, during delivery as well as adverse birth outcomes.

Keywords: Obstetric complications; adverse birth outcome; teenage pregnancy.

1. INTRODUCTION

Adolescent girls are the future mothers and this period is one of the windows of opportunities to recover the nutritional deficiencies. Pregnancy in this stage makes them vulnerable for their survival and hinders their physical and psychological development as well as for their offspring. Pregnancy and childbirth has been reported as the major killer of 15-19 years old women [1]. It has been reported that about 85% of adolescent population lives in the developing world [2]. Moreover, about one fourth of all maternal mortality occurs in this group [3]. Since its emergence in the 1970s, teenage pregnancies have been a focal point of alarm and inquiry as a substantial national and social problem [4] with medical and psychosocial penalties. The percentage of women who have their first offspring by eighteen years of age is often between 25-50% [5,6] in developing countries, where childbearing in adolescent ages is most common. However, it has also been reported in literature that the child marriage prevalence has been found highest in Bangladesh [7] and according to world population report (2013), Bangladesh has the highest rate of adolescent pregnancy in Asia and is ranked third globally [8]. In Bangladesh, where 65% of women who are presently 20 to 24 years old were married by 18 years old, early marriage and childbearing are severe problems [9].

Many obstetric complications have been found to be associated with adolescent pregnancies. Some of them are the high rates of hypertensive disorders of pregnancy, anemia, delivery complications, increased maternal and fetal

mortality rate [10-15]. Regarding the high prevalence of adolescent pregnancy and its reported adverse outcomes in literature, the aim of the present research was to determine the association between maternal age and obstetric complications during pregnancy, during delivery and adverse birth outcomes among the pregnant women of Dhaka in Bangladesh.

2. METHODOLOGY

2.1 Study Design and Study Area

A cross-sectional research design was undertaken for the current study among the adolescent pregnant and adult pregnant women who were followed by two visits. First visit was conducted during their third trimester of pregnancy and the second visit was taken after their delivery. Respondents were selected from three maternity centers and urban health care centers of Dhaka city: Azimpur Maternity Center, RH Step and Bapsa model reproductive health clinic. All of them were primigravida experiencing their third trimester of pregnancy.

2.2 Sampling Technique and Sample Size

The study was conducted upon 150 pregnant women (75 adolescents and 75 adults) who were purposively selected. The sample size was calculated by using the following formula:

$$N = Z^2 \times P \times (1-P) / d^2$$

Here, N=sample size; Z= at 95% confidence interval, Z-value is 1.96; P= prevalence of a maternal complication which was found to be 5% (.05), d= marginal error (.05).

Using the formula and values quoted above, sample size was found to be about 73 in each group of respondents and hence to round up the number, the total sample size for the study was held 150.

2.3 Study Period

Data was collected from January, 2016 to March, 2016.

2.4 Data Collection

Face-to-face interviews were accomplished with a semi-structured questionnaire. It was comprised of socio-demographic information; obstetric complications during pregnancy at first visit and the second visit questionnaire comprised of maternal complications during delivery and adverse birth outcomes.

2.5 Data Analysis

All data were analyzed using IBM SPSS statistics version 20.0. Binary logistic regression analysis was done for computing Adjusted Odds Ratios (AOR). Maternal complications during pregnancy, during delivery and adverse birth outcomes were considered as dependent variable while maternal age and sociodemographic variables were held as predictor variables.

2.6 Operational Definitions

Various medical terms have been used in the study and hence a brief explanation of those terms has been given below:

Adolescent and Adult: According to WHO, respondents of ten to nineteen years of age had been defined as Adolescent and person above than 19 years of age has been mentioned as adult [16]; Placental abruption: The separation of placenta from the uterus in earlier stage of pregnancy that is before the childbirth has been defined as placental abruption [17]; LBW and VLBW: As per WHO, new born with a birth weight of less than 2500 g was considered to be LBW. Moreover, LBW babies have been classified into VLBW, (<1500 g) and ELBW, (<1000 g) [18]; Cesarean section: It is the delivery of a baby through a surgical incision in the mother's abdomen and the uterus [19]; Stillbirth: It is the birth of a foetus after twenty-eight weeks of pregnancy where pulmonary respiration does not function before, during, or after birth,

whereas, before it has breathed [20]; SGA: Small for Gestational Age (SGA) denotes the newborn babies who possess lower-than-expected weight, length, and/or head circumference [21]; Excessive bleeding: Excessive bleeding has been defined as ≥ 7 mL/kg/h for ≥ 2 consecutive hours in the first 12 postoperative hours and/or ≥ 84 mL/kg total for the first 24 postoperative hours and/or surgical re-exploration for bleeding in the first 24 postoperative hours [22].

3. RESULTS

3.1 Part A: Socio-demographic Information

The mean age of the adolescent pregnant and adult pregnant mothers was 16.54 ± 2.38 and 25.23 ± 5.67 years of age, respectively. Table 1 displays the socio-demographic information of the respondents by maternal age categories. Significant associations were found between mothers' educational level, monthly household income, age at first marriage, ante natal care and maternal age ($P < .05$). Most of the mothers among the respondents were Muslim and housewife. Majority of the pregnant women in both study groups were observed to receive their antenatal care services.

3.2 Part B: Obstetric Complications and Adverse Birth Outcomes

Effect of maternal age on complications during pregnancy is shown in Table 2. Adjusted odds ratios (AOR) with 95% confidence interval (CI) were estimated where the models were adjusted for mothers' educational level, monthly household income, age at first marriage, ante natal care in both Tables 2 and 3. In the predictor variable (maternal age), adult pregnant mothers were considered as reference group and in case of dependent variables (maternal complications during pregnancy) response- 'No' was considered as reference category.

Table 2 depicts that adolescent pregnant women were found to be at 23% (AOR: 1.23) and 38% (AOR: 1.38) increased risk of anemia and eclampsia respectively, as compared to adult pregnant woman. Moreover, adolescent group had higher risks of preeclampsia (AOR: 1.03), severe fever (AOR: 1.01), jaundice (AOR: 1.09), abnormal position of baby (AOR: 1.07) and urinary problems (AOR: 1.04) than the reference group. On the contrary, adolescent mothers were

found to be at lower risks of gestational diabetes and leakage of amniotic fluid (AOR: 0.92) in (AOR: 0.51), excessive bleeding (AOR: 0.67) comparison with adult mothers.

Table 1. Socio-demographic information by adolescent and adult group

Characteristics	Maternal Age (in years)		P-value*
	Adolescent (≤ 19 years)	Adult (≥ 20 years)	
Household size			
Two	22.7%	24.0%	.341
Three	57.3%	37.3%	
Four	20.0%	38.7%	
Religion			
Islam	88.0%	94.7%	.573
Hindu	12.0%	5.3%	
Mothers' educational level			
PEC	46.7%	24.0%	.030
JSC	36.0%	5.3%	
SSC	9.3%	8.0%	
HSC	0.0%	14.7%	
Hons/ MS	0.0%	24.0%	
Can only read, write and sign	8.0%	24.0%	
Mothers' occupation			
Housewife	94.7%	90.7%	.210
Wage earner	5.3%	9.3%	
Monthly household income (in BDT)			
less than or equal to 10000	30.7%	17.3%	.024
10,001 to 20,000	62.7%	50.7%	
Greater than 20,000	6.7%	32.0%	
Age at first marriage (in year)			
Less than or equal to 19	92.0%	53.3%	.039
greater than or equal to 20	8.0%	46.7%	
Ante natal care (ANC)			
Yes	90.7%	98.7%	.042
No	9.3%	1.3%	

* Pearson chi-square test was used to obtain the p-values

Table 2. Effect of maternal age on obstetric complications during pregnancy

Maternal complications during pregnancy (reference category = No)	Adolescent Pregnant AOR* (95% CI)	Adult Pregnant
Gestational diabetes	0.51 (0.33-0.61)	Reference
Anemia	1.23 (0.92-1.35)	Reference
Preeclampsia	1.03 (0.96-1.09)	Reference
Eclampsia	1.38 (0.74-1.69)	Reference
Severe fever	1.01(0.98-1.05)	Reference
Jaundice	1.09(0.99-1.17)	Reference
Abnormal position of baby	1.07(0.85-1.27)	Reference
Urinary problems	1.04(0.88-1.11)	Reference
Excessive bleeding	0.67(0.61-0.86)	Reference
Leakage of amniotic fluid	0.92(0.87-1.02)	Reference

* Binary logistic regression analysis was done to obtain the Adjusted Odds Ratio for each variable; adjusted for mothers' educational level, monthly household income, age at first marriage, antenatal care

Table 3. Effect of maternal age on obstetric complications and birth outcomes during delivery

Maternal complications during delivery^a and adverse birth outcomes^b (reference category = No)	Adolescent Pregnant AOR* (95% CI)	Adult Pregnant
Excessive bleeding ^a	1.36(1.23-1.52)	Reference
Placental abruption ^a	1.05(0.93-1.14)	Reference
Cesarean delivery ^a	0.81(0.70-0.98)	Reference
Preterm delivery ^b	1.20 (1.11-1.37)	Reference
Still birth ^b	1.01(0.95-1.09)	Reference
Very LBW ^b	1.12(1.03-1.26)	Reference
LBW ^b	1.31(1.17-1.48)	Reference
SGA ^b	1.43(1.25-1.74)	Reference

* Binary logistic regression analysis was done to obtain the Adjusted Odds Ratio for each variable; adjusted for mothers' educational level, monthly household income, age at first marriage, antenatal care

Table 3 shows the effect of maternal age on complications during delivery and adverse birth outcomes. However, adult pregnant mothers were considered as reference group and in case of outcome variables (maternal complications during delivery and adverse birth outcomes) response- 'No' was considered as reference category. Among the maternal complications during delivery, adolescent mothers were observed to be at greater risks of excessive bleeding (AOR: 1.36) and placental abruption (AOR: 1.05) whereas at lower risk of cesarean section (AOR: 0.81). In terms of adverse birth outcomes, Adolescent pregnant women were found to be at 43% (AOR: 1.43) and 31% (AOR: 1.31) increased risk of giving birth to SGA and LBW babies respectively, as compared to adult pregnant woman. However, adolescent group had higher risks of preterm delivery (AOR: 1.20), still birth (AOR: 1.01) and very LBW babies (AOR: 1.12).

4. DISCUSSION

The current study explored that adolescent mother were more likely to have unfavorable maternal conditions and birth outcomes. During pregnancy, adult pregnant women had a higher risk for developing gestational diabetes, which was consistent with some previously conducted studies [10-12]. Similar finding was obtained in case of anemia during adolescent pregnancy in this study, in comparison with other studies [10,11,13,14-15,23]. The risk of preeclampsia was found to be slightly higher in adolescent mothers in current study, which is similar to the findings of some previous studies [10,12-14,23,24] and on the other hand, adolescent mothers were at a quite high risk of eclampsia. Higher risk of eclampsia in adolescent pregnancy was also found similarity in some studies [15,25,26]. Regarding some other maternal

complications in adolescent pregnancy such as abnormal position of the baby and urinary problems, various studies [12,13,15] reported similar findings to this study that these risk of developing these complications might be higher in adolescent mothers. On the contrary, excessive bleeding risk was found lower among the adolescent mothers in a study [15] which was also consistent with the current study.

In accordance with the previous studies [10,11,25,26] cesarean section delivery was found lower among the adolescent mothers. Moreover, in case of birth outcomes, findings of Mukhopadhyay (2010), Conde [11], Tippawan (2014), Graham (1981) Jolly (2000) supported the results obtained from the current study that preterm delivery risk increases in pregnancy during adolescence period. Not only preterm delivery but also some other adverse birth outcomes like still birth, very LBW, LBW, SGA were also found higher among the adolescent mothers and supporting literature was also found in these cases like several studies reported higher risk of still birth among adolescent mothers [10,13] but one study [12] found lower risk of still birth among adolescents. Phipps (2002) reported higher risk of very LBW; Kongnyuy [25], Santosh (2008), Mukhopadhyay (2010), Watcharaseranee [13], Conde [11], Salama [12] [27] found higher risk of LBW babies among adolescent mothers and Conde [11] reported that adolescent mothers had a higher risk for SGA.

Very recently, Ogawa *et al.* [28] in a multicenter cross sectional Japanese study showed that adolescent women had higher risk of adverse birth outcomes [28]. Amjad *et al.* [29] in a retrospective cohort study found that adolescent rural pregnant mothers of low socioeconomic status have higher probability of adverse birth

outcomes [29]. Similar findings were also depicted in several other recent studies [30-33] which found higher risk of adverse birth outcomes among adolescent pregnant women but no recent study was found in Dhaka city, Bangladesh regarding this issue and hence, the findings of the current study might be helpful in bringing light upon this grave issue.

5. CONCLUSION

It might be concluded from this study that teenage pregnancy in Dhaka city increases the risks of maternal complications during pregnancy, delivery and adverse birth outcomes. The authors would like to suggest that social awareness among the society should be increased and related education should be disseminated so that women get concerned about their as well as their offspring's health condition prior to plan for pregnancy during their adolescence period.

CONSENT

Informed consent was taken from each respondent prior to data collection. In case of adolescent respondents, consent was also taken from their husbands or local guardian accompanying them. It was made very clear to them that the data will be used solely for research purpose. However, their medical reports were also observed and were used for collecting related data.

ETHICAL APPROVAL

Ethical approval was taken from Ethical Review Board under the Faculty of Biological Sciences, University of Dhaka, Bangladesh.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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