

# The Menstrual Cycle and Nutritional Status

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**Abstract** — Menstrual cycle is the time from the first day of menstruation until the coming of the next period. Menstrual cycles occur for 28 days. The average normal menstrual cycle occurs around 21-35 days while those who experience menstrual cycles use polimenore (<20 days), oligomenorrhea (> 35 days), and amenorrhea (> 3 days). Normal menstrual cycles depend on interactions and hormones released from the hypothalamus-pituitary-ovary and their effects on the endometrium. Shortening of the menstrual cycle that causes shorter menstrual cycles (polimenore) is associated with a decrease in fertility and miscarriage while an extended menstrual cycle (oligomenorrhea) is associated with anovulation, fertilization, and miscarriages. Menstrual cycles are also influenced by age, nutritional status, transition and body fat mass. Nutritional status is a measure of a person's body that can be seen from the food needed and the use of nutrients in the body. Objective: to study the relationship between nutritional status and the menstrual cycle in midwifery students. Method: This type of correlational research with cross-sectional design. a sample of 30 midwifery students. Data were analyzed using chi square test. Results: No relationship between nutritional status with the menstrual cycle was considered with a p value of 0.674. Conclusion: nutritional status is not the dominant factor influencing the menstrual cycle in midwifery students of Muhammadiyah University but there are other influencing factors such as stress and physical activity.

**Keywords**—menstrual cycle, nutritional status, menstruation.

## I. INTRODUCTION

Women's reproductive health life is influenced by several factors that have the potential to lead to nutritional status. Characteristics of women who are able to carry out reproductive life is menstruation. Menstruation that repeats every month will eventually form a menstrual cycle. [1]. Menstruation is a vital part of female reproductive health, and its irregularities could interfere in the normal life of menstruating women and girls [2]. Menstruation is a complex process involving several hormones, sexual organs and nervous systems. Hormones have an important influence on menstruation, if the hormones are out of balance then the cycle will be disrupted. Menstrual cycle is a clinical sign of female reproductive function [3]. Each woman experiences menstruation for 400 times in her fertility age. It is such that one-seventh of a woman's life is accompanied with menstruation [4]. Menstruation usually starts between the ages of 10-16 years depending on various factors including women's health, nutritional consumption and nutritional status. Menstruation should have a regular cycle. Menstrual cycle is the distance between the start of the last

menstruation and the start of the next menstruation. Menstrual cycles in women normally range between 21-32 days and only 10-15% have a 28-day cycle with a long menstruation 3-5 days, or 7-8 days [5].

## II. REVIEW OF LITERATURE

The menstrual cycle is regarded as a physiological phenomenon that results from the precise coordination of events that occur in the hypothalamus, the anterior pituitary gland and the female reproductive system. This dynamic interaction allows the reproductive process to proceed in the form of a cycle[6]. The menstrual cycle is influenced by several factors including age, physical status, physical activity, nutritional status, hormones, and the environment. Hormonal influences associated with the menstrual cycle influences appetite control and eating behavior [7]. So far it has been known that women with poor nutritional status have a risk of menstrual cycle disorders. However, menstrual cycle disorders are also found in obese women. A woman who is experiencing malnutrition or excess nutrition will have an impact on the decline in hypothalamic function so that there will be an increase in the frequency of menstrual cycle disorders. [8]

Menstrual disorders can be in the form of prolonged disorders and menstrual blood counts, menstrual cycle disorders, bleeding disorders outside the menstrual cycle and other disorders related to menstruation. Long periods normally occur between 4-8 days. If menstruation occurs less than 4 days it is said to be hypomenorrhea and if more than 8 days it is said to be hypermenorrhea. Women usually have a menstrual cycle between 21-35 days. Called a polymenorrhea if the menstrual cycle is less than 21 days and oligomenorrhea if the menstrual cycle is more than 35 days. Non-menstrual bleeding is bleeding that occurs in the period between 2 menstruations. Women who experience menstrual cycles for more than 90 days are said to have amenorrhea[9]. Inadequate nutritional intake causes menstrual irregularities in most young women. In over nutritional status (overweight and obesity) usually experience chronic anovulatory or chronic irregular menstruation. Because it tends to have excess fat cells, so it produces excess estrogen. Whereas underweight there will be underweight and do not have enough fat cells to produce estrogen needed for ovulation and menstruation, resulting in irregular menstrual cycles [1]. Poor nutritional intake will affect the growth of bodily functions, will cause disruption of reproductive function and will have an impact on menstrual cycle disorders [8]. A normal menstrual cycle

depends on the actions and interactions of the hormones released from the hypothalamus-pituitary-ovary and their effects on the endometrium. Shortening of the menstrual cycle that causes shorter menstrual cycles (polymenorrhea) is associated with decreased fertility and miscarriage while prolonged menstrual cycles (oligomenorrhea) are associated with events of anovulation, fertilization, and miscarriage.

The impact if menstrual cycle disorders are not treated will result in the body losing too much blood, causing anemia. Menstrual cycle differences are caused by several factors, including nutritional status, food intake, age, physical activity, reproductive diseases, the influence of smoking, and stress. Research conducted on Turkish teenage girls found 31.2% experienced irregular menstrual patterns [10]

Nutritional status is a measure of a person's body condition that can be seen from the food consumed and the use of nutrients in the body. Nearly 50% of teenagers don't eat breakfast every morning. Other studies prove there are still many teenagers (89%) who believe that breakfast is important. But those who eat breakfast regularly are only 60%. [11]. Nutritional needs are closely related to the growth period, if nutrient intake is fulfilled then growth will be optimal. Nutritional needs that must be met come from carbohydrates, fats, and proteins. Inadequate nutritional intake can lead to insufficient intake of nutrients which can affect menstrual irregularities in most adolescents. Carbohydrate intake is related to calories during the luteal phase, protein intake is related to follicular phase length while fat intake is related to reproductive hormones. Nutritional status is a state of the body as due to food consumption and nutritional use. So far, it has been known that women with poor nutritional status or more at risk of menstrual cycle disorders. Research conducted at PSIK FK UNSRAT Manado, showed respondents with underweight nutritional status experienced irregular menstruation as much as 66.7% while in the nutritional status of irregular menstrual fat as much as 81.8% [10].

Nutritional status influences menstruation primarily through the provision of material to make the endometrial layer again and its effect on female hormone levels. Young women should adopt a healthy lifestyle with balanced nutrition and consume lots of vitamin E. One source of vitamin E is sprouts that can help balance the body's systems, and can help smooth the menstrual cycle. [12]

A preliminary study conducted by researchers on October 15th, 2019 of 10 midwifery students with interviews obtained from 6 students said that the nutritional status was normal, 3 students were fat nutritional status and 1 student was underweight nutritional status. From 6 students who had normal nutrition 4 people with normal menstrual cycles and 2 people with abnormal menstrual cycles. 3 students with fat nutritional status and 2 students with abnormal menstrual cycles and 1 student with normal menstrual cycles. From 1 student who underweight nutritional status experienced an abnormal menstrual cycle.

### III. METHODS

This type of correlational research with cross-sectional design. A sample of 30 midwifery students. Data were analyzed using chi square test.

### IV. FINDING AND DISCUSSION

TABLE 1 NUTRITIONAL STATUS

Nutritional status	Amount	%
Skinny	3	10,0
Fat	7	23,3
Normal	20	66,7
Total	30	100

Table 1 Shows that the majority of respondents experienced normal nutritional status of 20 people (66,7%), and at least experienced thin nutritional status of 3 people (10,0%).

TABLE 2 MENSTRUAL CYCLE

Nutritional status	Amount	%
Normal	25	83,3
Abnormal	5	16,7
Total	30	100

Table 2 Shows that the majority of respondents have a normal menstrual cycle as many as 25 people (83,3%), and most abnormal menstruation as many as 5 people (16,7%).

TABLE 3 CORRELATION BETWEEN MENSTRUAL CYCLE WITH NUTRITIONAL STATUS

Menstrual Cycle	Nutritional Status			P
	Skinny	Fat	Normal	
Normal	3	6	16	0,674
	10 %	20 %	83,3%	
Abnormal	0	1	4	
	0 %	3,33 %	16,7 %	
Total	3	7	20	
	10 %	23,3 %	66,7%	

Based on table 3 it explains about the spread of data between 2 variables, namely the menstrual cycle with nutritional status, it can be seen that from 30 respondents studied 25 respondents were normal menstrual cycles and thin nutritional status of 3 people (10.0%), moderate fat as many as 6 people (20.0%), and normal as many as 16 people (83.3%) while 5 respondents, abnormal menstrual cycles and thin nutritional status of 0 people (0%), fat as much as 1 person (3.33%), and normal as many as 4 people (16.7%). After cross-tabulation, an analysis is carried out in order to obtain a p value of  $0.674 < 0.05$ , so that  $H_0$  is accepted and  $H_a$  is rejected. So, there is no correlation between nutritional status with the menstrual cycle.

### V. DISCUSSION

#### A. Nutritional Status

The results showed that the majority of respondents experienced normal nutritional status of 20 people (66.7%), and at least experienced thin nutritional status of 3 people (10.0%). According to Dieny (2014) there are two factors

that affect nutritional status, namely direct and indirect causative factors[13]. Direct causative factors are food intake and infectious diseases. While the indirect factors are physical activity, individual factors, family factors, school environment and peers, social and economic level and mass media. [8] The eating disorders anorexia and bulimia nervosa have long been associated with ovulatory dysfunction. Adequate nutritional status is a critical determinant of the onset and maintenance of normal reproductive functions. Abundant evidence shows that menstrual function regresses to a prepubertal hormonal architecture in patients with anorexia nervosa, other extreme underweight women, and normal subjects consuming diets that promote weight loss. However, menstrual irregularities have been observed in the absence of weight loss, notably in normal-weight patients with bulimia nervosa [14].

#### B. Menstrual Cycle

The results showed that the majority of respondents have a normal menstrual cycle as many as 25 people (83.3%), and most abnormal menstruation as many as 5 people (16.7%). However, the results of this study differ from studies conducted by Putri (2015) that from the results of research where adolescents with regular menstrual cycles are fewer than adolescents with irregular menstrual cycles. In the opinion of Attarchi (2013) a regular menstrual cycle is a menstrual cycle that is in an interval of 23-35 days with a maximum difference of 7 days between the shortest and the longest menstrual cycle [15]. Meanwhile, according to the concept of the theory of Maryanti & Septikasari (2009), the length of a normal menstrual cycle is 21-35 days and an average of 28 days. If the cycle is less than 21 days or more than 35 days and irregular, usually the cycle is anovulatory. Anovulatory is a condition where there is a possibility that each cycle is not accompanied by ovulation, usually the cycle occurs less than 18 days or more than 42 days. This is supported by the results of research conducted by Parawita (2014) states that regular or not menstrual periods can be influenced by several factors, one of which is the factor of excessive adolescent activity that causes stress that can make menstrual periods uncertain. Long periods that are too long can indicate a disease in the teenager.[16]

#### C. The Correlation between Nutritional Status and Menstrual Cycle

The results of the study indicate that the menstrual cycle with nutritional status, it can be seen that from 30 respondents studied 25 respondents were normal menstrual cycles and thin nutritional status of 3 people (10.0%), moderate fat as many as 6 people (20.0%), and normal as many as 16 people (83.3%) while 5 respondents, abnormal menstrual cycles and thin nutritional status of 0 people (0%), obese 1 person (3.33%), and normal 4 people (16.7%).

After cross-tabulation, an analysis is carried out in order to obtain a p value of  $0.674 < 0.05$ , so that  $H_0$  is accepted and  $H_a$  is rejected. So, there is no correlation between nutritional status with the menstrual cycle. The results of this study are not in line with research conducted by Noviandari (2016)[17]. There is a correlation between nutritional status and the menstrual cycle in young women. Dieny (2014) said that nutritional status plays an important

role in influencing the function of reproductive organs. So far, it has been known that women who have poor nutritional status have a risk of menstrual cycle disorders caused by disruption of the growth and development of the reproductive system. However, menstrual cycle disorders are also found in adolescents with more nutritional status. This is associated with the amount of body fat tissue. This statement is supported by the results of Pratiwi's research (2011) that most respondents who have regular menstrual cycles are female students with normal nutritional status and those who experience irregular menstrual cycles are female students with underweight nutritional status[18].

According to the results of the study Sheetal et al. (2015) shows that adolescent girls who are overweight and obese have irregular menstrual cycles called oligomenorrhea[19]. This condition is in line with Proverawati's opinion and Asfuah (2009) that excess nutritional status such as fat and obesity will have an impact on the function of the body's hormonal system, given that fat is able to produce estrogen which causes disruption of the menstrual cycle. Forms of menstrual disorders vary. The nutritional status will affect the function of hormonal work, in the form of an increase, balance or decrease. Nutritional status itself is influenced by many factors, in general, an unbalanced diet. Changes in nutritional status can have an impact on changes in reproductive hormonal cycles that are directly related to excess body fat, obesity in the abdomen, and disorders of ovulation and hyperandrogism. The hypothesis from scientists that the appearance of menstruation is influenced by body fat is associated with total body weight. The menstrual function is very dependent on the percentage of body fat. The percentage needed to maintain regular menstruation is around 22% [8]. Conclusion: Nutritional status is not the dominant factor influencing the menstrual cycle in midwifery students of Muhammadiyah University of Kudus but there are other factors that influence such as stress and physical activity.

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