

# Chronic Energy Malnutrition and Anemia in Pregnant Women in Medan

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**Abstract --** Chronic energy malnutrition (CEM) and anemia in pregnancy may affect the weight of babies born will have an impact on the quality of human resources. Anemia in pregnant women potentially endanger the mother and child and to this day it happened is still high in Indonesia, because that CEM and anemia require serious attention of all parties involved in health care. This study aims to determine the magnitude of the problem of anemia and chronic energy malnutrition (CEM) in pregnant women and analyze the relationship between CEM with the incidence of anemia in pregnant women in Medan. This study included a survey explanatory research with cross sectional design, conducted in four working area of community health centers in Medan (Belawan, Pekan Labuhan, Medan Deli and Terjun) on 114 pregnant women. CEM is determined by measuring the Upper Arm Circumference (MUAC). Blood hemoglobin concentration was measured by a "Hemoglobin Testing System: Quik-Check", plus the characteristic data of pregnant women (age, gestational age, pregnancy spacing, and parity) was obtained by questionnaire interviews. The results showed that of 114 pregnant women with 14,0 % was aged <20 years, 42.1% in the 2nd trimester of gestation and 47.4% trimester 3. 52.6% of pregnant women with pregnancy spacing <24 months and 27 2% parity  $\geq 3$ . Chronic energy malnutrition (CEM) in pregnant women was 23.7% and 44.7% anemia. Chi square analysis results obtained significant relationship between CEM with anemia in pregnant women with OR of 4.082 95% CI 1.604 to 10.387. This shows that pregnant women who are at risk of anemia CEM four times greater compared with pregnant women who are not CEM. There was a significant correlation between anemia and CEM, and CEM was a risk factor for anemia in pregnant women in Medan. Thus one of the efforts that need to be done in the context of prevention of anemia of pregnant women in Medan is to reduce the incidence of CEM. Improvements nutrition not only during pregnancy but before the mother into their pregnancy, so that mothers begin pregnancy at a good nutritional condition.

**Keywords—** Chronic Energy Malnutrition (CEM), anemia, pregnant women.

## I. INTRODUCTION

Iron deficiency anemia is the most prevalent type of nutritional problems in the world which has afflicted about 2 billions of people. However, the extent to which it is required depends on age, sex and

physiological status. For example pregnant women require higher amounts of iron due to an increased blood volume and the growth of the fetus, placenta and other body tissues [1]. In Indonesia, anemia in pregnancy is a national problem because it reflects the value of socio-economic welfare of society, and has had enormous influence on the quality of human resources. Anemia in pregnant women called "potential danger to mother and child" (the potential harm to the mother and child), because that's anemia requires serious attention from all parties involved in health care [2].

The high maternal anemia affecting negatively impact on the fetus, childbirth and the postpartum and babies born with low birth weight (LBW), preterm parturition, abortion, postpartum hemorrhage, obstructed labor. This is related to many factors, among others, age, parity, education, employment, and knowledge [3].

Insufficient or inadequate food intake be it from lack of quantity or lack of essential nutrients including protein and specific micronutrients remains a blight across the developing world. Under-nutrition can have effects throughout the life cycle. Physical stunting (defined by the WHO as low height-for-age) can affect cognitive development, increase susceptibility to infection, and impair school attainment and future productivity of survivors as well as of later generations [4].

Besides the problem of anemia, chronic energy malnutrition (CEM) is also a problem that is common in women of childbearing age, pregnant women including. Data basic health research in Indonesia in 2013 showed that the number CEM 24.2 percent in pregnant women [5]. When mothers lack

of energy and protein intake usually mothers also lack other nutrients including vitamins and minerals, so that mothers are also at risk of micronutrient deficiencies, including iron and folic acid which allows mothers are anemic. North Sumatra Province Health Office report in 2014 the incidence of anemia among pregnant women in North Sumatra 28.7%, which is caused by pregnant women are insufficient intake of iron include iron tablets [6].

Based on those background, this study aims to describe the prevalence of anemia and to analyze the relationship between chronic energy malnutrition with the incidence of anemia among the pregnant women in Medan city.

**II. METHODS**

This is the explanatory research by cross-sectional design. The research conduct in Medan, community health center named Puskesmas Belawan (Medan Belawan Subdistrict), Puskesmas Terjun (Medan Marelan Subdistrict), Puskesmas Pekan Labuhan (Medan Labuhan Subdistrict), Puskesmas Medan Deli (Medan Deli Subdistrict).

The population in this study were all pregnant women in the work area of those community health center. Sampling by the formula to research an analytical survey of the population of categorical data [7].

$$n = \frac{\{z_{1-\alpha} \sqrt{P_0(1-P_0)} + Z_{1-\beta} \sqrt{Pa(1-Pa)}\}^2}{(P_a - P_0)^2}$$

- $\alpha = 5\%$ ,  $z = 1,96$
- $\beta = 10\%$ ,  $z = 1,282$
- $P_0 =$  estimate the proportion of anemia  $= 0,5$
- $Pa - P_0 = 15\%$
- $n = 114$

In this study, 114 pregnant women were taken in four working areas of community health centers in Medan. Sampling techniques is the accidental sampling when the pregnant women came to visit the health centers in their respective working area health centers.

Data on maternal characteristics (age, gestational age, pregnancy spacing, and parity) obtained by interview using a questionnaire. Hb levels measured

using Hb "Quik-Check" and the incidence of chronic energy malnutrition (CEM) measured by circumference of the upper arm. Analysis of the relationship of chronic energy malnutrition with anemia done with chi square test.

**III. RESULT and DISCUSSION**

Table 1 it can be seen the characteristics of pregnant women which showed that 86.0% of pregnant women were 20-35 years of age, gestational age at most on the trimester III, pregnancy spacing as much as 52.6% < 24 months, and 72.8% less than 3 parity.

TABLE I  
THE FREQUENCY DISTRIBUTION PREGNANT WOMEN CHARACTERISTICS (AGE, GESTATIONAL AGE, SPACING PREGNANCIES AND PARITY)

Characteristic	n	%
Age		
< 20 years	16	14,0
20 – 35 years	98	86,0
Total	114	100,0
Gestation age		
- Trimester 1	12	10,5
- Trimester 2	48	42,1
- Trimester 3	54	47,4
Total	114	100,0
Spacing pragnencies		
- < 24 mount	60	52,6
- >=24 mount	74	47,4
Total	114	100,0
Parity		
- >=3	31	27,2
- <3	83	72,8
Total	114	100,0

Table 2 shows 27 people (23,7%) pregnant women suffer from chronic energy malnutrition (KEK). This figure is slightly below the average chronic energy malnutrition in pregnant women in Indonesia that is 24,2% and above the number of chronic energy malnutrition in women of childbearing age that is 20,8% [8].

TABLE II  
FREQUENCY DISTRIBUTION OF CHRONIC ENERGY MALNUTRITION (CEM) IN PREGNANCY

Incidence	n	%
CEM	27	23,7
Normal	87	76,3
Total	114	100,0

The incidence of anemia was measured based on levels of Hemoglobin (Hb) of pregnant women, with the criteria of the levels of Hb is less than 11 mg/dl [8]. The results of the examination of Hb levels found that pregnant women who experience anemia as much as 51 people (44.7%) which can be seen in Table 3. Numbers of anemic pregnant women in the study was far above the average of women's anemia in Indonesia based on the results of the Riskesdas (2013) that is 24%. While St. Fatima, et al's research result in South Sulawesi Maros found the incidence of anemia in pregnant women as much as 41% [9].

TABLE III  
FREQUENCY DISTRIBUTION OF ANEMIA INCIDENCE IN PREGNANT WOMEN

Incidence	N	%
Anemia	51	44,7

TABLE IV  
RELATIONSHIP OF CHRONIC ENERGY MALNUTRITION (CEM) AND ANEMIA IN PREGNANT WOMEN

CEM incidence	Anemia		Normal		Total		P	OR	CI
	n	%	n	%	n	%			
Yes	19	70,4	8	29,6	27	100,0	0,002	4,08	1,604-10,387
No/Normal	32	36,8	55	63,2	87	100,0			

Pregnant women who experience CEM describe the condition of very low dietary energy and protein especially, so the availability of nutrients in the body including a decrease in fat reserves.

When the mother suffered a lack of energy and proteins, usually the mothers experienced the lack of other nutritional intake too including vitamins and minerals, it means those at-risk mothers experience lack of a variety of micro nutrients including iron and folic acid, that allows the mother become anemia. The results of this study in accordance with research of St. Fatima, et al. that shows that the levels of hemoglobin of pregnant women was associated with significant maternal nutritional status (LILA), consumption of iron tablets and meal consumption patterns on expectant mothers in South Sulawesi Maros [9].

Atiek Zahruliansyah [10] in a review article about anemia and eating habits of pregnant women in Indonesia said that the incidence of anaemia in pregnant women is closely related to economic and cultural factors. The cultural factors such as the presence of food abstinence for pregnant mothers, and fathers in the family always gets the priority of

Normal	63	55,3
Total	114	100,0

A. *Relationship of Chronic Energy Malnutrition and Anemia in Pregnant Women*

Relationship between chronic energy malnutrition and anemia was analyzed statistically by chi square test. The relation result can be seen in Table 4. It shows 70.4% mothers who experience chronic energy malnutrition (CEM) is anemic. Chi square analysis results indicated that CEM has a significant relationship with the incidence of anemia in pregnant women (OR = 4.082). It means the risk of pregnant women who experience CEM is 4 times greater to be anemia compared to mothers who are not CEM or normal.

the food, so it was common to mothers experiencing nutritional deficiencies. The other factors that also play a role is the knowledge of mothers and families about the importance of nutrition and foods that are good for women of fertile age, moreover for pregnant women.

Thus, one kind of effort to improve the nutritional status of the mother is through increased knowledge of nutrition and health. Improvement of knowledge is expected to improve the attitude and actions of the mother in food consumption so with the good eating pattern the mother will avoid anemia.

IV. CONCLUSION

Chronic energy malnutrition is related significantly and become a risk factor of anemia in pregnant women. Risk of pregnant women with chronic energy malnutrition is 4 times higher than pregnant women without chronic energy malnutrition. Based on the results of this study, to reduce the numbers of anemia in pregnant women especially in Medan, the nutritional intake of pregnant women can be improved, even should be

noted before the pregnancy so the mothers who start pregnancy are on the adequacy of good nutrition.

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