



RISK FACTORS ASSOCIATED WITH CHRONIC ENERGY DEFICIENCY IN PREGNANT WOMEN

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Abstract

Background: Chronic Energy Deficiency (CED) is a nutritional problem in pregnancy. Basarang Community Health Center has the fifth highest percentage of pregnant women with Chronic Energy Deficiency in Kapuas Regency, Central Kalimantan, Indonesia, is 22.90%. Community Health Centers are first-level health care facilities in Indonesia, tasked with organizing and coordinating promotive, preventive, curative, rehabilitative, and/or palliative health services in their working areas, with a primary focus on improving public health. The study purposed to find out the relationship between maternal knowledge about nutrition, husband's support, family income, maternal age, and pregnancy distance with the incidence of CED in pregnant women in the working area of Community Health Center Basarang, Kapuas Regency in 2023. **Method:** The research was analytical observational with a cross sectional approach, the sample was 66 pregnant women in the Basarang Community Health Center Working Area, Kapuas Regency, taken using the total sampling technique. The research instrument used a questionnaire. **Result:** The results show that there is a relationship between maternal knowledge about nutrition, husband's support, family income, and the age of the pregnant mother with the occurrence of CED, while the variable of pregnancy spacing is not related to the occurrence of CED. **Conclusion:** The most dominant variable with the incidence of CED in pregnant women is maternal knowledge about nutrition.

keyword : *maternal support, pregnancy distance, Chronic Energy Deficiency (CED), family income, maternal knowledge of nutrition*

INTRODUCTION

Chronic Energy Deficiency (CED) is one of the nutritional problems that often occur in pregnancy, the World Health Organization (WHO) reports that the prevalence of Chronic Energy Deficiency (CED) in pregnancy globally is around 35-75%. WHO also records 40% of maternal deaths in developing countries are related to Chronic Energy Shortages (Lestari, 2023). CED is an important manifestation of malnutrition and is also a problem in many developing countries,



which one of them is Indonesia. The research results show that the prevalence of CED risk among pregnant women in Indonesia is quite high, 17.3% (Ministry of Health RI, 2021).

At the national level, Central Kalimantan is below the National target, contributing 10.5% of pregnant women with CED incidence, when compared with Jakarta with the lowest percentage of CED Pregnant Women in Indonesia (4%), it looks very high (Ministry of Health RI, 2021). Kapuas Regency is in second place as a contributor to CED pregnant women with a percentage of 8.5%. The percentage of KEK in Kapuas district will increase significantly to 11.54% or 685 pregnant women in 2022 (Dinas kesehatan Kabupaten Kapuas Kalimantan Tengah, 2022).

Based on the behavioral theory by Lawrence Green (1980), there are 3 factors that play a role in the emergence of health problems, in this case the problem of KEK in pregnant women, namely predisposing factors, enabling factors, and reinforcing factors (Arifin, et al., 2020). Theory of nutritional status of pregnant women, Republic of Indonesia Ministry of Health (2015), factors that play a role in the emergence of CED, namely nutritional/food intake, disease, family food availability, provision of additional food, health care, housing, purchasing power/economic level and knowledge of habits.

METHOD

This research is quantitative research with design used in this research is observational analytic with a cross-sectional design. The population in this study were pregnant women in the working area of the Basarang Community Health Center, Basarang District, Kapuas Regency, Central Kalimantan. Based on predictions, there are 66 pregnant women. The sampling technique used in this research is total sampling. This research instrument used a questionnaire that has been tested for validity and reliability. Data analysis used the chi-square or Fisher-exact statistical test and multiple logistic regression. The researcher has received a certificate of ethical suitability with letter number No. 493/KEPK-FK ULM/EC/XII/2023. This letter was issued by the Health Research Ethics Commission, Faculty of Medicine and Health Science, Lambung Mangkurat University.

RESULT AND DISCUSSION

a. Respondent Characteristics

This study presents the results of the frequency distribution of respondent characteristics which can be seen below:

Table 1. Frequency Distribution of Respondent Characteristics in the Basarang Community Health Center Working Area, Kapuas Regency

Respondent Characteristics	Total (N)	Percentage (%)
Husband's job		
Private employees	6	10
Self-employed	31	47
Farmer	14	21
Laborer	14	21
Etc	1	1
Wife's Job		
Private employees	1	1
Self-employed	5	8
Farmer	2	3
Laborer	2	3
Etc	1	1
Doesn't work	56	84
CED		
Yes	21	31,8
No	45	68,2
Mother's Knowledge		
Not enough	13	19,7
Good	53	80,3
Husband's Support		
Does not support	16	24,2
Support	50	75,8
Family Income		
Low	42	63,6
high	24	36,4
Mother's Age		
Risky	12	18,2
No Risk	54	81,8
Pregnancy Spacing		
Not safe	38	57,6
Safe	28	42,4
Total	66	100

b. Relationship between maternal knowledge and Chronic Energy Deficiency (CED)

This study presents the results of the relationship between maternal knowledge and CED in the Basarang Community Health Center Working Area, Kapuas Regency.

Table 2. Relationship between maternal knowledge and CED in the Basarang Community Health Center Working Area, Kapuas Regency

Mother's Knowledge	CED		Total	p-value	OR
	Yes	No			
Not enough	9 (69.2%)	4 (11.8%)	13 (20%)	0.002	7.688
Good	12 (22.6%)	41 (38.2%)	53 (80%)		
Total	21 (31.8%)	45 (68.2%)	66 (100%)		

The research results stated that the p-value was $0.002 < 0.05$. This indicates that there is a relationship between mother's knowledge and CED. The odds ratio figure is 7.688, which means that the tendency for poor maternal knowledge to have CED is 7.688 times compared to good maternal knowledge and this is significant.

Knowledge factors influence health behavior regarding the incidence of CED. Sensing produces knowledge and this is greatly influenced by the intensity of perceptual attention to objects in the formation of pregnant women's behavior and open behavior. The results of sensing from the process of knowing, understanding, applying, analyzing, synthesizing and evaluating give rise to an increasingly positive attitude towards the nutritional needs of pregnant women so that mothers will not experience CED, this is where health education is important (Notoatmodjo, 2010).

Knowledge is an important factor that encourages a person to be more caring and motivated to improve the health status of himself and his family. Even though pregnant women have low incomes, if pregnant women have good knowledge about nutrition, pregnant women will spend their money on food that is cheap but contains good nutrition. On the other hand, if there is a lack of understanding about good eating habits, as well as an understanding of the contribution of nutrition, the mother's nutrition will be inadequate (Amin, 2021). If this continues for a long time and continuously, the mother will not be able to meet her nutritional needs during pregnancy and will enter a state of CED (Fakhriyah, et al, 2021). Good nutritional knowledge can help someone learn how to store, process and use quality food for consumption. Insufficient knowledge causes the available nutritious food ingredients to not be consumed optimally (Primadani, 2016).

Nutrition during pregnancy is an important factor that can influence embryo development and this type of nutritional improvement can be carried out with four

pillars, namely (1) improving food consumption patterns, (2) improving nutritional awareness behavior, (3) increasing access and quality of nutrition services, and (4) improving the food and nutrition awareness system (Fitriani, et al, 2021).

The results of this research are in line with research conducted by Diningsih, et al. (2021) shows that the p value = 0.000 < 0.05, it can be concluded that there is a relationship between the level of knowledge about nutrition and the incidence of CED in pregnant women at the Matraman District Health Center, East Jakarta.

The results of this research are in line with research conducted by Nur'aini, et al (2021) which states that there is a significant relationship between knowledge of pregnant women and chronic energy deficiency in the working area of the Mauk Tangerang Community Health Center. According to Diningsih, et al. (2021) one of the factors that influences knowledge is formal education, so knowledge is closely related to education, where it is hoped that if someone has higher education, the person's knowledge will be broader.

Among mothers who have good knowledge, some of them also experience CED. This can happen because of the level of education pursued. Even though the information or knowledge possessed is good, the level of education pursued is a factor in the occurrence of CED. Based on research conducted by Andini (2020), it is stated that the higher a person's education, the easier it is to receive information.

c. The Relationship Between Husband's Support and CED

Table 3. Relationship between husband's support and CED in the Basarang Community Health Center working area, Kapuas Regency

Husband's Support	CED		Total	p-value	OR
	Yes	No			
Does not support	9 (56.2%)	7 (43.8%)	16 (24%)	0.036	4.071
Support	12 (24%)	38 (76%)	50 (76%)		
Total	21 (31.8%)	45 (68.2%)	66 (100%)		

The research results show that the P -value is 0.036 < 0.05, which means there is a relationship between husband's support and CED. The odds ratio figure is 4.071, which means that the tendency for unsupportive husbands to support the incidence of CED is 4.071 times, compared to supportive husbands, this is significant.

Family/husband support is a form of interpersonal support which includes attitudes, actions and acceptance of family members or pregnant women so that family members, in this case pregnant women, feel that someone is paying attention. This support can be in the form of informational support, assessment support, instrumental support and emotional support (Zulaikhah, 2022). Husband's support has an important role in the mother's health status, a husband should be able to be a husband who is ready, accompanies the mother during pregnancy, and accompanies the mother during examinations, as well as monitoring what the mother consumes during her pregnancy, providing advice, suggestions and information. It is important that it can increase pregnant women's nutritional knowledge, provide love and attention so that husbands can encourage mothers to fulfill their nutritional needs in order to maintain the nutritional condition of the mother and her pregnancy. Pregnant women who do not have the support of their husbands, where their husbands are unable to supervise and provide them with nutritious food needs, while pregnant women require increased nutrition from before pregnancy, both for themselves and the baby they are carrying, plus there are many taboo rules recommended by their families/husbands. If this continues for a long time it will have an impact on the mother's nutritional condition so that the mother may experience CED, because the mother's food intake cannot meet the mother's needs during pregnancy (Friedman, 2012).

The results of this research are in line with research conducted by Hayat, et al. (2021) shows that the p value = 0.000 < 0.05, it can be concluded that there is a relationship between husband's support and the risk of CED at the Kasemen Health Center, Serang City in 2019. The results of this research are also in line with research conducted by Yuniar & Fatmawati (2023) there is a relationship between husband's support and the risk of CED in the Surakarta area. The role and support of the husband in the behavior of utilizing nutrition services is very important, the husband as the person closest to the pregnant mother is a motivator to check her pregnancy and supports the pregnant mother morally and materially, so that the mother can get through her pregnancy well.

Husband's support is support, encouragement, attention and assistance provided by a partner for good (Harlissa, 2023). Husband's support is an important

factor, because the decisions taken by the husband are important. Husband's support is a big decision for the wife when she wants to take action (Harlissa, Sugesti, Darmi, 2023). Forms of husband's support can be in the form of instrumental support, appreciation support, information support, and emotional support (Mansoben & Gurning, 2022).

The results of this research are in line with research by Novitasari (2019) which shows that there is a relationship between family support and the incidence of KEK. In this research, it was also discovered that there were pregnant women who received good support from their husbands, but still experienced CED. This happens because CED occurs before the mother becomes pregnant. This is due to lack of energy. Pregnancy causes increased energy metabolism. Therefore, the need for energy and other nutrients increases during pregnancy (Rohmah, 2020).

d. Relationship between family income and chronic energy deficiency (CED)

Table 4. Relationship between family income and CED in the working area of the Basarang Community Health Center, Kapuas Regency

Family Income	CED		Total	P-value	OR
	Yes	No			
Low	18 (42.9%)	24 (57.1%)	42 (64%)	0.023	5.250
High	3 (12.5%)	21 (87.5%)	24 (36%)		
Total	21 (31.8%)	45 (68.2%)	66 (100%)		

The research results show that the income P-value is $0.023 < 0.05$, which means there is a relationship between family income and CED. The odds ratio figure is 5.250, which means that the tendency for low family income with 4.071 times the occurrence of CED compared to high family income, this is significant.

The results of this research are in line with research conducted by Rahayu & Sagita (2019) showing that the p value = $0.002 < 0.05$, it can be concluded that there is a relationship between family income and chronic energy deficiency in pregnant women in the second trimester. The results of this research are also in line with research conducted by Andini (2020) showing that the p value = $0.000 < 0.05$, it can be concluded that there is a relationship between family income and the incidence

of CED in pregnant women at the Prambontergayang Community Health Center, Tuban Regency.

In families with a low economic level, usually most of the income will be spent to meet needs. The family's economic status will determine the type of food purchased. Family income is the total real income of all household members which is used to meet collective and individual needs in the household. Family income is the result of work or services, compensation obtained due to donations made in production activities (Rahayu & Sagita, 2019).

Income determines the pattern of what food will be purchased, the higher the income, the greater the spending on shopping. Income is the most important factor because it determines the quality and quantity of food consumed. Pregnant women with low incomes experience CED because they are unable to meet their nutritional intake. Fransiska, et al (2022). Low income will result in low purchasing power for food so that mothers cannot meet their food needs and this will lead to a lack of food consumption. Lack of food consumption is a direct cause of CED (Vladimir, 2021).

Family income is a reflection of the community's ability to meet life's needs, in this case health and nutrition. If the family income is lower, the CED level will be higher. In order to get more income, mothers also need to help their husband's work or look for another job. This income itself can have a lot of influence on nutritional conditions. Low income means that a respondent's purchasing level can only buy basic necessities. Pregnant women cannot consume food with good nutrition which is plentiful at quite high prices, such as meat, fish, milk and other animal protein. This causes the CED value to increase (Yunita & Ariyati, 2021

Apart from that, in this study it was also discovered that there were cases of CED in mothers with good family incomes. This can happen if the family income cannot be managed well. According to research conducted by Kurniawan et al (2021), diverse living needs cause nutritional intake to be less of a priority. This causes earnings or income to influence nutritional intake in pregnant women.

e. Relationship between maternal age and chronic energy deficiency (CED)

Table 5. Relationship between maternal age and CED in the Basarang Community Health Center working area, Kapuas Regency

Mother's Age	CED		Total	<i>p-value</i>	OR
	Yes	No			
Risky	8 (66.7%)	4 (33.3%)	12 (18%)	0.013	6.308
No Risk	13 (24.1%)	41 (75.9%)	54 (82%)		
Total	21 (31.8%)	45 (68.2%)	66 (100%)		

The research results stated that the p -value was $0.013 < 0.05$, which means there is a relationship between maternal age and KEK. The odds ratio figure is 6.308, which means that the tendency for maternal age to be at risk is 6.308 times for the occurrence of CED, compared to the age of the mother who is not at risk of not having CED, this is significant. The results of this research are in line with research conducted by Fitri (2022) showing that the p value = $0.027 < 0.05$, it can be concluded that there is a relationship between maternal age and the incidence of CED in pregnant women at the Ganjar Agung Community Health Center, West Metro District, Metro City.

The results of this research are in line with research conducted by Teguh (2020) showing that the p value = $0.010 < 0.05$, it can be concluded that there is a relationship between maternal age and the incidence of CED in pregnant women in the UPT Puskesmas I Pekutatan Working Area, Jembrana , Bali.

The mother during pregnancy really determines the health condition of the mother and the fetus she is carrying. Pregnancy that occurs at an age that is too young or too old both have bad risks for the health of the mother and fetus. Age that is classified as too young is under 20 years of age. At that age, reproductive organs such as the uterus and pelvis often have not yet grown to adult size. As a result, pregnant women at that age are not ready to accept their duties and responsibilities as parents (Permana & Wijaya, 2019). Being too old, 35 years or more, also has a risk of developing CED. Mothers who become pregnant at too old an age need a lot of energy to support the function of their increasingly weakened organs. In this case, competition for energy occurs again. Women are recommended to get pregnant between the ages of 20-35 years because at that age they are ready to get pregnant physically and mentally (Rudiyanti & Rosmadewi, 2019).

Pregnancy that occurs at more than 35 years of age can also affect the nutritional condition of pregnant women because at that age the body begins to experience a decline in health, which can hinder the fetus's intake of nutrients which are distributed through the placenta. Apart from that, at the age of >35 years, many women experience changes in blood pressure and even an increase in blood sugar levels, so they have to limit their food intake in order to maintain a diet that suits their body condition. Meanwhile, on the other hand, a pregnant woman needs a fairly balanced nutritional intake so that this condition causes an increased risk of CED.

In this case, in general, it can be stated that pregnancy when a mother is less than 20 years old has a high risk. This causes competition for food between the fetus and the mother, who are still in the process of growing. This competition certainly results in a fetus' nutritional intake being hormonally disrupted. Apart from that, if a mother becomes pregnant at the age of 35 years, she will have a high risk. This is because the reproductive organs experience degeneration and disruption occurs in hormonal balance (Marini, et al, 2023).

In this research, it is known that CED can also occur at mothers who are not at risk. This can happen due to other things such as the mother's lack of knowledge about nutrition, so that the proper nutritional intake needed for the mother and baby is not met. Apart from that, the lack of knowledge, even though food is abundant, but the lack of knowledge on how to process, store and serve food causes mothers to suffer from shortages, resulting in CED. Apart from that, low income also results in less purchasing power for nutritious food, which can result in mothers experiencing CED.

f. Relationship between pregnancy spacing and Chronic Energy Deficiency (CED)

Table 6. Relationship between pregnancy distance and CED in the Basarang Community Health Center working area, Kapuas Regency

Pregnancy Distance	CED		Total	p-value	OR
	Yes	No			
Not Safe	16 (42.1%)	22 (57.9%)	38 (58%)	0.068	3.345
Safe	5 (17.9%)	23 (82.1%)	28 (42%)		

Total	21 (31.8%)	45 (68.2%)	66 (100%)
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The results of this study show that the p-value is $0.068 > 0.05$, which means there is no relationship between pregnancy distance and CED in pregnant women in the Basarang Community Health Center area, Kapuas Regency. This is because the p-value produced through data processing is > 0.05 . The results of this research are in line with research conducted by Marisi (2021) showing that the p value = $0.156 > 0.05$. This can be concluded that there is no relationship between pregnancy distance and the incidence of CED in pregnant women in the posyandu in the working area of the Kutabumi Health Center, Kutabumi Village, District. Kemis Market, Tangerang Regency. The results of this research are also in line with research conducted by Lestari, et al. (2023) shows that the p value = $0.0671 > 0.05$, it can be concluded that there is no relationship between pregnancy distance and the incidence of CED in pregnant women in the North Bogor Health Center UPT Working Area in 2022.

CED usually occurs in the first pregnancy. This is due to the mother's lack of experience in her first pregnancy. Apart from that, the knowledge they have is not enough. This knowledge is related to the nutritional needs of pregnant women and the diet consumed (Halimah, et al, 2022). Mothers are said to give birth too closely together if the distance is less than 2 years. Research shows that if families can regulate the distance between their child's pregnancies by more than 2 years, the child will have a higher probability of survival and the child's condition will be healthier than children with birth intervals of less than 2 years. Birth spacing that is too close will result in low quality of the fetus/child and will also be detrimental to the mother's health. The mother does not have the health to repair her own body (the mother needs sufficient energy to recover after giving birth to her child). By re-conceiving, it will cause nutritional problems for the mother and fetus/baby following the pregnancy (Suryani, et al. 2021).

The condition of pregnancy with pregnancies that are too close together, where at the same time the mother is still breastfeeding, will further increase nutritional problems for the mother and fetus if she does not get a balanced nutritional intake to fulfill her body. Pregnancy will increase metabolism, thereby increasing the need

for energy and nutrients. Repeated pregnancies in a short time will deplete fat, protein, glucose, vitamins, minerals and folic acid so that ATP decreases which causes a decrease in the body's metabolic processes, then the body carries out the catabolism process so that it will use existing food reserves, as a result the body will lack energy (Nugraha , et al. 2019).

Based on the theory of Erita, et al. (2023) The spacing of pregnancies greatly influences the incidence of CED when repeated pregnancies in a short period of time will deplete the mother's nutritional reserves. In addition, mothers who become pregnant less than 2 years after giving birth are at risk of giving birth prematurely and the baby will experience low birth weight. Pregnant women are one of the groups that are vulnerable to nutritional problems and have a greater risk of CED during pregnancy. In primi gravida, unplanned pregnancies often occur, in this case the mother is not yet fit for pregnancy, BKKBN states that there can be negative impacts from unplanned pregnancies. This is in line with Lestari's (2021) research which shows that distance is not a risk factor for CED in pregnant women in the Gunungpati Community Health Center working area with p-value = 0.77.

g. Dominant Factors Associated with CED in the working area of the Basarang Community Health Center, Kapuas Regency

Table 7. Multivariate analysis results

No.	Variable	B	p-value	OR	95% CI
1	Mother's knowledge	2.456	0.007	11.655	1.978 – 68.687
2	Husband's support	2.122	0.011	8.352	1.611 – 43.301
3	Family income	1.655	0.046	5.231	1.033 – 26.487
4	Maternal age	1.545	0.057	4.686	0.954 – 23.018
5	Pregnancy spacing	1.405	0.076	4.075	0.862 – 19.270

Based on table 7, the final results of the multivariate analysis show that the factor most related to Chronic Energy Deficiency (CED) is the maternal knowledge variable with an Exp(B) value of 11.655, with knowledge that mothers with Chronic Energy Deficiency (CED) will be at risk of 4.480 times more than those with husband's support with an Exp(B) value of 8.352, family income with an Exp(B) value of 5.231, maternal age with an Exp(B) value of 4.686 and pregnancy spacing



with an Exp(B) value of 4.075. The variable maternal knowledge about nutrition is the most dominant variable in the incidence of Chronic Energy Deficiency (CED).

According to Revinda et al (2018), knowledge is more influential than husband's support. This is because knowledge has a positive impact compared to husband's support in CED cases. Knowledge makes pregnant women understand the steps they must take to prevent CED. Mothers do not depend on other people because those who can change their behavior and fulfill their own nutrition are mothers with good knowledge. This factor is in line with the culture in the area that women in the area have an independent nature. Therefore, she can find out about the potential that exists when she is pregnant. Meanwhile, husband's support is an external factor from the mother that influences CED. So, this factor will not have a better influence than the knowledge that the pregnant woman has regarding CED. This indicates that without good knowledge about CED there will be no change in behavior, and problems with poor nutrition will be at risk of appearing.

Meanwhile, inversely proportional to the relationship between knowledge and husband's support, husband's support is a factor outside of the mother, so its influence on behavior change is not as great as if the mother had good knowledge. The support given by the husband is moral support that can reduce or buffer the mental health conditions or effects of pregnant women so that it can strengthen pregnant women and prevent the occurrence of CED in pregnant women (Probowati, 2024).

Maternal age and gestational spacing in the multivariate test do not have a significant relationship because there is competition between each variable to see which variable influences the OR change $> 10\%$. Based on the book *Nutrition for Mothers and Children* written by Paramashanti (2019) said that pregnant women who are less than 20 years old have a very high risk of pregnancy. This risk can occur to herself or to the baby she is carrying. This high risk can occur due to linear growth or height, which generally only ends at the age of 16-18 years. This growth is then continued with the maturation of the growth of the pelvic cavity several years after the linear growth is complete, and the linear growth is completed at around 20 years of age. As a result, a pregnant woman who is not yet 20 years old may experience various birth complications, as well as disruption to the completion

of optimal growth. This is because the growth process itself has not yet been completed, and because various nutritional intakes are not or are not sufficient to meet the needs of those who are still growing, while a woman who experiences her first pregnancy at the age of 35 years or more is also very at risk. At the age of more than 35 years, a person who is pregnant will be more susceptible to disease. Women's uterine organs are getting older, and the birth canal is getting stiffer. At the age of more than 35 years, there is a risk of having a disabled child, and obstructed labor will occur, and bleeding in pregnant women will open more. (Paramashanti, 2019).

Short pregnancy intervals can result in low quality of the fetus or child and also the health of the mother. Consuming sufficient nutrients and in accordance with the nutritional adequacy rates recommended for each individual will result in a person's good nutritional status. On the other hand, if someone consumes excess or deficient nutrients, it will result in a person's nutritional status being more or less. The level of energy and nutrient adequacy is directly influenced by a person's energy and nutrient consumption (Suryani et al, 2021).

CONCLUSION AND SUGGESTION

There is a relationship between maternal knowledge about nutrition, husband's support, family income, pregnant mother's age and the incidence of chronic energy deficiency (CED) in pregnant women in the Basarang Community Health Center working area, Kapuas Regency in 2023. There is no relationship between the pregnancy spacing and the incidence of chronic energy deficiency (CED) in pregnant women in the working area of the Basarang Community Health Center, Kapuas Regency in 2023. The variable maternal knowledge about nutrition is the dominant variable related to the incidence of chronic energy deficiency (CED) in pregnant women in the working area of the Basarang Community Health Center in Kapuas Regency in 2023. Health education programs should focus on improving maternal knowledge about nutrition, ensuring early detection of CED, and providing nutritional counseling in primary healthcare settings. As well as increasing screening and screening of prospective pregnant women so that they are ready to become healthy pregnant mothers and give birth to healthy babies.



DECLARATION

Conflict of Interest

There is no conflict of interest in this research.

Authors' Contribution

The authors' contributions include: research design (LKH, MSN, EH); research instrument development (LKH, MSN); data collection and analysis (LKH, MSN, EH); and manuscript preparation and review (LKH, EH, T).

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Ethical Approval

This research has been approved by the ethics committee of the Faculty of Medicine and Health Sciences, Lambung Mangkurat University with No. 493/KEPK-FK ULM/EC/XII/2023

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Data Availability

The data used and/or analyzed in this study are available from the corresponding author upon request to the respondents. The raw data of this study cannot be published publicly due to ethical constraints and respondent confidentiality. However, the data are accessible from the corresponding author by applying the principle of anonymity.

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REFERENCE

- Andini, F.R., 2020. Hubungan faktor sosio ekonomi dan usia kehamilan dengan kejadian kekurangan energi kronis pada ibu hamil di Puskesmas Prambontergayang Kabupaten Tuban. *Amerta Nutrition*, 4(3): 218.
- Amin, S., Firdaus, A. M., & Murtafiah, W. 2021. Pelatihan Materi Gizi seimbang pada ibu rumah tangga untuk Peningkatan Status Gizi. *Jurnal Terapan Abdimas*, 6(2), 102-109.
- Arifin, S. 2020. Peta teori Ilmu Kesehatan Masyarakat. *Administrasi Kebijakan Kesehatan dan Perilaku Kesehatan*. Penerbit Mitra Wacana Media: Bogor.
- Astuti, A.B., Santosa, S.W. and Utami, M.S., 2000. Hubungan antara dukungan keluarga dengan penyesuaian diri perempuan pada kehamilan pertama. *Jurnal Psikologi*, 27(2): 84-95.
- Dinas kesehatan Kabupaten Kapuas Kalimantan Tengah. 2022. Pemantauan Wilayah Setempat KIA Desember 2021.
- Diningsih, R., F., Puji, A., W., Erika, L. 2021. Hubungan Tingkat Pengetahuan Tentang Gizi Terhadap Kejadian Kekurangan Energi Kronik (KEK) Pada Ibu Hamil. *Binawan Student Journal (BSJ)*, 3(3).
- Erita, M., Amlah, & Rahmawati, E. 2023. Hubungan Paritas, Jarak Kehamilan dan Riwayat Penyakit dengan Kejadian Kekurangan Energi Kronik (KEK) pada Ibu Hamil di Wilayah Kerja Puskesmas Makrayu Palembang tahun 2022. *Jurnal Ilmiah Obsgin*, 209-218.
- Fakhriyah, F., Noor, M.S.N., Setiawan, M.I., Putri, A.O., Lasari, H.H., Qadrinnisa, R., Ilham, M., Nur, S.Y.L.L.S., Zaliha, Z., Lestari, D. and Abdurrahman, M.H., *Buku Ajar Kekurangan Energi Kronik (KEK)*. Yogyakarta: CV.Mine.
- Fitri, N., L., Sari, A. A., Dewi, N. R., Ludiana, Hayati, N., 2022. Hubungan Usia Ibu Dengan Kejadian KEK Pada Ibu Hamil Di Puskesmas Ganjar Agung Kecamatan Metro Barat Kota Metro. *Jurnal Wacana Kesehatan*, 7(1).
- Fitriani, Afriyani, L.D., Diba, F., Wahyuni, Y.I., Indriani, D., Wahyuni, T., dkk. 2021. Literature Review Hubungan Pengetahuan dengan KEK pada Wanita Prakonsepsi. *Seminar Nasional Kebidanan*: 196-204
- Fransiska, Y., Murdiningsih, M., & Handayani, S. 2022. Faktor-Faktor yang Berhubungan dengan Kejadian Kurang Energi Kronis pada Ibu Hamil. *Jurnal Ilmiah Universitas Batanghari Jambi*, 22(2): 763. <https://doi.org/10.33087/jiubj.v22i2.1817>
- Friedman, M.M., Bowden, V.R. and Jones, E.G., 2012. *Buku Ajar Keperawatan Keluarga: Riset, Teori dan Praktek (Family Nursing: Research, Theory and Practice)*. edisi 5). Jakarta: EGC.
- Green, Lawrence., 1980. *Health Education Planning A Diagnostic Approach*. Baltimore. The John Hopkins University, Mayfield Publishing Co.

- Halimah. G.S., Jayanti, R.D., & Fatmaningrum, W. 2022. Hubungan Usia, Paritas, dan Pekerjaan Terhadap Resiko KEK Ibu Hamil Trimester 1 di Puskesmas Cilengkrang Bandung Tahun 2022. *Jurnal Sehat Mandiri*: 94-103.
- Harlissa, R., Sugesti, R., & Darmi, S. 2023. Hubungan antara Dukungan Suami, Status Gizi, dan Anemia pada Ibu Hamil dengan Kejadian Bayi Baru Lahir Rendah di Puskesmas Toboali Kabupaten Bangka Selatan Tahun 2021. *SIMFISIS Jurnal Kebidanan Indonesia*: 381-387.
- Hayat, F., Nurce A., Tria A. E. P., 2021 Peran Dukungan Suami Dan Faktor Lainnya Terhadap Pemanfaatan Pelayanan Gizi Oleh Ibu Hamil Dengan Risiko Kurang Energi Kronis (KEK). *Jurnal Keperawatan Silampari*, 5(1)
- Kemenkes RI. 2021 Pedoman Pelaksanaan Teknis Surveilans Gizi. Jakarta: Kemenkes RI. Laporan Kinerja Direktorat Jenderal Kesehatan
- Kementerian Kesehatan Republik Indonesia. 2015. Pedoman penanggulangan Kurang Energi Kronik (KEK) pada ibu hamil. Jakarta: Ditjen Bina Gizi dan KIA Direktorat Bina Gizi.
- Kurniawan, D.A.N., Triawanti, Noor, M.S., Djallalludin, & Qamariah, N. 2021. Literature Review: Hubungan Pekerjaan dan Penghasilan Keluarga dengan Kejadian Kurang Energi Kronik pada Ibu Hamil. *Homeostatis*: 115-126.
- Lestari, D.S., Nasution, A.S. and Nauli, H.A., 2023. Faktor-Faktor yang Berhubungan dengan Kejadian Kurang Energi Kronik (KEK) pada Ibu Hamil di Wilayah Kerja Puskesmas Bogor Utara Tahun 2022. *PROMOTOR*, 6(3): 165-175.
- Mansoben, N. and Gurning, M., 2022. Pengetahuan, Dukungan Suami Dan Pendapatan Ekonomi Dengan Kejadian Kekurangan Energi Kronik Pada Ibu Hamil. *Jurnal Keperawatan*, 14(2): 401-408.
- Marini, Solechah, S.A., Fathullah, D.M., Suryani, N., Yulidasari, F., Setiawan, M.I., & Rahayu, A. 2023. Hubungan Usia Ibu, Kadar Hemoglobin, dan Status KEK saat Kehamilan dengan Berat Badan Lahir Bayi. *Ghidza : Jurnal Gizi dan Kesehatan*: 296-304.
- Marisi, T. 2021. Faktor-Faktor Yang Mempengaruhi Kejadian Anemia Pada Ibu Hamil Di Wilayah Kerja Puskesmas Kecamatan Kebon Jeruk Jakarta Barat. Jakarta: Universitas Binawan.
- Notoatmodjo S. 2010. Ilmu Perilaku Kesehatan. Jakarta: Rineka Cipta.
- Novitasari, Y.D., Wahyudi, F. and Nugraheni, A., 2019. faktor-faktor yang berhubungan dengan kekurangan energi kronik (KEK) ibu hamil di wilayah kerja Puskesmas Rowosari Semarang. *Jurnal Kedokteran Diponegoro (Diponegoro Medical Journal)*, 8(1): 562-571.
- Nugraha, R.N., Lalandos, J.L., & Nurina, Rr.L. 2019. Hubungan Jarak Kehamilan Dan Jumlah Paritas Dengan Kejadian Kurang Energi Kronik (Kek) Pada Ibu Hamil Di Kota Kupang. *Cendana Medical Journal*: 273-280.
- Nur'aini, F., Avianty, I., & Prastia, T.N. (2021). Faktor- Faktor Yang Berhubungan Dengan Kejadian Kurang Energi Kronis (Kek) Pada Ibu Hamil Di Wilayah Kerja Puskesmas Tegal Gundil Bogor Tahun 2020. *Promotor Jurnal Mahasiswa Kesehatan Masyarakat*: 219-226
- Paramashanti. 2019. Gizi Ibu dan Anak. Yogyakarta: *Pustaka Baru*
- Permana, P & Wijaya, G.B.R. 2019. Analisis faktor risiko bayi Berat Badan Lahir Rendah (BBLR) di Unit Pelayanan Terpadu (UPT) Kesehatan Masyarakat (Kesmas) Gianyar I tahun 2016-2017. *Intisari Sains Medis*: 674-678.

- Primadani, F.D., 2016. Faktor-Faktor Yang Mempengaruhi Kejadian Kek Pada Ibu Hamil Di Puskesmas Baturraden Ii Kabupaten Banyumas (Doctoral dissertation, Universitas Muhammadiyah Purwokerto).
- Probowati, R., Astuti, A. M., Anasulfallah, H., & Pangestu, J. B. 2024. Masalah kesehatan mental ibu hamil dengan upaya melakukan dukungan sosial 3h (bahagia ibu, selamat kehamilan dan bayi sehat). In Prosiding Seminar Informasi Kesehatan Nasional: 125-130.
- Rahayu, T. D., & Sagita, D. Y. 2019. Pola Makan dan Pendapatan Keluarga dengan Kejadian Kekurangan Energi Kronik (KEK) pada ibu hamil Trimester II. *Holistik Jurnal Kesehatan*, 13(1).
- Rohmah, L. 2020. Evaluasi Program Pemberian Makanan Tambahan (PMT) pada Ibu Hamil Kekurangan Energi Kronis (KEK) di Wilayah Kerja Puskesmas Karanganyar Kota Semarang. Semarang: Universitas Negeri Semarang.
- Rudiyanti, N. & Rosmadewi. 2019. Hubungan Usia, Paritas, Pekerjaan Dan Stress Dengan Emesis Gravidarum Di Kota Bandar Lampung. *Jurnal Ilmiah Keperawatan Sai Betik*, 7-18.
- Suryani, L., Riski, M., Sari, R.G. and Listiono, H., 2021. Faktor-faktor yang mempengaruhi terjadinya kekurangan energi kronik pada ibu hamil. *Jurnal Ilmiah Universitas Batanghari Jambi*, 21(1): 311-316
- Teguh, N.A., Hapsari, A., Dewi, P.R.A. and Aryani, P., 2019. Faktor-faktor yang mempengaruhi kejadian kurang energi kronis (KEK) pada ibu hamil di wilayah kerja UPT Puskesmas I Pekutatan, Jembrana, Bali. *Intisari Sains Medis*, 10(3).
- Vladimir, V. F. 2021. Pengendalian Kejadian Kekurangan Energi Kronis (Kek) Pada Masa Kehamilan Di Wilayah Kerja Puskesmas Rambah. *Maternity and Neonatal*, 09(69): 5–24.
- Yuniar, A., K., B., Fatmawati, S., 2023. Gambaran Karakteristik Ibu Hamil Kekurangan Energi Kronik (KEK) Dan Dukungan Suami Di Wilayah Surakarta. *Jurnal Ilmiah Ilmu Kesehatan*, 1(4).
- Yunita, N & Ariyati, M. 2021. Hubungan Pola Makan dan Pendapatan Keluarga dengan Kejadian Kekurangan Energi Kronis (KEK) pada Ibu Hamil di Wilayah Kerja Puskesmas Kertak Hanyar. *Jurnal Kesehatan Indonesia*: 100-106.
- Zulaikhah, F., & Veftisia, V. 2022. Hubungan Dukungan Suami Terhadap Kunjungan K4 di Desa Mudal dan Slukatan Kecamatan Mojotengah Kabupaten Wonosobo. *Journal of Holistics and Health Sciences*, 4(1).