

Characteristics of Pregnancy and Birth Outcomes among Expectant Teenage Mothers: A Single Center of Retrospective Study of 10 Years Approach

Hendri Tanjaya,¹ Mutiara Riani,² Budi Darmawan,² Edihan Mardjuki²

¹School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia, Indonesia

²Department of Obstetrics and Gynecology, School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia, Indonesia
Corresponding: Hendri Tanjaya, M.D, Email: htanjaya011101@gmail.com

Abstract

Objective: This study aims to analyze the characteristics and birth outcomes of Indonesian adolescents who have experienced pregnancy.

Methods: This study assessed hospital-based retrospective cross-sectional study of 112 deliveries of teenage pregnancy. Bivariate analysis was conducted to examine the direct impact of each independent variable on the outcome variable. Following bivariate analysis, assumptions for logistic regression were examined using a variable with a p-value of <0.25.

Result: Adolescent pregnancy was associated with a notably higher risk of anemia, postpartum hemorrhage, and low Apgar score at birth at 1 minute ($p < 0.05$). Moreover, most adolescent pregnancies show complications. However, the rate of cesarean section deliveries was lower.

Conclusion: Adolescent pregnancies are associated with negative effects on neonates and maternal figures. It remains a severe health problem that impacts all countries worldwide. Adolescence is not a good period for pregnancy. Improving the quality of health education and healthcare services is crucial for better outcome of adolescent pregnancy.

Keywords: Birth outcomes, Complication, Pregnancy, Teenage

Karakteristik Kehamilan dan Hasil Persalinan pada Kehamilan Remaja: Sebuah Studi Tunggal, Studi Retrospektif dengan Pendekatan 10 Tahun

Abstrak

Tujuan: Penelitian ini bertujuan menganalisis karakteristik dan prognosis persalinan pada remaja di Indonesia.

Metode: Sebuah studi potong lintang retrospektif berbasis rumah sakit terhadap 112 persalinan dari kehamilan remaja dilakukan dalam penelitian ini. Analisis bivariat dilakukan untuk memeriksa dampak langsung dari setiap variabel independen terhadap variabel dependen. Regresi logistik dilakukan dengan menggunakan variabel yang memiliki nilai p kurang dari 0,25 setelah analisis bivariat.

Hasil: Kehamilan remaja dikaitkan dengan risiko anemia yang lebih tinggi, perdarahan pascapersalinan, dan skor APGAR yang rendah saat lahir pada menit ke-1 ($p < 0,05$). Sebagian besar kehamilan juga mengalami komplikasi. Namun, tingkat persalinan operasi caesar lebih rendah.

Kesimpulan: Kehamilan pada remaja berkaitan dengan berbagai komplikasi pada ibu dan neonatus, sehingga menjadi masalah kesehatan yang memengaruhi negara di seluruh dunia. Masa remaja bukanlah periode ideal untuk kehamilan, sehingga diperlukan upaya untuk meningkatkan kualitas pendidikan kesehatan dan layanan kesehatan guna memperbaiki prognosis kehamilan

Kata Kunci: Kehamilan, Komplikasi, Prognosis kehamilan, Remaja

Introduction

Adolescent (teenager) pregnancy is defined as pregnancy in a female aged between 10 to 19 years old.¹ Adolescence is a critical developmental stage; any stressful experience can have lifelong consequences from teenage to healthy adulthood. Pregnancy can be a stressful experience, as teenagers are not physically and mentally prepared enough.^{2,3} It increases the risk of life-threatening complications with serious health sequelae in later life. It is proven that pregnancy at this stage is associated with an increased risk of adverse maternal (preeclampsia, anemia, hemorrhage, chronic infection) and neonatal outcomes (stillbirth, preterm birth, and low birth weight).^{4,5} It is stated that women aged 10-14 years have five times the risk of dying during pregnancy or childbirth compared to those aged 20-35 years, while the risk increased by two times with the age group of 15-19 years old.^{1, 2, 6}

The World Health Organization (WHO) stated that an estimated 21 million pregnancies occurred among teenagers aged under 20 years old annually, half of which were unintended and resulted in 12 million births.⁷ Most of them are from low to middle-income countries. The majority of adolescent pregnancies are unintentional and unplanned.³ Data from Riskesdas 2018 showed that 4.1% of women aged 10-14 years and 63.2% aged 15-19 years have been pregnant. Additionally, it revealed that complications during pregnancy occur most frequently in women aged between 10-14 years (38.5%). Data proportion of pregnant women aged 10-14 years in Jakarta was completely absent, whereas 63.89% of women aged 15-19 years old were pregnant.⁸

Although this subject is well-documented and has always been the center of attention, conflicting results still exist regarding adolescent pregnancies

and their fetal outcomes.⁹ compared with 14,259 primigravida aged 20-29 years. The adolescents had significantly higher rates of maternal death, maternal heart disease, PIH, puerperal infection, chorioamnionitis, urinary tract infection, foetal anomaly, preterm delivery, low birth weight, low Apgar scores and stillbirth. Multivariate logistic regression analysis showed that both older 16-19 years old It remains unclear whether it is caused by sociodemographic factors or just by the biological immaturity of adolescents.¹

This study aims to determine the characteristics and birth outcomes of Indonesia's adolescents aged under 20 years who experienced pregnancy from January 2021 to May 2023. The results of this study can be considered and adopted to develop reproductive health education strategies for pre-adolescent children. Furthermore, this study may increase clinician's knowledge and awareness regarding the risk of adverse maternal and neonatal outcomes, providing a new basis for future research.

Methods

This observational study with a cross-sectional design was conducted at the School of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia, from late June 2023 to August 2023. This study was approved by the Ethics Commission School of Medicine and Health Science, Atma Jaya Catholic University of Indonesia (21/06/KEP-FKIKUAJ/2023). Data on pregnant adolescents who gave birth at Atma Jaya Hospital, Jakarta, from January 2013 to May 2023 were retrieved from the Hospital. The inclusion criteria in this study were adolescents aged 20 years old at the time of the infant's birth. Meanwhile, the exclusion criteria were medical records that were inaccessible and unreadable by the authors.

Data were collected using the total sampling method, obtaining 112 adolescents.

Data on the subject's characteristics such as age, parity, gestational age at delivery, mode of delivery, rupture of the perineum, episiotomy, birth outcomes (APGAR score; appearance, pulse, grimace, activity and respiration, birth weight, and neonatal care), the status of anemia during antenatal care, and complication during delivery were assessed from the diagnosis of an obstetrical doctor. Data were collected on the medical record. Informed consent was not required as this was based on secondary data analysis of medical records in Atma Jaya Hospital.

The collected data were presented in a table. Data analyses were performed with SPSS v-22 statistical software. Bivariate analysis was done to see the crude effect of each independent variable on the outcome variable. The association between categorical variables was evaluated using the chi-square

test. A value of $p < 0.05$ was considered statistically significant. Assumptions for logistic regression were conducted with a variable with a p -value < 0.25 after bivariate analysis was carried out. Adjusted odd ratio with its 95% confidence interval was used to identify factors independently associated with teenage pregnancy. A p -value < 0.05 was considered for statistical significance.

Results

The medical records of 112 patients from 2013 to May 2023 were included in the analysis. The mean age of the patients was 17.9 ± 1.2 years old. Most of the patients were aged between 18 and 19 years. Primipara, full-term delivery, a complication, and anemia during antenatal care were more frequent among teenagers. Most of the teenage patients had

Table 1 Maternal Characteristics and Neonatal Outcome during 10-Year (2013–2023)

Variable	Frequency (n=112)	Percentage (%)	p-value
Age			
Middle adolescent (14–17 years)	36	32.1	
Late adolescent (18–19 years)	76	67.9	-
Gravid*			
Primipara	100	89.3	0.099
Multipara	12	10.7	
Weeks of pregnancy†			
Preterm	51	45.5	
Term	57	50.9	0.019
Postterm	4	3.6	
Complication‡			
Yes	90	80.4	0.118
No	22	19.6	
Mode of delivery			
Vaginal	74	66.1	0.737
Caesarean section	38	33.9	
Episiotomy			
Yes	32	28.6	0.898
No	80	71.4	

Perineum rupture*			
No rupture	61	54.5	
Grade 1	5	4.5	
Grade 2	43	38.4	0.562
Grade 3	1	0.9	
Grade 4	2	1.8	
Hemorrhage			
Postpartum hemorrhage	80	71.4	0.001
Normal	32	28.6	
Anemia during last ANC			
Anemia	72	64.3	0.004
Normal	40	35.7	
APGAR one minute†			
Severely depressed (0–3)	21	18.8	
Moderately depressed (4–6)	16	14.3	0.002
Normal (7–10)	75	67	
Birth weight			
Low birth weight	38	33.9	0.445
Normal	74	66.1	
Neonatal care†			
Death	11	9.8	
NICU	32	28.6	0.011
Normal care	69	61.6	

*Variables were assessed with the Fisher exact test

†Variable were assessed with likelihood ratio

ANC, antenatal care; APGAR, Appearance, Pulse, Grimace, Activity and Respiration; NICU, neonatal intensive care unit.

Table 2 The Obstetrical Complications of the Teenage Pregnancy

Type of Complication	Frequency (n:125)
Hypertension of pregnancy	10
Premature rupture of membrane	7
Prolong labor & cephalopelvic disproportion	15
Fetal distress	8
Intrauterine fetal death	10
Oligohydramnios	5
Antepartum hemorrhage	5
Intrauterine growth restriction	3
Nuchal cord	3
Malpresentation	8
Preterm pregnancy	51

Table 3 Multivariate Analysis

Maternal Characteristics	p-value	OR (95% CI)
Status of Anemia	0.075	2.36 (0.91–6.09)
Postpartum hemorrhage	0.002	4.28 (1.67–10.9)
APGAR score 1 minutes	0.023	1.90 (1.09–3.30)

OR, odd ratio; CI, confidence interval; APGAR, Appearance, Pulse, Grimace, Activity and Respiration.

a complication during delivery (80.4% vs. 19.6%). The maternal characteristics and neonatal outcomes of the patients are shown in Table 1.

Preterm pregnancies were found to be the most common complication that happens in teenage pregnancy than other complication. The type of complication presented includes 97 types because a patient can have either one or more complications during pregnancy. The type of obstetrical complication is shown in Table 2.

The multiple logistic regression analysis shows that the status of anemia, postpartum hemorrhage, and APGAR score of 1 minute were the main dependent influential factors of adolescent pregnancy. Status of anemia in pregnancy (OR: 2.36, 95% CI = 0.91–6.09), postpartum hemorrhage (OR:4.28, 95% CI = 1.67–10.9) and APGAR score 1 minute (OR: 1.90, 95% CI=1.09–3.30) were at higher risk in teenage pregnancy.

Discussion

Adolescent pregnancy is a global issue that requires major attention and awareness. It can result in negative health effects, perpetuate cycles of poverty through generations, and contribute to congenital defects. The World Health Organization considers teenage pregnancy as a major global health concern in both developed and developing countries.¹⁰ Adolescence is a phase marked by substantial changes in both social and environmental aspects. Additionally, changes were made to the anatomical, structural, psychological, and physiological components. Inadequate readiness in teenagers, concerning both

physical and emotional health, is the primary cause of pregnancy and birthing problems, leading to unfavorable outcomes.¹¹

In Indonesia, 10% of total births are accounted for by teens who have given birth. Previous research has shown that teenage pregnancy is a significant issue with numerous problems.¹² Our study found that the percentage of anemia at the final antenatal care visit, postpartum hemorrhage, and low APGAR score at 1 minute were substantially associated with teenage pregnancy.

Previous literature has shown a higher incidence of anemia and low iron levels in pregnant teenagers.⁶ Pregnancy causes an increased demand for iron due to the expansion of maternal blood and the needs of fetal tissues. These factors result in decreased oxygen supply to the fetus and can lead to adverse delivery outcomes, including premature birth, low birth weight, stillbirth, or even post-partum hemorrhage. Pregnant teenagers are more likely to develop anemia because of the quick growth and significant biological changes in both the fetus and mother, as well as poor food habits and inadequate prenatal care.^{13, 14} Our findings show that 64.3% of the patients were anemia ($p < 0.01$) (OR: 2.36; 95% CI=0.91–6.09). Poor socio-economic status, such as low education, lack of prenatal care, and unsuitable lifestyle, are the primary factors contributing to adverse neonatal and maternal outcomes, especially in teenage settings.¹⁴

Studies conducted in developing countries revealed that anemia was a significant public health issue among pregnant adolescents. A comprehensive study showed that teenage pregnancy was

linked to anemia during delivery. Moreover, anemia detected during the antenatal period was also associated with teenage pregnancy, indicating a potential underestimation of anemia incidence during antenatal care in the study population.¹²

Previous studies on the association between teenage pregnancy and the likelihood of cesarean section are ambiguous. This study demonstrates a significant decrease in risk, possibly attributed to the low socioeconomic status of the patient who resisted to go on surgical treatment even though there might be an indication through it.

Moreover, previous studies considered the impact of maternal age on the APGAR score. Ogawa et al. demonstrated that neonates born from adolescent mothers exhibit a greater incidence of poor Apgar scores compared to adult patients; meanwhile, Yadav et al. observed no difference.^{15,16} Our study found that 33.1% of neonates had a one minute APGAR score less than 7 ($p < 0.05$) (OR=1.90; 95% CI=1.09–3.30). These findings may be explained by the patients' incomplete biological and physiological development or by anemia itself. To fully understand the association between teenage pregnancy and poor obstetric outcomes, it is essential to conduct more studies on the quality of antenatal care and the socioeconomic variables of the community.

Conclusion

Teenage pregnancies are related to adverse neonatal and maternal outcomes. It persists as a significant health issue affecting all countries, regardless of their income levels. Solutions are needed to prevent pregnancies in young individuals and enhance the health outcomes for both mothers and fetuses. This stage in a woman's growth is crucial, and demands increased focus and continuous effort from parents, schools, and

governments. Adolescence is not an ideal time for pregnancy. Therefore, enhancing the quality of health education and healthcare services is essential for enhancing the outcome of adolescent pregnancy.

Authors contribution

Conceptualization: H.T, M.R, B.D., E.M.; acquisition of data: H.T.; analysis and/or interpretation of data: H.T. M.R.; drafting the manuscript: H.T.; revising the manuscript critically for important intellectual content: H.T., M.R., B.D., E.M.; approval of the version of the manuscript to be published: H.T, M.R, B.D., E.M.

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Conflict of Interests

The authors have declared no conflict of interest.

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