



Parity and Eating Habits Trigger Chronic Energy Deficiency in Pregnant Women

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ABSTRACT: Nutrition of pregnant women is related to the welfare of the fetus they contain. Chronic energy deficiency (CED) during pregnancy is a trigger for cases of hypertension in pregnancy, pre-eclampsia, bleeding and premature rupture of membranes. Therefore, nutritional adequacy is something that needs to be considered, both before, during and after pregnancy ends. This research is an observational study using a case control design. This study aims to explore the factors that cause chronic energy deficiency in pregnant women. The sample used was 120 respondents who were divided into case and control groups with a ratio of 1:2. The results showed that the proportion of CED incidence was 33.3%, low education was 97.5%, risk parity was 43.3%, family income was below the district minimum wage (DMW) 60%, LILA was less than 23.5 cm 33.3% . , BMI <18.5 22.5%, anemia 31.67%, and unhealthy food consumption habits 69.16%. There is a relationship between parity, family income, anemia, and unhealthy eating habits with the incidence of CED, and there is no relationship between education and the incidence of CED. It is necessary to use appropriate technology as much as possible, such as social media in providing assistance in overcoming CED and the existence of cross-sectoral cooperation in increasing the use of home gardens for families to fulfill family nutrition.

KEYWORDS: Anemia, CED, Food consumption, Pregnant women.

INTRODUCTION

Pregnancy is a physiological process in a woman's life cycle. There are many things that need to be considered during pregnancy, from maternal health to care during pregnancy. Adequate nutrition is something that needs to be considered, both before, during and after pregnancy ends. Nutritional status is an indicator of maternal health status during pregnancy. This is because the nutrition of pregnant women is related to the welfare of the fetus they contain [1]. Poor maternal nutritional status, in addition to affecting the welfare of the fetus, can also have an impact on the health condition of the mother during pregnancy which will ultimately affect the delivery process [2]. It was recorded that in 2017, 53.9% of pregnant women experienced an energy deficit with a standard <70% energy adequacy rate (EAR) and as many as 13% of pregnant women experienced a mild energy deficit (standard 70% - 90% EAR). In addition, it is known that pregnant women who experience a protein deficit with a standard <80% protein adequacy rate (PAR) of 51.9% and 18.8% of pregnant women experience a mild deficit with a standard of 80% - 99% of the PAR [3]. The 2018 Basic Health Research (Riskesdas) in Indonesia noted that 17.3% of pregnant women experienced CED. This figure increased by 2.5% compared to the previous year [4]. Lampung Province in 2018, the percentage of pregnant women experiencing CED was 13.63%, and for Central Lampung being one of the highest contributors to CED as much as 52.8% with a proportion of 13.3% being pregnant women [5].

Chronic Energy Deficiency (CED) is a condition in which a person experiences a lack of energy for a long time. Individuals who experience CED will experience extreme fatigue so that they feel unwell and still feel tired even though they have rested. If CED is experienced by a mother who is pregnant, it can have an impact on the growth of the fetus in her womb and her health condition. CED during pregnancy can be a trigger for cases of hypertension in pregnancy, pre-eclampsia, bleeding and premature rupture of membranes [6]. CED cases in Indonesia still require serious attention. This is due to the high cases of CED in pregnant women. Factors causing CED include age, parity, education, wealth, living environment [7], 2020), family income [8], pregnancy distance [9], anemia [10], food consumption habits [11].

Lack of nutrients during pregnancy greatly affects the physical and cognitive development of the baby to be born and affects the growth and development of the baby in the future. During the pregnancy period, nutritional status is an important aspect to determine whether pregnant women can pass pregnancy well without any disturbances [12]. The habit of consuming unhealthy foods has an impact on the adequacy of nutrients that enter the body. Parity provides an overview of a mother's experience of the



importance of meeting nutritional needs, especially during pregnancy. Therefore, this study aims to examine the factors associated with the incidence of chronic energy deficiency in pregnant women in the Central Lampung region.

A. Method

This research is an observational study with an explanative quantitative method, using a case control design. Held in Central Lampung, Indonesia. The population of this study was pregnant women who were recorded in antenatal care visits in the working area of the Jatidatar Health Center. Calculation of sample size by using the formula for the proportion of a limited population by taking into account the 95% confidence level, 5% margin of error and case size of OR 7.6 (based on research conducted at Pekutatan Public Health Center, Jembrana) and the use of sample ratio is set to be 1:2.

Based on the calculation of the sample size, a case sample of 41.86 respondents was obtained which was rounded up to 42 respondents. As for the control sample, there are $42 \times 2 = 84$, so that the overall sample in this study is 126 respondents. At the time of implementation, due to the timing and conditions of PPKM due to the increase in COVID-19 cases, the sample used was 40 respondents for the case group and 80 respondents for the control group so that the total number of respondents was 120 respondents. Sampling was done by random sampling. If 1 case sample is found, it will be followed by taking 2 control samples.

The data collection instrument was prepared in the form of a questionnaire in Indonesian. Equality of perception is implemented to train enumerators (2 people) and supervisors (1 person). The instruments are arranged based on the required information, namely; age, occupation, education, parity, gestational age and anemia status taken from the mother's pregnancy records, family income and food consumption habits in the last 2 times 24 hours obtained by interview.

B. Measurement

1. Chronic Energy Deficiency (CED). The condition of pregnant women who experience chronic energy deficiency, assessed from the size of the upper arm circumference (UAC) of the mother for the first time (KIA book documentation). Mother is said to be CED if $UAC < 23.5$ cm.
2. Education. Mother's last formal education completed. The education group is low if they pass SD – SMP – SMA. Higher education if completed Diploma – Bachelor.
3. Family income. Wages earned by the family (husband and mother) from the work done. Grouped into; below the district minimum wage (DMW) and above the DMW. At the time of the study the DMW was Rp. 2,442,513,-
4. Parity. The number of children born to the mother, both alive and stillborn. If parity < 2 and > 4 mothers are grouped as risk groups. If parity 3 and 4 are grouped as a no-risk group.
5. Anemia Status. The hemoglobin level for the first time during an antenatal care visit was obtained from the documentation in the KIA handbook. Grouped into; anemia if Hb level < 11.8 g/dl and not anemia if Hb level ≥ 11.8 g/dl.
6. Eating habits. The respondent's eating habits to meet balanced nutritional needs were assessed based on the type of variation in the food group, portion and frequency based on food consumption in the last two 24 hours. The standard used is the standard of the contents of my plate for pregnant women with a portion of 4-6 times.

C. Data analysis

The completeness of the questionnaire was carried out after each completion of data collection by the supervisor manually and coded. Furthermore, data analysis was carried out using SPSS version 25.0. Descriptive statistics are presented in tabular form. Bivariate analysis using chi square test. The significance level was set at 95%.

D. Ethical Approval.

Ethical approval was obtained from the Health Polytechnic Ethics Commission of the Politeknik Kesehatan Tanjung Karang. An official letter for the implementation of the research was obtained from the Office of Investment and One Stop Service, Central Lampung Regency and the UPTD of Jatidatar Health Center Bandar Mataram, Central Lampung. Consent to participate was obtained from the respondents. Previously, an explanation regarding the purpose of the study was given, and confirmed willingness to participate. Evidence of willingness by including the signature of the respondent who is willing.



RESULTS

This study involved 120 pregnant women with a respondent's absorption rate of 95.2% from the initial determination of the research plan.

A. Characteristics of respondents.

The age of the respondents ranged from 16-40 years. With the proportion of less than 20 years of age as much as 13.3%, as housewives (not working) 93.3%, most of them completed their education at the junior high school level, which was 37.5%, and family income was 60% below the minimum wage (table 1).

Table 1. Characteristics of respondents.

No	Characteristics of Respondents	Total	%
1.	Age:		
	< 20 years	16	13,30
	20 sd. 35 years old	98	81,70
	> 35 years old	6	5,00
2.	Work		
	Housewife	112	93,33
	Teacher	3	2,50
	Self-employed	2	1,67
	Trader	2	1,67
	ART	1	0,83
3.	Education		
	Primary school	28	23,30
	Junior high school	45	37,50
	Senior High School	44	36,70
	Bachelor	3	2,50
4.	Educational status:		
	Low education	117	97,50
	higher education	3	2,50
5.	Family Income:		
	Under district minimum wage	72	60,00
	Above district minimum wage	48	40,00

B. Obstetric characteristics

Cases of CED in this study were 33.3%, most of the parity was multigravida 56.66% with parity at risk of 43.3%. The highest gestational age was in the third trimester, namely 47.5%, anemia at 31.67% and having unhealthy eating habits of 69.16% (table 2).

Table 2. Obstetric characteristics

No	Characteristics of Obstetric	Total	%
1.	CED incident:		
	CED	40	33,30
	No CED	80	66,70
2.	Parity:		
	Primigravida (1)	50	41,67
	Multigravida (2 – 4)	68	56,66
	Grande multi (> 4)	2	1,67



3.	Parity Status:		
	At risk (1 and >4)	52	43,30
	No Risk (2 – 4)	68	56,70
4.	Gestational Age:		
	First trimester	9	7,50
	Second Trimester	54	45,00
	Third Trimester	57	47,50
5.	UAC (upper arm circumference)		
	< 23,5 cm	40	33,30
	≥ 23,5 cm	80	66,70
6.	BMI		
	< 18,5 (thin)	27	22,50
	18,5 – 24,9 (normal)	63	52,50
	> 25	30	25,00
7.	Anemia Status:		
	Anemia	38	31,67
	No Anemia	82	68,33
8.	Eating Habits:		
	Unhealthy eating habits	83	69,16
	Healthy eating habits	37	30,84

C. The incidence of CED in pregnant women

The results of this study found that from 40 mothers (33.3%) who experienced CED, 70% (28 pregnant women) had a body weight of <42 kg. As many as 50% (20 pregnant women) were in the third trimester of pregnancy and 70% (14 pregnant women) in the third trimester weighed <45 kg. As many as 45% (18 pregnant women) experienced CED with anemia and 27.5% (11 pregnant women) had a BMI <17.00.

D. Factors causing CED

The results of the bivariate test using the chi square test identified four variables, namely: parity [OR 4.56, CI 2.02, 10.30], anemia status [OR 2.45, CI 1.10, 5.47], family income [OR 2.26, CI 0.99, 5.15] and unhealthy eating habits [OR 2.82, CI 1.11, 7.18], as the cause of the occurrence of CED cases, while education has no relationship to the incidence CED. The results of statistical tests showed that there was no relationship between education and the incidence of CED (table 3).

Table 3. Causes of CED in pregnant women

Variable category	CED				p-value	OR	CI	
	Case		Control				Lower	Upper
	n	%	n	%				
Education								
Low education	40	34,2	77	65,8	0,215	0,65	0,57	0,75
Higher education	0	0	3	100				
Income								
Under DMW	29	40,3	43	59,7	0,048	2,26	0,99	5,15
Above DMW	11	22,9	37	77,1				
Parity Status:								
At risk (1 and >4)	27	51,9	25	48,1	0,001	4,56	2,02	10,30
No Risk (2 – 4)	13	19,1	55	80,9				



Anemia Status								
Anemia	18	47,4	20	52,6	0,026	2,45	1,10	5,47
No Anemia	22	26,8	60	73,2				
Eating Habits								
Not healthy	33	39,8	50	60,2	0,025	2,82	1,11	7,18
Healthy	7	18,9	30	81,1				

n = 120

DISCUSSION

Chronic energy deficiency is a condition of pregnant women experiencing chronic food shortages [13]. This can cause health problems for the mother. One of the main indicators of a mother experiencing CED is if the UAC is found to be less than 23.5 cm. Other indicators such as weight before pregnancy <42 kg, weight in the third trimester less than 45 kg, sometimes accompanied by anemia (Hb <11 g%). Mother's height <145 cm and BMI before pregnancy <17.00 [14].

The results of this study indicate a fairly high number for the incidence of CED, reaching 33.3% when compared to other studies in Banyumas, Central Java, which is 9.2% [15]. Although the number of respondents' participation is almost equal, this difference is possible due to the use of design in the study. Furthermore, if examined from the characteristics of the mother, it is assumed that the CED experienced by pregnant women actually existed before the pregnancy occurred. This assumption is reinforced by the characteristics of the mother, namely 67.5% (27 pregnant women) who experience CED have a BMI <18.5 kg/m2.

CED experienced by the mother is currently exacerbated by the presence of anemia. The data stated that as many as 45% (18 pregnant women) who experienced CED experienced anemia. Pregnant women who experience CED are increasingly problematic if accompanied by anemia during their pregnancy [6]. Of course, at the time of delivery the mother will face problems [16]. This condition also has an impact on the fetus, including premature birth, low birth weight babies, and decreased iron stores for the baby, which can cause developmental disorders [17].

One of the factors that contribute to the occurrence of CED cases in adults, especially adult women, is inadequate food needs [18]. Many women have limited habits in consuming foods such as fruits, vegetables, milk, fish and meat. If this continues, there will be a shortage of major nutrients such as iodine, iron, folate, calcium and zinc [19].

Limited food consumption habits result in an imbalance in nutritional needs that triggers CED [11]. The data of this study showed that 38.6% (34) of 120 pregnant women who experienced CED had unhealthy eating habits. The food consumption habits referred to in this study are the respondent's eating behavior to meet balanced nutritional needs, assessed based on the type of variation from food groups, portions and frequency based on food consumption in the last two 24 hours.

Food consumption habits or what is often referred to as eating patterns are the amount and type of food consumed to meet the body's needs in the form of complete dishes that are consumed every day and are often prepared repeatedly [20]. A person's eating habits can be known by looking at the person's daily food consumption. If the nutritional needs of pregnant women are not fulfilled, they tend to be deficient in certain nutrients, such as Chronic Energy Deficiency [16]. Diet in pregnant women is very important to note. This is because the need for food consumed by pregnant women affects the continuity of fetal growth in the womb. In addition, food consumption during pregnancy has a function on the physical health of the mother in preparation for childbirth and lactation [21].

In this study, food consumption habits that cause pregnant women to experience CED are due to the frequency, portion and variety of food consumed. This is evidenced by 69.16% having bad eating habits, which means that in terms of frequency, portion and variety it does not meet the needs of the mother during pregnancy. One of the facts, pregnant women consume at least 6 spoons of rice to meet their needs, from this study it is known that the average pregnant woman consumes rice as the main source of energy is 5.16 spoons of rice. This figure only meets about 63% of the recommended value.

Parity is defined as the number of deliveries experienced by the mother, both live and non-live births, and does not include abortions [22]. Parity is a factor that greatly influences the outcome of pregnancy conception. A woman must always be vigilant, especially a woman who has been pregnant or has given birth to four or more children [21]. High parity (>4 times) describes repeated pregnancies that have a risk [23]. The mother's body does not have enough opportunity to repair including restoring energy after



giving birth. When pregnant women return, there is a chance for nutritional problems to arise, because they can affect the fulfillment of nutritional needs for both mother and fetus [16].

This vigilance is necessary because there will be various conditions, such as health conditions that may change quickly. Pregnant women will be very easily disturbed by their health, for example because of anemia, or experiencing a lack of nutritional needs [24]. This includes pregnant women who are pregnant for the first time. In this group, awareness of problems in pregnancy, especially in mothers at an early age and in mothers who are elderly, has the opportunity to experience risks [25].

In this study, it was stated that parity had a relationship with the incidence of CED. This is possible, one of the causes is the increase in cases of CED in women of childbearing age (15-49 years) by 14.5% [22], and this case continues until entering the period of pregnancy. The nutritional status of the mother before pregnancy also plays a significant role in achieving maternal nutrition during pregnancy. In addition, behavior in meeting the food needs of women of childbearing age is considered to be a factor causing CED [14].

Family income is the income of all family members who are in a household, used to meet the common needs of the family [26]. Income or income is a picture of a person's level of life in society. Income can be used as a benchmark, because it can affect various aspects of daily life, such as providing nutrition to the body on a daily basis. This basis makes income very important in determining a person's health status [14].

These results are assumed because income has an influence on the ability of families to increase opportunities to meet food needs with better quality and quantity. But income is not the main factor in meeting the food needs of a family. There are many opportunities that can be used to meet the food needs of the family. One of them is the use of yard land. If the use of Karang Anyar land can be used as an alternative to meet the family's food needs, of course it can help families who have incomes below the DMW in meeting family needs.

CONCLUSION

There is a relationship between parity, family income, anemia, and unhealthy food consumption habits with the incidence of CED, and there is no relationship between education and the incidence of CED. It is necessary to use appropriate technology as much as possible, such as social media in providing assistance in dealing with CED and cross-sectoral cooperation in increasing the use of home gardens for families to fulfill family nutrition.

RECOMMENDATION

Serious intervention is needed to overcome CED cases through pre-pregnancy care. The goal is to be able to detect early factors that can cause problems. Another alternative is to work together across sectors, especially to families with incomes below the DMW, to make optimal use of the yard, so that they are able to help meet food needs.

Conflict of Interests. Authors declare that they have no conflict of interests.

Ethical Issues. The current study has been approved by the Health Polytechnic Ethics Committee of the Politeknik Kesehatan Tanjung Karang number 230/KEPK-TJK/IX/2021

Financial Support. This research was independently funded by the research team

Acknowledgments. The authors would like to thank the Head of the Jatidatar Health Center, Central Lampung, who has provided the opportunity and gave permission to carry out the research.

REFERENCES

1. Sukarni IKMZ. Kehamilan Persalinan Dan Nifas Dilengkapi Dengan Patologi. cetakan 1. Yogyakarta: Nuha Medika; 2013. 420 p.
2. Suryaningsih. Kebidanan Teori dan Asuhan. In: Asuhan Kebidanan Antenatal. Vol 1-2. Jakarta: EGC; 2017. p. 307–33.
3. Kementerian Kesehatan RI. Laporan kinerja kementerian kesehatan tahun 2018. 2018;
4. Kementerian Kesehatan RI. Profil Kesehatan Indonesia Tahun 2017 [Internet]. Jakarta: Kementerian Kesehatan RI; 2018. 496 p. Available from: website: <http://www.kemkes.go.id>



5. Dinas Kesehatan Propinsi Lampung. Profil Kesehatan Provinsi Lampung Tahun 2019. Lampung: Pusdatin Kemenkes RI; 2019. 305 p.
6. Roberts D. Chronic fatigue syndrome and quality of life. *Patient Relat Outcome Meas.* 2018;Volume 9:253–62.
7. Tejayanti T. Determinants of Chronic Energy Deficiency and Low Body Mass Index of Pregnant Women in Indonesia. *J Kesehat Reproduksi.* 2020;10(2):173–80.
8. Mukkadas H, Salma WO, Cristian Bhinekada I. Factors Related to Chronic Energy Deficiency in Pregnant Mothers in the Konawe District, Indonesia. *J Res Dev Nurs Midwifery.* 2021;(February):19–21.
9. Teguh NA, Hapsari A, Dewi PRA, Aryani P. Faktor-faktor yang mempengaruhi kejadian kurang energi kronis (KEK) pada ibu hamil di wilayah kerja UPT Puskesmas I Pekutatan, Jembrana, Bali. *Intisari Sains Medis.* 2019;10(3):506–10.
10. Isti Angraini D, Musyabiq Wijaya S. The Analysis of Chronic Energy Malnutrition and Iron Intake with Anemia in Preconception Women of Childbearing Age in Terbanggi Besar Subdistrict, District of Central Lampung. *KnE Life Sci.* 2019;4(10):122.
11. Rahayu DT, Sagita YD. Pola Makan Dan Pendapatan Keluarga Dengan Kejadian Kekurangan Energi Kronik (Kek) Pada Ibu Hamil Trimester Ii. *Holistik J Kesehat [Internet].* 2019;13(1):7–18. Available from: <http://ejournalmalahayati.ac.id/index.php/holistik/article/view/847/pdf>
12. RI K. Pedoman Pemberdayaan Masyarakat dalam Penanggulangan Krisis Kesehatan. 2015;87.
13. Desyibelew HD, Dadi AF. Burden and determinants of malnutrition among pregnant women in Africa: A systematic review and meta-analysis. *PLoS One.* 2019;14(9):1–19.
14. Paramashanti BA. Gizi Bagi Ibu dan Anak : Untuk Mahasiswa Kesehatan dan Kalangan Umum. Tahun terb. Rachmawati Desy, editor. Yogyakarta: Pustaka Baru Press; 2019. 214 p.
15. Wiyono S, Burhani A, Harjatmo TP, Ngadiarti I, Prayitno N, . M, et al. Study causes of chronic energy deficiency of pregnant in the rural areas. *Int J Community Med Public Heal.* 2020;7(2):443.
16. Simbolong DJRA. Pencegahan dan penanggulangan kurang energi kronik (KEK) dan anemia pada ibu hamil. Yogyakarta: Deepublish Publisher; 2018. 78 p.
17. Abu-Ouf NM, Jan MM. The impact of maternal iron deficiency and iron deficiency anemia on child's health. *Saudi Med J.* 2015;36(2):146–9.
18. Letamo G, Navaneetham K. Prevalence and determinants of adult under-nutrition in Botswana. *PLoS One.* 2014;9(7).
19. Lipoeto NI, Masrul, Nindrea RD. Nutritional contributors to maternal anemia in Indonesia: Chronic energy deficiency and micronutrients. *Asia Pac J Clin Nutr.* 2020;29(December):9–17.
20. Supriasa IDN. Penilaian Status Gizi. 2nd ed. Jakarta: EGC; 2016. 296 p.
21. Wielgos A, Szymusik I, Bartnik P, Kacperczyk J, Kosinska-Kaczynska K PB. Pregnancy beyond the age of 40 - the influence of parity on perinatal outcome. *Neuro Endocrinol Lett [Internet].* 2015;36(4):387–93. Available from: <https://pubmed.ncbi.nlm.nih.gov/26454496/>
22. Kementerian Kesehatan. Laporan Nasional Riskesdas 2018 [Internet]. Badan Penelitian dan Pengembangan Kesehatan. Jakarta: Litbangkes; 2019. p. 674. Available from: http://labdata.litbang.kemkes.go.id/images/download/laporan/RKD/2018/Laporan_Nasional_RKD2018_FINAL.pdf
23. Dharma IPPS. Paritas sebagai Faktor Risiko Kejadian Kurang Energi Kronis (KEK) pada Ibu Hamil di Kecamatan Biduk-Biduk Kabupaten Berau. *Indones J Obstet Gynecol Sci eISSN.* 2019;2(2):111–7.
24. Farahdiba I. Hubungan Kekurangan Energi Kronik (KEK) Dengan Kejadian Anemia Pada Ibu Hamil Trimester I Di Puskesmas Lenanguar. *J Kesehat danSains [Internet].* 2021;5(1):45–9. Available from: <https://ojs.akbidpelamonia.ac.id/index.php/journal/article/view/195/213>
25. Gebre B, Biadgilign S, Taddese Z, Legesse T, Letebo M. Determinants of malnutrition among pregnant and lactating women under humanitarian setting in Ethiopia. *BMC Nutr.* 2018;4(1):1–8.
26. Marzuki SN. Relevansi Kesejahteraan Ekonomi Keluarga Dengan Peningkatan Perceraian Di Kabupaten Bone. *J Huk Kel Islam.* 2016;II(2):179–96.

Cite this Article: Firda Fibrila, M. Ridwan, Herlina (2023). Parity and Eating Habits Trigger Chronic Energy Deficiency in Pregnant Women. International Journal of Current Science Research and Review, 6(4), 2352-2358