# The Relationship Between Anemia and Chronic Energy Deficiency (Kek) In Pregnant Women At The Talun Public Health Center, Cirebon District In 2024

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***Abstract***.
*Background:Anemia during pregnancy remains a major public health problem that contributes to increased maternal and fetal morbidity and mortality. One of the contributing risk factors is Chronic Energy Deficiency (CED), a condition characterized by prolonged inadequate intake of energy and essential nutrients, which may impair hemoglobin synthesis. In Indonesia, the prevalence of anemia among pregnant women remains high, reaching approximately 44.1% based on national health data. Pregnant women with CED are at a higher risk of developing anemia; therefore, it is important to investigate the relationship between these two conditions. Objective: To determine the prevalence of anemia and Chronic Energy Deficiency (CED) and to analyze the association between anemia and CED among pregnant women at Talun Community Health Center, Cirebon Regency, in 2024. Methods: This analytical observational study employed a cross-sectional design. A total of 89 pregnant women were included using a total sampling technique. Data were obtained from the medical records of pregnant women at Talun Community Health Center, Cirebon Regency, in 2024. Univariate analysis was presented as frequency distributions and percentages, while bivariate analysis was performed using the Chi-square test with a significance level of $p<0.05$. Results: Of the 89 respondents, 18 (20.2%) had anemia and 26 (29.2%) had CED. Among pregnant women with anemia, 16 had CED and 2 did not. The Chi-square test demonstrated a statistically significant association between anemia and CED ($p=0.001$). Conclusion: There was a significant association between Chronic Energy Deficiency and anemia among pregnant women at Tafhun Community Health Center, Cirebon Regency, in 2024. Early detection through mid-upper arm circumference (MUAC) measurement, routine hemoglobin screening, nutritional education, and monitoring adherence to iron supplementation should be strengthened as part of antenatal care services.*

***Keywords: Anemia, Chronic Energy Deficiency, CED, Pregnant Women, Mid-Upper Arm Circumference and Cross-Sectional Study.***

## I. INTRODUCTION

Anemia remains a common public health problem across various age groups and physiological conditions. Anemia is defined as a condition in which hemoglobin (Hb) levels fall below normal limits, resulting in a decreased ability of the blood to transport oxygen to body tissues. This condition can be caused by various factors, including iron deficiency, folic acid and vitamin B12 deficiencies, chronic inflammatory diseases, and increased physiological needs. Pregnant women are particularly susceptible to anemia due to increased plasma volume and increased iron requirements during pregnancy to support maternal erythropoiesis, fetal growth, and placental development. [1,2]

Anemia during pregnancy can have detrimental effects on both the mother and the fetus. In the mother, anemia can cause fatigue, reduced functional capacity, and increase the risk of bleeding in the peripartum period. Meanwhile, in the fetus, maternal anemia is associated with an increased risk of premature birth and low birth weight. Therefore, anemia in pregnancy remains a critical issue in efforts to improve the quality of maternal and child health services. [2,3]

Globally, anemia in pregnant women remains a significant public health problem. A 2023 World Health Organization (WHO) report stated that approximately 35.5% of pregnant women worldwide suffer from anemia. In Indonesia, the prevalence of anemia in pregnant women is also relatively high, with an average of around 44.1% based on an analysis of national health data. At the provincial level, the West Java Provincial Health Office reported that in 2020 there were 63,246 pregnant women with anemia. In Cirebon Regency, regional health data showed that in 2022 there were approximately 1,930 pregnant women with anemia out of

a total of 5,284 pregnant women, indicating that anemia in pregnant women remains a problem even at the primary health care level. [4,5,6,7]

Several studies in Indonesia also show that anemia is still common among pregnant women. A 2023 study in Medan Tuntungan reported an anemia prevalence of around 27.1%. A 2024 study at the Cikupa Community Health Center (Puskesmas) showed that 11.32% of pregnant women were anemic. Furthermore, a 2021 study in Sleman Regency reported that some pregnant women still suffer from anemia, with the majority of cases being mild to moderate.[9,10]

The occurrence of anemia in pregnant women is closely related to the mother's nutritional status, particularly chronic energy deficiency (CED). Hemoglobin (Hb) levels are used as the main indicator to assess anemia status in pregnant women. CED is a condition of long-term imbalance in energy and nutrient intake that has a direct impact on decreasing iron reserves and disrupting the process of hemoglobin formation, thereby increasing the risk of anemia. CED status in pregnant women is assessed by measuring the Upper Arm Circumference (MUAC), where a MUAC value of <23.5 cm indicates a risk of CED. Although other factors such as maternal age, gestational age, and parity can also influence the incidence of anemia, including pregnancy at age <20 years or ≥35 years, physiological hemodilution in the second trimester, and high parity that can potentially reduce iron reserves, CED is the main factor that has a direct relationship to the incidence of anemia because it reflects the mother's overall nutritional condition. [2,10,11]

Anemia prevention efforts in pregnant women are part of the standard antenatal care service through anemia screening and iron supplementation. The American College of Obstetricians and Gynecologists (ACOG) recommends anemia screening early in pregnancy and oral iron therapy as the primary management of iron deficiency anemia. However, the success of anemia prevention is not only determined by adherence to iron tablet consumption, but is also greatly influenced by the mother's nutritional status, particularly chronic energy deficiency (CED). Pregnant women with CED tend to have low nutrient and iron reserves, thus increasing their risk of anemia. Community health centers, as first-level health care facilities, play a crucial role in the early detection and management of CED-related anemia through hemoglobin level examinations and mid-upper arm circumference (MUAC) measurements. The Talun Community Health Center in Cirebon Regency serves pregnant women with diverse characteristics, so research is needed to determine the relationship between CED and the incidence of anemia in pregnant women in the Talun Community Health Center's working area in Cirebon Regency in 2024 as a basis for planning and evaluating maternal health programs. [3,12]

## II. METHODS

This study is an observational analytical study with a cross-sectional approach, namely a study that aims to determine the relationship between the incidence of anemia and chronic energy deficiency (CED) in pregnant women based on data collected at a certain time. This study was conducted at the Talun Community Health Center, Cirebon Regency from April to June 2026. The target population in this study was all pregnant women. The accessible population was all pregnant women who checked their pregnancy at the Talun Community Health Center, Cirebon Regency in 2024. The research sample was all pregnant women registered at the Talun Community Health Center, Cirebon Regency in 2024 and met the inclusion criteria. This study used a total sampling technique, namely all members of the accessible population who met the inclusion and exclusion criteria were used as research samples.

The independent variable in this study is anemia in pregnant women, while the dependent variable is Chronic Energy Deficiency (CED). Inclusion criteria are pregnant women who undergo pregnancy check-ups at the Talun Community Health Center, have complete medical record data, are recorded in the KIA register book or Talun Community Health Center medical records in 2024. Exclusion criteria are pregnant women with a diagnosis of diseases that can affect hemoglobin levels, such as thalassemia, chronic kidney disease, malaria, tuberculosis, HIV/AIDS, chronic inflammatory diseases, or bleeding during pregnancy.

Data collection in this study was conducted using secondary data sourced from the medical records of pregnant women at the Talun Community Health Center, Cirebon Regency in 2024. Data were obtained by reviewing medical records documented by health workers during antenatal care (ANC) services. The use of

secondary data was chosen because the data were the results of routine examinations conducted in accordance with maternal health service standards.

The data used in this study focused on two main variables: chronic energy deficiency (CED) and anemia in pregnant women. CED status was determined based on the results of mid-upper arm circumference (MUAC) measurements recorded in medical records. Pregnant women were categorized as having CED if the MUAC value was less than 23.5 cm, while pregnant women with a MUAC value equal to or greater than 23.5 cm were categorized as not having CED. The MUAC measurement was used because it reflects the long-term nutritional status of pregnant women and is relatively stable throughout pregnancy.

This study has obtained ethical approval from the Health Research Ethics Committee of the Faculty of Medicine, Swadaya Gunung Jati University (FK-UGJ) Cirebon, with letter number NO. 126/EC/KEPK/UGJ/VI/2026. This study used secondary data in the form of medical records, thus did not involve direct interaction with respondents. Data confidentiality was maintained by not including patient personal identities and using the data only for research purposes.

Univariate analysis was used to describe the incidence of anemia in pregnant women and the characteristics of the research variables descriptively. This analysis included the frequency distribution and percentage of anemic pregnant women, pregnant women with CED, maternal age, gestational age, and parity. The results of the univariate analysis were then presented in the form of frequency distribution and percentage tables. Meanwhile, bivariate analysis was conducted to determine the relationship between anemia as an independent variable and the incidence of chronic energy deficiency (CED) in pregnant women as the dependent variable. The analysis was performed using the Chi-Square ($\chi^2$) test because both variables are nominal scale. If the contingency table contains cells with an expected count value of less than 5, the Fisher Exact test was used as an alternative. The relationship is considered statistically significant if the p-value is $<0.05$.

## III. RESULTS AND DISCUSSION

Based on medical records of pregnant women at the Talun Community Health Center in Cirebon Regency in 2024, data on 162 pregnant women were obtained. After a selection process based on inclusion and exclusion criteria, 89 respondents met the requirements for analysis. The analysis included univariate analysis to describe the respondents' characteristics and bivariate analysis to determine the relationship between anemia and chronic energy deficiency (CED) in pregnant women.

### Respondent Characteristics

**Table 1. Frequency distribution of age of pregnant women**

| Age | Frequency (n) | Percentage |
|---|---|---|
| <20 years | 3 | 3.4 |
| 20 - 35 years | 71 | 79.8 |
| >35 years | 15 | 16.9 |
| Total | 89 | 100 |

In table 1, the age of pregnant women in this study who were <20 years old was 3 people with a percentage of 3.4%, pregnant women aged 20 - 35 years were 71 people with a percentage of 79.8%, and pregnant women aged >35 years were 15 people with a percentage of 16.9%.

**Table 2. Frequency distribution of the number of parities of pregnant women**

| Parity | Frequency (n) | Percentage (%) |
|---|---|---|
| Nulliparous | 29 | 32.6 |
| Multipara | 60 | 67.4 |
| Total | 89 | 100 |

In table 2, the category of pregnant women with <2 pregnancies or nulliparous is 29 people with a percentage of 32.6% and pregnant women with >2 pregnancies or multiparous is 60 people with a percentage of 67.4%.

**Table 3. Frequency distribution of gestational age of pregnant women**

| Trimester | Frequency (n) | Percentage (%) |
|---|---|---|
| Trimester 1 | 46 | 51.7 |
| Trimester 2 | 21 | 23.6 |

| | | |
|---|---|---|
| Trimester 3 | 22 | 24.7 |
| Total | 89 | 100 |

The table above shows that the frequency distribution of gestational age in this study was 46 pregnant women with a gestational age classified as trimester 1 with a percentage of 51.7%, 21 pregnant women in trimester 2 with a percentage of 23.6%, and 24.7 pregnant women in trimester 3 with a percentage of 24.7%.

**Univariate Analysis**

**Table 4. Frequency distribution of pregnant women with anemia**

| Ane-mia | Fre-quency (n) | Percentage (%) |
|---|---|---|
| Yes | 18 | 20.2 |
| No | 71 | 79.8 |
| Total | 89 | 100 |

Table 4 shows that the frequency distribution of pregnant women with anemia is 18 people with a percentage of 20.2% and pregnant women without anemia are 71 people with a percentage of 79.8%.

**Table 5. Frequency distribution of pregnant women with KEK based on LILA**

| (KEK) | Frequency (n) | Percentage (%) |
|---|---|---|
| Yes | 26 | 29.2 |
| No | 63 | 70.8 |
| Total | 89 | 100 |

Table 5 shows that the frequency distribution of pregnant women with KEK is 26 people with a percentage of 29.2% and normal pregnant women are 63 people with a percentage of 70.8%.

**Bivariate Analysis**

**Table 6. Relationship between the incidence of anemia and KEK**

| Anemia | (KEK) | | *p-value* |
|---|---|---|---|
| | Yes | No | |
| Yes | 16 | 2 | 0.001 |
| No | 10 | 61 | |
| Total | 26 | 63 | 100 |

Table 6 shows that the relationship between anemia and CED in this study has a p-value of 0.001, indicating a significant relationship with a p-value <0.05. The incidence of anemia in pregnant women tends to increase in pregnant women with CED. Based on the results of the study, it was concluded that there is a significant relationship between anemia and CED in pregnant women.

## IV. DISCUSSION

### Characteristics of Pregnant Women Respondents at the Talun Community Health Center, Cirebon Regency in 2024

The characteristics of respondents in this study include maternal age, parity, and gestational age. These characteristics are presented to provide a general overview of the condition of pregnant women who were the subjects of the study at the Talun Community Health Center, Cirebon Regency in 2024. Based on the results of the study of 89 pregnant women, it was found that the majority of respondents were in the 20–35 age group (71 respondents (79.8%), had multiparous status (60 respondents (67.4%), and were in the first trimester (46 respondents (51.7%). These results indicate that the majority of respondents were in the 20–35 age range, which is the reproductive age with a relatively lower pregnancy risk compared to those aged <20 years or >35 years, had previous pregnancy experience, and had undergone pregnancy check-ups since the beginning of gestation.

### Age of Pregnant Mother

Based on age characteristics, most respondents were in the 20–35 age group. This age range is the recommended healthy reproductive age because reproductive organs have developed optimally, hormonal function is in good condition, and the mother's body's ability to adapt to physiological changes during pregnancy is still optimal. In this age range, the risk of obstetric complications such as anemia, hypertension in pregnancy, premature delivery, low birth weight babies, and maternal and perinatal death is relatively lower compared to pregnancies aged less than 20 years or more than 35 years. According to Cunningham et al. in

Williams Obstetrics, pregnancies at healthy reproductive age have better maternal and perinatal outcomes than pregnancies at extreme ages. This is also supported by the American College of Obstetricians and Gynecologists (ACOG), which states that pregnant women aged less than 20 years and more than 35 years require more intensive antenatal monitoring because they have a higher risk of pregnancy complications. [2,12]

The predominance of the 20–35 age group in this study indicates that most mothers had pregnancies within the recommended reproductive age. This is a positive indicator, as a healthy reproductive age is associated with a mother's physical and reproductive readiness for pregnancy. However, the study still found pregnant women experiencing anemia and Chronic Energy Deficiency (CED). These findings suggest that age is not the sole factor determining maternal health during pregnancy. Other factors, such as pre-pregnancy nutritional status, adequate energy and iron intake, adherence to iron supplementation, comorbidities, and the quality of antenatal care, also contribute to maternal health. These findings align with research by Mufidah (2022), which showed that the majority of pregnant women are in the 20–35 age group, but anemia is still found due to the influence of various factors besides age. [2,15,16]

**Parity**

Based on parity characteristics, the majority of respondents were multiparous mothers. These results indicate that the majority of respondents had previous pregnancy and childbirth experience. This experience can increase mothers' knowledge about the importance of prenatal checkups, taking iron tablets, and meeting nutritional needs during pregnancy. However, previous pregnancy experience does not always reflect better nutritional conditions. According to Prawirohardjo, each pregnancy increases the need for energy, protein, and iron. If pregnancies occur repeatedly without optimal recovery of nutritional status, the mother's nutritional reserves can decrease, increasing the risk of nutritional disorders in subsequent pregnancies. [16]

The results of this study are in line with research by Suarni et al. (2025) who also found that the majority of respondents were multiparous mothers. This study explains that multiparous mothers generally understand the importance of antenatal care better than mothers who are pregnant for the first time. However, nutritional status during pregnancy is still influenced by adequate food intake, socioeconomic conditions, and compliance with health care provider recommendations, so that previous pregnancy experience may not necessarily prevent anemia or CED. Therefore, in this study, parity is only used as a respondent characteristic and is not analyzed as a factor related to the occurrence of anemia. [13]

**Gestational Age**

Based on gestational age, most respondents were in their first trimester. This finding indicates that most pregnant women have utilized antenatal care services since early pregnancy. Antenatal care in the first trimester plays a crucial role in early detection of pregnancy risk factors, including anemia and CED, so that intervention can be initiated promptly. The Indonesian Ministry of Health, through its Maternal and Child Health Handbook, emphasizes that early pregnancy care allows health workers to screen for nutritional status, check hemoglobin levels, administer iron supplements, and provide education on dietary patterns during pregnancy. Similarly, the ACOG recommends hemoglobin testing in early pregnancy as part of routine screening to detect anemia so that treatment can be initiated as early as possible. [10,12]

Overall, the characteristics of the respondents in this study indicate that the majority of pregnant women were of healthy reproductive age, were multiparous, and had undergone prenatal checkups since the first trimester. This situation illustrates that most respondents had basic characteristics that support a healthy pregnancy. However, the continued presence of pregnant women with anemia and CED indicates that demographic characteristics do not fully determine maternal health during pregnancy. Nutritional status, adequate nutrient intake, adherence to iron supplementation, and the quality of antenatal care remain factors that require attention in efforts to improve maternal health. Therefore, the following discussion focuses on the incidence of anemia, CED, and the relationship between CED and anemia among pregnant women at the Talun Community Health Center, Cirebon Regency in 2024.

**Characteristics of Anemia Incidence in Pregnant Women at Talun Community Health Center, Cirebon Regency in 2024**

Based on the research results, it was found that of the 89 pregnant women who responded, 18 respondents (20.2%) had anemia, while 71 respondents (79.8%) did not experience anemia. These results indicate that the majority of pregnant women at the Talun Community Health Center, Cirebon Regency, in 2024 had hemoglobin levels within normal limits. However, the proportion of pregnant women with anemia still reached approximately one-fifth of all respondents, so this condition still requires attention because it can increase the risk of complications for both the mother and the fetus if not properly managed.

According to the World Health Organization (WHO), anemia in pregnancy is defined as a hemoglobin (Hb) level of less than 11 g/dL. Anemia remains a global public health problem due to its association with an increased risk of maternal and neonatal morbidity and mortality. During pregnancy, the need for iron increases for maternal red blood cell formation, fetal growth, placental development, and replacement of blood loss during childbirth. If these needs are not met through adequate dietary intake or supplementation, pregnant women are at risk of developing anemia. [1,2,12]

Physiologically, pregnancy causes a greater increase in plasma volume than in red blood cell mass, resulting in physiological hemodilution, a decrease in hemoglobin levels due to blood thinning. This condition is a normal adaptation process during pregnancy, but if accompanied by low iron reserves or inadequate nutritional intake, pregnant women are more susceptible to anemia. Therefore, iron requirements during pregnancy must be met through a balanced, nutritious diet and the consumption of iron-fortifying tablets as recommended by healthcare professionals. [2,16]

The prevalence of anemia in this study was 20.2%, lower than the national and global prevalence of anemia in pregnant women. The 2022 Indonesian Health Profile indicates that anemia in pregnant women remains a health problem that requires attention because it contributes to an increased risk of pregnancy complications. Meanwhile, the WHO reports that the global prevalence of anemia in pregnant women remains around 36.5%, making anemia a public health problem, especially in developing countries. This difference in prevalence indicates that the incidence of anemia in pregnant women in the Talun Community Health Center's work area is relatively lower than national and global figures. [4,5]

The low prevalence of anemia in this study is likely influenced by several factors. Most respondents had undergone prenatal checkups since the first trimester, thus providing them with the opportunity to receive optimal antenatal care (ANC) services, including hemoglobin level checks, education on nutrition during pregnancy, iron supplementation, and regular maternal health monitoring. According to the Indonesian Ministry of Health, quality antenatal care plays a crucial role in early anemia detection, enabling prompt treatment before more serious complications arise. [10,11]

However, the finding of 18 pregnant women with anemia indicates that anemia in pregnancy has not been completely eliminated. This condition indicates that in addition to health care factors, other factors also play a role, such as maternal nutritional status, chronic energy deficiency (CED), low iron intake, folic acid and vitamin B12 deficiencies, infectious diseases, and maternal compliance with iron supplementation. Therefore, efforts to prevent anemia need to be carried out comprehensively through improving nutritional status, education about a balanced nutritious diet, and increasing compliance with iron supplementation during pregnancy. [2,12,16]

The results of this study align with those of Mufidah (2022), which showed that most pregnant women did not experience anemia, but anemia was still found in some respondents. The study concluded that the incidence of anemia is influenced by various factors, particularly nutritional status, adequate iron intake, adherence to iron supplementation, and regular antenatal checkups. Research by Sirait et al. (2025) also reported that anemia remains a health problem among pregnant women in primary health care despite the implementation of various prevention programs. The study emphasized the importance of routine hemoglobin screening, nutritional education, and optimizing antenatal care as key strategies in reducing the prevalence of anemia in pregnant women. [5,8,15]

Based on the results of this study, it can be concluded that the majority of pregnant women at the Talun Community Health Center, Cirebon Regency, do not experience anemia. However, the prevalence of anemia of 20.2% indicates that this condition remains a health problem that requires attention. Therefore, continuous efforts are needed through improving the quality of antenatal care, routine monitoring of hemoglobin levels,

education about balanced nutrition, increasing compliance with iron supplementation, and early detection of risk factors associated with anemia. Considering that this study also assessed Chronic Energy Deficiency (CED) status as a factor suspected of being associated with anemia, the following discussion focuses on the incidence of CED among pregnant women at the Talun Community Health Center, Cirebon Regency, in 2024.

**Discussion of The Overview of Chronic Energy Deficiency (CED) Incidence in Pregnant Women at The Talun Community Health Center, Cirebon Regency in 2024**

Based on the results of the study, it was found that of the 89 pregnant women who were respondents, 26 respondents (29.2%) experienced Chronic Energy Deficiency (CED), while 63 respondents (70.8%) did not experience CED based on the results of the Upper Arm Circumference (MUAC) measurement. These results indicate that the majority of pregnant women at the Talun Community Health Center, Cirebon Regency, have good nutritional status. However, there are still almost a third of respondents who experience CED, so this condition indicates that nutritional problems in pregnant women are still a concern in maternal health services. This proportion illustrates that there are still pregnant women who are unable to meet their energy and nutritional needs during pregnancy optimally.

According to the Indonesian Ministry of Health, chronic energy and protein deficiency (CED) is a condition of prolonged energy and protein deficiency, resulting in decreased body energy reserves. In pregnant women, the risk of CED is determined based on a mid-upper arm circumference (MUAC) measurement of <23.5 cm. The MUAC measurement is used as a screening method because it is easy to perform, relatively stable throughout pregnancy, and can reflect the mother's long-term nutritional status. [10,19]

The results of this study indicate that the prevalence of chronic energy deficiency syndrome (CED) of 29.2% remains quite high. This condition indicates that nearly one in three pregnant women in the Talun Community Health Center (Puskesmas) area experiences chronic nutritional problems. This condition can be influenced by various factors, including insufficient energy and protein intake, low-quality food consumption, socioeconomic conditions, education level, maternal knowledge about nutrition during pregnancy, and the presence of infectious diseases that increase the body's metabolic needs. These factors can lead to unmet energy needs during pregnancy, resulting in the mother experiencing a prolonged energy deficit. [18,19]

According to Supariasa et al., maternal nutritional status before and during pregnancy plays a crucial role in the success of the pregnancy. Long-term energy deficiency reduces the body's fat and protein reserves, making it unable to meet the increased metabolic demands of pregnancy. Consequently, mothers are more susceptible to various complications, such as anemia, impaired fetal growth, premature delivery, low birth weight, and increased maternal and infant morbidity. Williams Obstetrics also explains that energy and nutrient requirements increase during pregnancy to support fetal growth, placental development, increased blood volume, and maternal tissue formation. If these increased requirements are not met with adequate nutritional intake, the mother will experience nutritional deficiencies, which can ultimately impact the health of both mother and fetus. [2,18]

The results of this study align with those of Suarni et al. (2025), who reported a persistently high incidence of CED among pregnant women at the Oransbari Community Health Center in South Manokwari Regency. The study concluded that CED is a nutritional problem still frequently encountered in pregnant women and is associated with an increased risk of anemia. The researchers explained that pregnant women with CED generally have low energy and nutrient reserves, resulting in suboptimal hemoglobin formation. [2,12,13]

The findings of this study are also supported by research by Yanti et al. (2023), which states that pregnant women with CED have a higher risk of experiencing adverse pregnancy outcomes, particularly low birth weight babies. This study confirms that maternal nutritional status during pregnancy influences fetal growth because adequate energy and protein are needed to support fetal tissue formation and placental development. Therefore, meeting nutritional needs from early pregnancy is an important strategy for improving maternal and infant health. [14]

Based on the results of this study, it can be concluded that the majority of pregnant women at the Talun Community Health Center do not experience CED. However, the prevalence of CED, which still reaches 29.2%, indicates that nutritional problems in pregnant women still require attention. Therefore, promotive and

preventive efforts are needed through improving the quality of antenatal care, education about balanced nutrition, regular monitoring of nutritional status using LILA, and providing supplementary food for pregnant women with CED. These efforts are expected to improve maternal nutritional status and thus reduce the risk of anemia and other pregnancy complications.

**The Relationship Between Chronic Energy Deficiency (CED) and The Incidence of Anemia in Pregnant Women at The Talun Community Health Center, Cirebon Regency in 2024**

Based on the results of bivariate analysis using the Chi-Square test, a p value of 0.001 ($p < 0.05$) was obtained, indicating that there is a significant relationship between Chronic Energy Deficiency (CED) and the incidence of anemia in pregnant women at the Talun Community Health Center, Cirebon Regency in 2024. The results of cross-tabulation showed that of the 26 pregnant women who experienced CED, 16 respondents (61.5%) experienced anemia, while 10 respondents (38.5%) did not experience anemia. In contrast, of the 63 pregnant women who did not experience CED, only 2 respondents (3.2%) experienced anemia, while 61 respondents (96.8%) did not experience anemia. These findings indicate that the proportion of anemia is much higher in the group of pregnant women who experienced CED compared to the group who did not experience CED.

The results of this study indicate that maternal nutritional status during pregnancy is a key factor associated with anemia. Pregnant women with chronic energy deficiency (CED) tend to have insufficient energy and protein intake over a prolonged period. This condition is generally accompanied by low micronutrient intake, particularly iron, folic acid, and vitamin B12, which play a role in hemoglobin formation. These nutritional deficiencies cause suboptimal erythropoiesis, resulting in decreased hemoglobin production and an increased risk of anemia. [2,16,18]

According to Cunningham et al. in Williams Obstetrics, iron requirements during pregnancy increase significantly to meet the needs of maternal erythrocyte formation, fetal growth, placental development, and to replace iron losses during labor. If these increased needs are not balanced with adequate iron-rich foods or supplementation, the body's iron reserves will continue to decline, making pregnant women more susceptible to iron deficiency anemia. Furthermore, Prawirohardjo explains that maternal nutritional status is an important determinant of pregnancy success. Pregnant women with poor nutritional status have a higher risk of anemia, impaired fetal growth, premature delivery, low birth weight, and other obstetric complications. (2,12)

The findings of this study are in line with the research of Suarni et al. (2025) which showed a significant relationship between KEK and the incidence of anemia in pregnant women at the Oransbari Community Health Center, South Manokwari Regency ($p=0.01$). The study explained that low energy and nutrient reserves in pregnant women with KEK cause hemoglobin formation to be suboptimal, thus increasing the incidence of anemia. The similarity of these results indicates that nutritional status is a factor that is consistently related to anemia in pregnant women, both in South Manokwari Regency and in Cirebon Regency. [13]

The results of this study are also supported by research by Yanti et al. (2023) who reported that KEK is associated with an increased risk of anemia and poor pregnancy outcomes, especially low birth weight babies. This study emphasized that meeting energy, protein, and iron needs during pregnancy is crucial for maintaining maternal hemoglobin levels and supporting fetal growth. Mufidah's (2022) study also obtained similar results, namely that pregnant women with poor nutritional status are more likely to experience anemia than pregnant women with good nutritional status. The researchers concluded that improving nutritional status is one of the main strategies in preventing anemia during pregnancy. [14]

The strength of the relationship obtained in this study is greater than that of several previous studies. This difference is likely influenced by the characteristics of the respondents, the sample size, the distribution of anemia cases in each group, and differences in socioeconomic conditions and consumption patterns of pregnant women in each study area. Furthermore, in this study, the number of pregnant women with anemia in the group without CED was relatively small, resulting in a higher odds ratio. Therefore, although the relationship found is very strong, the results still need to be interpreted with a fairly wide confidence interval.

According to the Ministry of Health of the Republic of Indonesia, efforts to prevent KEK are carried out through early detection using Upper Arm Circumference (MUAC) measurements, education on balanced

nutrition, monitoring nutritional status during pregnancy, providing iron tablets, and providing additional food made from local foods for pregnant women who experience KEK. [10,19,20]

## V. CONCLUSION

Based on the results of research on the relationship between anemia and the incidence of Chronic Energy Deficiency (CED) in pregnant women at the Talun Community Health Center, Cirebon Regency in 2024, the following conclusions can be drawn:

1. The description of the incidence of anemia in pregnant women at the Talun Community Health Center, Cirebon Regency in 2024 showed that of the 89 respondents, 18 respondents (20.2%) experienced anemia, while 71 respondents (79.8%) did not experience anemia.
2. The description of the incidence of Chronic Energy Deficiency (CED) in pregnant women at the Talun Community Health Center, Cirebon Regency in 2024 showed that of the 89 respondents, 26 respondents (29.2%) experienced CED, while 63 respondents (70.8%) did not experience CED.
3. There is a significant relationship between anemia and the incidence of Chronic Energy Deficiency (CED) in pregnant women at the Talun Community Health Center, Cirebon Regency in 2024. The results of the Chi-Square test showed a p value = 0.001 ($p < 0.05$), so the research hypothesis was accepted. These results indicate that pregnant women who experience Chronic Energy Deficiency (CED) have a greater chance of experiencing anemia than pregnant women who do not experience CED.

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