Original Research/Systematic Review

The Relationship Between Nutritional Status and Menstrual Cycle in Adolescent Girls

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ABSTRACT

Background: *A regular menstrual cycle indicates that a woman has good reproductive development and function. On the other hand, an irregular menstrual cycle is one of the signs of menstrual disorders. Factors that can influence changes in the menstrual cycle include nutritional status, as body weight and weight changes affect menstrual function.*

Objective: *The aim of this study is to determine the relationship between nutritional status and the menstrual cycle in adolescent girls.*

Method: *The research design used is observational analytic with a cross-sectional study approach. The population in this study includes all adolescent girls at SMAN 4 Kota Solok, totaling 99 individuals. A sample of 64 individuals met the inclusion and exclusion criteria. Data collection was conducted through interviews and a menstrual cycle questionnaire. Nutritional status was assessed by directly measuring the weight and height of the adolescent girls. Data analysis was performed using the chi-square test (p < 0.05).*

Results: *The results of the study showed that the majority of adolescent girls at SMA Negeri 4 Kota Solok in 2024 had normal menstrual cycles. More than half of the adolescent girls at SMA Negeri 4 Kota Solok in 2024 had a normal BMI. Less than half of the adolescent girls at SMA Negeri 4 Kota Solok in 2024 had underweight/overweight nutritional status with irregular menstrual cycles. After conducting statistical tests, a p-value of 0.215 (p > 0.05) was obtained, indicating that the alternative hypothesis (Ha) was rejected.*

Conclusion: *There is no relationship between nutritional status and the menstrual cycle in adolescent girls at SMA Negeri 4 Kota Solok in 2024.*

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INTRODUCTION

A regular menstrual cycle indicates that a woman has good reproductive development and function, whereas an irregular menstrual cycle is one of the signs of menstrual disorders. The WHO report (2020) states that the prevalence of menstrual cycle disorders among women is approximately 45%. According to the Basic Health Research (RISKESDAS) data (2018), in Indonesia, 13.7% of women aged 10-59 years experienced irregular menstrual cycles within a year. Irregular menstrual cycle disorders among

Indonesian women aged 17-29 years and 30-34 years are quite significant, reaching 16.4%. Based on RISKESDAS data from 2018, the prevalence of undernutrition among adolescents in Indonesia is 6.7%, while the prevalence of overnutrition among adolescents increased to 9.5%. In West Sumatra Province, the prevalence of overnutrition among adolescents in 2018 was 7.8%, and the prevalence of undernutrition was 7.6%.

In Solok City, the prevalence of overnutrition among adolescents in 2023 was 9.7%, while the prevalence of undernutrition was 5.4%. Factors influencing changes in the menstrual cycle include nutritional status, as body weight and weight changes affect menstrual function. Acute and moderate weight loss causes ovarian dysfunction, depending on the degree of stress on the ovaries and the duration of weight loss. Based on the above background, the author is interested in conducting research titled: "The Relationship Between Nutritional Status and Menstrual Cycle in Adolescent Girls at SMAN 4 Kota Solok in 2024."

MATERIAL METHOD

The research design used is descriptive analytic with a cross-sectional study approach. This study is conducted in Solok City, with a sample size of 64 participants. The sample was selected using the two-stage cluster random sampling technique. In the first stage, the sample clusters were selected using simple random sampling. In the second stage, adolescent samples were selected using systematic random sampling from the chosen schools. The independent variable is nutritional status, and the dependent variable is the menstrual cycle.

The respondents in this study are adolescent girls aged 15-20 years who have already experienced menstruation and are willing to participate as research respondents with parental consent (informed consent). The informed consent was sent to parents via Google Form for them to fill out their approval statement. The questionnaire used had been face-validated through checks in journals and conferences by scientific communities. The questionnaire was further evaluated by experts in the field of maternity nursing. Data collection was conducted over 30 days. The data were analyzed descriptively to describe the characteristics of all variables and then further analyzed using bivariate analysis with the chi-square test.

RESULTS

The data obtained from 64 samples, which are adolescent girls at SMA Negeri 4 Kota Solok, showed the following results.

Table 1. Frequency Distribution of Respondents Based on Menstrual Cycle in Adolescent Girls at SMAN 4 Kota Solok in 2024

Menstrual Cycle	Frequency	Percentage
Regular	46	71.9%
Irregular	18	28.1%
Total	64	100%

Based on Table 1, it shows that less than half of the respondents, 46 individuals, have a regular menstrual cycle, with a range of 21-35 days in the past 3 months. Only 18 individuals (28.1%) experienced irregular menstrual cycles.

Table 2. Frequency Distribution of Respondents Based on Nutritional Status in Adolescent Girls at SMAN 4 Kota Solok in 2024

BMI Category	Frequency	Percentage
Underweight / Overweight BMI	21	32.8%
Normal BMI	43	67.2%
Total	64	100%

Based on Table 2, it shows that 32.8% of the respondents have underweight/overweight BMI.

Table 3. The Relationship Between Nutritional Status and Menstrual Cycle in Adolescent Girls at SMAN 4 Kota Solok in 2024

Nutritional Status	Menstrual Cycle		Total	$\bar{\alpha}$	P
	Regular	Irregular			
	N (%)	N (%)	N (%)		
Underweight/Overweight BMI	13 (61.9%)	8 (38.1%)	21 (100%)	0.05	0.215
Normal BMI	33 (76.7%)	10 (23.3%)	43 (100%)		
Total	46 (71.9%)	18 (28.1%)	64 (100%)		

Based on Table 3, respondents with underweight/overweight nutritional status had more regular menstrual cycles, with 13 individuals (61.9%), compared to those with normal nutritional status and irregular menstrual cycles, which amounted to 10 individuals (23.3%). After conducting statistical tests, a p-value of 0.215 (p > 0.05) was obtained, indicating that the alternative hypothesis (Ha) is rejected. Therefore, it can be concluded that there is no relationship between nutritional status and the menstrual cycle in adolescent girls at SMA Negeri 4 Kota Solok in 2024.

DISCUSSION

Berdasarkan tabel 1 menunjukkan bahwa kurang dari sebagian responden sebanyak 46 orang memiliki siklus menstruasi yang teratur yaitu dengan rentang 21-35 hari dalam 3 bulan terakhir. Hanya 18 orang (28.1%) yang mengalami siklus menstruasi tidak teratur. Banyak factor yang dapat mempengaruhi Siklus menstruasi salah satunya di pengaruhi oleh status gizi, Gizi kurang menyebabkan terganggunya fungsi reproduksi, hal ini akan berdampak pada gangguan haid, asupan nutrisi bervariasi sepanjang siklus menstruasi, terjadi peningkatan asupan energi pada fase luteal dibandingkan fase folikuler gizi kurang mempengaruhi sekresi LH menyebabkan pemendekan fase luteal. Kekurangan gizi akan menyebabkan hormon steroid mengalami perubahan yang akan berdampak pada terjadinya siklus menstruasi tidak normal.

Based on Table 2, it shows that 32.8% of respondents have underweight / overweight BMI. Many factors influence the nutritional status of adolescents, such as unhealthy eating habits, including the increasing popularity of fast food products, which have become a trend among adolescents, leading them to neglect their nutritional intake. Additionally, misconceptions about nutrition among adolescents play a role, as a slim body is often seen as an ideal for teenage girls, prompting them to adopt incorrect dietary practices (Kurniati, 2020).

Excess nutrition or obesity also affects the menstrual cycle. Obesity can lead to anovulation due to increased tonic estrogen levels. Both the quantitative and qualitative

composition of the diet is believed to influence the menstrual cycle and reproductive performance. Both undernutrition and overnutrition negatively impact reproductive function. The effect of undernutrition on reproductive health can be seen in conditions like anorexia nervosa, where significant weight loss leads to hormonal changes, including reduced gonadotropin levels, particularly steroid hormones, in serum and urine. This is caused by hypothalamic dysfunction, resulting in changes to the ovulatory (menstrual) cycle. Similarly, acute obesity can cause infertile ovulation due to hormonal abnormalities, such as increased androgen production in the ovaries or adrenal glands, which subsequently raises estrogen levels (Rahmawati, 2020).

Adequate nutrition is crucial during menstruation, especially in the luteal phase, where nutritional needs increase. Among the nutrients that influence menstruation is fat consumption. A low-fat diet extends the menstrual cycle (+1.3 days), lengthens the duration of menstruation (+1 day), and shortens the follicular phase. Research shows that vegetarian women tend to experience a shortened follicular phase by an average of 3.8 days and an increased frequency of menstrual cycle irregularities (Rahmawati, 2020). Based on Table 3, respondents with underweight/overweight nutritional status experienced regular menstrual cycles more frequently, with 13 individuals (61.9%), compared to those with normal nutritional status and irregular menstrual cycles, which totaled 10 individuals (23.3%). Statistical testing resulted in a p-value of 0.215 ($p > 0.05$), indicating that the alternative hypothesis (Ha) is rejected. Thus, it can be concluded that there is no relationship between nutritional status and the menstrual cycle.

A similar study conducted by Puspita (2017) showed that respondents with regular menstrual cycles were more prevalent among those with normal nutritional status, with 72 students (79.12%). Conversely, students with irregular menstrual cycles were more common among respondents with overweight nutritional status, totaling 12 students (13.18%). The chi-square test results indicated a significant relationship between nutritional status and the menstrual cycle ($p = 0.00$). Another study conducted by Dya, N. M., & Adiningsih (2019) revealed a p-value of 0.036, indicating that $p < 0.05$. These results suggest a relationship between nutritional status and the menstrual cycle. Students with obesity were more likely to experience irregular menstrual cycles compared to those with normal nutritional status. The majority of respondents with normal nutritional status had regular menstrual cycles (69.1%), while most respondents with obesity had irregular menstrual cycles (71.4%).

CONCLUSION

Based on the data, 46 respondents (less than half) had a regular menstrual cycle (21-35 days) in the last 3 months, while 18 respondents (28.1%) experienced irregular cycles. Factors influencing the menstrual cycle include nutritional status, which affects reproductive function. Malnutrition can lead to menstrual disturbances, while overnutrition (obesity) can cause anovulation. Additionally, unhealthy eating habits, such as the consumption of fast food, also affect the nutritional status of adolescents. Research shows a relationship between nutritional status and the menstrual cycle, although statistical tests in this study did not find a significant relationship ($p = 0.215$). Other studies indicate a relationship between nutritional status and the menstrual cycle, with obese girls tending to experience irregular menstrual cycles. Conclusion : There is no significant relationship between nutritional status and the menstrual cycle in adolescent girls at SMA Negeri 4 Kota Solok in 2024.

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