Description of Energy, Protein, Iron and Folic Acid Intake in Pregnant Women Protein Energy Malnutrition at Sobo Health Center Banyuwangi City

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ABSTRACT
Protein Energy Malnutrition (PEM) is one of the prevailing nutritional issues in Indonesia. Dietary intake is a crucial factor related to malnutrition in pregnant women, with the common impact being Low Birth Weight (LBW) of babies. This research examines the intake of energy, protein, iron, and folate among pregnant women with PEM in the working area of Sobo Health Center, Banyuwangi City. The study is descriptive in nature and involves 15 pregnant women with PEM from the Sobo Health Center area as respondents. Data collection involved filling out personal sheets, measuring upper arm circumference using a LiLA tape, and conducting 2x24-hour food recall interviews. Descriptive analysis was performed using frequency distribution tables generated by the SPSS program. The research findings indicate that among pregnant women with severe energy deficiency PEM, all 15 individuals (100%) had severe energy deficit, 7 individuals (46.7%) had severe protein deficit, and all 15 individuals (100%) had insufficient dietary intake to meet their nutritional needs during pregnancy.

INTRODUCTION

In developing countries such as Indonesia, nutrition is a significant public health problem.¹ Indonesia has high nutritional problems, including Chronic Energy Deficiency. Chronic Energy Deficiency health problems experienced by pregnant women are most likely characterized by long-lasting or chronic energy deficiency and are usually accompanied by other comorbidities.² The measurement used to determine the state of Chronic Energy Deficiency is the Upper Arm Circumference with a measurement limit of <23.5 cm or in the red part.³ Low Birth Weight is the impact caused by the incidence of Chronic Energy Deficiency which is below 2500 grams.⁴

High maternal mortality is a phenomenon of malnutrition during pregnancy or chronic energy deficiency. Judging from Indonesia's own health profile, the maternal mortality rate is 305 maternal deaths per 100,000 live births.⁵ Lack of nutritional intake in pregnant women with nutritional status Chronic Energy Deficiency can result in pregnancy and childbirth disorders.⁶ The disorder arises as a result of the mother's low nutritional condition, impacting the mother's health condition and fetal birth.⁷ Health services are offered by the government to reduce maternal mortality. The procedure itself is performed during the first, second, and third trimesters according to age groups.⁸ Pregnant women are required to participate in health services with a minimum frequency of once for each trimester of pregnancy.⁹
The World Health Organization reports that the prevalence of Chronic Energy Deficiency in pregnancy is 73% worldwide, with the third trimester of pregnancy having a much higher incidence than the first and second trimesters. This information was provided by the Indonesian Ministry of Health in 2018. According to the World Health Organization, anemia and Chronic Energy Deficiency are directly linked to over 35% of maternal deaths in underdeveloped countries, with Chronic Energy Deficiency mothers having the largest incidence of these cases.10

Pregnant women in Indonesia experienced an increase in Chronic Energy Deficiency in 2018, from 14.8% in 2017 to 17.3% in 2018, according to statistics from Basic Health Research 2018. Of course, this figure is further from the target set by the Indonesian government, which is 12.2%.11 Meanwhile, the angaka for pregnant women with Chronic Energy Deficiency in East Java is 19.59% and in Banyuwangi 5%.10

From the preliminary study data conducted, data provided by nutrition officers in the Sobo Health Center Working Area of Banyuwangi City, in 2022-2023 data were obtained on 702 pregnant women and 50 of them experienced Chronic Energy Deficiency (7.12%). While the prevalence of Chronic Energy Deficiency pregnant women in Banyuwangi City is only 5%. This data shows that the prevalence of Chronic Energy Deficiency pregnant women in Sobo Health Center is higher.

MATERIALS AND METHODS

This study is an example of a form of descriptive observational research, which examines the value of one or more independent variables without drawing comparisons or relating them to these other variables.12 This study was conducted to determine the picture of energy, protein, Fe, and folic acid intake in pregnant women with Chronic Energy Deficiency in the work area of the Sobo Health Center in Banyuwangi City during November 2022 – May 2023.

The study population consisted of all pregnant women with Chronic Energy Deficiency in the working area of the Sobo Health Center in Banyuwangi City, which originally amounted to 29 people. However, due to time gaps, some respondents have given birth. In February confirmed with the puskesmas that as many as 15 pregnant women with chronic energy deficiency were obtained.

The simple random sampling method is a technique used in sampling research by paying attention to inclusion. This criterion of the problem group in this study is that students are in good health, allowing for weight weighing and height measurement, students who were present when the data was collected. The technique at the time the data is collected is primary data taken from interviews directly from the source or tear of research by researchers. The primary data collection method is obtained from filling out an identity sheet containing name, age, weight, height, upper arm circumference, address, gestational age. For intake, it is known through an interview form Food Recall 2 x 24 hours. Secondary data is obtained from the Sobo Health Center in Banyuwangi City.
which will be used for supporting information. Women who are pregnant and experiencing Chronic Energy Deficiency by 2023 constitute the target population.

Obtain information from previous respondents by obtaining their permission to participate in the study. Univariate analysis is then used in the data analysis phase of descriptive research. A narrative table displaying frequency and percentage distributions from univariate analyses is used to study the properties of each variable in detail.

RESULTS

Descriptive analysis shows that Sobo Health Center is located at Jalan Adi Sucipto no. 137, Banyuwangi. Puskesmas Sobo has 7 sub-district working areas which include, Sourcerejo, Kebalenan, Tamanbaru, Penganjuran, Tukangkayu, and Sobo.

Characteristics Responden

Based on the results of the study, in the age category, it can be seen that most pregnant women with chronic energy deficiency have the age of 27 years amounting to 4 people with a percentage of 26.7%. In the frequency distribution table, the mean value is 25.67 for the minimum age at the age of 18 years and the maximum age at the age of 35 years. According to gestational age, the most people at 9 weeks gestation amounted to 5 people with a percentage of 33.3%. In the frequency distribution table, the mean value is 15.07 and the minimum gestational age is at the age of 8 weeks and the maximum gestational age is at the age of 33 weeks.

Antropometri Responden

According to research findings, the majority of respondents have an Upper Arm Circumference of 22 cm which is equivalent to 6 pregnant women by 40%. In the frequency distribution table, a mean value of 21.63 is obtained for the minimum Upper Arm Circumference size of 20 cm and the maximum Upper Arm Circumference size is 23 cm.

Respondents’ Macronutrient Intake

The following table presents the distribution of respondents’ macronutrient frequencies.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intake Category</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weight deficit</td>
<td>Moderate deficit</td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Energy Intake</td>
<td>15</td>
<td>100</td>
</tr>
<tr>
<td>Protein Intake</td>
<td>7</td>
<td>46.7</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2023
Based on table 1, this is the result of recall for 2x24 hours, it is shown that all respondents have energy intake in the weight deficit category amounting to 15 people by 100%. With an average energy intake of 1156.05 kcal for the lowest energy intake of 806.4 kcal and the highest of 1667.3 kcal. Protein intake Most respondents had protein intake in the weight deficit category of 7 people (46.7%), moderate deficit of 2 people (13.3%), mild deficit of 2 people (13.3%) and normal category of 4 people (26.7%). With an average protein intake of 48.65-grams for the lowest protein intake of 32.6-grams and the highest of 81.85 grams.

Table 2. Frequency Distribution of Fe and Folic Acid Intake of Respondents to Pregnant Women with Chronic Energy Deficiency in the Sobo Health Center Area of Banyuwangi City

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intake Category</th>
<th>Total</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Less</td>
<td>Enough</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Fe intake</td>
<td>15</td>
<td>0</td>
<td>15</td>
<td>100</td>
</tr>
<tr>
<td>Folic Acid Intake</td>
<td>15</td>
<td>0</td>
<td>15</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary Data, 2023

Referring to table 2, it was shown that all respondents had a Fe intake of less than 15 people by 100%. With an average intake of 6.52 mg for the lowest Fe intake of 3.35 mg and the highest of 9.5 mg. For Folic Acid intake category less as many as 15 people by 100%. With an average intake of 126.33 mcg for the lowest folic acid intake of 68 mcg and the highest of 365.3 mcg.

Table 3. Anthropometric Frequency Distribution of Respondents of Pregnant Women with Chronic Energy Deficiency in the Sobo Health Center Area of Banyuwangi City

<table>
<thead>
<tr>
<th>Variable</th>
<th>Nutritional Status</th>
<th>Chronic Energy Deficiency (&lt;23.5 cm)</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Intake</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight Deficit</td>
<td>15</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate deficit</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild deficit</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protein Intake</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight deficit</td>
<td>7</td>
<td>46.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate deficit</td>
<td>2</td>
<td>13.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mild deficit</td>
<td>2</td>
<td>13.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>4</td>
<td>26.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fe Intake</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less</td>
<td>15</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Referring to table 3, Energy Intake in the weight deficit category category has a nutritional status of Chronic Energy Deficiency, which is the result of an upper arm circumference of 23.5 cm < totaling 15 people (100%). Protein intake is related to the nutritional status of Chronic Energy Deficiency, namely the size of the Upper Arm Circumference < 23.5 cm for the weight deficit category of 7 people (46.7%), the moderate deficit category of 2 people (13.3%), the mild deficit category of 2 people (13.3%), the normal category of 4 people (26.7%), for the over category there is none. Fe intake in the deficient category has a nutritional status of Chronic Energy Deficiency, which is the result of an upper arm circumference of < 23.5 cm as many as 15 people (100%). Folic acid intake in the category of lack of nutritional status Chronic Energy Deficiency is the result of Upper Arm Circumference < 23.5 cm a total of 15 people (100%).

**DISCUSSION**

The results showed that the energy intake of all respondents, namely 15 pregnant women with nutritional status of Chronic Energy Deficiency had a weight deficit energy intake with an average energy intake of 1156.05 kcal for the lowest energy intake of 806.4 kcal and the highest of 1667.3 kcal. According to researchers after a 2 x 24-hour food recall regarding the food consumed by respondents is mostly not always complete with side dishes, vegetables or fruit, respondents over often eat with portions that tend to be small such as rice consumption, some respondents only consume 1 to 2 centong of rice.

Energy sourced from food with carbohydrate nutrients is really needed by the body of pregnant women because it affects the baby's weight gain. Many metabolic changes in the body of pregnant women, the growth of the fetus and placenta are also fulfilled through carbohydrate intake.13 Energy needs are still minimal at the beginning of the first trimester of pregnancy, but increase in the 2nd trimester. Consuming foods such as rice, corn, wheat, potatoes, sweet potatoes, and cassava can be a source of energy.14

Protein Intake showed that respondents with Chronic Energy Deficiency nutritional status were 7 people (46.7%) for the severe deficit category protein intake (46.7%), moderate deficit category protein intake for 2 people (13.3%), light deficit category protein intake for 2 people (13.3%), normal protein intake for 4 people (26.7%), and for the over category there was none. With an average protein intake of 48.65 grams for the lowest protein intake of 32.6 grams and the highest of 81.85
grams. According to researchers, the intake of potassium respondents is mostly in a weight deficit condition. This may be caused by mothers who do not know what to eat to meet their protein needs due to a lack of understanding of these needs.

Protein itself can be obtained from 2 sources, namely animal and vegetable. Food sources of animal protein over recommended for consumption by pregnant women because the absorption is over good for the body of pregnant women. Examples of food consumption from livestock and fisheries. Pregnant women who lack protein are very risky to experience fetal growth and development disorders, maternal health and dangerous during labor. Given the function of protein itself for the fetus, which is to build cell tissues to function properly.

Fe intake showed that respondents with Fe intake in the deficient category had nutritional status of Chronic Energy Deficiency all respondents as many as 15 people (100%), adequate category Fe intake was absent. With an average intake of 6.52 mg for the lowest Fe intake of 3.35 mg and the highest of 9.5 mg. According to researchers, based on the results, all respondents experienced iron deficiency. The reason is that the assessment is only done by looking at food intake through food recall 2x24 hours. In addition, respondents also tend not to eat foods that contain high iron content which also causes less adequate Fe intake.

In the consumption of foods rich in iron, it can be noted the selection of foods with high absorption as well as animal foods (meat, fish, and poultry) over high absorption compared to vegetable foods. Another effect that should be avoided is impaired iron absorption by not consuming coffee, tea and chocolate. All three contain polyphenols and tannins which if consumed will cause a decrease in the ability of iron in the formation of hemoglobin.

Folic Acid intake showed that respondents with insufficient folic acid intake had a nutritional status of Chronic Energy Deficiency all respondents as many as 15 people (100%), adequate category Folic Acid intake was absent. With an average intake of 126.33 mcg for the lowest folic acid intake of 68 mcg and the highest of 365.3 mcg. According to researchers based on the results, all respondents experienced folic acid nutrient deficiency, this can be caused because the assessment is only done by looking at food intake. While in addition to food intake, folic acid in pregnant women must also be given additional through folic acid supplements.

Neural tube defects or congenital defects are one thing that can be prevented by giving folic acid during pregnancy. Some foods that are good for consumption during pregnancy with high folic acid content such as milk, potatoes, tomatoes, peas, spinach and cereals. Folic acid supplements can also be used to meet the increasing folic acid needs of pregnant women. While most respondents do not understand the kinds of foods and supplements that contain folic acid which is good for pregnant women, this is indicated by respondents do not eat many foods with high folic acid.
acid values, especially mothers are not interested in drinking pregnancy milk for various reasons, one of which is feeling nauseous.

In pregnant women with chronic energy deficiency, macronutrient deficiencies such as protein and energy and micronutrients such as iron will result in additional problems such as nutritional anemia because these nutrients, especially iron, are essential for the formation of hemoglobin and new cells. When Chronic Energy Deficiency is detected by low Upper Arm Deficiency, it usually means that the daily diet lacks calories and protein, as well as other nutrients, such as micronutrients such as iron and folic acid. Daily consumption of pregnant women must have enough folic acid in accordance with their nutritional needs. Folic acid deficiency is linked to low birth weight, placental separation, and neural tube abnormalities. Severe folic acid deficiency leads to Chronic Energy Deficiency and anemia.

CONCLUSION

All respondents, namely 15 pregnant women with nutritional status of Chronic Energy Deficiency had a weight deficit energy intake with an average energy intake of 1156.05 kcal for the lowest energy intake of 806.4 kcal and the highest of 1667.3 kcal. With an average protein intake of 48.65 grams for the lowest protein intake of 32.6 grams and the highest of 81.85 grams. Fe intake averaged 6.52 mg for the lowest Fe intake of 3.35 mg and the highest 9.5 mg. Folic acid intake of 126.33 mcg for the lowest folic acid intake of 68 mcg and the highest of 365.3 mcg.

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