

# COMPARISON OF THE MENSTRUAL CYCLE IN UNDERNOTED AND OVER NUTRITED ADOLESCENTS AT SMA NEGERI 1 PINOLOSIAN

Della Fatimi Modeong<sup>1)</sup>, Niluh Arwati<sup>2)</sup>, and Sunarto Kadir<sup>3)</sup>

<sup>1,2)</sup> Bina Mandiri University of Gorontalo

<sup>3)</sup> State University of Gorontalo

E-mail: [dellamodeong@gmail.com](mailto:dellamodeong@gmail.com)

## ABSTRACT

This study aims to determine the comparison of menstrual cycles in undernourished and overweight adolescents at SMA Negeri 1 Pinolosian. This research method uses an observational research design *with* a *cross-sectional approach*. The population of this study was 128 female students. The sample used was 95 respondents using a *purposive sampling technique*. Using data analysis techniques, namely Univariate analysis with frequency distribution tables and Bivariate with *Chi-Square test*  $P = <0.05$ .

The results showed that there were 46 (36%) undernutrition and 49 (38.2%) over nutrition. Normal menstrual cycles for undernourishment 31 (63.3%) and for over nutrition 26 (56.6%), while undernourished those with abnormal menstrual cycles 18 (36.8%) and over nutrition 20 (43.3%). A good diet with poor nutrition 27 (58.7%), and not good 19 (41.3%). While a good diet on excess nutrition 25 (51%) and not good 24 (49%). And the results of the *Chi Square* test of normal and abnormal menstrual cycles in undernourished and overweight adolescents with a *P value = 0.00*

There is a comparison of the menstrual cycle in undernourished and overweight adolescents. It is recommended for female students to pay attention to diet properly in order to get good nutritional status so that it can also have a good impact on the menstrual cycle.

**Keywords:** Menstruation, Adolescence, Undernutrition, Overnutrition

## INTRODUCTION

Menstruation is a natural process that occurs in women. Menstruation is regular bleeding from the uterus as a sign that the uterine organs are functioning properly. Generally, adolescents who experience menarche are at the age of 12 to 16 years. This period can change aspects of behavior, for example psychology and others. The normal menstrual cycle occurs on 22-35 days, with the duration of menstruation for 2-7 days [3].

The menstrual cycle varies for each woman and almost 90% of women have a 25-35 day cycle and only 10-15% have a 28 day cycle, but some women have irregular cycles and this can be an

indication that there is a fertility problem. The length of the menstrual cycle month's menstruation begins [3].

The year when menstruation starts is a period that is vulnerable to menstrual disorders. As many as 75% of girls in their late teens experience disturbances related to menstruation. Delayed, irregular menstruation, pain and heavy bleeding which causes teenage girls to see a doctor. According to Beniarz J et al who found a prevalence of primary amenorrhea of 5.7%, secondary amenorrhea of 18.0%, oligomenorrhea of 50%, polymenorrhea of 10.5% and mixed disorders of 15.8% [14].

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According to Basic Health Research (Riskesdas) it shows that as many as 24.7% of adolescents aged 13-15 years experience impaired nutritional status with the following details: very thin 1.9%, thin 6.8%, obese 11.2%, and obese 4.8%. Meanwhile, nutritional status disorders in adolescents aged 16-18 years amounted to 21.6% with the following details: very thin 1.4%, thin 6.7%, obese 9.5%, and obese 4.0% [12].

According to Basic Health Research (Riskesdas) in North Sulawesi, the prevalence of adolescents was 4.51% very thin, 72.08% thin, 12.06% normal and 9.44% obese. According to the North Sulawesi Basic Health Research (Riskesdas) in 2018, the prevalence of adolescents in South Bolaang Mongondow is very thin 10.89%, thin 72.33%, normal 7.99% and obese 6.05% [1].

Based on initial observations made of 20 female students, 6 female students or 6% were malnourished, 8 female students or 8% were overweight, and 6 female students or 6% were normal.

### **THEORITICAL REVIEW**

Polimenorea, oligomenorrhea and amenorrhea. Both short and long cycles show abnormalities in the metabolic and hormonal systems [9].

The menstrual cycle is shorter than usual, which is less than 21 days, while the amount of bleeding is relatively the same or 9 times more than usual. Polimenorea is a hormonal disorder with a shortened corpus luteum, so that the menstrual cycle is shorter, or it can be caused by a short proliferative stage or a short secretory stage, or both.

Polimenorea that lasts continuously can cause hemodynamic disturbances in the body due to continuous blood loss. Besides that, polimenorea can also cause complaints in the form of impaired fertility due to hormonal disturbances in

polimenorea resulting in ovulation disorders (the process of releasing eggs). Women with ovulation disorders often have difficulty conceiving [9].

The menstrual cycle extends for more than 35 days, while the amount of bleeding remains the same. Oligomenorrhea usually occurs as a result of a disturbance in the hormonal balance in the hypothalamus-pituitary-ovarian axis. These hormonal disturbances cause the length of the normal menstrual cycle to lengthen, so menstruation becomes less frequent [9].

Menstruation does not come for three months in a row. Amenorrhea is said to be physiological if it occurs before menarche, during pregnancy, breastfeeding or menopause. While pathological amenorrhea consists of two kinds, namely primary amenorrhea and secondary amenorrhea. Primary amenorrhea if until the age of 18 menstruation has not come. While it is said to be secondary amenorrhea if menstruation stops after menarche or has experienced menstruation but has stopped consecutively for three months.

Based on data analysis conducted by the nutrition and food research center, the prevalence of adolescent nutritional status in Indonesia reaches 7.3% overnutrition status and 12.1% undernutrition status. In 2018 the proportion of overweight and obesity in adolescents > 18 years in South Sumatra was 13.6% overweight and 21.8% obese [11].

Nutritional problems often occur in adolescents because the development and growth of the adolescent body requires energy and nutrients. Nutritional needs and intake are influenced by changes in eating habits and lifestyle of adolescents. Unbalanced consumption behavior that occurs in adolescents is because many teenagers choose food just to socialize and for pleasure, not based on the nutritional content contained in these foods.

The problem of undernutrition and overnutrition, especially in adolescents, will have a very bad impact on sufferers. Malnutrition status in adolescents will result in anemia, where if adolescents experience this it will have a sustainable impact in the future. Overnutrition status in adolescents will trigger the occurrence of obesity which continues to trigger other diseases that will arise such as hypertension which then results in a stroke. Furthermore, the undernutrition status and overnutrition status will result in a high mortality rate.

Nutrition is a measure of the condition of a person's body which can be seen from the food consumed and the use of nutrients in the body. Nutritional status is a condition determined by the degree of physical need for energy and nutrients obtained from food and food whose physical impact can be measured.

The nutritional needs of adolescents are relatively large, because adolescents are still experiencing a period of growth. In addition, adolescents generally carry out higher levels of physical activity compared to other ages, so they need more nutrients. The nutritional adequacy rate (RDA) for male adolescents aged 13-17 years requires energy ranging from 2,400-2,650 kcal, protein ranging from 70-75 gr, fat ranging from 80-85 gr, and carbohydrates ranging from 350-400 gr. Whereas for female adolescents aged 13-17 years, the energy required ranges from 2,050-2,100 kcal, 65 grams of protein, 70 grams of fat, and 300 grams of carbohydrates.

The nutritional status of adolescents aged 16-18 years by sex showed that adolescents with male sex with a prevalence of very thin were 1.9%, thin 7.9%, obese 4.1% and obese 1.0%. Adolescent girls show a prevalence of very thin as much as 3.0%, thin 8.4%, obese 6.6% and obese as much as 3.4% based on these data female adolescents

experience more nutritional problems than males.

The recommended method for calculating nutritional status is Body Mass Index (BMI) or (BB/TB). Where BB is body weight measured in kilograms and TB is height measured in meters. The nutritional status indicator used for children aged 5-18 years is the body mass index (BMI) according to age. BMI was chosen because it takes into account both weight and height, and BMI is standardized based on the child's age.

The problem that causes malnutrition is insufficient knowledge of nutrition and a lack of understanding about good eating habits. Many adolescent nutritional problems occur due to wrong nutritional behavior such as an imbalance between nutrition and recommended nutritional adequacy. Lack of energy and protein affects the body resulting in *obesity*, *chronic* lack of energy (malnutrition) and anemia.

The need for energy and nutrients in adolescents is shown for the deposition of body tissues. The total energy and nutritional needs of adolescents are also higher compared to the vulnerable ages before and after. Moreover, adolescence is an important transitional period of growth from children to adults. Balanced nutrition at that time will greatly determine their maturity in the future. The point is that adolescence is a time of rapid changes, so that adolescents' nutritional intake must be properly considered so that they can grow optimally. Moreover, at this time the physical activity of adolescents is generally more. Besides being preoccupied with various activities at school, generally they also start to pursue various activities such as sports, hobbies, courses. All of this will certainly drain energy, which will lead to having to adjust to a balanced nutritional intake.

Malnutrition is a condition in which the body lacks nutrients such as protein,

carbohydrates, minerals, vitamins and fat. This nutritional deficiency is below the average rate so that someone who is malnourished experiences growth process disturbances, lack of concentration, decreased body defense, disrupted brain structure and function. Malnutrition is an unhealthy condition due to lack of food and nutrition for a certain period of time. Malnutrition can be determined by assessing BMI and undernutrition is at 17-18.5 and less than 17.

During adolescence, many changes occur. In addition to physical changes due to increased muscle mass, increased fat tissue in the body, hormonal changes also occur. These changes affect their nutritional and dietary requirements. The peak speed of height increase for boys is at the age of 13.5 years and for girls at the age of 11.5 years. Changes in body composition in adolescence is an important factor affecting nutritional needs in adolescence.

Body image is something an individual feels about how comfortable and satisfied the individual is with the size, shape and overall body. Body image has a relationship with individual self-esteem, high self-esteem will increase a good body image. Conversely, when individuals have feelings of self-doubt, self-esteem will drop and cause *eating disorders*.

In adolescence, a high interest in the opposite sex begins to arise, so that young women will pay attention to their body shape and will try to be as attractive as possible. Many efforts are made by young women to support their appearance, one of which is to reduce body weight by limiting or reducing the frequency and amount of eating and vomiting the food they have eaten, this will have an impact on health problems such as poor nutritional status (chronic energy deficiency), anemia, lack of calcium, vitamins, and others that hinder the

reproductive process as well as the occurrence of obstacles to the growth and development of young women.

A person's nutritional state is strongly influenced by diet. The health of individuals, especially adolescents, will be in accordance with what they consume both food and drink in quantity and quality. There are 3 components in dietary management, namely frequency, amount, and composition of food ingredients. Physical development and intelligence for adolescents requires optimal nutrition which has an impact on good productivity.

Obesity comes from the Latin word *ob* which means "as a result of" and *esum* means "to eat" so that obesity can be defined as a pattern resulting from excessive eating patterns (Muhammad, 2017). Obesity is a medical condition in the form of excess body fat that has accumulated in such a way as to have a detrimental effect on health, which then reduces life expectancy or increases health problems.

Eating patterns with excess calories and lack of physical activity are the dominant factors for the occurrence of obesity. People who eat a lot will have symptoms tend to suffer from obesity. The habit of consuming foods high in fat and less fiber is a contributing factor to the problem of obesity. Based on the results of research on adolescents in Yogyakarta and Bantul, it can be seen that the higher the energy and fat intake, the higher the likelihood of obesity. This study also shows that there is a relationship between the contribution of fat to total energy and the occurrence of obesity.

Overweight and obesity are defined as conditions where a person's calorie intake is more than the calories used. The problem of excess nutrition that occurs in school-age children is a serious problem that can increase the risk of several chronic diseases in both developed and developing countries. If a child has more

nutritional problems at a young age, it will also tend to continue into adulthood where it can pose a risk of developing diseases such as diabetes and cardiovascular disorders at a young age [8].

**RESEARCH METHODS**

This type of research is analytic observational research with a quantitative approach. This research was conducted at SMA Negeri 1 Pinolosian. Kec, Pinolosian, Kab. South Mongondow Bolaang. Starting from August-September 2022.

Population In this study, there were 128 students in class X and XI at SMA Negeri 1 Pinolosian, Kec. Pinolosian, Kab. South Mongondow Bolaang. The sample in this study was 95 female respondents in class X and XI at SMA Negeri 1 Pinolosian, Kec. Pinolosian, Kab. South Mongondow Bolaang. Sampling in this study using purposive sampling. The primary data in this research is the data collected by the researcher when conducting the panel, namely distributing questionnaires and measuring BMI to female students at SMA Negeri 1 Pinolosian. Secondary data in this study are existing data obtained from related agencies, namely from SMA Negeri 1 Pinolosian, government publications and Riskesdas data from North Sulawesi Province. While the data source for this study was obtained from primary data, namely the distribution of questionnaires containing 2 indicators in the form of questions and statements that have been answered by respondents, as well as documentation and results from the distribution of questionnaires and BMI measurements for female students at SMA Negeri 1 Pinolosian, Kec. Pinolosian, Kab. South Mongondow Bolaang.

**RESULTS AND DISCUSSION**

**1. Bivariate Analysis**

a. Frequency Distribution of Menstrual Cycles Normal, Abnormal, Diet and Weight in Undernourished and Overnourished Adolescents at SMA Negeri 1 Pinolosian

**Table 1.** Frequency Distribution of Normal, Abnormal Menstrual Cycles, Diet and Weight in Undernourished and Overnourished Adolescents at SMA Negeri 1 Pinolosian.

N o	Indicator	Fre q.	Percentag e (%)
1.	Normal	31	63.2%
	Malnutritio n Not Normal Malnutritio n	18	36.8%
2.	Normal	26	56.6%
	Nutrition is more Not Normal Over Nutrition	20	43.3%
3.	Good Diet		
	Malnutritio n	27	58.7%
	More Nutrition	25	51,%
	Bad Diet Malnutritio n More Nutrition	19 24	41.3% 49%

Source: Primary Data, 2022

Based on the results of the study, the univariate analysis explained that there were 31 (63.2 %) normal menstrual cycles of respondents and 18 (36.8%) of abnormal menstrual cycles. In malnourished adolescents, menstrual disorders are fewer than those with excess nutrition so that the normal number of menstrual cycles is more than in excess nutrition, but it does not rule out that those who are

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malnourished do not have disorders such as excess nutrition, menstrual cycle disorders still exist because people those who have poor nutritional status produce a small amount of the hormone estrogen which can have an impact on their menstrual cycle later. The results of this study are in line with research conducted by Riris Novita stating that young women at SMA AL-Azhar who have 59 children (60.20%) have menstrual disorders with the results of the study showing the results of the *p-value* (0.035) <0.05 so there is relationship between nutritional status of young women with menstrual disorders. Students who experience more menstrual disorders are students with more nutritional status which can cause obesity [13].

Based on the results of the study on univariate analysis, it was explained that there were normal menstrual cycles in 26 (56.6%) respondents and 20 (43.3%) respondents with abnormal menstrual cycles. In the menstrual cycle of excess nutrition, we can see that people with more nutritional status are able to produce a lot of the hormone estrogen which can make the amount of blood increase/a lot so that they experience an elongated menstrual cycle. It's normal to be late for attendance, but once it comes, quite a lot of blood is released. According to the results of a study conducted by Sheetal *et al*, it was shown that female adolescents who are overweight and obese have an irregular menstrual cycle called *oligomenorrhea* [16].

Another study that was also conducted by Mentari that nutritional status has a significant relationship with menstrual disorders in young women conducted at the Cipto Midwifery Academy in Medan, the proportion of menstrual disorders is greater in adolescents with overweight

status, namely 75% [7]. Nutritional status is very influential on menstrual disorders. In fulfilling nutritional needs for normal growth, adequate nutrition is needed, adequate energy, protein, fat nutrients and the availability of essential nutrients as growth materials [9].

Based on the results of the research from univariate analysis, it was found that a good diet for undernourishment was found in 27 (58.7%) respondents and in excess nutrition as many as 25 (51%) respondents. Meanwhile, for poor diet, 19 (41.3%) respondents were undernourished and 24 (49%) respondents were overweight. In female adolescents, eating patterns greatly affect nutritional status or menstrual cycles. Adolescent girls with unhealthy eating patterns can have an impact on their physique/body which can make their nutritional status less or more nutritional. So indirectly when they experience menstruation, disturbances can occur because nutritional status and menstruation have a relationship.

A good diet for young women is consuming good nutritious foods such as foods that contain carbohydrates, vitamins, protein, fiber and minerals. Even though there are some students who don't really like to eat vegetables because of the bitter taste that makes them not really like it, they still eat it even if only occasionally. Food serves to maintain the health of the body through the benefits of the nutrients contained therein. The arrangement of good food and the amount of food that should be eaten will affect optimal body health. And also the environment can be influential when making friends with friends who have good eating habits, so automatically they will also follow the habits of other friends and

the importance of knowing about nutrition.

The eating pattern of young women who are not good is influenced by various factors including knowledge about nutrition. The level of one's nutritional knowledge will affect one's attitudes and behavior in choosing the type of food, which determines whether or not one easily understands the benefits of the nutritional content of the food consumed. Knowledge of good nutrition is expected to influence good food consumption so that it can lead to good nutritional status as well. Teenagers have many activities such as going to school from morning to afternoon, continuing with extra-curricular activities until the afternoon, not to mention additional activities. All these activities prevent them from having time to eat, let alone to think about the composition and nutritional content of the food they eat, which can impact their nutritional status.

The research conducted by Nurfatimah showed that there was a significant relationship between eating habits and the incidence of obesity. Another study conducted by Florence stated that there was a significant relationship between consumption patterns and nutritional status. Basically a person's nutritional status is determined based on nutritional consumption and the body's ability to use these nutrients. Adolescent eating patterns are strongly influenced by the surrounding environment. Teenagers prefer foods with high sodium and fat content but low in vitamins and minerals [6].

## 2. Bivariate Analysis

a. Normal Undernutrition and Overnutrition

**Table 1.** Normal Menstrual Cycle Undernutrition and Normal

Overnutrition			
Chi-Square Tests			
	Value	Df	asymp. Sig. (2-sided)
Pearson Chi-Square	650,000 <sup>a</sup>	625	.237
Likelihood Ratio	169,421	625	1,000
Linear-by-Linear Association	22018	1	.000
N of Valid Cases	26		

Source: Primary Data, 2022

Based on the results of the research on the *Chi-square test* explaining that normal menstrual cycle indicators of undernutrition and normal over nutrition have been presented in table 1. It can be seen that as many respondents had normal menstrual cycles in undernourishment as many as 31 respondents (63.2%) and some 26 respondents (56.6%) had normal menstrual cycles with excess nutrition with a *P value* (0.00),  $< P$  (0.05) meaning there is a comparison. Hormones in a woman's body have the hormones estrogen and progesterone which greatly affect the regular or irregular menstrual cycle. Therefore, the response of each respondent's body is different so that there is a comparison of the results of the two.

Other studies also show that as many as 0.8% of respondents (0.8 %) have a normal menstrual cycle. This can happen because the level of hormone tolerance in each individual's body is different so that the action of the hypothalamus-pituitary-ovary also adjusts to the condition of the respondent's body [2].

This is in accordance with previous researchers who stated that those with underweight nutritional status with normal menstrual cycles

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were (33.3%), normal nutritional status with abnormal menstrual cycles (20.7%), and overweight with normal menstrual cycles. as much (18.2%). After processing the data using the *Chi Square test*, the result is  $p = 0.000 < 0.05$ . These results indicate that there is

- a) significant relationship between nutritional status and the menstrual cycle in young women at PSIK FK UNSRAT Manado [5].
- b) Abnormal Undernutrition and Overnutrition.

**Table 2.** Abnormal Undernutrition and Abnormal Overnutrition

<b>Chi-Square Tests</b>			
	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	650.000 <sup>a</sup>	625	.237
Likelihood Ratio	169.421	625	1.000
Linear-by-Linear Association	22.018	1	.000
N of Valid Cases	26		

*Sumber: Data Primer, 2022*

Based on the results of the research on the *Chi-square test* explaining that the indicators of the menstrual cycle are not normal undernutrition and not normal overnutrition which has been presented in table 2. It can be seen that as many respondents had abnormal menstrual cycles in undernourishment as many as 18 respondents (36.8 %) and some had abnormal menstrual cycles in overweight as many as 20 respondents (43.3%) with a *P value* (0.00),  $< P$  (0.05) meaning there is a comparison. This is caused by poor diet and lifestyle , such as respondents consuming more fast food, fried foods,

and other processed products which trigger health problems, both obesity and malnutrition. In addition, it is also usually influenced by heredity.

This is consistent with previous research which stated that normal menstrual cycles were more common in respondents who had normal nutritional status 72 female students (79.12 %), on the other hand female students who had abnormal menstrual cycles were more numerous in respondents who had more nutritional status 12 female students (13.18%). The results of the *chi square test* showed that there was a relationship between nutritional status and the menstrual cycle ( $p = 0.00$ ) [4].

In addition, the results of previous studies stated that 3.6% had polymenorrhea and 10% had oligomenorrhea in women with a waist-to-hip ratio  $\geq 0.79$  (obese). The study concluded that the risk of menstrual cycle disorders is 2 times greater in women who are obese compared to normal women [15].

## CONCLUSION

1. Menstrual cycles in undernourished adolescents are normal for 31 (63.2 %) respondents and abnormal menstrual cycles for 18 (36.8%) respondents.
2. Menstrual cycles in overweight adolescents are normal for 26 (56.6%) respondents and abnormal menstrual cycles for 20 (43.3%) respondents
3. The eating patterns of undernourished and over-nourished adolescents, that is, in undernourishment, there are 27 (58.7%) good eating patterns and 19 (41.3%) respondents with bad eating patterns. Meanwhile, in excess nutrition, there were 25 (51%) respondents with good eating patterns and 24 (49%) respondents with bad eating patterns.



4. There is a comparison of the menstrual cycle where the undernourished and over-nourished are often disrupted by the menstrual cycle, namely excess nutrition, while undernourished the menstrual cycle is disrupted, but the risks are less than those with excess nutrition. This explanation is also in accordance with the results of the Chi Square test with a value of  $P = 0.00$

## SUGGESTION

### 1. For Further Researchers

In order to be able to continue research using different methods such as experiments with different variables

### 2. For Researchers

It is hoped that you will be more observant in conducting research and be able to pay attention to the limitations of the problems at the time of the research so that the results obtained can be in accordance with what the researchers expected.

### 3. For Teenagers

It is hoped that adolescents will begin to pay attention to changes in the menstrual cycle every month on a regular basis and begin to maintain their weight by adjusting their diet and exercising regularly.

### 4. For Research Agencies

hoped that the agency can pay more attention to adolescent reproductive health, especially the menstrual cycle and can work together with the local health center or health office so that they can provide health information to young women at SMA Negeri 1 Pinolosian.

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