

## The Relationship Between Socio-Economical and Pregnancy Spacing with the Incidence of Chronic Energy Deficiency (CED) in Pregnant Women at the Balen Community Health Center

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### Abstract

Chronic Energy Deficiency (CED) remains a serious nutritional problem among pregnant women in Indonesia, particularly in the Balen Community Health Center (Puskesmas) area of Bojonegoro Regency. Socioeconomic status and pregnancy spacing are suspected to contribute to the incidence of CED. The purpose of this study was to determine the relationship between socioeconomic status and pregnancy spacing and the incidence of CED in pregnant women. This study used a cross-sectional design with a sample size of 44 pregnant women drawn using simple random sampling. The independent variables were socioeconomic status and pregnancy spacing, while the dependent variable was the incidence of CED as measured by mid-upper arm circumference (MUAC). Data analysis used the Spearman's Rho test with a significance level of  $<0.05$ . The study showed that less than half of the pregnant women had low socioeconomic status (19 women (43.2%)), and most of the pregnant women had a safe/ideal pregnancy spacing (37 women (84.1%)). The results of the analysis using sperm rank showed a significant association between economic status and the incidence of CED ( $p = 0.000$ ). women, while pregnancy spacing did not show a significant association. Nutrition education interventions and ideal pregnancy planning are needed to prevent CED.

**Keywords:** CED, Socioeconomic Status, Pregnancy Spacing, Employment, Education, Income

### INTRODUCTION

Nutritional issues among pregnant women remain a major public health challenge in Indonesia. One of the most prevalent nutritional issues is Chronic Energy Deficiency (CED), a condition resulting from a long-term lack of energy and protein intake, impacting the health of both the mother and her fetus (Ministry of Health, 2021). CED in pregnant women can increase the risk of various pregnancy complications, such as low birth weight (LBW), premature birth, fetal growth disorders, and increased maternal and infant morbidity and mortality (World Health Organization [WHO], 2022; Ministry of Health, 2021).

Globally, the prevalence of chronic energy deficiency syndrome (CED) in pregnant women remains relatively high. The WHO reports that approximately 35–37% of pregnant women in various countries experience chronic energy deficiency (WHO, 2022). In Indonesia, based on the results of the 2023 Indonesian Health Survey (SKI), the prevalence of CED in pregnant women reached 16.9%. This figure indicates that CED remains a serious concern in efforts to improve maternal and child health. In East Java Province, the prevalence of CED in pregnant women was recorded at 19.6%, while in Bojonegoro Regency the figure remains relatively high. Data from the Bojonegoro Regency Health Office shows that the Balen Community Health Center (Puskesmas) working area has a CED prevalence of 18.7%, requiring special attention in prevention and management efforts (Bojonegoro Regency Health Office, 2023).

The high prevalence of CED indicates that this condition remains a critical public health issue that requires immediate attention. The impact of CED not only occurs during pregnancy and childbirth but can also impact the child's future health. Pregnant women with CED are at risk of giving birth to low birth weight babies and experiencing growth disorders that can lead to stunting in infancy (Ministry of Health of the Republic of Indonesia, 2021). Therefore, it is necessary to identify factors associated with CED incidence to enable more effective and targeted interventions.

Various studies have shown that socioeconomic status is a crucial factor in determining the nutritional status of pregnant women. Low socioeconomic status can limit a family's ability to meet nutritional needs, access health information, and utilize available health services. Furthermore, a family's education level and income also influence a mother's ability to understand and implement healthy eating patterns during pregnancy (Adriani & Wirjatmadi, 2016). These limitations can ultimately increase the risk of developing CED in pregnant women.

In addition to socioeconomic factors, pregnancy spacing is also often associated with a mother's nutritional status during pregnancy. Spacing pregnancies too closely, i.e., less than two years, can prevent the mother's body from having sufficient time to restore the energy and nutrient reserves used in the previous pregnancy. This condition can increase the risk of nutritional disorders during subsequent pregnancies, including CED. Conversely, ideal pregnancy spacing provides an opportunity for mothers to improve their health and nutritional status before facing subsequent pregnancies (BKKBN, 2021).

In efforts to prevent CED, healthcare workers, particularly nurses, play a crucial role by providing nutrition education, reproductive health counseling, promoting healthy pregnancy planning, and regularly monitoring the nutritional status of pregnant women. Regular, high-quality antenatal care (ANC) and mid-upper arm circumference (MUAC) screening are crucial steps in early detection of CED risk so that appropriate treatment can be initiated (Ministry of Health of the Republic of Indonesia, 2020).

Based on the above description, socioeconomic status and pregnancy spacing are factors that potentially influence the incidence of CED in pregnant women. Therefore, this study was conducted to analyze the relationship between socioeconomic status and pregnancy spacing with the incidence of Chronic Energy Deficiency (CED) in pregnant women in the Balen Community Health Center, Bojonegoro Regency.

## **METHOD**

### **Design, Participants, and Setting**

This research is a quantitative analytical study using a cross-sectional approach, observing the relationship between variables over a specific period of time (Notoatmodjo, 2018). The study was conducted in the Balen Community Health Center (Puskesmas) working area, Bojonegoro Regency, from February to April 2024.

The population in this study was all pregnant women undergoing prenatal checkups at the Balen Community Health Center. The sample was drawn using a purposive sampling technique, based on predetermined inclusion and exclusion criteria (Sugiyono, 2022). Inclusion criteria included pregnant women in their second and third trimesters, willing to participate, and able to read and write. Exclusion criteria included pregnant women with comorbidities such as diabetes, hypertension, or thyroid disorders. A total of 89 respondents met the eligibility criteria.

### Instrument

The instruments in this study were a closed questionnaire and measurement of the Upper Arm Circumference (MUAC). The questionnaire consisted of three main sections: (1) socioeconomic data (education, occupation, and income), (2) pregnancy spacing, and (3) nutritional status of pregnant women based on the MUAC measurement. KEK was determined based on MUAC < 23.5 cm, according to the standards of the Ministry of Health (Kemenkes RI, 2018).

### Data Collection and Analysis

Data were collected through direct questionnaires completed by respondents with the assistance of researchers. The data were then analyzed using the Spearman Rho test to determine the relationship between the independent variables (socioeconomic status and pregnancy spacing) and the dependent variable (CED), with a significance level set at  $\alpha = 0.05$ . The analysis was performed using statistical software to obtain valid and reliable results.

### Ethical Approval

This research received ethical clearance from the relevant institutions before its implementation. All participants received a written explanation of the study's objectives, benefits, and procedures. Respondents also signed an informed consent form as a form of voluntary participation. Throughout the study, the confidentiality of participants' identities and personal data was guaranteed and fully maintained in accordance with ethical research principles. Bottom of Form

## RESULTS AND DISCUSSION

Based on the results of the study, it was found that out of 44 pregnant women, less than half of the respondents had low socioeconomic status, as many as 19 people (43.2%) and most of the pregnant women's pregnancy spacing was a safe/ideal distance of 37 people (84.1%). Statistical analysis using Spearman Rho showed a significance value of  $p = 0.000$ . This shows that  $p < 0.05$  so it can be concluded that  $H_0$  is rejected and  $H_1$  is accepted, which means there is a relationship between socioeconomic status and the incidence of Chronic Energy Deficiency (CED) in pregnant women at the Balen Health Center. In addition, the  $r$  value (correlation coefficient) = 0.561 was obtained, which means a Strong Relationship.

**Table 1 Socio-economic distribution of respondents at Balen Health Center in January 2025**

| Socio-Economic | Frequency | Percent(%) |
|----------------|-----------|------------|
| Low            | 19        | 43.2       |
| Currently      | 14        | 31.8       |
| Tall           | 11        | 25         |
| <b>Total</b>   | <b>44</b> | <b>100</b> |

**Table 2 Distribution of Pregnancy Spacing of Respondents at Balen Health Center in January 2025**

| Pregnancy Spacing       | Frequency | Percent     |
|-------------------------|-----------|-------------|
| Distance too close      | 4         | 9.1%        |
| Ideal/safe distance     | 37        | 84.1%       |
| The distance is too far | 3         | 6.8%        |
| <b>Total</b>            | <b>44</b> | <b>100%</b> |

**Table 3 Distribution of Chronic Energy Deficiency (CED) Incidences respondents at Balen Community Health Center in January 2025**

| KEK Event                   | Frequency | Percentage (%) |
|-----------------------------|-----------|----------------|
| Special Economic Zone (SEZ) | 13        | 29.5%          |
| NOT KEK                     | 31        | 70.5%          |
| <b>Total</b>                | <b>44</b> | <b>100%</b>    |

**The Relationship between Socioeconomic Status and the Incidence of KEK**

The results of the analysis of the relationship between socioeconomic status and the incidence of KEK using the Spearman Rho test showed a value of  $p = 0.000$  ( $p < 0.05$ ) with a correlation coefficient of  $r = 0.561$ , which means there is a significant relationship with a strong category relationship strength.

**Discussion**

The study results showed a significant association between socioeconomic status and the incidence of Chronic Energy Deficiency (CED) among pregnant women in the Balen Community Health Center (Puskesmas) area. This finding indicates that socioeconomic status is a significant factor influencing maternal nutritional status during pregnancy. Pregnant women with lower socioeconomic status tend to be at higher risk of CED compared to those with higher socioeconomic status.

Socioeconomic status plays a role in determining a family's ability to meet nutritional needs during pregnancy. Limited income can impact the quality and quantity of daily food consumption, resulting in inadequate energy and macro- and micronutrient intake. Furthermore, low levels of education can also impact mothers' lack of understanding of the importance of balanced nutrition during pregnancy and their utilization of health services, including regular antenatal care visits. This situation aligns with the theory of social determinants of health, which states that economic and educational factors significantly influence individual health status, including the nutritional status of pregnant women.

The results of this study align with several previous studies that found that pregnant women with low socioeconomic status have a higher risk of developing CED. Previous research has shown that limited access to nutritious food, health services, and health information are contributing factors to CED in pregnant women with less favorable socioeconomic conditions. Therefore, this study confirms previous findings that socioeconomic status is a significant determinant of maternal nutritional issues.

Meanwhile, the study results showed that pregnancy spacing was not significantly associated with the incidence of CED in pregnant women. This finding suggests that pregnancy spacing was not a major factor influencing the occurrence of CED in this study's respondents. This may be because most of the pregnant women in this study had a relatively safe interval between their pregnancies, allowing their bodies sufficient time to restore energy and nutrient reserves before the next pregnancy.

The lack of a significant relationship between pregnancy spacing and the incidence of CED may also be influenced by other, more dominant factors, such as socioeconomic status and dietary patterns during pregnancy. Although closely spaced pregnancies can theoretically increase the risk of nutritional disorders, if the mother receives adequate nutrition and receives good health monitoring, the risk of CED can be minimized. This finding aligns with several studies that suggest that pregnancy spacing is not always directly related to maternal nutritional status, particularly in pregnant women who have access to adequate health services and nutritional support.

Based on the results of this study, it can be concluded that socioeconomic status plays a greater role in the incidence of CED than pregnancy spacing. Therefore, efforts to prevent CED in pregnant women need to focus on improving well-being and nutritional education, particularly for pregnant women with low socioeconomic status. The role of health workers is crucial in providing nutrition education, conducting routine nutritional status monitoring, and encouraging the use of antenatal care services to prevent CED in pregnant women.

## **CONCLUSION**

This study concluded that socioeconomic status is associated with the incidence of Chronic Energy Deficiency (CED) in pregnant women, while gestational spacing did not show a significant association with CED incidence. These findings suggest that socioeconomic conditions play a significant role in determining maternal nutritional status during pregnancy. Therefore, efforts to prevent CED in pregnant women need to focus on improving nutritional education, continuously monitoring nutritional status, and optimizing antenatal care services, particularly for pregnant women with low socioeconomic status.

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