

## Consequences of Adolescent Pregnancy on Maternal and Neonatal Health: A Narrative Review

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### ABSTRACT

**Introduction:** Adolescent pregnancy, classified as pregnancies occurring between the ages of 13 to 19, is a multifaceted and crucial public health concern that affects both the young mother and her newborn. The physiological and psychosocial immaturity of the adolescent mother presents distinctive challenges during pregnancy. Moreover, the effects of teenage pregnancy extend beyond the prenatal phase, influencing neonatal well-being and the long-term health paths of both the mother and child. The purpose is to review the literature and evaluate the impacts of adolescent pregnancy on both mothers and neonates.

**Methods:** A review of literature and journal publications was conducted by searching through various databases, including PubMed, CINHL, Science Direct, Cochrane, and Google Scholar. A specific search approach was applied for each database. Initially, 627 titles were retrieved, and after screening, 10 articles were chosen for a more detailed evaluation. Ultimately, 10 articles met the specific criteria for inclusion in the study.

**Results:** The findings indicated that adolescent pregnancy is linked to a higher likelihood of maternal health complications like anemia, pre-eclampsia, eclampsia, post-partum hemorrhage, and adverse neonatal outcomes, including preterm birth, low birth weight, and prolonged Neonatal Intensive Care Unit (NICU) admission.

**Conclusion:** Adolescent pregnancy leads to higher rates of maternal and neonatal complications. Therefore, it is crucial to provide health education, and support programs for teenage mothers.

**Keywords:** Adolescent pregnancy, Maternal Health, Neonatal Health, Outcomes

### INTRODUCTION

Adolescent pregnancy represents a notable worldwide issue in the realms of social and public health leading to unfavorable outcomes for both the mother and the newborn.<sup>1</sup> In 2019, it was reported that in low- and middle-income countries (LMICs), around 21 million pregnancies occurred annually among adolescents aged 15-19 years. Out of these pregnancies, roughly 50% were unintended and led to approximately 12 million births. According to data from the same year, about 55% of unintended pregnancies

among girls in the 15-19 age group resulted in unsafe abortions, particularly in LMICs.<sup>2</sup>

Regrettably, a significant portion of the global population grapples with the challenges of teenage pregnancy and school dropout. A study conducted in Brazil reveals a robust cause-and-effect correlation between teenage pregnancy and school dropout, particularly among white girls aged 15 and older who have experienced at least one pregnancy.<sup>2</sup>

Among the 709 deliveries at the institute, 138 were attributed to teenage pregnancies, comprising 19.4% of the overall count. Teenage mothers

experienced a notable prevalence of anemia, with a rate as high as 63.7%. Additionally, 26.8% of teenage pregnancies were associated with pregnancy-induced hypertension, and 9.4% resulted in abortions. The neonatal outcomes for teenage mothers were unfavorable, with 20.2% of newborns having low birth weight, which was the primary cause of morbidity.<sup>3</sup>

A study in Nepal, with the aim to investigate teenage pregnancy rates, associated risk factors, and the resulting outcomes. The study unveiled that the prevalence of teenage pregnancy in Nepal was 13.2%. Notably, a considerable proportion (18.6%) of these pregnancies occurred in individuals who lacked formal education. Consequently, teenage pregnancies were frequently observed among women with limited educational attainment and low socioeconomic status.<sup>4</sup>

A comparative study conducted in Nepal aimed to examine maternal complications which compared teenage pregnancy to adult pregnancy. The results showed that adolescent mothers were typically 17 years old and mostly first-time mothers. The research revealed a higher occurrence of fetal complications in teenage pregnancies, with a rate of 61% as opposed to 40% in normal pregnancies. These complications like low birth weight, neonatal intensive care unit (NICU) admission, low APGAR score, and neonatal death, show an association between these complications and adolescent pregnancies.<sup>5</sup>

An additional observational study was conducted in 12 hospitals across Nepal. Among a total of 60,742 deliveries, 7.8% involved adolescent mothers. An important discovery was that approximately two-thirds of these adolescent mothers belonged to disadvantaged ethnic groups, while only half of the adult mothers fell into this category (66.1% vs. 47.8%,  $p$ -value  $< 0.001$ ). Moreover, about one-third of the adolescent mothers lacked formal education, in contrast to only one in nine adult mothers (32.6% vs. 14.2%,  $p$ -value  $< 0.001$ ). These findings indicate that women from disadvantaged ethnic backgrounds are at a higher risk of experiencing teenage pregnancy. The study also demonstrated

that adolescent mothers were more susceptible to prolonged labor, premature birth, delivering babies with small gestational age, and encountering major congenital malformations.<sup>6</sup> The primary aim of this review is to evaluate the effects of adolescent pregnancy on the health of both mothers and neonates.

## METHODS

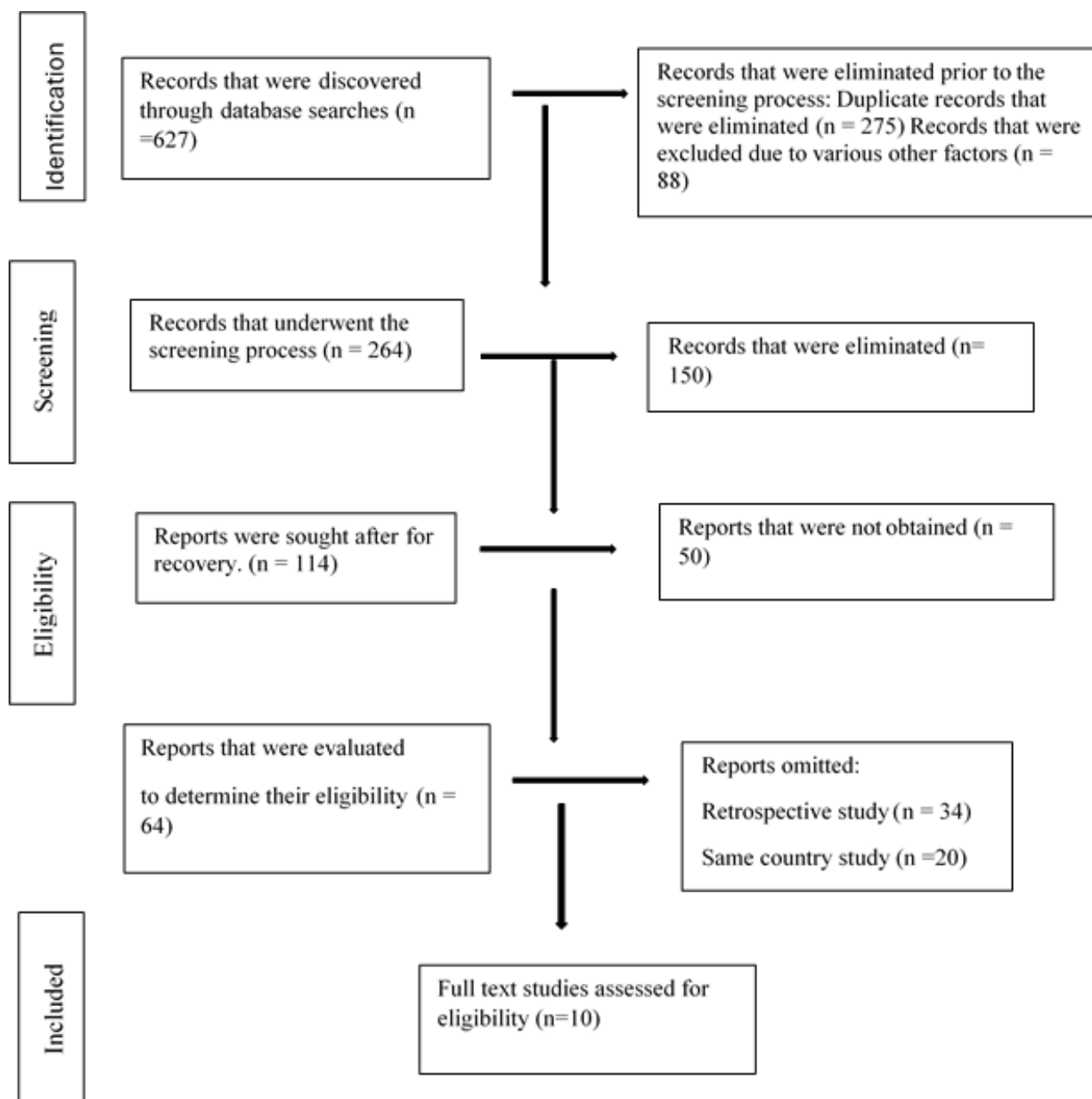
A comprehensive examination was carried out on articles gathered from various sources, including electronic databases, with a particular focus on the subject of interest. The purpose of this assessment was to locate studies that investigated the impact of teenage pregnancy on the health and educational status of both mothers and newborns. The review involved a detailed analysis of electronic databases such as PubMed, Science Direct, and EBSCO CINAHL Plus. The chosen articles were sourced from relevant healthcare science journals. MESH search parameters were applied to identify studies published between 2015 and 2023, ensuring complete access to article content and adherence to the inclusion and exclusion criteria. These studies specifically revealed the consequences of adolescent pregnancy on maternal and neonatal health, as well as educational outcomes.

## ANALYSIS AND DATA EXTRACTION

The literature search inclusion criteria focused on cross-sectional, case-control Prospective, retrospective quantitative studies conducted in healthcare centres and educational organizations. Literature related to adolescent pregnancy and its outcome on neonatal and maternal health and educational effect. Other factors were excluded. Initially, the search yielded a total of 627 studies on the topic of Adolescent pregnancy and its outcomes. Out of these, 363 studies were disregarded because the full text was not available, and another 150 research studies were excluded based on the predefined criteria for inclusion and exclusion. In the end, 10 studies were incorporated into the review, ensuring that each chosen study focused on measuring the effects of non-pharmacological approaches on labor pain. (Figure 1)

## RESULTS

### PRISMA FLOW CHART



## RESULTS

Following the inclusion criteria, the present review included 10 articles that closely matched the topic. Below are the details of the studies: out of the 10 research studies, 3 were descriptive cross-sectional, 1 was comparative cross-sectional, and the remaining 6 were prospective case-control studies.

Author	Objective	Method	Sample Size Setting	Instrument	Sampling Method	Data Analysis	Outcome
(7)	To conduct a comparison between the maternal complications experienced during teenage pregnancies and those during pregnancies in the general population,	A case control study	75 (case)/Adolescent pregnancy 75 (Control) 20-34 years a tertiary hospital in Nepal	Semi structure Interview and Physical examination	Nonprobability purposive sampling.	Logistic Regression	Adolescent mothers, with a mean age of 17.29 ± 1.19, are at a higher risk of experiencing medical and obstetric complications. Hypertensive disorders affect 24% of them, while anemia affects 49.3%, and postpartum hemorrhage affects 25.30%. In terms of neonatal outcomes, preterm labor occurs in 45.3% of cases. Teenagers are more prone to both maternal and neonatal complications.
(8)	To determine the effects on both the mother and newborn resulting from teenage pregnancy.	Descriptive cross-sectional study	100 adolescent pregnancy 100 adult In Bangladesh	semi-structured questionnaire	Non probability purposive sampling	Frequency percentage	In terms of maternal outcomes: Pre-eclampsia occurs (12.0% Vs 5.0 %.) Preterm labor is experienced by (13.0% Vs 5.0 %.) Postpartum hemorrhage affects (21.0% Vs 11.0%.) Hyperemesis gravidarum (48.0% Vs 33.0%.) As for neonatal outcomes: Stillbirth is observed in (23% Vs 14%.) Low birth weight is reported in 29% compared to 20%.
(3)	The goal is to examine the occurrence of adolescent pregnancies and investigate the societal consequences of such pregnancies in healthcare settings	observational cross-sectional study	138 adolescent pregnancy 571 adult pregnancy India	Semi structured interview and Record review	Non probability purposive sampling	Frequency percentage	Maternal outcomes Adolescent pregnancy was 19.4% among them Anemia 63.7% and PIH 26.8% and abortions 9.4%. Neonatal outcomes The occurrence of low birth weight was 20.2%, with 15.2% of infants requiring NICU admission due to conditions like Birth asphyxia and Neonatal jaundice.
(9)	The objective is to compare unfavorable fetal outcomes in teenage and adult pregnant women.	Comparative cross-sectional study	481 adolescent and 481 adult form rural Eastern Ethiopia.	structured questionnaire	Non probability purposive sampling	log-binomial regression	A significantly higher rate of adverse fetal outcomes was found in teenage women compared to adults (34.9% vs. 21%). Moreover, there was a statistically significant difference (P < 0.05) in the incidence of low birth weight (21.1% Vs. 9.3%) and preterm birth (18.7% vs. 10.6%) between the two groups.

(10)	To investigate the unfavorable obstetric and perinatal outcomes encountered by adolescent mothers during their first childbirth.	prospective case-control study	165 adolescent pregnant 330(20-25yrs) India	structured and pre-tested proforma and Interview	Non probability purposive sampling	chi-square test and unpaired t-test and Odds ratio	Maternal outcomes mean age in adolescent group was 17.72±1.12 years pre-eclampsia 11.52 Vs 6.06% OR 2.017 (1.045-3.894 p 0.03) eclampsia 3.03Vs 2.12% OR 0.995(0.310-1.193) Neonatal outcomes Preterm birth 23.64 Vs 15.76% OR 1.655(1.039-2.636) p 0.03 Low birth weight 26.06Vs 13.03 NICU admission 16.36 Vs 9.09% OR 1.957(1.120-3.417) p 0.02 Providing excellent prenatal, intrapartum, and postnatal care can potentially dispel the notion that adolescent pregnancy is linked to significant obstetric complications.
(11)	To evaluate the outcome of pregnancy in teenage mother	A prospective case-control study.	125/125 in Sikkim	structured and pre-tested proforma and Interview	Nonprobability purposive sampling	chi-square test	Maternal outcomes Preeclampsia is higher among adolescent mothers, preterm birth
(12)	To assess the foeto-maternal outcomes of adolescent mothers	Prospective case-control study	70/70 India	Semi-structured open-ended questionnaire	Nonprobability purposive sampling	Odds Ratio, chi-square test	Maternal Outcomes Severe anemia (11.4 Vs1.4%, p 0.033), Severe PIH(17.1%Vs4.2%,p 0.014). Neonatal outcomes Preterm birth(17.1 Vs 5.7% p 0,034), Low birth weight(77.2 Vs 22.8% p <0.001). Adolescent mothers have a higher probability of experiencing premature births, severe pregnancy-induced hypertension (PIH), significant anemia, and their newborns being born with low birth weight and prematurity.
(13)	To identify the factors linked to teenage pregnancy.	unmatched case-control study	216 cases and 216 control in Nepal	structured interview schedule	systematic random sampling	Logistic Regression	Neonatal outcomes Preterm birth (22.2Vs 5.6%), low APGAR in 1 minute (43.5Vs 36.6%), Low birth weight (25.0 Vs 10.6% and need of Resuscitation (6.0 Vs 3.2%)
(14)	To assess foeto-maternal outcome of teenage pregnancy	Cross-sectional study	100 adolescent pregnant mothers/ 108 adult Bangladesh	History taking interview and physical examination	Nonprobability purposive sampling	chi-square test	Outcomes Preterm labor(4.1 Vs 2.3% ) Fetal distress (12.8Vs 9.2% NICU admission (8.3 Vs 6.4%) and Fetal weight is significantly lower than adult pregnancy.
(16)	To emphasize the serious difficulties faced by adolescent mothers.	prospective case control study	606 adolescent pregnancy 2950 adult in Egypt	History taking and Interview and physical examination	Non probability purposive sampling	Unpaired t test and Chi square test	Maternal outcomes Eclampsia (2.5 Vs 0.6% p 0.0001) preeclampsia is higher among adult pregnancy Neonatal outcomes NICU admission (19.7 Vs 14.9% and fetal weight is significantly lower among teenage pregnancy

## DISCUSSION

In Kondu et al.'s study, it was revealed that adolescent pregnancy had a prevalence of 19.4%, with 63.7% experiencing anemia, 26.8% facing pregnancy-induced hypertension (PIH), and 9.4% having abortions. Additionally, the study found that 20.2% of the pregnancies resulted in low birth weight, while 15.2% were associated with birth asphyxia and neonatal jaundice. These findings are consistent with another study conducted in Brazil, which highlighted a high prevalence of anemia in adolescent women. Among them, a greater percentage had mild anemia (65.60%) compared to moderate (33.86%) and severe anemia (0.52%). Furthermore, Dowle's study in 2017 also demonstrated that babies born to adolescent women had an increased likelihood of extremely low birth weight and extreme prematurity. A statistically significant relationship ( $P=0.044$ ) was observed between birth weight and maternal age.

Mezmur et al. (2021) conducted a study comparing adverse maternal and fetal outcomes between teenage and adult pregnant women. The research revealed that teenage mothers experienced various health complications, including a higher risk of eclampsia and pre-eclampsia. These findings align with a study by Kawatika (2015) conducted in the United States, which also found that younger adolescents faced an increased risk of maternal pre-eclampsia (Adjusted Odds Ratio [aOR] = 1.44; 95% CI: 1.17-1.77). In the same study conducted by Mezmur et al. (2021), a higher proportion of teenage pregnancies resulted in low birth weight and premature delivery compared to adult pregnancies. These results were similar to those of the study by Kawatika (2015), where preterm delivery before 37 weeks of gestation was also associated with a higher risk (aOR = 1.36; 95% CI: 1.14-1.62) among teenage mothers.

Medhi (2016) conducted a study investigating the unfavorable obstetric and perinatal outcomes experienced by adolescent mothers during their first childbirth. The study found that neonatal outcomes, such as preterm birth, were 23.64% compared to 15.76% in older mothers, with an Odds Ratio (OR) of 1.655 (95% confidence

interval [CI]: 1.039-2.636), and a p-value of 0.03. Additionally, the rate of low birth weight among adolescent mothers was 26.06% compared to 13.03% in older mothers. Similarly, Ogawa (2019) conducted a study in Tokyo and found that adolescent women faced significantly higher risks for preterm birth (adjusted risk ratio [aRR] 1.17, 95% CI: 1.08–1.27), low birth weight (aRR 1.08, 95% CI: 1.01–1.15), and low Apgar score (aRR 1.41, 95% CI: 1.15–1.73) compared to women aged 20–24 years. The study concluded that adolescent women are at a higher risk of adverse birth outcomes.

Medhi et al. (2016) conducted a study that revealed an increased risk of NICU admission among infants born to adolescent mothers. This finding aligns with a study by Sandal (2011) in Turkey, where a sample of 317 mothers was taken. The Turkish study reported that 29% of the newborns were premature, and the rate of intrauterine growth retardation was 1%. Furthermore, out of forty-one newborns, 92.6% were born prematurely and required admission to the neonatal intensive care unit. The study concluded that adolescent mothers had higher rates of prematurity and NICU admission for their infants.

## SUMMARY

The available literature was refined to get 10 descriptive and prospective case-control studies. Teenage pregnancy is associated with several adverse neonatal outcomes. Studies have shown that teenage mothers are at increased risk of experiencing obstetric and birth related complications compared to adult mothers. These complications include anemia, pre-eclampsia and eclampsia during pregnancy, which pose serious health risks to both the mother and the baby. In addition, infants born to teenage mothers are at a greater risk of premature birth and low birth weight compared to infants born to older mothers. Furthermore, neonates of teenage mothers face an increased likelihood of NICU admission due to complications associated with prematurity and other health issues.

## CONCLUSION

In summary, teenage pregnancy leads to higher rates of maternal complications like PIH, pre-eclampsia, eclampsia, anemia, PPH, and preterm labor, as well as neonatal complications such as low birth weight, preterm birth, low APGAR score, and NICE admission. To address these risks and promote the well-being of both the mother and her baby, it is crucial to implement comprehensive education aimed at discouraging teenage pregnancy, along with targeted healthcare and support programs for teenage mothers.

## LIMITATIONS

Data search was limited. The search strategy was refined to teenage pregnancy and its neonatal outcome only.

## CONFLICT OF INTEREST: NONE

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