

Literature Review: Teenage Pregnancy is Associated with the Incidence of Anemia and Chronic Energy Deficiency in Pregnant Women

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Article Info	Abstract
Article History Submitted, 2025-11-02 Accepted, 2025-11-30 Published, 2025-12-31 Keywords: Pregnancy, adolescence, CED, Anemia	Adolescent pregnancy is a pregnancy that occurs at the age of 15-19 years old. Adolescent Pregnancy causes many complications, such as anemia and chronic energy deficiency. The aim this research to finding out more about the effect of adolescent pregnancy on the incidence of anemia and CED in pregnant women. This literature review employed a literature review method. A systematic search was conducted using a computer search using the Google Scholar database for articles published between 2020 and 2025. Only articles with a quantitative design and full text were included in this analysis. Key data were searched using the PICO (Population Intervention Compare Outcome) technique. Of the 20 articles reviewed, 10 were relevant to the topic of this literature review. Of these 10 articles, 6 showed a significant association between teenage pregnancy and the incidence of CED in pregnant women, while the other 4 articles did not find the same association. The results of the review indicate that pregnant women who are too young (under 20 years old) are at higher risk of experiencing CED. In addition, the incidence of low birth weight is also influenced by teenage pregnancy. Most studies show a significant association between teenage pregnancy and the incidence of CED in pregnant women. Based on the results of a literature review of 20 articles, it shows that there is a relationship between pregnant women with CED and there is an influence of pregnant women with CED with the incidence of anemia, there is a relationship between teenage pregnancy and the incidence of anemia and CED in pregnant women, the number of children a pregnant woman has affects the possibility of CED, anemia conditions also play an important role in the incidence of CED, there is a relationship between the age of pregnant women and CED status, there is a need for calculations of the level of energy and nutrient adequacy to describe the consumption habits of pregnant women which are direct factors causing CED, there is a significant relationship between age, parity, too close pregnancy spacing, economic status, low knowledge about nutrition and direct factors such as infection, and there is a significant relationship between CED in pregnant women and the incidence of LBW. Teenage pregnancy is associated with the incidence of CED and anemia in pregnant women.

Introduction

Indonesia faces a high maternal mortality rate (MMR), at 359 per 100,000 live births. This high maternal mortality rate (MMR) was caused by bleeding, hypertension, infection, prolonged labor, and abortion between 2010 and 2013 (Ministry of Health of the Republic of Indonesia, 2014). Maternal hemorrhage contributed to the highest percentage of maternal deaths (28%). Anemia and Chronic Energy Deficiency (CED) are also major causes of bleeding in pregnant women (Apriyanti, 2017). The World Health Organization (WHO) reports that anemia and CED in global pregnancies occur in 35-75% of the third trimester compared to the first and second trimesters. The WHO also states that 40% of maternal deaths in developing countries are related to anemia and CED (Rukiah, 2010). One of the risk factors for CED in pregnant women is an upper arm circumference of less than 23.5 cm or a weight gain of less than 9 kg during pregnancy (Ministry of Health of the Republic of Indonesia, 2015). The Indonesian Ministry of Health (2014) states that the first 1,000 days of a child's life are a golden period that can be maximized to improve their nutritional status. This is because brain growth occurs rapidly during this period, supporting the entire child's growth and development. If children do not receive adequate and good nutrition during this period, it will affect brain growth, physical growth, and cognitive development, leaving them weak and susceptible to disease.

Pregnant women are a nutritionally vulnerable group at risk of developing CED, which can significantly impact the growth and development of the fetus and unborn child. These impacts include miscarriage, stillbirth, neonatal death, congenital defects, anemia in infants, and low birth weight (Sandjaja, 2009). According to research by Palimbo (2014), there is a correlation between pregnant women's knowledge and attitudes about CED, with a prevalence of 74.2%. AUSA's research (2013) found that maternal dietary patterns, energy intake, and economic status influence the incidence of CED in Gowa Regency, South Sulawesi. Chronic Energy Deficiency (CED) is a condition in which mothers suffer from malnutrition, which occurs in women of childbearing age (WUS) and pregnant women (Ministry of Health of the Republic of Indonesia, 2002). Among women of childbearing age (WUS), 38.5% of women aged 15-19 are pregnant and 46.6% are non-pregnant. Among women aged 20-24, 30.1% and 30.6% are pregnant. Among women aged 25-29, 20.9% are pregnant and 19.3% are non-pregnant. Meanwhile, among those aged 30-34, 21.4% are pregnant and 13.6% are not. This indicates that the proportion of women of childbearing age at risk of chronic energy deficiency (CED) has increased over the past 7 years, with the highest-risk age group being those aged 15-19, both pregnant and non-pregnant (Ministry of Health of the Republic of Indonesia, 2013).

According to the 2012-2013 Susenas (National Survey), the percentage of women aged 10 years and over who had ever married in rural areas reached 37.79% in 2012 and 37.71% in 2013. The high rate of early marriage in Indonesia is one of the causes of first pregnancies also occurring at an early age or when the mother is still a teenager, which is often referred to as teenage pregnancy. The course of pregnancy is greatly influenced by the mother's age at the time of her first pregnancy. The ideal age for a woman to give birth is 20-25 years old, and if a mother is younger or older, she is at greater risk of complications during pregnancy.

Methods

This study used a literature review method. The search was conducted electronically using the Google Scholar database from 2021 to 2025. The keywords used were "Pregnant Women with Chronic Keloids", "Factors Affecting Pregnant Women with Chronic energy deficiency", and "The Relationship between Pregnant Women with Chronic energy deficiency and Anemia". The search used these keywords in the Google Scholar, Garuda, and Sinta databases in accordance with the inclusion and exclusion criteria. The inclusion criteria were articles in Indonesian and English, with complete PDF formats. The exclusion criteria were articles in languages other than Indonesian and English, the lack of complete PDF formats, and secondary articles (such as review articles). Twenty articles were obtained, of which six were selected, both in Indonesian and English, with complete PDF formats. The PICO (Population, Intervention, Comparison, Outcome) framework was used.

Results and Discussion

Pregnancy during adolescence, which occurs between the ages of 15 and 19, increases the risk of death 2-4 times compared to women who become pregnant between the ages of 20 and 30. Similarly, the risk of infant mortality is 30% higher in women who become pregnant during adolescence compared to those who become pregnant between the ages of 20 and 30 (Widyastuti, 2009). The occurrence of early marriage is inseparable from the large percentage of the population in adolescence, namely 26.7 percent of the 237.6 million Indonesian population. The age of adolescence according to the World Health Organization (WHO) is between the ages of 12 and 24 years. In Indonesia, one-third of marriages are carried out by couples under the age of 16, even in some rural areas, marriage often occurs soon after girls get their first menstruation. Data obtained shows that 41.9 percent of marriages occur at the

age of 15-19 years and 4.8 percent at the age of 10-14 years (Hapisah & Rizani, 2015). The predicted cause of chronic energy deficiency syndrome (CED) and anemia in pregnant women is teenage pregnancy, where a woman is not psychologically and physically prepared to bear the burden of a baby. This impacts both the baby and the mother, with the baby being born with low birth weight (LBW) or stunted growth, while the mother experiences malnutrition, such as anemia and CED. Teenage pregnancy poses complex physical, psychological, economic, and social problems. Physical problems arising from teenage pregnancy include anemia, impaired fetal growth in the womb, the risk of premature birth, the risk of abortion, and preeclampsia. Although teenage pregnancy has negative impacts on both mother and fetus, its incidence is increasing. Women who suffer from malnutrition before pregnancy or during the first week of pregnancy are more likely to give birth to babies with brain and spinal cord damage because the central nervous system is very sensitive in the first 2-5 weeks. If this occurs in pregnant women, the mother will give birth to a baby with a low birth weight (LBW) of <2500 grams (Arisman, 2009).

The article search was conducted in the database using the keyword "Pregnant Women with Chronic Energy Deficiency (CED)". The following is a list of the seven journals found, described in table:

Table 1. Article Research

No	Researchers	Research methods	Results
1.	The Relationship Between Teenage Pregnancy and the Incidence of Anemia and Chronic Energy Deficiency Syndrome (CED) at Banjar City Community Health Centers in 2024	The research method used was correlational analytic research with a cross-sectional design. The sampling technique used was total sampling of 76 individuals. The study population consisted of 76 pregnant women aged 10-19 years in the Banjaran Kota Community Health Center working area between January and December 2024. Data were analyzed using univariate and bivariate analyses, with statistical testing using the chi-square test.	The results of the study showed that there was no significant relationship between teenage pregnancy and the incidence of anemia (p = 0.549) and the incidence of CED (p = 0.182). Conclusion: There was no significant relationship between teenage pregnancy and the incidence of anemia and CED.
2.	Factors related to Chronic Energy Deficiency (CED) in pregnant women in the working area of Putri Ayu Community Health Center, Jambi City 2025	The research method used was quantitative research within a case-control design framework. A case-control study is an observational research design that compares two groups. The sample size for this study was 39 pregnant women, meeting inclusion and exclusion criteria in a 1:1 ratio: 39 cases and 39 controls. The total sample size was 78 pregnant women selected using purposive sampling.	shows that parity, anemia, attitude, and role of health workers have a significant relationship with the incidence of CED in pregnant women, while age, pregnancy spacing, and knowledge do not have a significant relationship.
3.	Factors Associated with the Incidence of Chronic Energy Deficiency (CED) in Pregnant Women 2024	Based on the results of the study, it shows that from 65 respondents with the category of most mothers having high knowledge as many as 4 respondents (6.2%), while mothers who have moderate knowledge as many as 22 respondents (33.8%) and mothers who have low knowledge as many as 39 respondents (60.0%). The results of the analysis test using chis-square obtained (p-0.948 <0.05), which means Ha is accepted, then there is a relationship between respondent knowledge and Chronic Energy Deficiency (KEK) in pregnant women. However, this study is in line with research conducted by Febriyeni (2017) with the title of factors related to the incidence of chronic energy deficiency in pregnant women at the Banja Laweh Health Center. Bivariate analysis found that there was a relationship between knowledge (p = 0.013), and the incidence of KEK in pregnant women. It can be concluded that the factors related to the occurrence of KEK in pregnant women are knowledge. This research is also in line with the results of research conducted by Sri Handayani	The prevalence of CED in this study was 23.9 percent. Maternal age was associated with CED status, while education, occupation, socioeconomic status, family size, meal frequency, and food quality were not (p>0.05).

		entitled Analysis of Factors Influencing Chronic Energy Deficiency in Pregnant Women in the Wedi Klaten Community Health Center Area.	
4.	The influence of teenage pregnancy on the incidence of anemia and KEK in pregnant women 2020	The method used is a literature review of various international and national journals. This method is used to summarize a topic to improve current understanding. A literature review restates previously published material and reports new facts or analysis. A literature review summarizes the best and most relevant publications, then compares the results presented in the article.	The discussion detailed that the predicted cause of CED and anemia in pregnant women is teenage pregnancy, which means the woman is not psychologically and physically ready to bear the burden of a baby. This impacts both the baby and the mother, with the baby being born low birth weight (LBW) or stunted, and the mother experiencing nutritional deficiencies such as anemia and CED.
5.	The relationship between maternal age and the incidence of KEK in pregnant women in the PKM Ganjar Agung work area 2022	The research method used was analytical research and a case-control design. The population in this study were pregnant women in the PKM Ganjar Agung work area. A sample of 108 people was divided into 36 cases and 36 controls each. The sampling technique used simple random sampling, and the analysis used the chi-square test.	The study results showed a significant relationship between age, parity, closely spaced pregnancies, economic status, low nutritional knowledge, and direct factors such as infection.
6.	The Relationship Between Age of Marriage in Pregnant Women and the Incidence of Chronic Energy Deficiency (CED) in the Soriutuk Community Health Center Work Area, Dompu Regency 2023	This study used an observational analytical cross-sectional design, with a population of 235 pregnant women. The sampling technique used purposive sampling, with a sample size of 148 respondents. The instrument used was a questionnaire, and data analysis was conducted using the chi-square test.	Based on the results of data analysis using the Chi-Square test with a significance level of $\alpha = 5\%$, the p-value was 0.000, indicating a p-value $<\alpha$ (0.000 <0.05), indicating a relationship between marital age in pregnant women and CED.

Of all the articles analyzed, the predicted cause of chronic energy deficiency syndrome (CED) and anemia in pregnant women is teenage pregnancy, which occurs when a woman is not psychologically and physically prepared to bear the burden of a baby. This impacts both the baby and the mother, with babies being born with low birth weight (LBW) or stunted growth, while the mother is more likely to experience malnutrition such as anemia and CED. Teenage pregnancy poses complex physical, psychological, economic, and social challenges. Physical problems resulting from teenage pregnancy include anemia, fetal growth restriction, the risk of premature birth, abortion, and preeclampsia. While teenage pregnancy has negative consequences for both mother and fetus, its incidence is increasing. Women who suffer from malnutrition before pregnancy or during the first week of pregnancy are more likely to give birth to babies with brain and spinal cord damage, because the central nervous system is very sensitive in the first 2-5 weeks. If a pregnant woman experiences this condition, she is more likely to give birth to a low birth weight (LBW) baby, namely a baby weighing less than 2500 grams (Arisman, 2009). The author will present the results of an analysis of six interrelated articles on pregnant women and CED.

The influence of teenage pregnancy on the incidence of anemia and chronic energy deficiency syndrome (CED) in pregnant women

Based on the results of data analysis using the Chi-Square test with a significance level ($\alpha = 5\%$), a p-value of 0.000 was obtained, indicating a p-value $<\alpha$ (0.000 <0.05), indicating a relationship between age of marriage in pregnant women and CED.

Factors Associated with Chronic Energy Deficiency (CED) in Pregnant Women

Factors influencing CED vary from region to region. Research shows that younger mothers are more likely to experience CED in pregnant women, in addition to education, occupation, economic status, family size, meal frequency, and food quality. Research also indicates that

parity, anemia, attitudes, and the role of health workers are significantly associated with CED in pregnant women, while age, pregnancy spacing, and knowledge are not.

The Relationship between Maternal Age and the Incidence of Chronic Energy Deficiency (CED) and the Relationship between CED in Pregnant Women and the Incidence of Low Birth Weight

demonstrated that age is a factor that is proven to be associated with the incidence of CED in pregnant women. Pregnant women aged <20 years and >35 years have a 4.089 times greater risk of CED compared to pregnancies occurring between 20-35 years of age. The results showed a significant association between age, parity, closely spaced pregnancies, economic status, low nutritional knowledge, and direct factors such as infection. The discussion detailed the significant association between CED in pregnant women and the incidence of low birth weight, with a p-value of 0.000 <0.05.

Conclusion and Recommendations

Teenage pregnancy is common in society, especially in Indonesia, where teenage pregnancies occur between the ages of 15 and 19. However, according to the WHO, this type of pregnancy occurs between the ages of 12 and 24. Teenage pregnancy can cause several complications, such as anemia and Chronic Energy Deficiency (CED) in pregnant women. Anemia is caused by bleeding during pregnancy, which can result in significant blood loss. Anemia can also be caused by poor adherence to iron tablet intake, diet, and regular prenatal checkups. The most common cause of Chronic Energy Deficiency (CED) is protein intake, which is controlled by variables such as age at menarche, gynecological age, husband's education level, physical activity, and energy intake

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