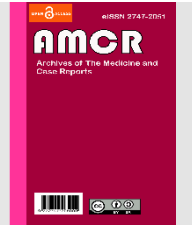




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The Relationship between Chronic Energy Deficiency in Pregnant Women and the Incidence of Low Birth Weight at the Senggo Health Center, Mappi Regency, Indonesia

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ABSTRACT

Globally, it is estimated that 15-20% of all births, or >20 million newborns each year, are low birth weight babies. Low and middle-income countries have a fairly high burden of LBW. The incidence of low birth weight in Papua is highest in the city of Jayapura. Namely, with a birth rate of 5,142 there are 169 incidents of LBW, while in Mappi city, with a birth rate of 2532, there are 80 incidents of low birth weight, and this is still quite high. This study is research descriptive analytics with a planned cross-sectional study. The population in this study is all patients with chronic energy deficiency at the Senggo Health Center were 61 respondents taken from January to February 2023 with a total sample of 53 obtained using simple random sampling. The results showed that there is a relationship between chronic lack of energy in pregnant women with the incidence of low birth weight at the Senggo Health Center with a value of $p=0.007 < \alpha=0.05$. So it can be concluded that pregnant women who experience chronic energy deficiency will be at risk of giving birth to babies with low birth weight.

1. Introduction

Low birth weight (LBW) is the term used if a baby is born with a weight below 2500 grams. Normal birth weight ranges from 2500-4000 grams. Globally, it is estimated that 15-20% of all births, or >20 million newborns each year, are low birth weight babies. Low and middle-income countries have a fairly high burden of LBW. More than 95% of the world's LBW babies are born in these countries. There are marked global and regional variations in LBW rates. An estimated 6% of babies are born with LBW in East Asia and the Pacific, 13% in Sub-Saharan Africa, and up to 28% in South Asia. In Indonesia, the incidence of low birth weight is

still high. Nine provinces with the highest incidence of LBW are Yogyakarta 7.6%, Central Sulawesi 6.9%, Gorontalo 5.9%, West Sulawesi 5.1%, Bangka Belitung 5.0%, NTT 4.9%, North Kalimantan 4.8%, North Maluku 4.8%, and Papua 4.7%. Meanwhile, the two provinces with the lowest LBW incidence were Jambi and Maluku, with an incidence rate of 1.3%. The highest incidence of low birth weight in Papua is in the city of Jayapura, namely, with a birth rate of 5,142, there are 169 LBW events, while in Mappi city, with a birth rate of 2532, there are 80 incidents of low birth weight, and this is still quite high. Data at the Senggo Health Center from 2019 there were 106



pregnant women who experienced chronic energy deficiency, with 3 of them giving birth to LBW babies, while in 2020, the incidence of CED increased to 118 and 10 who gave birth to LBW babies. In 2021 the incidence of CED will drop again to 90, and 6 will give birth to LBW people, the incidence of CED will increase again in 2022, namely 112 pregnant women and 7 people who gave birth to LBW babies. So that the incidence of LBW from 2019 to 2022, namely, there are 26 incidents of low birth weight.¹⁻⁵

LBW and premature birth are the main causes of infant mortality which accounts for 30% of child deaths during the first 28 days of life. Therefore, LBW is considered a major public health problem and a major cause of neonatal death with various adverse health-related effects. LBW is an important health indicator for the survival of babies born weighing less than 2500 gr. LBW children are at increased risk of illness and death because of their low birth weight during childhood. Individual and family factors are important variables in the prevalence of LBW. Nurses are responsible for providing socialization to mothers and fathers who will have and plan to have children. Cultural factors in the family and community where the mother lives also need further research. Several factors that cause LBW are a history of maternal anemia during pregnancy, antepartum bleeding, multiple pregnancies, preeclampsia Eclampsia, premature rupture of membranes, diseases during pregnancy, maternal age, parity, the interval between pregnancies, exposure to cigarette smoke, congenital defects, intrauterine infections, and chronic energy deficiency (CED).⁶⁻¹⁰

Chronic energy deficiency (CED) is a body condition characterized by low body weight and low energy stores, possibly limited physical capacity due to lack of food in the long term, with body mass index (BMI) less than 18.5 kg/m² for adults. Chronic energy deficiency is higher in rural women of childbearing age and is caused by eating too little or an unbalanced diet that lacks sufficient nutrients. The health and

nutritional status of pregnant women, during and before pregnancy, are considered to be strongly associated with pregnancy outcomes. Poor nutritional status and inadequate food intake in pregnancy not only affect women's health but also affect birth weight and infant development. Mother's nutritional status is closely related to the baby's birth weight. Deficiencies of energy, fatty acids, and micronutrients have all been implicated in causing LBW in infants. Other research states that mothers who have a history of giving birth to LBW babies are 5 times more at risk of giving birth to LBW babies again, while mothers who have experienced CED are 7 times more at risk to give birth to LBW babies. Fulfillment of nutrition for pregnant women is one of the main factors that determine the health of the mother and fetus. Lack of nutritional intake during pregnancy and an unfavorable lifestyle can harm the fetus, which is a higher risk of experiencing disorders, such as low birth weight, growth and development barriers, to birth defects.¹¹⁻¹⁵

2. Methods

This study is an analytic observational study with a cross-sectional approach. This study uses primary data obtained from subject studies. The subjects of this study were pregnant women in the Senggo Health Center, Mappi Regency, Indonesia. A total of 53 research subjects participated in this study. The research subjects had informed consent to participate in this study. This study made observations using questionnaires on the sociodemographic parameters of the study subjects, the history of nutritional status of pregnant women, and the baby's birth weight. Data analysis was carried out using SPSS software version 25. Univariate analysis in this study was to distribute the characteristics of the respondents, including age, occupation, education, history of the mother's nutritional status during pregnancy, and birth weight of the baby, while bivariate analysis was done by conducting a Chi-square test with a value of $\alpha=0.05$.



3. Results and Discussion

Table 1 shows that the average patient is in the age range of 31-40 years, namely 36 respondents (76.92%), while the least is in the age range of 41-50, namely 3 respondents (5.67%). Most of the respondents had only primary school education, namely 26 respondents (49.1%), and the least were in junior high school and senior high school, with the number of respondents each being 4 (7.5%). Most of

the respondents worked as housewives, with 41 respondents (77.4%), and the least were private companies, with 12 respondents (22.6%). It can also be seen that the majority of respondents have an income of <1 million, namely 41 respondents (77.4%). In addition, most of the respondents did not have a history of illness during pregnancy, namely 48 respondents (90.6%).

Table 1. Distribution of the characteristics of respondents.

Age	Frequency	Percentage
20-30 years	14	26.41
31-40 years	36	67.92
41-50 years	3	5.67
Education	Frequency	Percentage
No school	19	35.8
Primary school	26	49.2
Junior high school	4	7.5
Senior high school	4	7.5
Occupation	Frequency	Percentage
Housewife	41	77.4
Private	12	22.6
Income	Frequency	Percentage
< 1 million	41	77.4
≥ 1 million	14	22.6
History of disease during pregnancy	Frequency	Percentage
Yes	5	9.4
No	48	90.6
Total	53	100

Table 2. Distribution of data anthropometry mother and baby.

Characteristics	Average value
MUAC size	23.55 cm
Mother's weight	47.91 Kg
Mother's height	149.87 cm
BMI	21.41/kgBB
Baby's weight	2498.11 g
Baby's length	48.64 cm

In Table 2, it can be seen that most of the respondents at the Senggo Health Center have an average MUAC size of 23.55 cm, with the smallest size being 19.0 cm. whereas if seen from the average maternal weight own body weight is 47.91 kg, with heavy the lightest body is 36 kg. for height many the average mother has a height of 149.87 cm and the

shortest is 138 cm, so the average BMI is 21.41 kg/BB and the lowest BMI is 14.98 kg/BB. Data for baby weight, the average weight is 2,498.11 grams, and the lowest has a weight of 1,200 grams. While the average baby's body length is 48.64 cm, and the shortest is 46 cm. The number of respondents was 53. Most of the pregnant women did not experience chronic energy



deficiency, namely 39 respondents (73.6%). The number of respondents was 53, and most of the babies

born had normal weight, namely 36 respondents (67.9%).

Table 3. Distribution based on the incidence of CED at the Senggo Health Center, Mappi Regency.

Incidence of CED	n	Percentage (%)
CED pregnant women	14	26.4
Pregnant women are not CED	39	73.6
Total	53	100

Table 4. Distribution of respondents based on the incidence of LBW.

Birth weight	n	Percentage (%)
LBW	17	32.1
Normal weight	36	67.9
Total	53	100

Table 5. The relationship between chronic energy deficiency in pregnant women and the incidence of low birth weight at the Senggo Health Center.

Variable	Low birth weight						P-value*
	Low birth weight		Normal weight		Total		
	n	%	n	%	n	%	
CED	9	17	5	9,4	14	26,4	0,007
Not CED	8	15,1	31	58,5	39	73,6	
Total	17	32,1	36	67,9	53	100	

*Chi-square test, $p < 0,05$.

Table 5 shows that of the 14 pregnant women who experienced CED, 9 gave birth to LBW babies, and 5 others gave birth to babies with normal weight. Then of the 39 pregnant women who did not experience CED, 31 of them had normal weight, and 8 others were born with LBW. The results showed that the value of $p = 0.007 < \alpha = 0.05$, which means that there is a relationship between chronic energy deficiency in pregnant women and the incidence of low birth weight in infants at Senggo Health Center. The results of this study are in line with other studies, which state that there is a significant relationship between chronic energy deficiency (CED) in pregnant women and the incidence of low birth weight babies (LBW). Other research states that pregnant women who experience chronic energy deficiency have a higher risk of giving birth to babies with low birth weight compared to mothers who do not experience CED.

Chronic energy deficiency (CED) is a body condition characterized by low body weight and low energy stores, possibly limited physical capacity due to lack of food in the long term, with body mass index (BMI) less than 18.5 kg/m^2 for adults. In pregnant women, the need for nutrients needed for the body's metabolism in both the mother and the fetus in the womb will increase. So that during pregnancy, the intake of necessary nutrients will also increase, for the growth and development of the fetus will cause an increase in the size of the uterine organs, changes in body composition, and metabolism in the mother and fetus. Pregnant women who experience nutritional deficiencies and poor nutritional status will have a great opportunity to give birth to babies with low birth weight (LBW).¹⁶⁻²⁰

Pregnant women who experience chronic energy deficiency will experience poor nutritional status. This



can cause an imbalance of energy in and out of the body. In other studies, it was stated that chronic energy deficiency is determined by the incidence of low birth weight in pregnant women with a 3.333 times greater risk of giving birth to babies with low birth weight than pregnant women who have good nutritional status.²¹⁻²⁴ The magnitude of this risk is due to the chronic lack of energy experienced by pregnant women caused by low intake of macronutrients, where these nutrients play a very important role in the growth and development of the fetus as a result of disturbances in the process of transferring maternal nutrients to the fetus. Lack of nutritional intake in pregnant women results in minimal nutrients that can be distributed to the fetus through the placenta, including the size of the placenta, which tends to be smaller in women who experience chronic energy deficiency than in mothers who have good nutrition. Lack of nutritional counseling during pregnancy, lack of iron/folic acid supplementation during pregnancy, not consuming snacks during pregnancy, maternal malnutrition, maternal anemia, and inadequate minimum dietary diversity score of women (MDDS-W) independently related to LBW. Mothers who were counseled about feeding practices during pregnancy were 88% less likely to give birth to LBW babies than those who were not counseled. increasing food intake during pregnancy effectively reduces the risk of giving birth to LBW babies.²⁵⁻²⁸

4. Conclusion

There is a relationship between chronic energy deficiency in pregnant women and the incidence of low birth weight at Senggo Health Center, Mappi Regency, Indonesia.

5. References

1. Abbas F, Kumar R, Mahmood T, Somrongthong R. Impact of children born with low birth weight on stunting and wasting in Sindh province of Pakistan: a propensity score matching approach. *Scientific Reports*. 2021; 11: 1–10.
2. BPS Papua Province. Number of babies born, low birth weight babies (LBW), and less nutritious by District/City in Papua Province (inhabitants). 2017.
3. Cutland CL, Lackritz EM, Mallett-moore T, Bardaji A, Chandrasekaran R, Lahariya C, et al. Low birth weight: Case definition & guidelines for data collection, analysis, and presentation of maternal immunization safety data. *Vaccine*. 2017; 35(48): 6492–500.
4. Desiman NV, Syamruth YK, Riwu RR. The incidence of chronic energy deficiency (CED) in pregnant women at Borong Health Center. *Timorese Journal of Public Health*. 2022; 4(1): 1–12.
5. Ekowati D, Ani LS, Windiani IGAT. High parity and chronic energy deficiency increase risk for low birth weight in Situbondo District. *Public Health and Preventive Medicine Archive*. 2017; 5(1): 1–6.
6. Fathonah S. Nutrition and health for pregnant women. Jakarta: Erlangga. 2016.
7. Girma S, Fikadu T, Agdew E, Haftu D, Gedamu G, Dewana Z. Factors associated with low birthweight among newborns delivered at public health facilities of Nekemte town, West Ethiopia : A case control study. *BMC Pregnancy and Childbirth*. 2019; 1–6.
8. Hardiati RH, Thasliyah D. Chronic energy deficiency (CED) as a risk factor for low birth weight infants: A Literature review. *Medika: Jurnal Ilmiah Kesehatan*. 2022; 2: 6–11.
9. Hidayat AAA. Nursing and health research methodology. (T. Utami, Ed.). Jakarta: Salemba Medika. 2018.
10. Ministry of Health of the Republic of Indonesia. (2019). *Riskesdas National Report 2018*. Jakarta.



11. Maryunani A. Care for babies with low birth weight (LBW). East Jakarta: Trans Info Media. 2015.
12. Muharrina CR, Susanti I, Zulaikha, Yolanda. Analysis of childbirth history of low birth weight (LBW) and the incidence of chronic energy deficiency (CED) in the working area of the Darussalam Health Center, Aceh Besar Regency, in 2022. *Jurnal Ilmiah Bidan*. 2022; 6(4): 6–10.
13. Notoatmodjo S. Health research methodology. Jakarta: Rineka Cipta. 2018.
14. Nursalam. Nursing research methodology (4th ed.). Jakarta: Salemba Medika. 2016.
15. Pantiawati I. Infants with low birth weight (First). Yogyakarta: Nuha Medika. 2010.
16. Paramashanti BA. Nutrition for Mother and Child. Pustaka Baru. 2020.
17. Prihatini S, Lindayani, Surati. The relationship of chronic lack of energy in pregnant women in the first quarter with the incidence of low birth weight babies. *Jurnal Ilmiah Kebidanan*. 2020; 9(2): 148–54.
18. Proverawati A, Sulistyorini CI. Low birth weight (LBW). Yogyakarta: Nuha Medika. 2013.
19. Rukiyah AY, Yulianti L. Neonatal care for infants and children under five. DKI Jakarta: Trans Info Media. 2017.
20. Rusependhi U, Utari DM. Analysis of the status of CED pregnant women towards the incidence of low body weight (LBW) in Puskesmas Manggari Kuningan District. *Jurnal Teknologi dan Seni Kesehatan*. 2020; 11(1): 65–76.
21. Safitri D, Yunola, SH, Farida T. The relationship of parity, anemia and lack of energy. *Jurnal Kesehatan dan Pembangunan*. 2019; 13(25): 15–21.
22. Setiawan D, Prasetyo H. Health research methodology for health students. Yogyakarta: Graha Ilmu. 2015.
23. Sharma M, Mishra S. Effects of maternal health and nutrition on birth weight of infant. *International Journal of Science and Research*. 2018; 3(6).
24. Sukaeni I, Margareth. Pregnancy, Childbirth, and Puerperium. Yogyakarta: Nuha Medika. 2013.
25. Sumiati, Suindri NN, Mauliku J. The association of chronic lack of energy in pregnant women with low birth weight babies. *Infokes: Info Kesehatan*. 2021; 11(2): 360–6.
26. Utami S, Susilaningrum R. Analysis of the causes of low birth weight infants in terms of nutritional status and maternal health history. *Jurnal Ners*. 2022; 17(2): 131–7.
27. Winarsih. Introduction to nutrition science in midwifery. Yogyakarta: Pustaka Baru. 2018
28. Wubie A, Seid O, Eshetie S, Id SD, Member Y. Determinants of chronic energy deficiency among non-pregnant and non-lactating women of reproductive age in rural Kebeles of Dera District, North West Ethiopia, 2019: Unmatched Case Control Study. *PLoS ONE*. 2020; 15(1): 1–12.

