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Research Article

The Relationship Between Pregnant Women's Knowledge About Pregnancy Nutrition and the Incidence of Chronic Energy Deficiency (CED)

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Abstract: Chronic energy deficiency (CED) in pregnalnt women is al problem thalt still occurs todaly. Chronic energy deficiency in pregnalnt women caln halve aln impalct on the heallth of the mother during pregnalncy, childbirth alnd the heallth conditions of the child who will be born. The purpose of this study is to determine the relaltionship between the level of knowledge albout nutrition alnd the incidence of chronic energy deficiency (CHD) in pregnalnt women alt the Siko Heallth Center. This study used al descriptive correlaltion design with al cross sectionall alpproalch. Daltal alnallysis used the Chi Squalre test method. This study wals conducted with al salmple of 1l0l4 people. The results showed al relaltionship between the level of knowledge The results showed thalt there wals al relaltionship between the level of knowledge albout nutrition alnd the incidence of chronic energy deficiency (CHD) in pregnalnt women alt the Siko Heallth Center, with al p-vallue of 0l.0l0l0l <0l.0l5. Nurses als palrt of heallth workers plaly aln importalnt role in efforts to increalse pregnalnt women's nutritionall knowledge so thalt the nutrition of pregnalnt women caln be fulfilled. nutrition of pregnalnt women caln be fulfilled optimallly to prevent the occurrence of SEZ.

Keywords : Incidence Chronic Energy Deficiency (CED), Knowledge albout nutrition, Pregnalnt Women.

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1. Introduction

Indonesia is a country rich in natural resources, yet many cases of Chronic Energy Deficiency (CED) still occur. This issue is caused by an imbalance in nutrient intake, which can lead to impaired physical and mental growth (Chinue, 2019). One of the nutritional problems faced in Indonesia is nutrition during pregnancy. Nutrition during pregnancy is a crucial factor influencing the development of the embryo and fetus as well as the health status of pregnant women (Cetin, 2019).

A country's health status is determined by several indicators, one of which is the Maternal Mortality Rate (MMR). According to the 2015 Indonesia Demographic and Health Survey (IDHS), the MMR in Indonesia was still high at 305 per 100,000 live births. This figure had decreased compared to 2012, when the MMR was 359 per 100,000 live births. Chronic Energy Deficiency (CED) is one of the nutritional problems that occur during pregnancy due to an imbalance between nutrient intake and nutritional needs.

CED can be identified by measuring the Mid-Upper Arm Circumference (MUAC) of pregnant women, with a measurement of less than 23.5 cm or MUAC falling into the red zone. The most common consequence of CED is the birth of low birth weight (LBW) babies, defined as weighing less than 2,500 grams (Anwar, 2014). According to the 2016 Nutritional Status Monitoring Survey (PSG), the percentage of pregnant women with CED was 16.2%, still below the target of 21.7%. Inadequate food intake is the main risk factor for CED in pregnant women.

Data from the Nutrient Consumption Evaluation (PKG), conducted alongside PSG in 2016, showed that only 26.3% of pregnant women met their daily energy needs and only 29.3% met their daily protein needs. According to research by Sandjaja, the percentage of pregnant women with CED in Indonesia, based on height indicators, showed that women with a height of 145 cm or more had a 12.8% risk of CED. Meanwhile, pregnant women shorter than 140 cm had a 37.4% risk of CED (Sandjaja, 2019).

One factor contributing to CED among pregnant women is a lack of knowledge regarding appropriate nutrition during pregnancy. Nutritional intake during pregnancy should contain sufficient energy, protein, vitamins, minerals, folic acid, iron, and calcium, which are essential for fetal development. Nutritional status during pregnancy significantly affects the labor and delivery process. Malnourished mothers have a higher risk of miscarriage, perinatal death (death of the fetus at 22 weeks gestation to one week after birth), and neonatal death (death of the baby within 0–28 days).

Several studies conducted in developing countries revealed that half of the causes of Low Birth Weight (LBW) are related to maternal nutritional status, including maternal height, pre-pregnancy weight, and weight gain during pregnancy (Sulistyoningsih, 2011). Caloric needs during pregnancy depend on activity levels and the increase in Basal Metabolic Rate (BMR). Pregnant women require an additional 300 kcal/day above their usual needs. Adequate energy intake is crucial to prevent the body from breaking down proteins for energy (Adriani & Wirjatmadi, 2012).

A preliminary study conducted by researchers at Siko Health Center through interviews with health workers in the MCH (Maternal and Child Health) clinic found that out of 10 pregnant women in the second and third trimesters, 5 experienced CED. Further records indicated that many pregnant women at the Siko Health Center had a MUAC measurement below 23.5 cm, based on the Maternal Cohort Register Book, especially among those in the second and third trimesters.

2. Research methods

This research is a descriptive correlational study using a cross-sectional approach, conducted in the working area of Siko Public Health Center. The population in this study consisted of all pregnant women in their second and third trimesters at Siko Health Center, totaling 122 individuals. The sample size was determined using the Slovin formula, resulting in 104 respondents. The sampling technique used was non-probability sampling with a purposive sampling method. The data collected were primary data.

In this study, the instrument used was a questionnaire developed by the researcher based on relevant theories and tested for validity. The results of the instrument analysis showed a Cronbach's alpha value of 0.761 with an r-table value of 0.631, indicating that the questionnaire was considered reliable. In addition, this study also used a MUAC (Mid-Upper Arm Circumference) measurement instrument. The data analysis techniques included univariate analysis using frequency distribution and bivariate analysis using the Chi-Square statistical test.

3. Result and Discussion

Table 1. Distribution Based on Respondents' Characteristics

Variable	n	%
Age		
> 20 years	3	2.9%
20–35 years	89	85.6%
< 35 years	12	11.5%
Gestational Age		
Second Trimester	36	34.6%
Third Trimester	68	65.4%
Education Level		
Elementary School	7	6.7%
Junior High School	13	12.5%
Senior High School	66	63.5%
Higher Education	18	17.3%
Occupation		
Civil Servant	11	10.6%
Entrepreneur	6	5.8%
Housewife	87	83.7%

Based on Table 1, the majority of pregnant women were in the age range of 20–35 years, totaling 89 respondents (85.6%). Most of the pregnancies were in the third trimester, with 68 respondents (65.4%). The majority of respondents had a senior high school education, totaling 66 respondents (63.5%), and most of them were unemployed or worked as housewives, totaling 87 respondents (83.7%).

Table 2. Distribution Based on Knowledge Level and Incidence of Chronic Energy Deficiency (CED)

Variable	**n**	**%**
Knowledge Level		
Good	40	38.5%
Fair	39	37.5%
Poor	25	24.0%
CED Incidence		
Not experiencing CED	60	57.7%
Experiencing CED	44	42.3%

Based on Table 2, it was found that 40 respondents (38.5%) had a good level of knowledge, 39 respondents (37.5%) had a fair level of knowledge, and 25 respondents (24.0%) had a poor level of knowledge. Meanwhile, regarding the incidence of Chronic Energy Deficiency (CED), 60 pregnant women (57.7%) did not experience CED, while 44 pregnant women (42.3%) were found to have CED.

Table 3. The Relationship Between Knowledge of Nutrition and the Incidence of Chronic Energy Deficiency (CED) in Pregnant Women

Mother's Knowledge	Not Experiencing CED	Experiencing CED	Total	p-Value
Good	33	7	40	
Fair	21	18	39	
Poor	6	19	25	
Total	60	44	104	0.010

Based on Table 3, it was found that among pregnant women with good knowledge, 33 respondents (82.5%) did not experience CED, while 7 respondents (17.5%) did. Among those with fair knowledge, 21 respondents (53.8%) did not experience CED, while 18 respondents (46.2%) did. Meanwhile, among respondents with poor knowledge, only 6 (24.0%) did not experience CED, while 19 (76.0%) did.

The results of the Chi-Square statistical test showed a p-value of 0.010 ($p < 0.05$), indicating a significant relationship between the level of nutritional knowledge and the incidence of Chronic Energy Deficiency (CED) in pregnant women at Siko Public Health Center.

Discussion

Chronic Energy Deficiency (CED) is a condition characterized by poor nutritional status due to insufficient consumption of energy sources containing both macronutrients—required in large amounts—and micronutrients—needed in smaller amounts (Arisman, 2010).

Based on age distribution, most pregnant women in this study were in the 25–35-year range, totaling 89 respondents (85.6%). The younger a woman is (under 35), the more significant her nutritional needs during pregnancy, not only to support the development of the fetus but also to sustain her own physical growth. Meanwhile, older pregnant women require greater energy intake due to the declining function of organs, thus demanding more energy to maintain a healthy pregnancy (Proverawati & Asfuah, 2019). This is supported by Efrinita (2010), who found that 8.3% of pregnant women in her study were over 35 years old, showing that high-risk pregnancies due to age still occur. On the other hand, pregnant women under 20 years of age may also be unable to meet their own nutritional needs, which raises concerns about inadequate nutrition for the fetus.

Pregnant women in the second and third trimesters need more energy intake due to the fetus's rapid development. Inadequate intake may increase the risk of CED. If adequate energy is provided throughout pregnancy, the risk of CED is reduced (Mastrulah, 2013).

In terms of education level, most pregnant women in this study had completed senior high school (63.5%). Higher education levels correlate with better knowledge, higher intellectual abilities, and greater concern for personal and family health. Formal education is often associated with better dietary habits in families. Halwarti (2016) also notes that education

affects one's thinking process, enabling individuals to process new information. However, education does not guarantee nutritional knowledge. Mothers with higher education can still experience poor nutrition if they lack the skills to plan a balanced diet, while those with lower education may have good nutritional knowledge if they actively seek information from informal sources like community groups, health posts, or media (Kartikawati, 2013).

Regarding occupation, the majority of pregnant women in this study were unemployed or housewives (83.7%). Surprisingly, most CED cases were found among housewives. This may be due to the demanding nature of domestic responsibilities, limiting time and energy for nutritional care. In addition, lack of employment may reduce access to health information and financial resources. Ernawati (2018) found similar results, showing a higher proportion of unemployed mothers experiencing CED. Musni et al. (2017) also found that all CED cases in their study occurred in non-working mothers. Working mothers may contribute to higher household income, which allows them to fulfill their nutritional needs more easily (Arisman, 2010).

This study found that most pregnant women had good knowledge of nutrition, which may be linked to the high number of respondents with senior high school education (63.5%). According to Sukmawati (2012), formal education is an important factor influencing knowledge, and the higher the education, the broader the knowledge. On the other hand, poor knowledge was also found among those with lower education levels and those not working, possibly due to limited access to health information.

A total of 44 pregnant women in this study experienced CED, indicating that CED remains a prevalent issue in the region. Pregnant women suffering from poor nutrition are more likely to develop CED, which can lead to adverse physical outcomes, including a higher risk of delivering low birth weight (LBW) babies. These babies are 2–3 times more likely to die than those born to well-nourished mothers (Andriani, 2015).

Chi-Square analysis showed a p-value of 0.010 ($p < 0.05$), indicating a significant relationship between nutritional knowledge and the incidence of CED. Respondents with poor knowledge were more likely to experience CED (90.9%) compared to those with good knowledge (84%), suggesting that the better a mother's nutritional knowledge, the better her nutritional status, which helps prevent CED. This aligns with the theory by Makhfudli (2019), which states that knowledge plays a key role in shaping health behaviors.

These findings are also consistent with Widyawati (2012), who found a significant relationship between nutritional knowledge and protein intake with CED incidence (p-value = $0.010 < 0.05$). Individuals with better nutritional knowledge tend to be more mindful of food choices based on nutritional value, while those with poor knowledge are more likely to choose food based on taste and appearance alone.

According to Notoatmodjo (2011), knowledge, attitude, intention, and behavior influence one's participation in health-related activities. When individuals perceive more positive than negative aspects of a health behavior, they are more likely to adopt it. Pregnant women who routinely attend antenatal care are more likely to apply the advice given, such as consuming nutritious food to prevent CED. A mother's knowledge greatly influences her decision-making and behavior, especially in early pregnancy, when appetite and tolerance for food may fluctuate. In such cases, a knowledgeable mother will still strive to meet her and her baby's nutritional needs (Atika & Siti, 2019).

This study aligns with research by Erna (2019), which found a meaningful relationship between maternal knowledge of CED and its incidence. The better the mother's knowledge, the lower her likelihood of developing CED.

However, findings from Budiani (2010) differed, with a p-value of 0.013 indicating no significant relationship between nutritional knowledge and CED. This may be due to other influencing factors such as maternal health condition, food intake, age, workload, infections, and family income.

4. Conclusions

Based on the results of the study, the majority of pregnant women at Puskesmas Siko had a good level of nutritional knowledge (30.8%), followed by those with sufficient knowledge (40.4%), and the rest with poor knowledge (28.8%). In terms of nutritional status, most respondents did not experience chronic energy deficiency (CED), totaling 57.7%, while 42.3% of respondents were found to have CED.

These findings suggest a significant relationship between the level of nutritional knowledge and the incidence of CED among pregnant women at Puskesmas Siko, as indicated by the Chi-Square test result with a p-value of 0.010 ($p < 0.05$). It is hoped that the results of this study can serve as a useful reference in the development of scientific knowledge, particularly in the field of maternal nutrition. Future research is still needed to explore other factors influencing the occurrence of CED in pregnant women and to investigate strategies for reducing the risk of poor nutritional status during pregnancy.

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