

Original Research Article

Study causes of chronic energy deficiency of pregnant in the rural areas

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ABSTRACT

Background: Chronic energy deficiency (CED) is one of the malnutrition problems that often occurs in pregnant, caused by lack of energy in a long period of time. One of the effects of pregnant suffering from CED is to increase the risk of maternal and short baby mortality.

Method: The study was conducted in 8 villages of Kemranjen Subdistrict, Banyumas, Central Java, Indonesia in 2019. A cross sectional research design with population is that has pregnant. A sample of 130 pregnant was taken incidentally, with inclusion criteria that be able to do interviews and anthropometric measurements, while as the exclusion criterion was that pregnant were suffering from illness that could not be measured.

Results: Most of the age was over 30 years and 9.2% suffered from CED. Nutrient intake is mostly less than 80.0% of the nutrition adequacy rate (RDA). The average intake of macro nutrients is 28.05%, the average micronutrient intake is 27.70%. Most graduated were from high school, worked as housewives, consumed supplements, additional food, and added blood tablets and drank milk, suffered from upper respiratory infections (ARI), high blood pressure, and diabetes mellitus, did not get complete immunizations.

Conclusion: There were no significant differences in CED based on energy intake ($p=1.00$), protein intake ($p=1.00$), fat intake ($p=0.179$) and carbohydrate intake ($p=0.460$), work status ($p=0.216$) and education ($p=0.553$) and consuming additional food ($p=0.225$).

Keywords: Chronic energy deficiency, Nutrient intake, Pregnant, Supplementary food

INTRODUCTION

One of the main objectives of health development policy is to improve the health and nutrition status of mothers and children.¹ Basic Health Research Results 2018 found that 17.3% of pregnant suffered from chronic energy deficiency (CED) and as many as 74.8% did not get additional food, as many as 26.7% of pregnant did not get blood-added tablets, by 96.1% of pregnant doing examination pregnancy, while Indian pregnant suffer from chronic malnutrition by 36.0% and suffer anemia by

55%.^{2,3} Chronic energy deficiency (CED) is one of the malnutrition problems that often occurs in pregnant, which is caused by a lack of energy in a long period of time.⁴ According to Deuis NH, that meal habits are one of the causes of CED in pregnant.⁵ Nishant et al concluded that about a quarter of pregnant experience acute malnutrition, more than two-thirds are under normal pregnancy weight gain and more than one-tenth suffer anemia. Ethnicity, food security, and food diversity are factors that have a significant relationship with the nutritional status of pregnant.⁶

One of effects from pregnant is suffering from chronic energy deficiency is to increase the risk of maternal and short baby mortality.⁷ Sharma et al in 2014 concluded that low birth weight in malnourished pregnant and women with low hemoglobin levels had a higher risk of having low birth weight babies.⁸

This study aimed to determine the factors that cause chronic energy deficiency in pregnant in the rural area of Kemranjen Subdistrict, Banyumas, Central Java, Indonesia 2019.

METHODS

Study was conducted in 8 villages of Kemranjen Subdistrict, Banyumas, Central Java Indonesia in 2019. The cross-sectional research design with a population is a house stair that have pregnant. A sample of 130 pregnant was taken incidentally, with the inclusion criteria that be able to do interviews and anthropometric measurements,

while as the exclusion criterion was pregnant suffering from pain that could not be measured. Identifying pregnant with CED by measuring the upper arm of the daily inactive arm using a plastic tape capacity of 32.0 cm with an accuracy of 0.1 cm. Nutrient intake was measured by the method of recall 24 hours ago in a row, then processed using the Nutri Survey software.

Data on infectious diseases is measured by asking the child's mother about infectious diseases suffered by pregnant in the past month, while sanitation is measured through observation and interviews. To prove the research hypothesis the Chi Square test was used.

RESULTS

Age and CED

It was found that most pregnant aged was over 30 years and 9.2% of pregnant women suffer from CED.

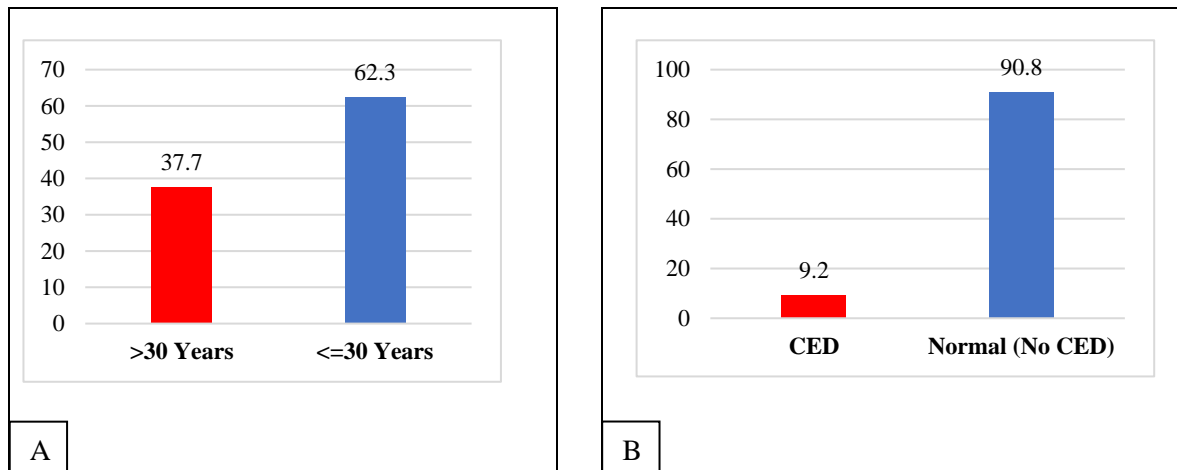


Figure 1: (A) Age and (B) status of CED.

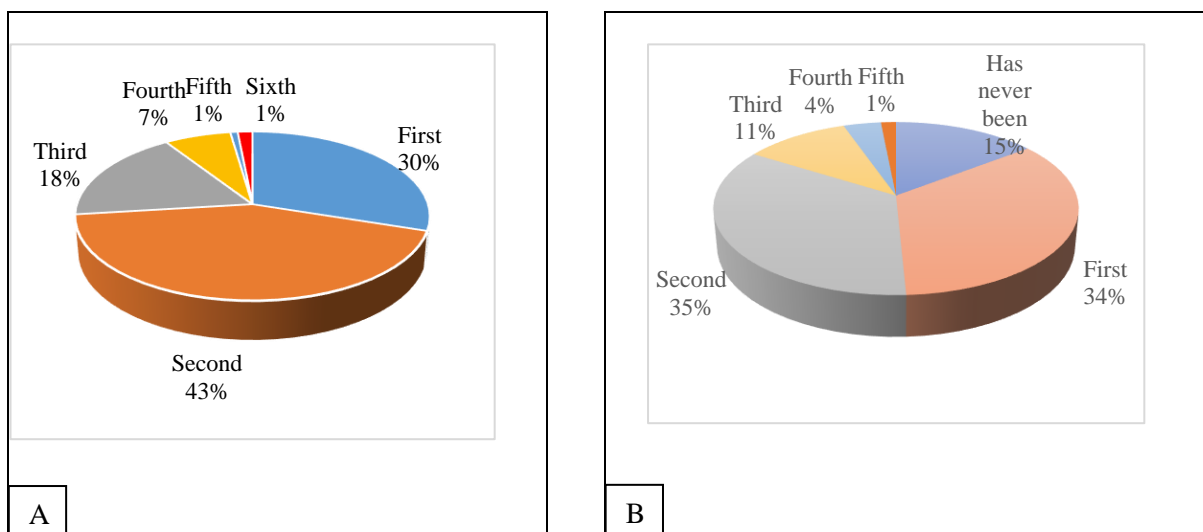


Figure 2: (A) Pregnancy status and (B) birthing experience.

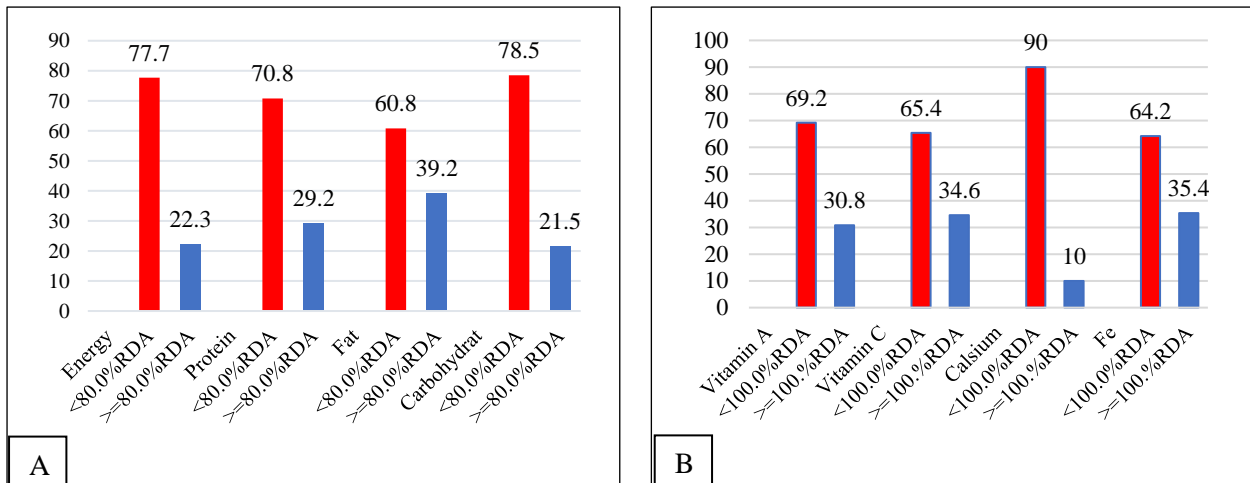


Figure 3 (A and B): Macro and micronutrient intake.

Pregnancy status and birthing experience

The results show that the most are second pregnancies; most birthing experiences are mostly second births.

Macro nutrition intake

It was found that the fourth intake of macro nutrients and micronutrients was mostly less than 80.0% of the recommended dietary allowance (RDA). The average intake of 4 kinds of macro nutrients is 28.05%, while the average intake of 4 kinds of micronutrients is 27.70%

Education and work

Most pregnant complete their study in secondary education, they work as housewives, consume supplements, consume additional food, and consume Fe tablets and drink milk during pregnancy.

Infectious diseases, non-communicable diseases and immunizations

During pregnancy most of them do not suffer from diarrhea, do not suffer from upper respiratory tract infections (ARI), do not suffer from high blood pressure, and do not suffer from diabetes mellitus, and do not get complete immunizations.

Socioeconomic

Most pregnant are not poor and have knowledge about nutrition and good health and also have high expenditure every month.

Sanitation

For household sanitation facilities mostly pregnant using the toilet personally, most of them are good in waste

management, good drinking water sources, but most of the house status is not healthy.

Table 1: Distribution of education, working status of pregnant.

Profile	N	%
Women education		
Primary school	15	11.5
Completion of Junior High School	52	40.0
Completion of High School	53	40.8
Completion of College	10	7.7
Working status		
Housewives	112	86.2
Working	45	34.6
Consuming supplements		
Yes	86	66.2
No	44	33.8
Consuming Additional food		
Yes	69	53.1
No	61	46.9
Consume Fe tablets		
Yes	77	59.2
No	53	40.8
Drink milk during pregnancy		
Yes	69	53.1
No	61	46.9

Bivariate analysis

There is a bit tendency that pregnant suffering from CED are bigger in the group whose energy intake, protein intake, fat intake and carbohydrate intake are less than 80.0% RDA. Conversely, there is a tendency that normal pregnant not CED intake, then energy intake, protein intake, fat intake and carbohydrate intake are greater than 80.0% RDA.

Table 2: Distribution of diseases of pregnant.

Disease	N	%
Suffering from diarrhea		
Yes	10	7.7
No	120	92.3
Suffering from ARI		
Yes	9	6.9
No	121	93.1
High blood pressure		
Yes	5	3.8
No	125	96.2
Symptoms of diabetic mellitus		
Yes	15	11.5
No	115	88.5
Immunization status		
Complete	15	11.5
No complete	115	88.5
No data available	40	30.8

Table 3: Distribution of pregnancy socioeconomic.

Socioeconomic	N	%
Levels of expenditure		
High	78	60.0
Low	52	40.0
Level of knowledge		
Good	100	76.9
Less	30	23.1
Poor status		
Yes	18	13.8
No	112	86.2

Based on the Chi square test there was no significant difference in CED of pregnant based on energy intake ($p=1.000$), protein intake ($p=1.000$), fat intake ($p=0.179$) and carbohydrate intake ($p=0.460$).

Table 5: Chronic energy deficiency of pregnant based on macro nutrient intake.

Risk factors	CED				Total	χ^2	df	P	
	Yes		No						
Macro nutrient intake	N	%	N	%	N	%			
Energy							0.243	1	1.000
<80.0% RDA	10	9.9	91	90.1	101	100			
$\geq 80.0\%$ RDA	2	6.9	27	93.1	29	100			
Protein							2.791	1	1.000
<80.0% RDA	11	12.0	81	88.0	92	100			
$\geq 80.0\%$ RDA	1	2.6	37	97.4	38	100			
Fat							0.1923	1	0.179
<80.0% RDA	8	10.1	71	89.9	79	100			
$\geq 80.0\%$ RDA	4	7.8	47	92.2	51	100			
Carbohydrate							1.364	1	0.460
<80.0% RDA	11	10.8	91	89.2	102	100			
$\geq 80.0\%$ RDA	1	3.6	27	96.4	28	100			

Table 4: Distribution of household sanitation for pregnant.

Sanitation	N	%
Toilet		
Private toilet	111	85.4
Public	11	8.5
Other	8	6.2
Status of house		
Healthy	50	38.5
Unhealthy	80	61.5
Water source		
Good	89	68.5
Bad	41	31.5
Waste management		
Good	15	11.5
Bad	115	88.5

There is a bit tendency that pregnant who suffer from CED are bigger in groups who have lack of knowledge, do not work in formal and poor categories, and age groups between 20-30 years and upper secondary education groups. On the contrary, there is a tendency for normal pregnant to have a bigger intake in the good knowledge group, age groups between <20 and >30 years and secondary education and also not poor.

Based on the Chi Square test there is no significant difference in the CED of pregnant based on knowledge ($p=1.00$), age ($p=0.364$), stat us work ($p=0.216$) and education ($p=0.553$) and poor status ($p=0.672$). There is a bit tendency that pregnant who suffer from CED are bigger in the group that does not get additional food. However, based on Chi Square test there was no significant difference in CED of pregnant based on consuming additional food ($p=0.225$).

Table 6: Chronic energy deficiency pregnancy by socio-economic level.

Risk factors	CED				Total	χ^2	df	P
	Yes	No	N	%				
Social status	N	%	N	%	N	%		
Knowledge							0.028	1 1.000
Less	3	10.0	27	90.0	30	100		
Good	9	9.0	90	91.0	100	100		
Age							1.123	1 0.364
<20 and >30 years	3	5.9	48	94.1	51	100		
20-30	9	11.4	70	88.6	79	100		
Work status							2.125	1 0.216
No	12	10.7	100	89.3	112	100		
Yes	0	0	18	100	100	100		
Education							2,282	1 0.553
Intermediate	5	7.5	62	92.5	67	100		
Over	7	11.1	566	88.9	63	100		
Poor							0.088	1 0.672
Yes	2	11.1	16	88.9	18	100		
No	10	8.9	102	91.1	112	100		
Consuming supplementary food							2.069	1 0.225
No	8	13.1	53	86.9	61	100		
Yes	4	5.8	65	94.2	69	100		

DISCUSSION

It was obtained 9.2% of pregnant experience CED, while Riskesdas 2018 reported that the proportion of chronic energy deficiency in fertile women, 2007-2018 46.6 was 5.2% for ages 40-44 years and 11.1% for ages 45-49 years.²

Almurshed et al results study in Riyad Saudi Arabia (2007) showed that the percentage of average nutrient intake is below the recommended nutritional adequacy rate (RDA) for pregnant, respectively: 51.8%, 93.9%, 82.5% and energy 98.2%, vitamin B1, calcium and iron substance.⁸ Al Bahhawi et al stated that maternal habits are very important for the health of mothers and children. Meat, fish, and fruit consumption are 97%, 86%, and 90%.¹⁰ According to Hasanah et al, aspects of eating habits are one of the causes of CED in pregnant, all the aspects of eating behavior such as the habit of not eating together with family, less diverse and energy-sourced food patterns, lack of frequency and portion of food, abstinence from foods that are good for consumption, how to distribute poor family food, and how to choose food ingredients that are not good is the cause of CED in pregnant.⁴ The results study of Azizah et al showed that there was no correlation between the level of carbohydrate adequacy ($p=1,000$), protein ($p=1,000$), and fat ($p=0.635$) with the CED of pregnant ($p>0.05$).¹⁰ Furthermore the relationship of knowledge, age, work status, education and poverty status. The results study of Nurdin et al in Jeneponto, Indonesia showed that the variables that contributed to the occurrence of chronic energy deficiency in pregnant were age (OR=2.662, 95%

CI=1.785-3.968, $p<0.001$) and education level (OR=0.505, 95% CI=0.340-0.751, $p=0.001$).⁷ Subasinghe's results study and her poor communities show a significant relationship with chronic energy deficiency in pregnant.¹¹ This is reinforced by the results study of Nisa and her friends in 2018, that there is a relationship between predisposing factors including variables of age and knowledge, to the lack of chronic energy.⁶ The results Pastuty et al in Palembang city, Indonesia showed that there were some differences in the size of the upper arm circumference in pregnant before and after supplementary feeding ($p=0.001$).¹²

CONCLUSION

It was found that the majority of pregnant's age was over 30 years and 9.2% of pregnant suffer from CED, the majority of second pregnancies, the experience of birthing was mostly second births. Macro nutrient intake and micronutrients are mostly less than 80.0% of the RD). The average intake of macro nutrients is 28.05%, while the average intake of micronutrients is 27.70%. Most graduated from high school, worked as housewives, consumed supplements, consumed additional food, and consumed Fe tablets and drank milk during pregnancy.

During pregnancy most of them are not suffering from diarrhea, upper respiratory tract infections (ARI), are not suffering from high blood pressure, and are not suffering from diabetes mellitus, and not getting complete immunization. Most of them are not poor and have knowledge about nutrition and good health and have high expenditure every month. Most of household sanitation

facilities use private toilets, both in waste management, good drinking water sources, and unhealthy house status. Based on Chi Square test there were no significant differences in CED for pregnant based on energy intake ($p=1.00$), protein intake ($p=1.00$), fat intake ($p=0.179$) and carbohydrate intake ($p=0.460$). There is a bit tendency that pregnant who suffer from CED are bigger in groups with less knowledge, do not work in formal and poor categories, and age groups between 20-30 years and upper secondary education groups. On the contrary, there was a tendency for normal pregnant to have a bigger intake in the good knowledge group, the age group between <20 and >30 years, and secondary education and not poor. There were no significant differences in CED for pregnant based on knowledge ($p=1.00$), age ($p=0.364$), work status ($p=0.216$) and education ($p=0.553$) and poor status ($p=0.672$). There is a bit tendency that pregnant who suffer from CED are bigger in the group that does not get additional food. However, there was no significant difference in CED of pregnant based on consuming additional food ($p=0.225$).

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