

Preconceptional Nutrition Knowledge Relationship and Energy Consumption Level with CED in Class XI of IPIEMS High School Surabaya

Azzizah Rahmawati Putri¹, Nur Hatijah², Inne Soesanti³, Nurul Hindaryani⁴

^{1,2,3,4}Department of Nutrition, Politeknik Kesehatan Kemenkes Surabaya, Surabaya, Indonesia

Email: enha@poltekkesdepkes-sby.ac.id

ARTICLE INFO

Article History:

Received August, 15th, 2023

Accepted November, 13th, 2023

Published online November, 30th, 2023

Keywords:

CED;

Knowledge of Preconception Nutrition;

Level of Energy Consumption;

Women of Reproductive Age;

ABSTRACT

Chronic Energy Deficiency (CED) is a state of imbalance in energy and protein intake that lasts for a long time. One of the influencing factors is preconception nutritional knowledge and the level of energy consumption. The purpose of the study was to determine the relationship between preconception nutrition knowledge and the level of energy consumption with the incidence of CED in class XI SMA IPIEMS Surabaya. Research method, using analytical survey design with cross sectional. The sample of this study was 50 female students. The results of the study, the majority of female students were 17 years old and experienced CED. Have a deficient level of preconception nutritional knowledge and a severe deficit energy consumption level. There is a relationship between preconception nutrition knowledge with CED incidence ($p = 0.005$) and energy consumption level with CED incidence ($p = 0.008$) in class XI SMA IPIEMS Surabaya. The conclusion of this study is that there is a relationship between preconception nutrition knowledge, the level of energy consumption with the incidence of CED in class XI students of IPIEMS Surabaya High School, efforts that must be made are given counseling on proper nutrition from an early age to increase knowledge.

INTRODUCTION

Women of childbearing age and adolescents aged 15 - 49 years are the range of reproductive age groups who are at risk of suffering from Chronic Energy Deficiency (CED).¹ Based on the reproductive age range, namely 15-49 years for women, the age category included in puberty is 12 - 21 years, at the adult level is generally defined as early adulthood (21-35 years), middle adulthood (36-45 years), and late adulthood (46-65 years).² CED is a condition when a woman is 15 years old. -49 years old experienced an imbalance in nutritional intake, especially in macronutrients, namely energy and protein, which occurred for years specifically in women of childbearing age. Women of childbearing age should maintain and care for their personal hygiene, especially their reproductive organs, to avoid various reproductive disorders.³ The risk of CED in women of childbearing age is carried out by measuring the Upper Arm Circumference. The Upper Arm Circumference women of childbearing age measurement limit for CED risk is 23.5 cm.

According to information data from Basic Health Research, 2018, it was found that the proportion of CED at the national level among non-pregnant women of childbearing age was 14.5% and among pregnant women was 17.3%. At the East Java level, the proportion of CED among non-pregnant women of childbearing age is 13.88% and among pregnant women it is 19.59%. The

prevalence of CED in Surabaya City among non-pregnant women of childbearing age is 11.99% and among pregnant women is 33.21%.⁴

This high number of cases can occur due to 2 causes, namely direct and indirect causes. Direct causes such as the level of consumption of food intake which is still not properly balanced with heavy physical activity. The level of consumption is the composition of the types and total quantities of food consumed in a particular community group. To see food consumption, you will need good standards to recommend. Instead, a method that can be used to measure an individual's level of food consumption or nutrient intake is through the 24-hour Food Recall method.

Apart from that, there are indirect causes such as preconception nutritional knowledge, economic level, body image and social culture. Preconception nutritional knowledge is knowledge about balanced nutritional status related to food and the nutrients contained therein which are needed during the preconception period or the period before marriage in women of childbearing age in order to prepare for a healthy and quality generation. If an individual's nutritional knowledge is high, the greater the responsibility of women of childbearing age in handling the family regarding the type, quantity and frequency of appropriate food ingredients.⁵ According to WHO in 2018 in Rima et al's research, the aim of preconception health services is to ensure that mothers and children are always in good health and function to prevent and reduce the risk of mortality and morbidity in mothers and children.⁶

Based on data obtained from a preliminary study of 27 female students, the results showed that 18 female students (66.6%) experienced CED with the upper arm circumference measurement results obtained < 23.5cm and after interviews with several female students it was also found that there were other problematic factors, namely regarding preconception nutritional knowledge. which is less driven by economic factors that make these female students have to work and then enter marriage.

From this data, it can be seen that the increase in cases of CED in women of childbearing age is still a health problem to this day, one of which is caused by a lack of knowledge of preconception nutrition or the period before pregnancy, and low levels of consumption, especially energy, therefore, this researcher wants to do more in-depth research with chose the title "The Relationship between Preconception Nutritional Knowledge and Energy Consumption Levels with the Occurrence of CED in Women of Childbearing Age Class XI SMA IPIEMS Surabaya.

MATERIALS AND METHODS

This type of research is analytical observational, where this type of research uses direct measurements on respondents to analyze the variables studied. This research uses a cross sectional approach, where this approach is used to collect variable data on preconception nutritional knowledge, energy consumption levels, and SEZ status taken at one time. This research starts from

preparing proposals to preparing a report, namely October 2022 - June 2023. This research was carried out at IPIEMS Surabaya High School in December 2022 with a population of class XI female students, and a sample calculation of 50 female students was carried out using a simple random sampling technique.

This research data collection technique consists of primary and secondary data. Respondent identity information, the upper arm circumference measurements, nutrition and CED knowledge questionnaires, as well as respondents' energy consumption levels are all part of primary data. The data related to the number of female students is part of secondary data.

Before collecting data, the researcher introduces himself and explains the aims and procedures of the research, then asks whether he is willing to be a respondent or not. If the respondent is willing, they are asked to fill out an informed consent form to become a research respondent, then the researcher will carry out the upper arm circumference measurements and interviews related to the preconception nutritional knowledge questionnaire and 2x24 hour food recall to determine the level of energy consumption. The collected data will be processed for statistical data analysis, starting from editing, coding, data entry, tabulating and deleting. The data analysis technique uses the Spearman's rho correlation test with a significance value of <0.05 .

RESULTS

The research results include the characteristics of respondents age, preconception nutritional knowledge, level of energy consumption, and incidence of CED as follows:

Table 1 Age Frequency Distribution of Class XI Female Students at SMA IPIEMS Surabaya in 2022

Age	Amount (n)	Percentage (%)
16	12	24
17	36	72
18	1	2
19	1	2
Total	50	100

Source: Primary Data, 2022

The table above proves that the majority of class XI students at SMA IPIEMS Surabaya are 17 years old, 36 female students (72%).

Table 2 Frequency Distribution of Preconception Nutrition Knowledge of Class XI Female Students at IPIEMS High School Surabaya in 2022

Preconception Nutrition Knowledge	Amount (n)	Percentage (%)
Good	4	8
Enough	12	24
Less	34	68
Total	50	100

Source: Primary Data, 2022

The table above proves that most of the consumption levels are in the low category with the number of respondents being 34 female students (68%) in class XI SMA IPIEMS Surabaya.

Table 3 Frequency Distribution of Energy Consumption Levels for Class XI Female Students at IPIEMS High School Surabaya in 2022

Energy Consumption Levels	Amount (n)	Percentage (%)
Severe level deficit	38	76
Moderate level deficit	10	20
Mild level deficit	2	4
Total	50	100

Source: Primary Data, 2022

The table above proves that the majority are in the severe level deficit category with the number of respondents being 38 female students (76%).

Table 4 Frequency Distribution of Chronic Energy Deficiency (CED) for Class XI Female Students at IPIEMS High School Surabaya in 2022

Status CED	Amount (n)	Percentage (%)
Non CED	14	28
CED	36	72
Total	50	100

Source: Primary Data, 2022

The table above shows that there are 14 female students with non-CED status (28%) while there are 36 female students with CED status (72%).

Table 5 Cross Tabulation of Preconception Nutrition Knowledge with the Occurrence of CED in Class XI Students of IPIEMS High School Surabaya in 2022

Preconception Nutrition Knowledge	Kejadian CED				Total		Sig. (2-tailed)
	Non CED		CED		n	%	
	n	%	n	%			
Good	1	25	3	75	4	100	0.005
Enough	8	66.7	4	33.3	12	100	
Less	5	14.7	29	85.3	34	100	
Total	14	28	36	72	50	100	

Source: Primary Data, 2022

The table above proves that of the 50 respondents, 29 respondents (85.3%) lacked knowledge and experienced SEZ. There were 8 respondents (66.7%) who had sufficient knowledge and did not experience CED. And 3 respondents (75%) had good knowledge and experienced CED. Spearman's rho test shows significance, namely 0.005. This indicates that there is a correlation between preconception nutritional knowledge and the occurrence of CED, with a significance value of <0.05 in class XI students at SMA IPIEMS Surabaya.

Table 6 Cross Tabulation of Energy Consumption Levels with CED Incidents for Class XI Female Students at IPIEMS High School Surabaya in 2022

Tingkat Konsumsi Energi	Kejadian CED				Total		Sig. (2-tailed)
	Non CED		CED		n	%	
	n	%	n	%			
Severe level deficit	7	18.4	31	81.6	38	100	0.008
Moderate level deficit	6	60	4	40	10	100	
Mild level deficit	1	50	1	50	2	100	
Total	14	28	36	72	50	100	

Source: Primary Data, 2022

The table above shows that of the 50 female students, the level of energy consumption in the severe deficit category and 31 respondents (81.6%) experienced SEZ. At the level of energy consumption in the moderate deficit category and not experiencing SEZ, there are 6 people (60%). And in the level of energy consumption in the mild deficit category, there was no difference between 1 person (50%) between respondents who experienced SEZ or not. Spearman's rho test shows significance, namely 0.008. This indicates that there is a correlation between the level of energy consumption and CED events, with a significance value of <0.05 in class XI students at SMA IPIEMS Surabaya.

DISCUSSION

According to the results of research carried out at SMA IPIEMS Surabaya, the majority of class in research that has been conducted, quite a few respondents asked about ideal body shape. Some of them want to have a body shape that they think is ideal like public figures or their idols. In line with their desire to achieve an ideal body weight, respondents reduce food consumption and follow diets that are currently trending. Thus, the preconception period is the main preparation period to prevent future nutritional problems that could affect future generations.⁷

The description of body image is an individual's psychological description of the shape and dimensions of a person's body, the way the individual views and evaluates thoughts and perceptions of body size and shape.⁸ This is also comparable to research researched by Mirniatun, Afifah and Kamala in 2018 which stated that efforts To reduce weight is done because of negative perceptions of appearance such as a lack of self-confidence in the body that meets society's ideal beauty standards. Meanwhile, women who already have a positive perception of their appearance will feel comfortable or not consider it a problem with their body condition because they already have a level of self-confidence.⁹

Preconception Nutritional Knowledge

According to the results of research carried out at SMA IPIEMS Surabaya, class There are 4 female students with good knowledge and 12 female students with sufficient knowledge. Based on the results of interviews with the instrument used, namely a questionnaire, most of the respondents had received a lot of information about nutrition in general. This information was obtained from various media sources, including social media, magazines and television as well as outreach. However, the majority of female students still do not understand about balanced nutrition, especially in women of childbearing age during the preconception period.

In research by Augustine and Sulandjari (2021), women who are healthy and have normal nutritional status during the preconception period tend to have optimal health before pregnancy, become pregnant and later give birth to babies in healthy conditions.¹⁰ Half of human knowledge comes from sight and hearing. Knowledge or cognition dominates in shaping individual behavior.¹¹

This is comparable to research conducted by Paratmanitya et al. (2021) with the aim of identifying nutritional readiness before conception of women of childbearing age in Indonesia using one indicator used to evaluate preconception nutritional knowledge and it was found that the majority of respondents aged 17-35 years had less knowledge regarding preconception nutrition.¹²

Level of Energy Consumption

According to the results of research carried out at SMA IPIEMS Surabaya, class XI female students had the highest frequency of energy consumption in the severe deficit category with a total of 38 female students. A total of 10 female students were in the moderate level deficit category and 2 female students were in the mild level deficit category. Based on the results of interviews using the 2x24 hour food recall method, most respondents were in the deficit category, this is because the food consumed by respondents was still below PGS and less than the AKG standard according to age recommended by the Ministry of Health.

Nutrients are the result of the decomposition of food that is digested in the intestine and then distributed to other parts of the body.¹³ Lack of energy intake can result in an energy imbalance. Energy imbalance that continues to occur will cause nutritional problems. Women who don't get enough energy can disrupt brain function and structural development, and cause delayed cognitive development. Energy also plays a role in physical activity, which functions to support the body's growth and metabolism processes.¹⁴

The results of research by Nilfar Ruaida (2017) state that women of childbearing age, especially teenage girls, have eating habits that do not meet the Balanced Nutrition Guidelines (PGS), namely not consuming food with frequency of 3 times per day and average portion sizes for food groups such as rice, animal side dishes, vegetable side dishes, vegetables and fruit which are still below

PGS. This can also be seen from irregular eating habits, such as rarely eating breakfast.¹⁵ Sufficient food for women of childbearing age is food that is consumed regularly every day and can meet the body's nutritional needs in quantity and quality.¹⁶ Therefore, the balance between substances macro and micro nutrients in women of childbearing age during the preconception period are very important for the development and growth of the next generation of fetuses.¹⁷

Chronic Energy Deficiency (CED)

According to the results of research carried out at SMA IPIEMS Surabaya, the majority of reproductive age students, namely class the occurrence of CED can be seen from the the upper arm circumference size < 23.5 cm, using a measuring tape. From research conducted at SMA IPIEMS Surabaya, it can be seen that before this research was carried out, respondents or female students had never previously had the upper arm circumference measurements to determine the incidence of CED and the results of the the upper arm circumference measurements that had been carried out found that more than 50% of female students experienced CED. In line with the theory presented by Hardiansyah and Supariasa in their book, the the upper arm circumference status of women of childbearing age, especially those of reproductive age, namely among teenagers, is also related to the level of sexual maturity, because arm circumference indicates the availability of fat and muscle nutrition.¹⁸

Women of childbearing age often experience CED. Women of childbearing age is someone who is in the maturity phase of a reproductive system that is already operating well, aged 15 – 49 years, such as women who are pregnant, women who are not pregnant, mothers who have just given birth, pregnant women, teenage girls, and women who are working. CED can also refer to a person's nutritional condition worsening due to lack of energy intake and inadequate protein intake.¹⁹ The intake of nutrients that the body needs to obtain the energy needed to carry out daily physical activities is related to the food consumed.²⁰

One method to solve this problem is by providing additional food in the form of biscuits to be distributed to all women of childbearing age and pregnant women, providing iron tablets or blood supplements to prevent anemia, as well as holding outreach programs on reproductive health issues, preparation before pregnancy, childbirth, postpartum. postpartum, and family planning (KB) in women of childbearing age.²¹

Relationship between Preconception Nutritional Knowledge and Chronic Energy Deficiency (CED)

According to the results of research that has been carried out, it can be seen that class Meanwhile, those who have good knowledge and experience CED are 75%. And the statistical test

results obtained by Spearman's rho $p = 0.005$ (pvalue <0.05) prove that there is a significant correlation between the level of preconception nutritional knowledge and the incidence of CED in class XI female students at SMA IPIEMS Surabaya.

The results of the research that has been carried out show that respondents have less knowledge and experience CED because the majority of respondents stated that they still received little material about balanced nutrition, especially during the preconception period which was associated with the incidence of CED. Meanwhile, respondents with good knowledge still experience CED because they have not implemented daily eating habits or behavior because they want to have a body shape that they think is ideal, like that of a public figure or their idol. In line with their desire to achieve an ideal body weight, respondents reduce food consumption and follow diets that are currently trending.

Experts (Notoatmodjo, 2018) stated that each individual's understanding or knowledge will be different depending on how they perceive through the five senses the object or thing.²² In comparison with the research of Masluroh and Suherlan (2023), results were also obtained, namely the existence of a relationship or correlation between knowledge of preconception women of childbearing age and the incidence of CED and states that preconception women of childbearing age who have less knowledge have a very high risk of experiencing CED, where a person's nutritional knowledge will also influence their attitudes and behavior when choosing food so that it will affect the person's nutrition. If individuals know more deeply about nutritional knowledge, the better their nutritional status will be.²³

In the opinion of researcher Stephanie, CED is influenced by lack of knowledge about preconception nutrition and health, this will also affect the level of food consumption, especially energy nutrients.²⁴

Relationship between Energy Consumption Level and Chronic Energy Deficiency (CED)

Based on research that has been carried out, class Meanwhile, with the level of energy consumption in the mild deficit category, there is no difference between CED and non-SEZ respondents at 50%. And the statistical test results obtained by Spearman's rho $p = 0.008$ (pvalue <0.05) prove that there is a significant relationship or correlation between the level of energy consumption and the incidence of CED in class XI female students at SMA IPIEMS Surabaya.

According to the results of research that has been carried out, the majority of respondents have food intake that is still less than the Balanced Nutrition Guidelines (PGS) and below the AKG standards according to age recommended by the Ministry of Health, this is also due to busyness,

pressure from the environment related to body image, and along with their desire to achieve ideal body weight, respondents reduced food consumption.

According to PGS, to fulfill the AKG, the 16–18-year age group should consume 5 portions of rice or its substitutes a day, 3 portions of animal and vegetable side dishes a day, 3 portions of vegetables a day and 4 portions of fruit a day. The eating habits of female respondents of childbearing age show that they still do not meet the Balanced Nutrition Guidelines (PGS) so that the Nutritional Adequacy Rate (AKG).²⁵

Comparable to the research results of Nilfar Ruaida (2017), there is a relationship between the level of energy consumption and the incidence of CED in women of childbearing age and states that women of childbearing age, especially women, have eating habits that do not meet the PGS, namely not consuming food with a frequency of 3 times a day and food portions. The average for food groups, namely rice, animal side dishes, vegetable side dishes, and vegetables and fruit, is still below PGS. This can also be seen from irregular eating habits, such as rarely eating breakfast.¹⁵

CONCLUSION

The results of research carried out on class the level of energy consumption in the category of severe deficit, and there is a significant relationship between preconception nutritional knowledge and the level of energy consumption and the incidence of CED in women of childbearing age class XI SMA IPIEMS Surabaya. The suggestion that the researcher wants to convey is that students at SMA IPIEMS Surabaya should increase their knowledge regarding nutritional problems, especially CED issues, which can be obtained from several media sources. At educational institutions, namely SMA IPIEMS Surabaya, they can collaborate with local health centers to provide nutritional counselling.

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