


## The Relationship Between Knowledge And The Incidence Of Chronic Energy Deficiency (CED) In Pregnant Women At UPTD Puskesmas II, Denpasar Utara District Health Office

Bella Cantika Putri Ariyanti<sup>1</sup>, I Nyoman Wirata<sup>2</sup>, Gusti Ayu Tirtawati<sup>3</sup>

<sup>1,2,3</sup>Applied Bachelor Program in Midwifery, Department of Midwifery, Poltekkes Denpasar, Jalan Raya Puputan 11 A Renon Denpasar, Indonesia

Article Info	ABSTRACT
<p><b>Keywords:</b> Knowledge, Chronic energy deficiency, Nutritional Pregnant woman.</p>	<p>Pregnant women who experience nutritional problems have a higher risk of complications during pregnancy, childbirth, and for the baby they give birth to. The objective of this research is to identify the characteristics of primigravida mothers with KEK, to identify the knowledge of primigravida mothers, and to determine the relationship between knowledge and the incidence of KEK in pregnant women at UPTD Puskesmas II, Denpasar North District Health Office. This research is a correlational analytical study conducted with a case-control study design. The population in this study consists of pregnant women at UPTD Puskesmas II, Denpasar North District Health Office, with a sample of 70 people divided into case and control groups, each consisting of 35 people. Analysis using the chi-square test. The research instrument consisted of a questionnaire with 30 questions. The analysis results show that a majority of respondents who do not experience Chronic Energy Deficiency (CED) have good knowledge, amounting to 97.1%, while respondents who experience CED have good knowledge at 65.7%. There is a positive relationship between knowledge and the incidence of Chronic Energy Deficiency (CED) in pregnant women. Pregnant women with less knowledge are 17.739 times more likely to experience Chronic Energy Deficiency (CED). Health centers are expected to optimize promotional activities, innovations, and continuously strive to enhance the integrated ANC program in order to improve pregnant women's knowledge in fulfilling nutrition during pregnancy to reduce the incidence of KEK.</p>
<p>This is an open access article under the <a href="https://creativecommons.org/licenses/by-nc/4.0/">CC BY-NC</a> license</p> 	<p><b>Corresponding Author:</b> Bella Cantika Putri Ariyanti Poltekkes Kemenkes Denpasar Pemecutan Kaja, Kec. Denpasar Utara, Kota Denpasar, Bali <a href="mailto:bellaaryant@gmail.com">bellaaryant@gmail.com</a></p>

### INTRODUCTION

Nutrition for pregnant women is one of the focal points of community nutrition improvement activities due to its significant impact on the condition of the fetus they are carrying. Especially regarding insufficient energy and protein intake in pregnant women, it can lead to Chronic Energy Deficiency (CED). Pregnant women are at risk of experiencing Chronic Energy

Deficiency (CED) if they have a Mid-Upper Arm Circumference (MUAC) of less than 23.5 cm (Ministry of Health of the Republic of Indonesia, 2016).

The impact of KEK on pregnant women is a higher risk of giving birth to low birth weight babies, experiencing death during delivery, bleeding, difficult postpartum recovery due to weakness, and being prone to health complications. Babies born with low birth weight (LBW) can experience intrauterine growth retardation (IUGR), premature birth, or even miscarriage, and babies born with low birth weight (LBW) (Hidayanti and Rahfiludin, 2020).

According to the 2020 Performance Accountability Report of the Ministry of Health of the Republic of Indonesia, the issues commonly encountered by pregnant women are nutrition-related problems such as chronic energy deficiency, anemia, and disorders due to iodine deficiency. The Basic Health Research (Riskesmas) of 2018 shows that the prevalence of chronic energy deficiency (CED) risk among pregnant women (15-49 years) is still quite high at 17.3%. The percentage of pregnant women with KEK is expected to decrease by 1.5% each year (Ministry of Health of the Republic of Indonesia, 2018). Based on the source data from the 2020 routine report collected from 34 provinces, it was found that out of 4,656,382 pregnant women whose upper arm circumference (UAC) was measured, approximately 451,350 pregnant women had a UAC < 23.5 cm (experiencing the risk of KEK).

The issue of pregnant women with chronic energy deficiency (CED) in Indonesia indicates that the prevalence of pregnant women at risk of CED is still high. Based on the results of the Health Office Profile Report of Denpasar City in 2022, there were 672 pregnant women with KEK in Denpasar City. The UPTD Puskesmas of the Denpasar North District Health Office contributed 6% to the number of pregnant women with KEK, totaling 35 people.

Efforts to improve health standards and help reduce Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) contributed by the occurrence of Chronic Energy Deficiency (CED) in pregnant women can be achieved by enhancing knowledge about maternal nutrition. This is evidenced by research conducted by Hilda (2022), which found a significant relationship between knowledge and the occurrence of CED in pregnant women, as good knowledge can prevent the occurrence of CED in pregnant women. The government has also implemented a program for counseling with nutritionists and providing supplementary food in the form of biscuits and local foods for pregnant women as an effort to meet nutritional needs and reduce the incidence of chronic energy deficiency (CED) among pregnant women.

Based on the preliminary study conducted by the researcher. A trend of increasing numbers of pregnant women with Chronic Energy Deficiency (CED) has been found each month. This prompted the researchers to analyze the relationship between the level of knowledge and the incidence of Chronic Energy Deficiency (CED) among pregnant women at UPTD Puskesmas II, Denpasar North Health Office, located at Jl. Gunung Agung Gang II No. 8X, Denpasar North District, Denpasar City.

## METHOD

This research was conducted at UPTD Puskesmas II, Denpasar Utara District Health Office. The type of research used in this study is correlational analytical research with a case-control

study design. This research was conducted at UPTD Puskesmas II, Denpasar Utara District Health Office, from February to April 2024. The population of this study is pregnant women in their third trimester. The sample in the case group was taken using the total sampling technique, which is a sampling method where the sample size is equal to the population size. In this study, a sample of 70 pregnant women was used, divided into case and control groups, each consisting of 35 individuals. The type of data used is primary data obtained directly from respondents through questionnaires. Data collection was conducted after obtaining research permission.

## RESULTS AND DISCUSSION

### Characteristics of the respondents

The characteristics of the respondents being studied can be described based on the mothers' knowledge presented in the following table:

**Table 1.** Frequency Distribution of Characteristics of Pregnant Women with KEK at UPTD Puskesmas II, Denpasar North District Health Office

Characteristics	Frequency (f)	Percentage (%)
Age (Year)		
< 20	4	5.7
20-35	66	94.3
Total	70	100.0
Education		
Basic	6	8.6
Intermediate	54	77.1
Higher	10	14.3
Total	70	100.0
Occupation		
Employe	23	32.9
Unemploye	47	67.1
Total	59	100.0
Income		
< Rp 3.096.823	23	32.9
≥ Rp 3.096.823	47	67.1
Total	70	100.0

\*) source: primary data

The table above shows that the majority of respondents are aged between 20-35 years, totaling 66 (94.3%), with the most common highest level of education being secondary education, totaling 54 (77.1%). The majority of respondents are employed, totaling 47 (67.1%), and the majority of respondents have an income of ≥ Rp 3,096,823, also totaling 47 (67.1%). The table above shows that most respondents are between 20-35 years old, totaling 66 (94.3%), with the highest level of education being secondary education, totaling 54

(77.1%). Most respondents are employed, totaling 47 (67.1%), and most respondents have an income of  $\geq$  Rp 3,096,823, also totaling 47 (67.1%).

The results of the univariate analysis related to the knowledge of pregnant women from the case group and the control group who have undergone the data analysis process can be described as follows:

**Table 2.** Knowledge of Pregnant Women at UPTD Puskesmas II Health Office Health Office of North Denpasar District

Knowledge	Frequency (f)	Percentage (%)
Non Chronic Energy Deficiency (CED)		
Good	34	97.1
Less	1	2.9
Total	35	100,0
Chronic Energy Deficiency (CED)		
Good	23	65.7
Less	12	34.3
Total	35	100,0

\*) source: primary data

The results from the table above show that a majority of respondents who do not experience KEK have good knowledge, amounting to 34 (97.1%), while respondents who experience KEK have good knowledge amounting to 23 (65.7%). The results of the bivariate analysis of the knowledge of pregnant women from the case group and the control group regarding the incidence of KEK can be described as follows:

**Table 4.** The Relationship Between Knowledge and the Incidence of Chronic Energy Deficiency (CED) in Pregnant Women at UPTD Puskesmas II Dinas Kesehatan Kecamatan Denpasar Utara

Knowledge	Chronic Energy Deficiency (CED) Incidence		Total	P	OR
	CED	Non-CED			
Good	34	23	57	0,001	17.739
Less	1	12	13		
Total	35	35	70		

\*) source: primary data

Based on the table above, it shows that the P Value result (0.001)  $<$   $\alpha$  (0.05) and the OR value (17.739). This indicates that  $H_a$  is accepted, thus it can be concluded that there is a positive relationship between knowledge and the incidence of Chronic Energy Deficiency (CED) in pregnant women at UPTD Puskesmas II Dinas Kesehatan Kecamatan Denpasar Utara. Pregnant women with less knowledge are 17.739 times more likely to experience chronic energy deficiency (CED).

## Discussion

### Characteristics of pregnant women at UPTD Puskesmas II, Denpasar Utara District Health Office

Found mothers aged < 20 were 4 people and mothers aged 20-35 years were 66 people. Pregnant women who marry at a teenage age tend to be at risk of experiencing KEK. Pregnant women under the age of 20 have a higher risk of KEK, and even pregnant women who are too young can significantly increase the risk of KEK. Both very young and very old ages carry a risk of experiencing KEK. This means that if the age of a pregnant woman is < 20 years or > 35 years, she has a higher risk during pregnancy, including experiencing KEK. Because in pregnant women under 20 years old, the reproductive organs are not yet mature, whereas in pregnancies over 35 years old, the reproductive organs have already experienced a decline (Yayuk, 2019).

It was found that the pregnant women who participated as respondents in the study were predominantly those with secondary and higher education. Mothers with higher education levels will be more receptive to the information they receive, thereby increasing their knowledge. The knowledge possessed by a mother will influence decision-making and also affect her behavior. A mother with good nutritional knowledge is likely to provide adequate nutrition for her baby.

The mother's employment status is categorized into two: working and not working. There are 47 pregnant mothers who are respondents and working, and 23 pregnant mothers who are not working. The mother's employment status can affect the incidence of KEK. This is because working respondents have tasks as housewives. Mothers with jobs are associated with high levels of activity, greater workloads, and more energy expenditure. The heavier the work done by a mother, the greater the potential for experiencing KEK.

Family income is closely related to the incidence of KEK in pregnant women. In this study, 23 pregnant women were found to have family incomes below the UMR of Denpasar City, which is Rp 3,096,823. For mothers with lower incomes, meeting basic food needs can only be fulfilled through the consumption of carbohydrate sources. If income increases, then the type of food consumed will include more cheap protein sources, so the food purchased does not fall into the second priority. In communities with sufficient economic resources, they can purchase food items that are the last priority, namely animal-based foods and other food products. Generally related to various health problems faced due to the inability and lack of knowledge in addressing various health issues, especially nutritional intake problems. The level of income directly determines consumption patterns, which in turn affects family food consumption.

### The level of knowledge of pregnant women at UPTD Puskesmas II, Denpasar North District Health Office

According to Rizky (2018) Knowledge is an understanding obtained through experience or education, whether theoretical or practical, involving complex cognitive processes such as communication, perception, and reasoning. Good knowledge about the nutritional patterns and dietary needs during pregnancy is due to the fact that most of the

pregnant mothers' education level in this study is high school. The education level of pregnant women will influence their understanding of their pregnancy health, particularly regarding food consumption for pregnant women (Rini et al., 2020).

In this study, it was also found that mothers had insufficient knowledge about nutritional patterns and dietary intake during pregnancy. Insufficient nutritional knowledge, lack of understanding about good eating habits, and inadequate understanding of the nutritional contributions of various types of food will lead to problems in determining the food choices consumed (Syahfitri, 2020).

The lack of maternal knowledge about nutritional patterns and dietary intake during pregnancy leads to insufficient consumption of nutritious food by the mother. Basically, knowledge related to nutritional patterns and dietary intake during pregnancy is an important aspect that must be possessed to meet the nutritional needs of pregnant women. Mothers with good knowledge usually understand correctly how important it is to meet nutritional intake so that the baby in their womb can grow well.

In Table 2, it was also found that the majority of pregnant women work, totaling 47 people (67.1%). According to Permatasari et al. (2008), the motivation for women to work is to expand their social circles and increase their knowledge. Changes in knowledge will bring about changes in attitudes, behaviors, income, and dietary patterns. These changes will affect the selection of types and amounts of food consumed. In addition, working mothers can improve the family's socio-economic status. Working mothers have their own income, so they do not depend on their husbands to meet their nutritional needs. This condition is in accordance with Arisman's opinion (2007).

#### **The relationship between knowledge and the incidence of KEK at UPTD Puskesmas II, Denpasar North District Health Office**

The results of the chi-square test show that the P Value ( $0.001 < \alpha (0.05)$ ) and the OR value (17.739). This indicates a positive relationship between knowledge and the incidence of Chronic Energy Deficiency (CED) in pregnant women at UPTD Puskesmas II, Denpasar Utara District Health Office. Pregnant women with low knowledge are 17.739 times more likely to experience chronic energy deficiency (CED). The results of this study are in line with previous research conducted by Rika et al. (2021) titled "The Relationship Between the Level of Knowledge About Nutrition and the Incidence of Chronic Energy Deficiency (CED) in Pregnant Women." The results of the study showed that based on the Chi Square statistical test, a p-value of 0.000 ( $p < 0.05$ ) was obtained, which means that there is a significant relationship between the level of knowledge about nutrition and the incidence of Chronic Energy Deficiency (CED) in pregnant women at the Puskesmas Matraman District, East Jakarta.

In addition, the results of this study are also supported by research conducted by RA Rishel and Rika Armalini (2022) titled "The Relationship Between Knowledge and Attitude of Pregnant Women About Nutrition and the Incidence of Chronic Energy Deficiency (CED) at the Sikapak Health Center, Pariaman City in 2022." The significance test results on the relationship between knowledge and the incidence of chronic energy deficiency (CED) the

result obtained was a p value =  $0.004 < \alpha 0.05$ , which means there is a significant relationship between knowledge and the occurrence of KEK in pregnant women. This is also in line with previous research conducted by Mulyani (2018) titled "The Relationship Between Knowledge and the Incidence of Chronic Energy Deficiency in Pregnant Women at UPT Puskesmas Garuda." The research results indicate that there is a relationship between knowledge and the incidence of Chronic Energy Deficiency (CED) in pregnant women with a p-value of 0.018. In addition, the results of this study are also supported by previous research by Aulia et al., (2020) titled "The Relationship Between Food Restrictions, Nutritional Knowledge, Food Availability, and Food Intake with the Incidence of Chronic Energy Deficiency in Pregnant Women." The research results show that there is a significant relationship between the nutritional knowledge of pregnant women and the incidence of Chronic Energy Deficiency (CED) in pregnant women with a p-value = 0.000.

In addition to being supported by previous research, this study is also in accordance with Notoadmodjo's theory (2011) which states that the relationship between knowledge, attitude, intention, and behavior will influence a person's participation in a particular activity. The existence of knowledge about the benefits of something will cause people to have a positive attitude towards it. Knowledge contains both positive and negative aspects. If an activity is considered to have more positive aspects, then it is likely that someone will participate in that activity. In this case, pregnant women who diligently undergo pregnancy check-ups will implement the positive recommendations suggested by health workers, such as paying attention to consuming nutritious food, especially during pregnancy, to prevent the occurrence of KEK (Chronic Energy Deficiency).

Knowledge of pregnant women regarding nutritional fulfillment and dietary patterns during pregnancy is very important because a lack of knowledge can lead to mothers paying less attention to their nutritional intake during pregnancy. In this study, it was found that mothers had insufficient knowledge about the consumption of food sources of protein and several foods that can reduce nausea and vomiting during pregnancy, as evidenced by the number of mothers who answered incorrectly to questions 7, 9, and 14 in the questionnaire.

Nausea and vomiting during pregnancy are very important to address because if left untreated, mothers will lose a significant amount of weight due to insufficient food intake caused by the nausea and vomiting they experience. Nausea and vomiting occur in 60-80% of primigravida and 40-60% in multigravida. The first trimester of pregnancy is a critical period when the fetus is in the early stages of organ formation. If the fetus experiences a deficiency in certain nutrients, the formation of perfect organs can fail. In addition, the fetus is at risk of being born with low birth weight (Somoyani et al., 2018). One way to reduce nausea and vomiting non-pharmacologically during the first trimester of pregnancy is by consuming warm ginger. Consuming warm ginger can relax the muscles of the digestive tract, resulting in reduced nausea and vomiting (Nurul Laily & Astriana 2018).

The selection of protein is also important during pregnancy because protein is a nutrient that plays a role in the process of synthesizing pregnancy and fetal tissues. The increased protein requirement is also needed for the process of tissue development. If there is a protein

deficiency during pregnancy, it can affect the growth of the fetus. Where protein is also involved in the synthesis of hormones and neurotransmitters. Inadequate intake of protein and energy usually occurs simultaneously, making it difficult to determine the effects of energy deficiency and protein deficiency.

Consuming foods that contain macronutrients and micronutrients is one of the ways to prevent anemia, in addition to the administration and consumption of iron tablet supplements. In the first trimester, pregnant women usually experience nausea and vomiting, so they are not given iron tablets. Iron intake can be obtained from food (animal or plant-based) that contains iron to increase Hb levels in the blood. Pregnant women among these respondents were also found to have a limited understanding regarding iron supplement tablets, which should not be taken with tea. This is because there are tannins in tea that can interfere with the absorption of iron obtained through iron supplementation. Pregnant women with chronic energy deficiency (CED) who continuously consume iron supplements with tea can experience anemia.

In this study, it was found that there is a significant relationship between knowledge and the incidence of KEK in pregnant women. Pregnant women with good levels of knowledge can also be at risk of experiencing KEK, as the occurrence of KEK is not solely caused by knowledge, and the rest can be attributed to other factors such as infectious diseases, the amount of food intake, food availability, and income.

## CONCLUSION

The knowledge of respondents in this study, mostly pregnant women with good knowledge, do not experience KEK. There is a relationship between maternal knowledge and the incidence of chronic energy deficiency (CED), as evidenced by the p-value result (0.0001), and mothers with less knowledge are 17.739 times more at risk of experiencing CED.

## REFERENCE

- Abadi, E., and Putri, L. A. R. (2020). Macronutrient Consumption in Pregnant Women with Chronic Energy Deficiency (CED) During the Pandemic COVID-19. *Malang Health Journal*, 6 (2): 85-90.
- Ahmad, A., Wagustina, S., and Estuti, W. (2020). *Nutritional Pocket Guide for Pregnant Women*. Aceh: NEM.
- Arisman. (2007). *Nutrition in the Life Cycle*. Jakarta: EGC
- Armalini, R., Rishel, R. (2022). The Relationship Between Knowledge and Attitude of Pregnant Women About Nutrition and the Incidence of Chronic Energy Deficiency (CED) at the Sikapak Health Center, Pariaman City in 2022. *JOURNAL NTHN: Nan Tongga Health and Nursing* 18(1) 2022: 82-94
- Dinas Kesehatan Kota Denpasar. (2022). *Introduction to the Health Profile of Gianyar Year 2023*.
- Fakhriyah, Zaliha., Lestari, D., et al. (2021). *Textbook on Chronic Energy Deficiency (CED)*. Yogyakarta: CV Mine Perum

- Ministry of Health of the Republic of Indonesia. (2021). Pocket Book on Planning a Healthy Pregnancy. Jakarta: Ministry of Health of the Republic of Indonesia 2021. ISBN 978-623-301-255-3
- Mulyani, N. (2018). The Relationship Between Knowledge and the Incidence of Chronic Energy Deficiency (CED) in Pregnant Women at UPT Puskesmas Garuda in 2018.
- Mutmainnah, Patimah S, Septiyanti. (2021). The Relationship Between Chronic Energy Deficiency (CED) and Wasting with the Incidence of Anemia in Adolescent Girls in Majene District. *Window of Public Health Journal* 1(5): 561-569.
- Nurhasanah., Verawati, Besti., Harmia, Elveria., (2022). The Relationship Between Knowledge and Food Restrictions with the Incidence of Chronic Energy Deficiency (CED) in Pregnant Women in Alam Panjang Village, the Working Area of Upt Blud Rumbio Health Center in 2022. *Plenary Health: Jurnal Kesehatan Paripurna*. Volume 1 Issue 1 2024 Page 10-17
- Nuryanti, Pepi., Azzahroh, Putri., & Rukmaini. (2022). Factors Associated with the Incidence of Chronic Energy Deficiency (CED) in Pregnant Women. *Midwifery Journal* Vol. 11 No. 2 October 2022
- .Permatasari, H., Hamid, A. Y. S., Setyowati (2008), The Experience of Women Working in Carrying Out Family Health Tasks in the Jakarta, Bogor, Tangerang, Bekasi Region. *Indonesian Nursing Journal*, 12(1), 21-28.
- Pohan, A., Mahyunidar., & Puspan Sari, S. (2022). Pregnancy Nutrition Knowledge: Chronic Energy Deficiency. *Range: Forthisa Karya*. ISBN: 978-623-98427-4-1.
- RA Rishel, R Armalini. (2022). The Relationship Between Knowledge and Attitude of Pregnant Women About Nutrition and the Incidence of Chronic Energy Deficiency (CED) at Sikapak Health Center, Pariaman City in 2022. *Nan Tongga Health And Nursing* 17 (2), 82-94, 2022
- Retni, A., Puluhuwala, N. (2021). The Influence of Pregnant Women's Knowledge on the Incidence of Chronic Energy Deficiency in the Working Area of Batudaa Pantai Health Center. *Zaitun Journal*, Muhammadiyah University of Gorontalo
- Rika, Fitri Diningsih., P, Wiratmo., Lubis, Erika. (2021). The Relationship Between the Level of Knowledge About Nutrition and the Incidence of Chronic Energy Deficiency (CED) in Pregnant Women. *Binawan Student Journal* (2021) 3(3) 8-15
- Somoyani, Ni Ketut. (2018). Literature Review: Complementary Therapy to Reduce Nausea and Vomiting During Pregnancy. *Journal of Midwifery: The Journal of Midwifery*; Vol. 8 No. 1 Year 2018
- Syahfitri, E. R. (2020). The Relationship Between Nutritional Knowledge and Eating Habits with the Incidence of Anemia in Adolescent Girls at Elmode Management Model Agency, Medan City.
- Syakur R, Usman J, Dewi NI. (2020). Factors Associated with the Incidence of Chronic Energy Deficiency (CED) in Pregnant Women in the Working Area of Maccini Sombala Health Center, Makassar. *Community Health Journal* 1(2): 51-9.