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THE RELATIONSHIP BETWEEN OCCUPATION AND BIRTH SPACING WITH CHRONIC ENERGY DEFICIENCY (CED) IN PREGNANT WOMEN IN BANDAR LAMPUNG CITY

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ABSTRAK
Kekurangan Energi Kronis (KEK) pada ibu hamil masih merupakan masalah gizi yang dapat membahayakan kesehatan ibu dan perkembangan bayi. Berat badan lahir rendah, anemia, dan masalah kehamilan dapat meningkat kemungkinannya akibat KEK. Studi ini bertujuan untuk mengetahui bagaimana status pekerjaan dan jarak antar kelahiran berhubungan dengan keberadaan KEK pada ibu hamil di Kota Bandar Lampung. Studi kuantitatif ini dilakukan di lima puskesmas di Kota Bandar Lampung menggunakan pendekatan cross-sectional. Sebanyak 200 ibu hamil dipilih sebagai sampel menggunakan purposive sampling. Data dikumpulkan melalui kuesioner dan kemudian dianalisis secara individual dan berpasangan menggunakan uji chi-square dan metode Odds Ratio (OR). Hasil penelitian menunjukkan bahwa 83 orang (41,5%) mengalami KEK. Jarak antar kelahiran dan kejadian KEK memiliki nilai p = 0,008; OR = 3,00; 95% CI: 1,27–7,10 dan pekerjaan serta kejadian KEK (nilai p = 0,032; OR = 2,11; 95% CI: 1,06–4,19) ditemukan berkorelasi signifikan berdasarkan analisis bivariat. Ibu hamil yang tidak memiliki pekerjaan dan memiliki jarak kelahiran yang tidak ideal lebih mungkin mengalami KEK, Temuan penelitian menunjukkan hubungan yang jelas antara faktor pekerjaan, waktu antar kelahiran, dan terjadinya KEK pada ibu hamil. Oleh karena itu, peningkatan program keluarga berencana, pemberdayaan ekonomi perempuan, dan peningkatan pendidikan gizi merupakan langkah pencegahan dan promosi yang diperlukan untuk mengurangi prevalensi KEK di kalangan ibu hamil di Kota Bandar Lampung.

Kata kunci: Jarak Kelahiran, KEK, Pekerjaan,

ABSTRACT
Chronic Energy Deficiency in pregnant women is still a nutrition problem that can harm both the mother's health and the baby's development. Low birth weight, anemia, and pregnancy problems can all be made more likely by CED. This study aims to find out how being employed and the time between births are connected to the presence of CED in pregnant women in Bandar Lampung City. This quantitative study was carried out at five community health facilities using a cross-sectional approach. 200 pregnant women were selected for the sample using purposeful sampling. Data was gathered through questionnaires and then looked at both by itself and in pairs using the chi-square test and Odds Ratio (OR) method. The results show that 83 people (41.5%) have CED. Birth spacing and the incidence of CED p-value = 0.008; OR = 3.00; 95% CI: 1.27–7.10 and employment and the incidence of CED p-value = 0.032; OR = 2.11; 95% CI: 1.06–4.19 were found to be significantly correlated by bivariate analysis. CED is more common in pregnant women with non-ideal birth spacing and unemployment. The results of the study show a strong correlation between work-related factors, the interval between pregnancies, and the incidence of CED in expectant mothers. Therefore, improving family planning programs, empowering women's economics, and increasing nutritional education are necessary preventative and promotional measures to reduce How common CED is among pregnant women in Bandar Lampung City.

Keywords: *Birth Spacing, CED, employment*

INTRODUCTION

Chronic Energy Deficiency (CED) in pregnant women remains one of the most serious public health and nutritional problems in Indonesia and other low- and middle-income countries. CED is defined as a prolonged inability to meet the body's energy and nutrient requirements, which can be measured through nutritional status indicators such as a mid-upper arm circumference (MUAC) of less than 23.5 cm. Pregnant women with CED are more vulnerable to adverse outcomes, including anemia, prolonged labor, postpartum hemorrhage, and the birth of low birth weight (LBW) infants, which contribute significantly to elevated maternal and neonatal morbidity and mortality. The implications of CED extend beyond individual health outcomes, affecting community health indices and national efforts to improve maternal-child health. Its persistence in many Indonesian regions reflects the complex interaction of socioeconomic, reproductive, dietary, and health service utilization factors that influence maternal nutritional status. Among the essential determinants of maternal nutrition, socioeconomic factors**,** particularly maternal employment status, play a pivotal role. Employment influences household income, access to nutritious foods, and affordability of health services. Pregnant women who are unemployed or in unstable employment often face economic constraints that limit their ability to secure adequate food, predisposing them to insufficient dietary energy intake and increased risk of CED. Studies have documented significant associations between maternal economic status and CED prevalence, highlighting the need to address economic determinants in nutritional interventions.

In addition to socioeconomic factors, reproductive health characteristics such as birth spacing significantly affect maternal nutritional reserves. Short interpregnancy intervals may not allow women sufficient time to recuperate and restore depleted energy and nutrient stores, increasing the likelihood of CED in subsequent pregnancies. Conversely, optimal birth spacing supports maternal recovery and improves nutritional outcomes, reinforcing the importance of integrating reproductive health planning into maternal nutrition programs.Dietary intake patterns also directly influence the risk of CED. Inadequate food consumption—including insufficient macro- and micronutrient intake—is consistently identified as a major risk factor for CED among pregnant women. Poor dietary diversity, limited access to nutrient-rich foods, and inadequate antenatal nutritional counseling further exacerbate this nutritional deficiency. Beyond nutrition, health behavior and knowledge regarding maternal nutrition have shown relationships with CED and its consequences such as anemia and impaired fetal growth. Research indicates that pregnant women with better nutritional knowledge and higher adherence to antenatal supplementation programs exhibit lower prevalence of CED and its associated adverse outcomes. Although the focus of this study is on Chronic Energy Deficiency, it is relevant to contextualize maternal health research within broader maternal well-being frameworks. For example, *breastfeeding self-efficacy*—a concept that relates to mothers' confidence in their ability to perform health behaviors—has been demonstrated to significantly affect exclusive breastfeeding success among working women in Bandar Lampung City. In the study "Exclusive Breastfeeding and The Importance of Breastfeeding Self-Efficacy in Working Women at Korpri Primary Health Care", it was found that higher breastfeeding self-efficacy was significantly associated with successful exclusive breastfeeding practices among working mothers, emphasizing the role of self-confidence and support in attaining optimal maternal care outcomes.

Although this breastfeeding study focuses on a different health outcome (infant feeding), its findings highlight how behavioral, social, and cognitive factors can influence health practices

among pregnant and postpartum women, suggesting that similar psychosocial determinants might also interact with nutritional behavior and adherence to dietary recommendations during pregnancy. Data from Bandar Lampung City further show that the prevalence of CED among pregnant women remains considerable, with significant associations observed between CED incidence and both maternal employment status and birth spacing. Pregnant women with inadequate birth intervals and those without employment exhibited higher rates of CED compared to their counterparts, reinforcing the need for multisectoral strategies addressing economic and reproductive determinants to reduce CED prevalence and improve maternal-child health outcomes in the region

METHOD

This study is a quantitative cross-sectional type, the research will take place at five community health centers in Bandar Lampung that have the most pregnant women with special needs: Panjang, Kedaton, Kemiling, Kupang City, and Rajabasa. The total group of people involved in this study will be all the pregnant women at these five health centers. The people chosen for the study are the pregnant women from these five areas. The number of participants was calculated using the Slovin formula. Based on a total population of 384 people across the five areas, the sample size was determined to be 196 pregnant women, with at least 40 women selected from each health center area. The participants were selected using a purposive sampling method. To be included in the study, pregnant women needed to live within the service area of one of the five selected health centers and must have agreed to take part, shown by their signed consent. Those who were excluded were women who had birth defects during pregnancy, those who did not want to be part of the study, and those who did not live in the area of the health center being studied. Data was collected by giving questionnaires directly to mothers when they visited the health center or Posyandu, as well as through home visits. The main factor we looked at was the mothers' knowledge about the causes of CED. The result we measured was the occurrence of CED in pregnant women. After collecting the data, we analyzed it using two types of analysis: univariate and bivariate. The univariate analysis was shown using frequency tables, while the bivariate analysis used the chi-square statistical test and logistic regression.

RESULTS

Table 1.1 Respondent Characteristics

Characteristics	Number	Percentage (%)
Nutritional Status		
CED	83	41.5
Not CED	117	58.5
Total	200	100
Occupation		
Employed	113	43,5
Not Employed	87	56,5
Total	200	100
Birth Spacing		
Ideal	366	18
Not ideal	164	82
Total	200	100

Based on the analysis of 200 respondents, the nutritional status data show that the majority of respondents did not experience Chronic Energy Deficiency (CED), accounting for **117** individuals (58.5%), while 83 respondents (41.5**%)** were classified as having CED. Although the proportion of respondents without CED was higher, the percentage of respondents experiencing CED remains considerable, indicating a persistent nutritional problem. Regarding employment status, more than half of the respondents were not employed, totaling 87 individuals (56.5%), whereas 113 respondents (43.5%) were employed. This finding suggests that a large proportion of respondents lacked formal employment, which may influence household income and access to adequate nutrition and health services. In terms of birth spacing, the majority of respondents had non-ideal birth spacing, with 164 individuals (82%), while only 36 respondents (18%) had ideal birth spacing.

Table 1.2 The Relationship Between Occupation And Birth Spacing With CED In Pregnant Women

Variable	KEK		Not KEK		Total	p- value	OR	note
	N	%	N	%				
Occupation								
Not working	45	51,7	42	48,3	87	0,032	2,11	Signifikan
working	38	33,6	75	64,4	113		(1,06–4,19)	
Birth Spacing								
Not ideal	76	46,3	88	53,7	164	0,008	3,00	Signifikan
Ideal	7	19,4	29	80,6	36		(1,27–7,10)	

Table 1.2 presents the relationship between occupation **and** birth spacing with the incidence of Chronic Energy Deficiency (CED)among pregnant women, analyzed using statistical tests and expressed through p-values and odds ratios (OR**)**. Relationship Between Occupation and CED, Among pregnant women who were not working**,** 45 respondents (51.7%) experienced CED, while 42 respondents (48.3%) did not experience CED. In contrast, among working women**,** 38 respondents (33.6%) had CED and 75 respondents (64.4%) did not. The statistical analysis showed a p-value of 0.032, which is less than 0.05, indicating a statistically significant relationship between occupation and CED. The odds ratio (OR) was 2.11 (95% CI: 1.06–4.19)**,** meaning that pregnant women who were not working had 2.11 times higher risk of experiencing CED compared to those who were working. Relationship Between Birth Spacing and CED For respondents with non-ideal birth spacing**,** 76 women (46.3%) experienced CED, while 88 women (53.7%) did not. Meanwhile, among women with ideal birth spacing**, only** 7 respondents (19.4%) experienced CED and 29 respondents (80.6%) did not. The analysis produced a p-value of 0.008**,** indicating a statistically significant relationship between birth spacing and CED. The odds ratio was 3.00 (95% CI: 1.27–7.10)**,** suggesting that pregnant women with non-ideal birth spacing were three times more likely to experience CED compared to those with ideal birth spacing.

DISCUSSION

This study involved 200 pregnant women in Bandar Lampung City and demonstrated that 41.5% of respondents experienced Chronic Energy Deficiency (CED)**,** while 58.5% did not. This finding indicates that maternal undernutrition remains a substantial public health problem in the region.

The prevalence of CED found in this study is relatively high and reflects persistent nutritional challenges among pregnant women, particularly in urban settings with socioeconomic disparities. According to the Indonesian Ministry of Health (2018), the continued high incidence of CED among pregnant women is influenced by unresolved risk factors, including inadequate dietary intake, low socioeconomic status, limited access to nutrition education, and suboptimal reproductive health practices. Based on occupational characteristics, this study found that 43.5% of pregnant women were unemployed, while 56.5% were employed. Bivariate analysis revealed a significant association between employment status and the incidence of CED ($p = 0.032$; OR = 2.11; 95% CI: 1.06–4.19), indicating that unemployed pregnant women were more than twice as likely to experience CED compared to those who were employed. This finding confirms that employment status plays a critical role in determining maternal nutritional status during pregnancy. These results are consistent with studies by Rahman and Sari (2019), Fitriani et al. (2020), Utami et al. (2021), and Yuliana et al. (2021), all of which reported a significantly higher prevalence of CED among unemployed pregnant women. Employment is a key indicator of a family's socioeconomic condition. Pregnant women who are employed generally have independent income or contribute economically to their households, allowing them to better meet increased energy and protein requirements during pregnancy. In contrast, unemployed pregnant women tend to rely solely on their partner or family income, which may be insufficient to ensure adequate nutrition, particularly in low-income households. In addition to economic factors, employment status is also associated with access to health information and maternal health services. Studies by Handayani (2018), Putri et al. (2020), and Amalia et al. (2022) found that working pregnant women generally have broader social networks, higher exposure to health-related information, and better nutritional knowledge. These advantages positively influence dietary behavior and antenatal care utilization, thereby reducing the risk of CED. This supports the findings of the present study, which indicate that working during pregnancy is associated with a lower likelihood of experiencing chronic energy deficiency. Birth spacing was another important determinant identified in this study. The majority of respondents (82%) had non-ideal birth spacing, and the analysis showed a statistically significant relationship between birth spacing and CED ($p = 0.008$; OR = 3.00; 95% CI: 1.27–7.10). Pregnant women with non-optimal birth spacing were three times more likely to experience CED compared to those with optimal spacing. This highlights the substantial impact of reproductive patterns on maternal nutritional status. These findings are in line with studies conducted by Wulandari et al. (2020), Lestari and Putri (2019), Nugroho et al. (2021), and Dewi et al. (2018), which consistently reported that short interpregnancy intervals increase the risk of CED and other nutritional deficiencies. Closely spaced pregnancies prevent the mother's body from fully restoring depleted nutrient reserves, including energy, protein, iron, and calcium, thereby increasing vulnerability to chronic undernutrition. Sukmawati et al. (2022) further emphasized that inadequate birth spacing is associated not only with CED but also with anemia, low birth weight, and adverse maternal outcomes. The Indonesian Ministry of Health (2018) recommends an interpregnancy interval of at least two years to allow sufficient recovery of maternal nutritional and physiological status. Family planning programs, therefore, play a crucial role in preventing CED by promoting optimal birth spacing. Studies by Prasetyo et al. (2021) and Kurniawan et al. (2023) suggest that integrating family planning services with maternal nutrition education significantly reduces the risk of chronic undernutrition among pregnant women. Overall, the findings of this study, supported by at least 15 previous national and regional studies, confirm that unemployment and non-ideal birth spacing are major risk factors for Chronic Energy Deficiency among pregnant women. CED is a multifactorial condition influenced by

socioeconomic, reproductive, and behavioral factors. Therefore, comprehensive interventions focusing on economic empowerment of women, nutrition education, improved access to antenatal care, and strengthened family planning programs are essential to reduce the prevalence of CED in Bandar Lampung City.

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design limits the ability to establish causal relationships between employment status, birth spacing, and the occurrence of CED. Second, nutritional status assessment was based primarily on anthropometric indicators and did not include detailed dietary intake or micronutrient analysis, which may underestimate the complexity of maternal nutritional deficiencies. Third, important socioeconomic variables such as household income, food security, and partner support were not examined in depth and may act as confounding factors. Lastly, the study was conducted in a single urban area, which may limit the generalizability of the results to rural or culturally diverse populations. Future studies should employ longitudinal designs, incorporate comprehensive dietary assessments, and explore broader socioeconomic determinants to provide a more complete understanding of factors contributing to Chronic Energy Deficiency among pregnant women.

CONCLUSION

Based on the research findings and the discussion, it is clear that employment and the timing between births are important factors linked to the occurrence of chronic energy deficiency (CED) in pregnant women. Because of this, efforts to prevent CED should be done in a thorough way, considering both economic and health-related aspects. Better nutrition education, giving women more economic opportunities, and improving family planning programs are likely to be good ways to lower the rate of CED in pregnant women, especially in Bandar Lampung City.

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REFERENCES

Arisman. (2017). *Nutrition in the life cycle*. Jakarta: EGC.

Aswar, H., & Istyanto, R. (2020). Socioeconomic status and energy deficiency among pregnant women in rural Indonesia. *Global Health Science Journal*, *4*(3), 34–45.

Budiarti, A., & Suja, N. (2025). Exclusive breastfeeding and the importance of breastfeeding self-efficacy in working women at Korpri Primary Health Care. *Jurnal Ilmu Kesehatan*, *10*(1), 99–108. https://ejournalwiraraja.com/index.php/JIK/article/view/3318

Fitriani, D., Astuti, R., & Yuliana, E. (2020). Socioeconomic factors associated with the incidence of chronic energy deficiency in pregnant women. *Journal of Public Health*, *15*(2), 123–131.

Handayani, S. (2018). The relationship between employment status and nutritional knowledge of pregnant women. *Indonesian Midwifery Journal*, *9*(1), 45–52.

Lestari, W., & Putri, R. M. (2019). Birth spacing and its risk for chronic energy deficiency and anemia in pregnant women. *Journal of Reproductive Health*, *10*(2), 89–97.

Ministry of Health of the Republic of Indonesia. (2018). *Indonesian health profile 2017*. Jakarta: Ministry of Health of the Republic of Indonesia.

Ministry of Health of the Republic of Indonesia. (2020). *Guidelines for the prevention and management of chronic energy deficiency (CED) in pregnant women*. Jakarta: Ministry of Health of the Republic of Indonesia.

Notoatmodjo, S. (2014). *Health behavioral sciences*. Jakarta: Rineka Cipta.

Prawirohardjo, S. (2016). *Obstetrics*. Jakarta: PT Bina Pustaka Sarwono Prawirohardjo.

Rahman, A., & Sari, D. P. (2019). Occupation and family income factors on chronic energy deficiency in pregnant women. *Indonesian Nutrition Journal*, *7*(1), 34–41.

Sulistyoningsih, H. (2011). *Nutrition for maternal and child health*. Yogyakarta: Graha Ilmu.

Supariasa, I. D. N., Bakri, B., & Fajar, I. (2016). *Nutritional status assessment*. Jakarta: EGC.

UNICEF. (2019). *Improving maternal nutrition: Programming guidance*. New York: UNICEF.

World Health Organization. (2016). *WHO recommendations on antenatal care for a positive pregnancy experience*. Geneva: WHO.

Wulandari, R., Nurhayati, S., & Pratiwi, A. (2020). The relationship between birth spacing and the incidence of chronic energy deficiency in pregnant women. *Journal of Nutrition and Maternal and Child Health*, *4*(2), 67–75.