THE RELATIONSHIP DIET AND NUTRITIONAL STATUS WITH THE MENSTRUAL CYCLE AT THE STUDENTS OF SMAN 13 LUWU

Musdalifah[1]*, Siti Saharia Rowa[1], Nadimin[1]
[1]Nutrition Study Program, Polytechnic of Health Kemenkes Makassar, Indonesia
*Corresponding author email address : musdalifah@poltekkes-mks.ac.id

Abstract
Malnutrition factors arise due to wrong diets such as overeating or eating unbalanced foods. Insufficient nutritional intake, causes menstrual irregularities in most young women. This study aims to determine the relationship between diet and nutritional status with the menstrual cycle in students of SMAN 13 Luwu. This study is an observational study with a Cross-Sectional study design. The sample was 138 students of SMAN 13 Luwu who were selected by simple random sampling. The diet was obtained through interviews using the food frequency questioinaire form. Nutritional status is obtained through weighing weight and measuring height based on Body Mass Index (BMI). The Menstrual Cycle is obtained through an interview using a questionnaire. The results showed that the diet is sufficient as much 39,9%, the diet is less as much 60,1%. Nutritional status is less by 31,2%, good nutritional status is 52,2%, nutritional status is more by 7,2%. A normal menstrual cycle of 78,3%, an abnormal menstrual cycle of 21,7%. The results of statistical tests between dietary variables and nutritional status with the menstrual cycle showed no relationship between diet and menstrual cycle and no relationship between nutritional status and menstrual cycle. Further research suggestions are expected for female students who have a deficient diet to improve their diet, pay attention to the type, amount and frequency of eating. For students who have abnormal nutritional status in order to be able to meet their nutritional intake according to their needs. For researchers, they can further examine the classification of diet less than adequate diet as well as nutritional status to further examine abnormal nutritional status compared to normal nutritional status so that more details can be obtained about the relationship between diet and nutritional status with the menstrual cycle.

Introduction

Adolescence, not only grows taller, but also in the body allows the process of reproduction. This period is called puberty. puberty is characterized by the onset of

menstruation (menarche) (1). Adolescents are a group that is vulnerable to various nutritional problems such as undernutrition and overnutrition. Adolescent nutrition problems need special attention because they affect the growth and development of the body as well as its impact on adult nutrition problems (2). Malnutrition factors arise from eating patterns such as overeating or eating foods that are less balanced. Diet is a variety of information that provides a description of the type of food and frequency of use of food ingredients commonly consumed by a person at a certain time (

Indonesian teenagers today are facing three nutrition-related problems (triple burden of malnutrition), namely undernutrition, overweight, and anemia. The prevalence of anemia among adolescent girls is still high, ranging from 40-88%, with 21.7% in Indonesia. Menstrual blood loss makes adolescent girls vulnerable to anemia, which also puts them at risk of experiencing anemia during pregnancy. Anemia during pregnancy has negative impacts on the growth and development of the fetus and can potentially lead to pregnancy and delivery complications, and even maternal and infant mortality (3).

Factors influencing the nutritional status of adolescents can be divided into two categories: direct and indirect factors. Direct factors include food intake and infectious diseases, while indirect factors include parental income, nutritional knowledge, socioeconomic status, and family size (4). Insufficient nutritional intake leads to irregular menstruation in many adolescent girls (5). Other factors contributing to menstrual cycle disturbances include hormonal imbalances, systemic abnormalities, stress, thyroid gland issues, and excess prolactin hormone (6).

Irregular menstrual cycles refer to menstruation patterns that do not follow a regular cycle. Menstrual cycles are classified into three categories: short cycles (≤25 days), normal cycles (26-34 days), and long cycles (≥35 days). Nutritional status plays a crucial role in menstrual regularity, where at least 22% body fat and a body mass index (BMI) greater than 19 kg/m2 are needed for normal oogenesis cycles. This is because fat cells release estrogen, which helps with ovulation and the menstrual cycle. Changes in women's body weight (increase or decrease) can increase the number of anovulatory women (7).

Materials and Methods

This research is anobservational analytic research with Cross Sectional study design that aims to determine the relationship of diet and nutritional status with menstrual cycle in students of SMAN 13 Luwu which is done by approach, observation, and data collection at one time. This study was conducted at SMAN 13 Luwu, South Larompong District, Luwu Regency, South Sulawesi in November 2022 - March 2023. To obtain sample diet data obtained through interviews using the food frequency quetionaire form to the sample. Nutritional status data can be obtained by weighing body weight using a digital step scale with an accuracy of 00 kg with the GEA Medical scale brand and measuring height using a

microtoice accuracy of 0.1 cm based on Body Mass Index (BMI). Menstrual cycle data can be obtained by interview using a questionnaire. The data analysis used was univariate analysis presented in the form of frequency distribution tables and analyzed descriptively and using bivariate analysis with the Chi square test using the Statistical Product for Service Solution (SPSS) 16.0 for Window program.

Results

Table 1 shows that the majority of respondents have an insufficient eating pattern, totaling 83 individuals (60,1%). Eating patterns are behaviors that impact an individual's nutritional status, where the quantity and quality of food or drinks significantly influence individual and community health levels. The research results indicate that the majority of respondents (AKG) have an insufficient eating pattern, with 29 respondents having an AKG value of less than 80%.

Table-1. Frequency and Percentage Distribution of Eating Patterns

Eating Patterns	n	%
Less	83	60.1%
Enough	55	29.7%
Total	**138**	**100%**

Table 2 shows that most of the respondents had normal nutritional status with 85 respondents (61.6%). According to the research conducted, it was found that food intake, such as energy intake, protein intake, and carbohydrate intake, was also one of the causes of nutritional improvement.

Table-2. Frequency and Percentage Distribution of Nutritional Status

Nutritional Status	n	%
Underweight	43	31.2%
Normal	85	61.6%
Overweight	10	7.2%
Total	**138**	**100%**

Table 3 shows that the majority of the SMAN 13 Luwu samples have a deficient eating pattern, amounting to 83 people, with a normal menstrual cycle accounting for 79.5% and an abnormal menstrual cycle accounting for 20.5%. The research results indicate a p-value of 0.660, which means there is no significant relationship between eating patterns and menstrual cycles in the samples from SMAN 13 Luwu.

Table-3. The relationship between eating patterns and menstrual cycles.

Variable	Menstrual Cycle				Total		P-Value
	Regular		Irregular				
	n	%	n	%	n	%	
Eating Patterns							
Less	42	76.4%	13	23.6%	55	100%	**0.011**
Enough	66	79.5%	17	20.5%	83	100%	
Total	**108**	**78.3%**	**30**	**21.7%**	**138**	**100%**	

Table 4 shows the SMAN 13 Luwu samples with a normal nutritional status, amounting to 85 individuals, with a normal menstrual cycle accounting for 82% and an abnormal menstrual cycle accounting for 18%. The research results indicate a p-value of 0.333, which means there is no significant relationship between nutritional status and menstrual cycles in the samples from SMAN 13 Luwu.

Table-4. Relationship between nutritional status and menstrual cycle

Variable	Menstrual Cycle				Total		P-Value
	Regular		Irregular				
	n	%	n	%	n	%	
Nutritional Status							
Underweight	31	72	12	28	43	100%	
Normal	70	82	15	18	85	100%	**0.333**
Overweight	7	70	3	30	10	100%	
Total	**108**	**78.3%**	**30**	**21.7%**	**138**	**100%**	

DISCUSSION

Relationship between diet and menstrual cycle

The results of research on the relationship between diet and menstrual cycle among female students of SMAN 13 Luwu as shown in Table 6 showed that there was no significant relationship between diet and menstrual cycle among female students of SMAN 13 Luwu. In line with the research conducted by Ayu (2017) at SMAN 51 East Jakarta showed no relationship between diet and menstrual cycle. This is because the diet of students of SMAN 13 Luwu is mostly adequate and students consume a lot of nutrients sourced from calcium, high fiber and iron. So that it can meet the needs of intake and nutrition well so that it affects the balance of the work of estrogen and progesterone hormones in the body of these students. These two hormones play a role in the formation of the mucous membrane of the uterus which will fall out every time menstruation.

The menstrual cycle of women is easily influenced by the circumstances of their lives, such as factors like fatigue, high levels of stress, emotional states, lack of exercise, certain health risks, and an unhealthy or improper diet. An improper diet can lead to disrupted levels of estrogen and progesterone, which are essential for the menstrual cycle. Consuming unhealthy foods can affect the production of these hormones. When hormone production is disrupted, it can hinder menstruation (11).

Relationship nutritional status and menstrual cycle

There is no significant relationship between nutritional status and the menstrual cycle of female students at SMAN 13 Luwu. This is consistent with a study conducted by Magfirah (2021) that showed no correlation. Both malnutrition and overnutrition in women can lead to a decline in hypothalamus function, which fails to stimulate the pituitary gland to produce FSH and LH. FSH stimulates the production and growth of egg cells, while LH is involved in egg cell maturation or ovulation. If an egg cell remains unfertilized, menstruation occurs. Thus, disturbances in FSH and LH production can disrupt the menstrual cycle. In relation to menstruation, the number of anovulatory women may increase if there are changes in body weight (either an increase or decrease) (8).

Nutritional status refers to the body's received nutrient intake. Nutritional deficiencies in female students can lead to disturbances in ovulation cycles, potentially resulting in fertility problems. Additionally, insufficient nutrition can impact sexual maturation, overall growth, organ function, and may lead to reproductive dysfunction. Disruptions in reproductive function manifest in menstrual irregularities(9). Nutritional status and eating patterns significantly influence growth and organ functions, ultimately affecting reproductive function and potentially leading to menstrual cycle disturbances. Normal body growth requires adequate nutrition, including sufficient energy, protein, fat, and the availability of all essential nutrients as the basis for overall body growth(10). There are other factors that also influence the menstrual cycle, such as stress, systemic disorders, hormone imbalances, thyroid gland issues, and excessive prolactin hormone. It is possible that a menstrual cycle's normal or abnormal occurrence is not solely determined or influenced by one factor but rather by various uncontrollable factors within this study.

Conclusion

The eating patterns of female students at SMAN 13 Luwu are mostly categorized as insufficient. The nutritional status is mostly categorized as good. The menstrual cycles of female students are considered normal. There is no relationship between eating patterns, nutritional status and menstrual cycles among female students at SMAN 13 Luwu.

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