Overview of Nutrition Intake for Pregnant Women with CED and High Risk in The Waru Health Center Area, Sidoarjo District

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Abstract. In 2022, pregnant women with chronic energy deficiency (CED) had a prevalence of 1.2%, up from 0.8% in 2021. This increase suggests a rise in CED among pregnant women in the Puskesmas Waru area. The research aimed to assess the macro and micronutrient intake and high-risk factors for pregnant women with CED in the same area, using a descriptive approach. The study included a sample of 19 pregnant women with CED and high risk. Data were collected through interviews, questionnaires, and anthropometric measurements, then analyzed using descriptive statistics. Results indicated that pregnant women had a mild deficit in energy intake (36.8%), a severe deficit in protein intake (42.1%), a severe deficit in carbohydrate intake (78.9%), sufficient iron intake (89.5%), sufficient folate intake (84.2%), and insufficient calcium intake (89.5%). In conclusion, pregnant women showed deficits in energy, protein, and carbohydrate intake, while having sufficient iron and folate intake, and insufficient calcium intake. Recommendations include meeting dietary intake requirements and diversifying food consumption.

Keywords: Pregnant Woman With CED, High Risk Pregnancy, Nutrient Intake.

1 Background

Achieving progress in the development of qualified, smart, healthy and useful human resources is one of the main challenges for the country's development. Based on the 2020-2024 National Medium-Term Development Plan, it is estimated that the prevalence of Chronic Energy Deficiency (CED) will decrease to 10%. However, the results of the 2018 Riskesdas illustrate that the percentage of CED in pregnant women in the East Java Region reaches 19.6%, while in women of childbearing age it is 13.9%, so that comprehensive and integrated treatment is needed to deal with the problem of malnutrition in pregnant women[1–3].

Essential public health initiatives encompass various areas such as health promotion, environmental health, maternal and child health, family planning, nutrition services,

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and the prevention and control of diseases, including treatment. Among these six crucial public health efforts, one area that demands attention is the prevention and control of diseases. Chronic Energy Deficiency (CED) is characterized by a prolonged insufficiency of energy intake and is one of the concerns within this context[4].

Anthropometric measurements, especially the upper arm circumference on the arm which is rarely used for physical activity can be used as a parameter to identify the threat of CED and nutritional status in women of reproductive age. The threshold used in Indonesia is the standard value of an average upper arm circumference of less than 23.5 cm, which indicates a threat of CED in the group of women of reproductive age. The causes associated with CED in pregnant women are nutritional intake, economic status and spacing of pregnancies. Based on the research conducted, it is explained that family income and age are related to CED events in pregnant women. Infectious diseases, antenatal care. As well as accessibility to health services, anemia, and the trimester period is also an influence on the occurrence of CED in pregnant women [5–8].

The impact of CED on the mother is severe nausea (hyperemesis gravidarum) which can cause nutritional deficiencies in the unborn fetus. If this condition continues, the growth and development of the baby in the womb can be disrupted, so that the baby is at risk of being born prematurely and or with low birth weight, and finally the consequences of experiencing stunting. In addition, preeclampsia, vaginal bleeding, hypertension, gestational diabetes, premature rupture of membranes, and miscarriage are at risk for pregnant women who experience CED[9, 10].

Integrated pregnancy care (Antenatal Care/ANC) must be carried out at least 4 times during pregnancy, namely once in the first trimester, once in the second trimester, and twice in the third trimester. Upon arrival for an examination in the first trimester, the doctor will immediately look for risk factors for pregnancy, including medical history, for early detection. If a pregnant woman is found to have chronic energy deficiency (upper arm circumference < 23.5 cm), the doctor will look for the cause and provide appropriate treatment according to the condition of the pregnant woman, such as providing additional food containing high animal protein and providing counseling about consumption nutritious food high in animal protein during pregnancy and lactation[11–13].

Minister of Health Regulation No. 51 of 2016 concerning Product Requirements for Nutritional Supplements explains that Additional Foods are in the form of biscuits which contain unsaturated fatty acids, protein, carbohydrates, and are fortified with eleven kinds of vitamins and seven kinds of minerals. In addition, administration of supplemental blood supplement (at least 90 pills when pregnancy began in the 1990s)[14].

Based on initial research by researchers using data from nutrition officers at the Waru Health Center's operational area, there were 2575 pregnant women in 2022, with 31 experiencing CED (1.2%). In 2021, data showed 2589 pregnant women, with 21 experiencing CED (0.8%). This suggests an increased prevalence of pregnant women with CED in the Waru Health Center's operational area, Sidoarjo Regency. Consequently, researchers are interested in studying the macro and micro nutrient consumption of pregnant women with CED and high risks in this region.

2 Method

This research is structured with descriptive research type. This survey was conducted from October 2022 to June 2023, starting from proposal preparation to report preparation. This research was conducted in the task area of the Waru Health Center, Sidoarjo Regency with a population of 129 CED and high-risk pregnant women. After calculating the sample, 19 people (respondents) were obtained using a quota sampling technique. In this study the method used was in the form of interviews with the help of questionnaires and anthropometric measurements of pregnant women. Then performed univariate data analysis using frequency distribution tables.

3 Result

Based on table 1, it shows that the predominance of pregnant women aged between 20 to 35 years is 15 people (78.9%), the third trimester of pregnancy is 15 people (78.9%), the dominant high school graduate education level is 10 people (52.6%), the dominant The activities of pregnant women were 14 people (73.7%) as housewives, 10 people (52.6%) experienced second pregnancies, 12 people (63.2%) had a dominant spacing of >2 years, Respondents according to Hb levels ≥11 mg/dL or not anemia were 14 people (73.7%), and respondents who did not have enough weight gain during pregnancy were 15 people (78.9%).

Table 1. Frequency Distribution of Respondent's Characteristics

Responden's Characteristics	Amount	
	n	%
Age		
< 20 Years	0	0
20-35 Years	15	78.9
> 35 Years	4	21.1
Total	**19**	**100**
Age of Pregnancy		
1st Trimester	0	0
2nd Trimester	4	21.1
3rd Trimester	15	78.9
Total	**19**	**100**
Respondent's Education		
Graduate from middle school	4	21.1
Graduate from high school	10	52.6
Bachelor's degree	5	26.3
Total	**19**	**100**
Respondent's Work		
Housewife	14	73.7
Merchants	2	10.5

Responden's Characteristics	Amount	
	n	%
Factory Workers	1	5.3
Other	2	10.5
Total	**19**	**100**
Parity Statue		
Primigravida	4	21.1
Secundigravida	10	52.6
Multipara (2-3 Childs)	2	10.5
Grandemultipara (>4 childs)	3	15.8
Total	**19**	**100**
Pregnancy Spacing		
<2 Years	3	15.8
>2 Years	12	63.1
First Pregnancy	4	21.1
Total	**19**	**100**
Anaemia Status		
Anaemia	5	26.3
Not Anaemia	14	73.7
Total	**19**	**100**
Weight Gain		
Insufficient	15	78.94
Sufficient	2	10.53
Over	2	10.53
Total	**19**	**100**

Referring to Table 2, the preponderance of pregnant women with a moderate level of energy intake category was 7 people (36.8%), the dominant pregnant women with a severe level of protein intake category were 8 people (42.1%), the preponderance of pregnant women 15 people (78.9%) were pregnant with a category of carbohydrate intake with a deficit level of weight.

Table 2. Frequency Distribution of Macro-Nutrition Consumption Levels

Consumption Level of Macronutrients	Amount	
	n	%
Energy Intake		
Severe Deficit	5	26.3
Moderate Deficit	7	36.8
Mild Deficit	4	21.1
Normal	2	10.5

Consumption Level of Macronutrients	Amount	
	n	%
Excess	1	5.3
Total	**19**	**100**
Protein Intake		
Severe Deficit	8	42.1
Moderate Deficit	3	15.8
Mild Deficit	2	10.5
Normal	5	26.3
Excess	1	5.3
Total	**19**	**100**
Carbohydrate Intake		
Severe Deficit	15	78.9
Moderate Deficit	1	5.3
Mild Deficit	1	5.3
Normal	2	10.5
Excess	0	0
Total	**19**	**100**

Referring to Table 3, the preponderance of pregnant women with less calcium intake category was 17 people (89.5%), the dominant pregnant women experienced sufficient Fe intake category as many as 17 people (89.5%), the dominant pregnant women experienced acid intake category folate as many as 16 people (84.2%) with sufficient category

Table 3. Frequency Distribution of Micro-Nutrition Consumption Levels

Consumption Level of Micronutrients	Amount	
	n	%
Calsium Intake		
Insufficient	17	89.5
Sufficient	2	10.5
Total	**19**	**100**
Fe Intake		
Insufficient	2	10.5
Sufficient	17	89.5
Total	**19**	**100**
Folate Intake		
Insufficient	3	15.8
Sufficient	16	84.2

Consumption Level of Micronutrients	Amount	
	n	%
Total	**19**	**100**

4 Discussion

4.1 Macronutrient Intake

Energy Intake. Regarding Table 2 concerning the energy intake of respondents, it can be observed that the dominant group of pregnant mothers falls into the category of moderate energy intake deficit, with 7 individuals (36,8%). The respondents experiencing average energy intake deficits are primarily due to physiological factors such as poor appetite and reduced food consumption during pregnancy. Furthermore, respondents with poor dietary patterns were identified, including those who eat only 1-2 times a day with portions below recommendations, those who have limited food variety due to cultural beliefs, some pregnant mothers who rarely consume vegetables and fruits in a day, and economic factors that hinder adequate household food supply. Energy intake during pregnancy aims to fulfill the metabolic needs of mothers in fetal development, leading to an increased requirement for maternal nourishment during the pregnancy period[15]. From the stated objectives, pregnant mothers should ensure proper energy intake during pregnancy. Based on the conducted research, it was found that pregnant mothers experiencing insufficient energy requirements have a risk of experiencing Chronic Energy Deficiency (CED) of 26,7%[16].

Protein Intake. Based on Table 2 concerning protein intake, the dominant group of respondents exhibits a severe deficit in protein intake, with 8 individuals (42.1). Respondents experiencing average protein intake deficits are primarily due to poor appetite or even reduced food consumption during pregnancy. Additionally, there were respondents who restricted their protein intake, particularly animal protein, due to cultural beliefs, resulting in limited variety in animal protein sources. Furthermore, physiological factors such as nausea and vomiting when consuming animal products and prenatal milk were also identified. As a result, most pregnant mothers only consume a mix of animal and plant-based proteins 2-3 times a day, with small portions. The development and growth of the embryo, uterus, placenta, breasts, and the increase in maternal blood volume are influenced by protein intake. Therefore, continuous protein deficiency in pregnant mothers can lead to metabolic disturbances within the body. Pregnant women with insufficient protein intake will have negative effects on themselves and the unborn baby, as protein serves as a building material for body structures and tissues. It also plays a crucial role in future childbirth processes. Pregnant women need to meet their protein requirements, considering that the need for protein for the health of both the mother and the baby increases. Protein's essential role in forming and maintaining cells and body tissues cannot be substituted by other nutrients[17].

Carbohydrate Intake. Based on Table 2 regarding carbohydrate intake, it is evident that the dominant group of respondents falls into the category of severe deficit in carbohydrate intake, with 15 individuals (78,9%). Respondents experiencing average carbohydrate intake deficits are primarily due to physiological factors, such as poor appetite or reduced food consumption during pregnancy. Additionally, there were respondents with inadequate dietary patterns, consuming only 1-2 meals per day with servings of rice or substitutes like bread, tubers, and others, typically amounting to 1 scoop or piece. Carbohydrates play a crucial role in metabolism and serve as the primary energy source for humans. If not promptly addressed, CED can significantly lower the quality of human resources, which in turn may contribute to physical growth disturbances, mental development and intelligence impairments, lower productivity, and an increased risk of maternal mortality, morbidity, and low birth weight[18, 19].

4.2 Micronutrient Intake

Calsium Intake. Based on Table 3 regarding calcium intake, it is evident that the dominant group of respondents falls into the category of insufficient calcium intake, with 17 individuals (89.5%), while 2 individuals (10.5%) have adequate calcium intake. Calcium deficiency is largely due to the fact that most respondents do not meet their protein intake requirements adequately. They rarely consume animal protein sources, especially marine fish which are rich in calcium. Additionally, local healthcare providers advise pregnant mothers to consume pregnancy-specific milk, but only a few actually follow this recommendation. In terms of food selection, it is observed that the majority of pregnant mothers seldom consume calcium-rich green vegetables Economic factors also play a role in the limited availability of household food supplies. Sufficient calcium intake can help reduce the risk of hypertension during pregnancy. This aligns with research findings, which show that only 33.3% of mothers consume an adequate amount of calcium[20].

Iron Intake. Based on Table 3 regarding iron intake, it is evident that the dominan group of pregnant mothers falls into the category of sufficient iron consumption, with 17 individuals (89.5%), while 2 individuals (10.5%) have insufficient iron intake. This situation can be attributed to the majority of pregnant mothers adhering to the vitamins provided by healthcare providers (such as Laduni), while only a few do not comply. Additionally, some respondents consume supplementary vitamins with high iron content, such as Bionce and Blackmores pregnancy supplements. According to health regulations in 2019, it is recommended to increase iron intake by 9 milligrams during the second trimester and an additional 9 milligrams during the third trimester of pregnancy. The administration of iron supplements to pregnant women can be an effective approach to address iron-deficiency anemia and also serves as a special measure to rapidly reduce the prevalence of stunting. This is due to the increased iron requirement during pregnancy, as the growth of the embryo, placenta, and the prevention of bleeding during childbirth necessitate additional iron. Pregnant women who experience anemia during pregnancy are at a 9 times higher risk of giving birth to a baby with Low Birth Weight (LBW) compared to women who are pregnant and not experiencing anemia[21–23].

Folate Intake. Based on Table 3 regarding folate intake, it is evident that the dominant group of respondents falls into the category of sufficient folate intake, with 16 individuals (84.2%), while 3 individuals (15.8%) have insufficient intake. This is due to the fact that during the study, respondents were found to consume more plant-based dishes and other legumes compared to animal-based dishes. Additionally, some respondents also reported consuming pregnancy-specific milk. Folate indeed plays important roles in various physiological processes during pregnancy. It is responsible for the production of red blood cells, supports the synthesis of embryonic DNA, and contributes to the growth of the placenta. Folate's involvement in these processes is crucial for the overall health and development of both the mother and the developing fetus. Prematurity, anemia, birth defects, LBW and embryo growth retardation are risk factors for folic acid deficiency during pregnancy[24].

5 Conclusion

The conclusion of this study indicates that the majority of pregnant women have insufficient intake of energy, protein, and carbohydrates. On the positive side, most pregnant women's intake of iron and folic acid is adequate, but their calcium intake is often inadequate. To address chronic energy deficiency in pregnant women and combat stunting, one effective and simple approach is to ensure that pregnant women have a diverse and sufficient dietary intake. This can significantly contribute to improving their nutritional status and overall health [25].

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