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RISK FACTORS FOR CHRONIC ENERGY DEFICIENCY (CED) IN PREGNANT WOMEN IN BENGKULU CITY

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Abstract

Chronic Energy Deficiency (CED) is a major nutritional problem in pregnant women, especially in developing countries including Indonesia. CED is caused by long-term calorie and protein deficiency, which affects both the mother and the fetus. Data from the Bengkulu City Health Office in 2024 shows that 318 pregnant women experienced CME. This study aims to determine the factors that influence the incidence of CME in pregnant women in Bengkulu City. This study is an analytical study with cross-sectional design. Sampling in this study used a total sampling method with 66 respondents. The study was conducted in June 2025. The results of the study show significant influence of age, education, parity, and occupation on the incidence of CED in pregnant women. The most influential factor on the incidence of CED in the working area of the Muara Bangkahulu Community Health Center is age, with OR value of 39.768, which means that age has a 39.768 times higher risk of suffering from CED in pregnant women when compared to other independent variables.

Keywords: Chronic Energy Deficiency, Age, Education, Parity, Occupation

INTRODUCTION

Chronic Energy Deficiency (CED) in pregnant women is currently the most common case of concern worldwide. Chronic Energy Deficiency (CED) is a condition in which mothers suffer from chronic calorie and protein deficiencies (malnutrition) that last for years (chronic) resulting in health problems in women of childbearing age (WUS) and pregnant women. The prevalence of Chronic Energy Deficiency (CED) is highest in developing countries such as Bangladesh, Myanmar, India, Indonesia, Nepal, Sri Lanka, and Thailand. Indonesia ranks fourth in the world with a prevalence of 35.5% (WHO, 2023). The Indonesian Ministry of Health (2021) noted that 283,833 of 3,249,503 (8.7%) pregnant women in Indonesia have a LiLA <23.5 cm (experiencing CED). The top three provinces are West Papua (40.7%), East Nusa Tenggara (25.1%), and Papua (24.7%). Meanwhile, Bengkulu Province ranks 17th with 11.9% of cases. The prevalence of CED risk in pregnant women is highest among women aged <20 years and >35 years, at 17.3% (Ministry of Health of the Republic of Indonesia, 2021).

Based on data from the Bengkulu City Health Office in 2024, information was obtained on 318 pregnant women with Chronic Energy Deficiency (CED). The Muara Bangkahulu Community Health Center in

Bengkulu City ranked first, with 37 out of 240 pregnant women with CED (15.4%). The initial survey was conducted from April 19-23, 2025, in the Muara Bangkahulu Community Health Center's working area Using the KIA visit logbook for the period December 2024-May 2025, it was found that out of 40 pregnant women, 19 suffered from KEK (47.5%).

The factors that influence the occurrence of KEK in pregnant women include age, education, occupation, and parity. Women under the age of 20 are considered too young to become pregnant because at that age the reproductive system is still growing and developing. If a pregnant woman becomes pregnant under the age of 20, the baby she is carrying will compete with the young mother for nutrients, as both are undergoing growth and development. This competition causes the mother to experience ME. Being too old, i.e., 35 years or older, also poses a risk for ME. Mothers who become pregnant at an older age require a lot of energy to support their organs, which are becoming weaker. In this case, competition for energy occurs again (Nuri, 2022).

In addition to age, parity is also one of the factors causing KEK in pregnant women. The first and fourth or more pregnancies for mothers are pregnancies at risk of KEK. Mothers with low parity will have low awareness of the nutritional intake needed during pregnancy or it can be said that mothers are still indifferent to the pregnancy they are experiencing. Meanwhile, mothers with high parity (pregnant with their fourth or more child) will experience damage to the blood vessels in the uterine wall, affecting the circulation of nutrients to the fetus, where the amount of nutrients will be reduced compared to subsequent pregnancies. High parity will also be detrimental to the mother's health. Mothers do not obtain The opportunity to restore her own body (mothers need sufficient energy to recover after giving birth). Becoming pregnant again causes nutritional problems for the mother and fetus or baby. Parity affects the nutritional status of pregnant women because it can affect the optimization of both the mother and fetus during pregnancy (Rosita, 2023).

Education is also closely related to cases of KEK in pregnant women. Mothers with higher education have a higher level of knowledge about nutritional intake during pregnancy. With higher education, mothers will tend to obtain information from others and the media. Conversely, a low level of education will hinder the development and attitude of pregnant women to meet their nutritional needs and those of the fetus they are carrying (Syukur, 2020).

Another factor that can cause KEK in pregnant women is employment. Working mothers can increase their knowledge through experience, social interaction, and extensive social networks. The positive impact of extensive interaction is that it can increase awareness, including awareness about health. Awareness will bring about changes in attitudes, behavior, income, and eating patterns, which can influence the types of food consumed. In addition, working mothers can improve the socioeconomic status

of their families. Working mothers can earn their own income, which can help meet the nutritional needs of their families (Fakhriyah, 2021).

The novelty of this study is the age factor, which is known to be the dominant factor causing KEK in the working area of the Muara Bangkahulu Community Health Center in 2025. In addition, there is also a difference in the sampling technique, where the researcher used the total sampling method to determine the actual condition of the respondents and reduce bias in the study. The purpose of this study is to determine the factors that influence the incidence of KEK in the working area of the Muara Bangkahulu Community Health Center in 2025.

MATERIALS AND METHODS

Methods Subsection 1

This research is an analytical study using a cross-sectional design. Analytical research aims to identify factors that can cause a health problem and analyze the relationship between risk factors (influencing variables) and effect factors (variables influenced by the risk) Muslihah et al., (2021). The cross-sectional approach used in this study allows researchers to evaluate the relationship between risk factors and effect factors at a single point in time.

In this study, data for the independent and dependent variables were collected simultaneously over the same period, allowing researchers to analyze the relationship between various factors considered to influence the incidence of chronic energy deficiency (CED) in pregnant women. This study focuses on the influence of several factors, such as age, education, parity, and occupation, on the incidence of Chronic Energy Deficiency (CED) in the Muara Bangkahulu Community Health Center working area.

Methods Subsection 2

The variables in this study include the dependent variable, namely CED in pregnant women, while the independent variables are age, education, parity, and occupation. This research was conducted from June 06 to 24, 2025, after obtaining ethical approval No. KEPK.BKL/542/06/2025. The sampling technique used in this study was total sampling, with 66 respondents. Respondents were contacted via their mobile phone numbers listed in the Muara Bangkahulu Community Health Center's KIA register to schedule appointments or to check their addresses for primary data collection. The required data were divided into secondary and primary data.

Data analysis used univariate, bivariate, and multivariate analyses. Univariate analysis analyzes each variable by scientifically describing and summarizing the data in the form of tables or graphs, Setiadi (2007). Univariate analysis was used to analyze the distribution and percentage of each variable. The variables in this study included independent variables: age, education, parity, and occupation; and the dependent variable: pregnant women with CED. Bivariate analysis was conducted to examine the

relationship between independent and dependent variables using the chi-square statistical test. This bivariate analysis was used to determine the relationship between the independent and dependent variables—age, education, parity, and occupation—and the incidence of CED in pregnant women. In this study, bivariate analysis was conducted using the chi-square test. This analysis aims to test the difference between two or more proportions to determine whether or not there is a statistically significant relationship. In this study, the confidence level used was 95% with an α of 5%. Therefore, it can be assumed that if the p-value > 0.05, there is no significant relationship between the variables studied. Conversely, if the p-value ≤ 0.05, the statistical calculation results indicate a significant relationship between the variables studied.

Multivariate testing using logistic regression is used to predict the magnitude of variable outcomes using categorical independent variables with known magnitudes. Candidate variables for multivariate testing are selected by including all independent variables, including age, education, parity, and occupation. Variables included in multivariate candidate detection were those with a p-value ≤ 0.25. Multivariate analysis is used to test simultaneous relationships between more than two variables. The multivariate analysis used was multiple logistic regression.

RESULTS AND DISCUSSION

Table.1 Results show the frequency distribution for each research variable. In the age group, it was found that pregnant women in the Muara Bangkahulu Community Health Center Working Area in Bengkulu City in 2025 aged 20-35 years numbered 37 respondents (56.1%), while those aged <20 years or >35 years numbered 29 respondents (43.9%). In the education group, mothers with low education numbered 47 respondents (71.2%) and those with higher education numbered 19 respondents (28.8%). In the parity group, mothers with high-risk parity numbered 36 respondents (54.5%) and mothers with non-risk parity numbered 30 respondents (45.5%). In the occupation group, 37 respondents (56.1%) were working mothers and 29 respondents (43.9%) were non-working mothers. In the KEK group, 37 respondents (56.1%) did not suffer from KEK and 29 respondents (43.9%) suffered from KEK.

Table 1. Frequency Distribution of Factors Influencing Special Economic Zones (KEK) in Bengkulu City

Variable	n	Persentace (%)
Age		
<20 old >35 old	29	43,9
20-35 old	37	56,1
Education		
Low	47	71,2
High	19	28,8
Parity		
High risk	36	54,5
Not risk	30	45,5
Occupation		
Not employed	29	43,9

Employed	37	56,1
CED		
CED	29	43,9
Not CED	37	56,1

The results of the table.2 test on age groups show that a p-value of 0.000 ≤ α (0.05) means that age has an effect on the incidence of KEK in pregnant women in the Muara Bangkahulu Community Health Center Working Area in Bengkulu City, with an OR of 51.563, meaning that pregnant women aged <20 years or >35 years are 51.563 times more likely to suffer from KEK. This is in line with Rosita's (2023) research, which states that pregnant women under the age of 20 are not ready for pregnancy, and in young pregnancies, there is competition for food between the fetus and the mother, who is still growing, as well as hormonal growth that occurs during pregnancy. Pregnant women aged >35 years are at higher risk of pregnancy complications and weakened organ function, requiring them to work at maximum capacity. Therefore, sufficient additional energy is needed to support the ongoing pregnancy. Therefore, mothers under the age of 20 and over the age of 35 are considered to be in the high-risk pregnancy category and may experience chronic energy deficiency during pregnancy. This is in line with research (Syukur, 2020) which states that pregnant women under the age of 20 and over the age of 35 are 13.5 times more likely to experience KEK than those aged 20-35. The younger or older a pregnant woman is, the greater the impact on her nutritional needs. Pregnant women who are too young or still teenagers tend to be underweight and will gain less weight during pregnancy. Meanwhile, older women require more energy due to weakened organ function and the need to work at maximum capacity. Therefore, the ideal age is between 20 and 35 years old to avoid the risk of KEK in pregnant women.

The results of the table.2 for the education group obtained a p-value of 0.000 ≤ α (0.05), it can be concluded that there is a significant effect of education on the incidence of KEK in pregnant women in the Muara Bangkahulu Community Health Center Working Area in Bengkulu City with an OR value of 26.526, which means that pregnant women with low education are 26.526 times more likely to suffer from KEK. Mothers with low and medium levels of education experience KEK more often because they lack understanding of the nutritional content of food, how much nutrition is needed during pregnancy, and how to prepare food, resulting in reduced or even lost nutritional value. Sometimes mothers only eat the same foods, only foods they like, assuming that the important thing is to eat and They have no appetite, so their nutritional needs are not met and the mother experiences KEK (Husna, 2020). Research (Hasanah, 2023) states that mothers with higher education are more knowledgeable about how to access various information. Information on preventing KEK can be accessed from social media, television, pregnancy counseling programs, and other sources. Thus, mothers can gain a deeper understanding and information that will help them overcome the impacts and difficulties of pregnancy in their daily lives and prevent them from suffering from KEK, both for themselves and their families. In this study, it was found that mothers with low education are 26.526 times more likely to suffer from KEK. This is in line with research (Mardhatilah, 2024) which states that pregnant women with low education are 13.2 times more likely to

experience KEK than those with higher education. Mothers' knowledge about nutrition has little effect on meeting their nutritional needs.

The results of the bivariate parity group test obtained a p-value of 0.000 ≤ α (0.05), it can be concluded that there is a significant effect of parity on the incidence of KEK in pregnant women in the Muara Bangkahulu Health Center Working Area, Bengkulu City, with an OR value of 23.400, which means that pregnant women with high parity are 23.4 times more likely to suffer from KEK. Primiparous pregnant women do not have much experience and lack knowledge about the importance of nutrients for the fetus and themselves, and are greatly influenced by the types of food they consume. Parity 2-3 is the safest parity in terms of maternal mortality, while parity 1 and high parity (≥ 4) have higher maternal mortality rates (Mardhatilah, 2024). Research (Rosita, 2023) states Primigravida/nulliparous mothers have a significant influence on the incidence of KEK due to their lack of previous pregnancy experience. The nutritional, health, and emotional status of mothers during pregnancy will determine the quality of the baby born and its subsequent development. Mothers experiencing KEK during their first pregnancy may lack sufficient knowledge about the nutritional needs of pregnant women and dietary patterns. In addition, based on research, most mothers with their first pregnancy are under the age of 20, thus falling into the high-risk category.

Furthermore, the results of the bivariate test of occupational groups obtained a p-value of 0.000 ≤ α (0.05), it can be concluded that there is a significant effect of occupation on the incidence of KEK in pregnant women in the Muara Bangkahulu Community Health Center Working Area in Bengkulu City, with an OR value of 19.806, which means that pregnant women who do not work are 19.806 times more likely to suffer from KEK. Women who are housewives or have never worked in their lives have a lower level of health than women who have jobs and routines outside the home. Working women have the ability to make decisions to overcome health problems they face. Therefore, women who work as employees as well as wives and housewives generally have better health. A person who works can increase their knowledge through experience and social interaction, as well as extensive social interactions (Rafiani, 2020). The results of this study are in line with research (Supeni, 2025) which states that working women have the ability to recognize family health problems. Working women's knowledge about health issues is obtained from books, magazines, newspapers, radio, and television. Working women have the ability to make decisions to overcome health problems they face. Therefore, women who play the role of workers as well as wives and housewives generally have better health.

Table 2. Results of Bivariate Analysis of Factors Influencing KEK in Pregnant Women in Bengkulu City

Independent Variable	CED for Pregnant Woman				p-*value*	OR (95% CI)
	CED		Not CED			
	n	%	n	%		

Aged						
< 20 old atau > 35 old	25	86,2	4	13,8	0.000	51,563
20-35 old	4	10,8	33	89,2		
Education						
Low	28	59,6	19	40,4	0,000	26,526
High	1	5,3	18	94,7		
Parity						
High risk	26	72,2	10	27,8	0,000	23,400
Not risk	3	10,0	27	90,0		
Occupation						
Not employed	23	79,3	6	20,7	0,000	19,806
Employed	6	16,2	31	83,8		

Based on the results of the final stage of table 3. multivariate analysis with logistic regression testing, it is known that the most dominant independent variable affecting the incidence of CED in pregnant women in the Muara Bangkahulu Community Health Center Working Area in Bengkulu City is age because it has the largest OR value of 39.768, which means that age has a 39.768 times greater risk of suffering from CED in pregnant women when compared to other independent variables.

Table 3. Multivariate Test Results of Factors Influencing KEK in Pregnant Women in Bengkulu City

Variable	B	p-value	PR (95% CI)
Age	39,768	0,000	6,907-228,969
Education	13,624	0,052	0,978-189,699
Parity	16,882	0,003	52,615-108,997
Occupation	0,236	0,300	0,015-3,625

Pregnancy at too young or too old an age carries risks for the health of both the mother and the fetus. Age is a dominant factor causing KEK in pregnant women because women under the age of 20 are still developing and need adequate nutrition to meet their bodily needs in order to develop properly. Therefore, if a woman becomes pregnant at this age, the nutrients that should be used to meet her bodily needs will be disrupted. Pregnancy at the age of 35 or older can also affect The nutritional status of pregnant women because at that age the body begins to experience a decline in health, which can inhibit the intake of nutrients for the fetus that are transmitted through the placenta (Nuri, 2021).

This is in line with the results of Kurniawan's (2021) study, which states that age is a dominant factor causing KEK in pregnant women. This is because women under the age of 20 are still developing and need adequate nutrition to meet their bodily needs in order to develop properly. Therefore, if a woman becomes pregnant under the age of 20, there will be competition for nutrients between her and her fetus. Meanwhile, during pregnancy at an age of >35 years, many women experience changes in blood pressure and even an increase in blood sugar levels, so they must limit their food intake to maintain a diet that suits their physical condition. On the other hand, pregnant women need a sufficient and balanced intake of

nutrients, which increases the risk of KEK. Required. Young women need additional nutrients because, in addition to being used for their own growth and development, they must also share with the fetus they are carrying. Meanwhile, older women need a lot of energy because their organs are weakening and are required to work optimally, so they need sufficient additional energy to support their pregnancy. Therefore, the best age is between 20 and 35 years old, with the expectation that the pregnant woman's nutrition will be better. Giving birth at a young or too old age results in low-quality fetuses or children and also harms the mother's health (Husna, 2020).

CONCLUSION

There is a significant influence between age, education, parity, and occupation on the incidence of KEK, and it is known that the most dominant risk factor for the incidence of KEK in the working area of the Muara Bangkahulu Community Health Center in Bengkulu City in 2025 is age.

Declaration of Interest Statement

The authors declare that they have no conflict of interests.

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