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Energy Intake, Macro Nutrition and Nutritional Status of Preeclampsia Patients in The RSIA Siti Fatimah, Makassar

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ABSTRACT

Preeclampsia until now is still a health problem that can not be solved completely. Statistical data in developed countries show that 10-30% of all maternal deaths are caused by preeclampsia. Preeclampsia is one of the three major causes of maternal death in addition to bleeding and infection. Nutritional intake is an indicator to see the nutritional adequacy and upper arm circumference of pregnant women is one tool to assess the nutritional status, so it can be known complications during pregnancy. This study aims to determine how the relationship of energy intake and macro nutrition and nutritional status with the incidence of preeclampsia in the RSIA Siti Fatimah Makassar. The type of this research was a cross-sectional study. Data collection was done by interview using a questionnaire with sample size of 34 people. The result of the research using statistical analysis of Chi-square test showed that energy intake, protein intake, fat intake, and carbohydrate intake as well as nutritional status were obtained by p-values of 0.584, 0.611, 0.416, 0.649 and 0.547 means that there was no relationship between energy intake and macro nutrition and nutritional status in patients preeclampsia in the RSIA Siti Fatimah Makassar. It is expected that the respondent health officer can increase the frequency of counseling both personally and group-related factors that can influence the occurrence of preeclampsia.

Keywords: Intake of energy, Macronutrient, Nutritional status, Preeclampsia

INTRODUCTION

Background

According to the 2014 World Health Organization (WHO) data, around 800 women die every day due to pregnancy complications and the birth process. Around 99% of all maternal deaths occur in developing countries. Around 80% of maternal deaths are the result of increased complications during pregnancy, childbirth and after childbirth. While in Indonesia, around 18,000 women die each year due to pregnancy and childbirth complications(1).

The maternal mortality rate (MMR) in the world in 1990 was 400 per 100,000 live births, down to 260 in 2008. The highest rate was in Sub-Saharan Africa (64.0%), followed by South Asia (29.0%), compared to Latin America and the Caribbean (85%), North America (23%) and in Europe (10%). In Southeast Asia, the highest MMR were Lao PDR (58.0%), Timor Leste (37.0%) and Cambodia (29.0%), and countries with relatively low maternal mortality, Malaysia (31%), Brunei Darussalam (21%) and (9%) Singapore(2).

Based on data obtained from the World Health Organization states that cases of maternal death caused by preeclampsia for developing countries were 16.1%, whereas in Indonesia it was 33%(3). The main causes of maternal death can be divided into 4 (four) groups, namely, direct, unpredictable, and the cause is unknown, the most common direct causes of maternal death in Indonesia are preeclampsia/eclampsia about 24%, bleeding 28%, and infections 11%(4).

Based on research conducted by Manuaba, in Indonesia, pre-eclampsia/eclampsia is still one of the causes of maternal death, which ranges from 1.5% to 25%, while infant mortality is between 45% to 50%(5). In contrast to the research conducted by Betty and Yanti, the maternal mortality rate due to preeclampsia in Indonesia is quite high, between 9.8% to 25%(6).

Meanwhile, based on data from the South Sulawesi Provincial Health Office the number of maternal deaths in 2015 was 175 people with the cause of bleeding as many as 91 people (62%), preeclampsia 30 people (30.7%), infections 7 people (5.7%), and others 33 people (14.9%)[7].

Data obtained from the Medical Record at the RSIA Siti Fatimah Makassar in 2009 as many as 71 preeclampsia events out of 205 pregnant women who examined their pregnancy, in 2011 the number of preeclampsia cases was 120, then in 2013 there were 146 visits of pregnant women with cases preeclampsia 76, in 2014 the number of preeclampsia cases was 78 cases, while in 2015 the number of preeclampsia cases was 81 cases, and in 2016 it increased to 112 cases of preeclampsia.

Study of nutrient intake is associated with the incidence of preeclampsia. A cohort study in pregnant women using FFQ found maternally with a diet high in vegetables, vegetable foods, and vegetable oils had a reduced risk of preeclampsia, while a high consumption pattern of processed meat, high salt foods, and soft drinks increased the risk of preeclampsia[8].

To meet the MDG's target of reducing maternal mortality, hard work is needed so there is a need to anticipate the risk factors that can cause pre-eclampsia in mothers.

METHODS

This type of research was explanatory research, using cross-sectional design. Data from independent variables (energy intake, macronutrient intake and nutritional status) and dependent variable (incidence of preeclampsia) were taken one time and the sample in this study was preeclampsia pregnant women at the RSIA (hospital) "Siti Fatimah", Makassar, Indonesia. Data collection was done in two ways, namely primary data and secondary data. The primary data were collected through interviews and direct measurements (respondent characteristic, energy intake and macronutrient intake and nutritional status, anthropometry and 24-hour recall forms). The secondary data were collected from documents such as the research location or geographic data and the incidence of preeclampsia.

The steps of data processing were:

1. Editing
   The editing process was done after the data was collected and done by checking the completeness of the data, checking the continuity of data and uniformity of data
2. Coding
   All the results obtained were simplified by giving certain symbols to each criterion.
3. Data entry
   The data input sequence was based on the respondent's name in the questionnaire.
4. Data presentation
   The categorical data were presented in the form of frequency and percentage.[9]
5. Data analysis
   Data were analyzed using Chi-square test

RESULTS

All of the respondents were females as a housewife which become the sample for this research. The response rate was 100%.

Characteristics of Respondents

Table 1. Distribution of age

Age	Frequency	Percentage
< 20 tahun	2	5.9
20 - 35 tahun	21	61.6
> 35 tahun	11	32.5
Total	34	100

Based on table 1, it was known that the age group of preeclampsia patients in the RSIA Siti Fatimah Makassar, the highest number was in the age group of 20 - 35 years, namely 21 people (61.6%).

Tabel 2. Distribution of education levels

Education	Frequency	Percentage
Uncompleted in elementary school	1	2.9
Elementary school	9	26.5
Junior high school	12	35.3
Senior high school	11	32.4
Diploma/bachelor	1	2.9
Total	34	100

Based on table 2, it was known that the level of education of preeclampsia patients in the RSIA Siti Fatimah Makassar was mostly junior high school or equivalent, which is 12 people (35.3%).

Tabel 3. Distribution of period of maternal pregnancy

Gestational Age	Frequency	Percentage
Trimester 2	3	8.8
Trimester 3	31	91.2
Total	34	100

Based on table 3, it was known that the gestational age group of preeclampsia patients at the RSIA Siti Fatimah Makassar, the highest number was in the third trimester of pregnancy, namely 31 people (91.2%).

Tabel 4. Distribution of preeclampsia incidence

Preeclampsia	Frequency	Percentage
Mild	28	82.4
Severe	6	17.6
Total	34	100

Based on the results of this study it was known that the data of mild preeclampsia were 28 people (82.4%) and severe preeclampsia were 6 people (17.6%).

Tabel 5. Distribution of energy intake

Energy Intake	Frequency	Percentage
Good	13	38.3
Poor	21	61.7
Total	34	100

Based on the results of this study it was known that the energy intake of preeclampsia patients in the RSIA Siti Fatimah Makassar, in general, was less as many as 21 people (61.7%).

Tabel 6. Distribution of macronutrient intake

Intake	Frequency	Percentage
Protein		
Well	12	35.3
Less	22	64.7
Fat		
Well	16	47
Less	18	53
Carbohydrate		
Well	10	29.4
Less	24	70.6

Based on the results of this study, it was known that the intake of macronutrients in preeclampsia patients at the RSIA Siti Fatimah Makassar was generally lacking, including 22 proteins (64.7%), 18 fat (53%), and 24 carbohydrates people (70.6%).

Tabel 7. Distribution of nutritional status

Nutritional status	Frequency	Percentage
Well	31	91.2
Less	3	8.8
Total	34	100

Based on the results of this study, it was known that the nutritional status of preeclampsia patients in the RSIA Siti Fatimah Makassar was generally good as many as 31 people (91.2%).

Energy Intake and Incidence of Preeclampsia

Tabel 8. Relationship between energy intake and incidence of preeclampsia

Energy intake	Preeclampsia				Total		p-value
	Mild		Severe				
	f	%	f	%	n	%	
Well	11	39.2	2	33.3	13	38.2	
Less	17	60.8	4	66.7	21	61.8	0.584
Total	28	100	6	100	34	100	

Based on the results of this study it was found that there was no relationship between energy intake in preeclampsia patients in the RSIA Siti Fatimah Makassar (p = 0.584).

Macronutrient Intake and Incidence of Preeclampsia

Tabel 9. Relationship between macronutrient intake and incidence of preeclampsia

Macronutrient intake	Preeclampsia				n	Percentage	p-value
	Mild		Severe				
	f	%	f	%			
Protein							
Well	13	46.4	3	50	16	47	0.611
Less	15	53.6	3	50	18	53	
Fat							
Well	9	32.1	1	16.6	10	29.4	0.416
Less	19	67.9	5	83.4	24	70.6	
Carbohydrate							
Well	10	35.7	2	33.3	12	35.2	0.649
Less	18	64.3	4	66.7	22	64.8	

Based on the results of this study it was found that there was no relationship between the intake of macronutrients in preeclampsia patients in the RSIA Siti Fatimah Makassar, each protein (p = 0.611), fat (p = 0.416), and carbohydrates (p = 0.649).

Nutritional Status and Incidence of Preeclampsia

Tabel 10. Relationship between nutritional status and incidence of preeclampsia

Nutritional status	Preeclampsia				Total		p-value
	Mild		Severe				
	f	%	f	%	n	%	
Well	25	89	6	100	31	91	0.547
Less	3	11	0	0	3	9	
Total	28	100	6	100	34	100	

Based on the results of this study it was found that there was no relationship between nutritional status in preeclampsia patients the RSIA Siti Fatimah Makassar (p = 0.547).

DISCUSSION

Energy Intake and Incidence of Preeclampsia

Preeclampsia is hypertension that arises after 20 weeks of pregnancy accompanied by proteinuria. Clinical symptoms of preeclampsia can be divided into mild preeclampsia and severe preeclampsia. The division of preeclampsia becomes mild and severe does not mean there are two clearly distinct diseases. Formerly called preeclampsia when there are trials of clinical signs, namely: blood pressure ≥140 / 90 mmHg, proteinuria, and edema. Now edema is no longer included in the diagnostic criteria because edema is also found in normal pregnancy.

The results showed that the relationship of energy intake in preeclampsia patients was obtained that the lack of energy intake was still relatively high for mild preeclampsia by 60.8% and severe preeclampsia by 66.7%, whereas good energy intake for mild preeclampsia was only 39.2% and for severe preeclampsia is only 33.3%, the lack of energy intake is caused because preeclampsia patients are given a low salt diet thereby reducing food taste and reducing the patient's appetite. Based on statistical tests, there is no meaningful relationship between energy intake in preeclampsia patients with a p-value of 0.584. The results of this study are not in line with research conducted by Nuryani in 2013 which showed the result that the percentage of energy intake was less in the case group with p-value of 0.001[(8)].

Theoretically, it is known that energy intake in individuals is a limitation to the fulfillment of other nutritional needs. This means that if energy intake is met then all other macronutrients will usually also be met[(10)].

The energy density of food will determine the amount of energy consumed by a person. The energy density of foodstuffs is determined by the type of food, the amount and frequency of food in the last 24 hours.

This study is in accordance with previous studies conducted by Clausen et al. (2001) in Norway who found that energy intake > 3350 kcal/day had a 3.7 times risk of experiencing preeclampsia[(11)].

Macronutrient Intake and Incidence of Preeclampsia

The results of research on the relationship of protein with the incidence of preeclampsia obtained that the intake of protein that is still lacking is still relatively high for mild preeclampsia of 53.6% and those with severe preeclampsia by 50%, whereas good protein intake for mild preeclampsia is only 46.6% and for severe preeclampsia is only 50%. Based on statistical tests, there was no significant relationship between protein intake in preeclampsia patients with a p-value of 0.611.

The results of research on the relationship of fat in preeclampsia patients obtained that the intake of less fat is still relatively high for mild preeclampsia by 67.9% and those for severe preeclampsia by 83.4%, while good fat intake for mild preeclampsia is only 32.1% and for severe preeclampsia was only 16.6%. Based on statistical tests, there was no significant relationship between fat intake in preeclampsia patients with a value of p = 0.416.

The results of research on the relationship of carbohydrates with the incidence of preeclampsia showed that carbohydrate intake was still relatively low for mild preeclampsia of 64.3% and those for severe preeclampsia by 66.7%, whereas good carbohydrate intake for mild preeclampsia was only 35.7% and for severe preeclampsia was only 33.3%. Based on statistical tests, there was no significant relationship between carbohydrate intake with patients with a P-value = 0.649.

The lack of energy intake is due to preeclampsia patients being given a low salt diet thereby reducing food taste and reducing appetite. This study is in line with research conducted by Siti Widyaningrum in 2012 by

showing the results obtained P-value = 0.599, meaning that the level of consumption of macronutrients is proven has no relationship in preeclampsia patients[11].

Macro nutrition as a whole does not have a significant relationship with the incidence of preeclampsia, this is caused because the intake of macronutrients is not a direct factor of preeclampsia because the direct factor of preeclampsia is stress, physical activity, health services (ANC routine pregnant women), gestational age, obesity, disease history, and environmental factors.

Nutritional Status and Incidence of Preeclampsia

The results of research on the relationship of nutritional status in preeclampsia patients showed that the nutritional status that was lacking in mild preeclampsia was only 11% and severe cases were not 0%, while those who had a normal nutritional status for mild preeclampsia were 89%, and those with severe preeclampsia were 100%. Based on statistical tests, there is no significant relationship between nutritional status (MUAC) in preeclampsia patients with a P-value = 0.547.

This study is in line with research conducted by Muhammad Nur Anas in 2013 by showing the results obtained p-value = 0.85, meaning that preeclampsia pregnant women whose size (upper arm circumference) >23.5 were not a major risk factor in the incidence of preeclampsia[12].

The occurrence of hypertension, preeclampsia, gestational diabetes, macrosomia, etc. are some of the complications in pregnancy due to excessive levels of fat in the body. The incidence of preeclampsia/eclampsia will increase in women whose weight gain is above normal during pregnancy, chronic hypertension because the blood vessels of the placenta have been disrupted. Predisposing factors for preeclampsia are obesity, chronic hypertension and family history of preeclampsia/eclampsia. If the mother had previously suffered from hypertension, this situation will aggravate the situation of the mother. Women's health status before and during pregnancy is an important factor influencing the emergence and development of complications. History of hypertension is one of the factors associated with preeclampsia.

CONCLUSION

The average energy intake of preeclampsia mothers who had good intake was only 13 (38.3%), and less 21 (61.7%). The average protein intake of preeclampsized mothers who had good protein intake was only 12 (35.3%), and was lacking 22 (64.7%), fat intake that had good intake 16 (47.0%), and less 18 (53.0%), then good carbohydrate intake 10 (29.4%), and less 24 (70.6%). The nutritional status of preeclampsia mothers who had normal nutritional status was 31 (91.2%), and was lacking 3 (8.8%). There was no relationship between energy intake in preeclampsia patients (p = 0.584). There was no relationship of protein intake with the incidence of preeclampsia (p = 0.611), and there was no relationship of fat intake with the incidence of preeclampsia (p = 0.416), and there was no relationship of carbohydrate intake in preeclampsia patients (p = 0.649). There was no relationship between nutritional status in preeclampsia patients (p = 0.547).

It is recommended for pregnant women to always look after pregnancy by maintaining nutritional status, improving eating patterns by following a hospital diet, consuming nutritious food, adequate rest and exercise.

For other researchers, it should conduct a study with a larger sample design and conduct further research related to the incidence of preeclampsia using other factors that have not been studied such as micronutrients and multiple / twin pregnancies and so on.

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