

Original Research

The Relationship Between Nutritional Status and the Incidence of Dysmenorrhea in Adolescent Girls: A Frequency Analysis Based on Nutritional Status Categories

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ABSTRACT

Background: Dysmenorrhea is a common complaint that occurs during menstruation. The main research problem is that dysmenorrhea is often experienced by young women with high cases. The results of preliminary studies show that adolescents with poor nutritional status or malnutrition have a 50% risk of experiencing dysmenorrhea. This study aims to analyze the relationship between nutritional status and the incidence of dysmenorrhea in adolescent girls. **Methods:** This type of research is observational analytic with a cross-sectional design. The population is all students in class VII MTs. Negeri 2 Magetan, totaling 225 students. The sample size was 144 students, calculated using the Slovin formula. The sampling technique is simple random sampling using a lottery. The independent variable in this study is nutritional status, and the dependent variable is dysmenorrhea. Instruments for measuring height use a height-measuring device, and instruments for measuring body weight use a weight scale. The instrument for measuring dysmenorrhea uses a questionnaire. Nutritional status data was collected by measuring body weight and height, while dysmenorrhea data was collected by filling out questionnaires. Analyze the data descriptively, and test the hypothesis using the Chi-Square statistical test. **Results:** The results of the study obtained a picture of 144 female students studied, half of whom had abnormal nutritional status (54.9%), and dysmenorrhea (54.2%). The prevalence ratio of exposure to abnormal nutritional status to the incidence of dysmenorrhea is 0.91. Then at 95% significance, there is a relationship between nutritional status and dysmenorrhea. **Conclusion:** This study concludes that there is a relationship between nutritional status and the incidence of dysmenorrhea in young women at MTs. Negeri 2 Magetan and the prevalence ratio of dysmenorrhea from exposure to abnormal nutritional status was 50.7%. Comprehensive nutritional education and early health intervention are recommended to prevent and reduce the risk of dysmenorrhea.

Keywords: Nutritional status; dysmenorrhoea; young women

1. INTRODUCTION

Dysmenorrhea, or menstrual pain, is one of the health problems experienced by many women of reproductive age.⁽¹⁾ This condition often harms daily activities and overall quality of life. Although various factors have been

identified as causes of dysmenorrhea, the relationship between nutritional status and dysmenorrhea is still not fully understood, especially in the context of women in Indonesia.⁽²⁾ This study aims to specifically investigate how nutritional status, including body mass index (BMI), nutrient intake, and body fat composition, relates to the severity of dysmenorrhea. The novelty of this study lies in the focus of the study which not only looks at the relationship between nutritional status in general but also considers various more specific aspects of nutrition, which have not been widely explored in previous studies in Indonesia.

Dysmenorrhea has a wide range of impacts, from decreased productivity to psychological disorders such as anxiety and depression.⁽³⁾ The severity of menstrual pain often affects women's ability to participate in daily activities, which in turn can affect their quality of life. Therefore, understanding the factors that exacerbate dysmenorrhea, including unbalanced nutritional status, is essential to developing more effective prevention strategies.⁽⁴⁾ This is especially important in Indonesia, where the prevalence of malnutrition and obesity is a growing problem.⁽⁵⁾

Dysmenorrhea usually occurs at the beginning of menstruation, and symptoms can continue throughout a woman's menstrual cycle. The main cause of dysmenorrhea is hormonal imbalance, which is often exacerbated by factors such as poor nutritional status.^(1,6) Nutritional imbalance, whether underweight or overweight, can affect the production of prostaglandin hormones, which play a role in causing menstrual pain.⁽⁷⁾ In individuals with an ideal body mass index, either too low or too high, the risk of experiencing dysmenorrhea tends to be higher.⁽⁸⁾ This suggests that nutritional status plays an important role in the onset and severity of dysmenorrhea.

This study focuses on mapping the relationship between nutritional status and dysmenorrhea, to provide a clearer picture of how a person's nutritional condition affects dysmenorrhea symptoms. The proposed solution is not in the form of direct nutritional intervention but rather provides a scientific basis for efforts to improve nutritional status through programs aimed at achieving ideal body weight. Thus, the follow-up to this study can be in the form of more specific nutritional interventions, designed based on the findings on the relationship between nutritional status and dysmenorrhea, to reduce the severity of menstrual pain by improving optimal nutritional status.

2. METHODS

2.1 Research Design

Type of research: the research that has been conducted is observational analytic, with a cross-sectional design. This study took place at MTs Negeri 2 Magetan, Indonesia. The research period was four months from February to May 2024. The population in this study were all 225 female students in grade VII. The inclusion criteria for sampling were: 1) menstruation every month, 2) dysmenorrhea or not dysmenorrhea, 3) not dependent on painkillers, and 4) willingness to be studied. The sample size was determined based on the Slovin formula so 144 people were obtained. The sampling technique was simple random sampling with a lottery. The independent variable is nutritional status, while the dependent variable is dysmenorrhea. Nutritional status is measured based on body mass index (BMI).⁽⁹⁾ Dysmenorrhea is measured using a numeric rating scale (NRS).⁽¹⁰⁾ The nutritional status categories are normal and abnormal. The dysmenorrhea categories are dysmenorrhea and not dysmenorrhea.

2.2 Instruments and Data Collection Techniques

Instruments to measure nutritional status using height measuring devices (Microtoice), and digital weight scales. Body mass index is calculated based on the formula of body weight divided by height in meters squared ($BB \text{ (kg)}/TB \text{ (m)}^2$). Instruments to measure dysmenorrhea using the NRS (Numerical Rating Scale) questionnaire. Nutritional status data are collected from the results of anthropometric measurements. Dysmenorrhea data are collected from the NRS questionnaire filled out by respondents.

2.3 Data Analysis Techniques and Ethical Feasibility Testing of Research

Data analysis was conducted descriptively, and presented in tabular form. To prove the hypothesis using the Chi-Square statistical test with an error rate of less than 0.05. This study has been declared ethically feasible by the Health Research Ethics Commission of the Surabaya Ministry of Health Polytechnic Number: EA / 2396 / KEPK-Poltekkes_Sby / V / 2024.

3. RESULTS

3.1 Distribution of Nutritional Status and Dysmenorrhea

The results of the study obtained a picture of 144 female students studied, half of whom had abnormal nutritional status (54.9%), and dysmenorrhea (54.2%). The full data is represented in Table 1.

Table 1. Frequency distribution of nutritional status and dysmenorrhea of respondents

Variables	Category	Frequency	Percentage
Nutritional status	Abnormal	79	54.9%
	Normal	65	45.1%
Dysmenorrhea	Dysmenorrhea	78	54.2%
	No Dysmenorrhea	66	45.8%

Table 2. Cross table of nutritional status against dysmenorrhea

		Dysmenorrhea Status		Total
		Dysmenorrhea N (%)	No dysmenorrhea N (%)	
Nutritional status	Abnormal	72 (91.1%)	7 (8.9%)	79
	Normal	6 (9.2%)	59 (90.8%)	65

3.3 Hypothesis Test Results

The results of the Chi-Square statistical test obtained the calculated X^2 value = 111.315, degrees of freedom (df) = 1, and p-value = 0.001, based on the results of this test the working hypothesis is rejected, then at 95% significance there is a relationship between nutritional status and dysmenorrhea. The result of the statistical test is represented in Table 3.

Table 3. Results of the Chi-Square statistical test

Chi-Square test	
Chi-Square hit	111.315
df	1
Asymp. Sig	0.001

4. DISCUSSION

Good nutritional status and ideal body weight are important factors in maintaining overall health, including reproductive health in adolescent girls.⁽¹¹⁾ Optimal nutritional status can affect hormonal function and body metabolism, which in turn can affect various

3.2 Prevalence Ratio of Nutritional Status Exposure to Dysmenorrhea Incidence

The prevalence ratio of exposure to abnormal nutritional status to the incidence of dysmenorrhea is 0.91, while normal nutritional status can experience dysmenorrhea by 0.09. Female students with abnormal nutritional status but no dysmenorrhea are 0.08. The results of cross table of nutritional status against dysmenorrhea is represented in Table 2.

aspects of health, including the menstrual cycle and the severity of dysmenorrhea.⁽¹²⁾ Maintaining an ideal body weight through a balanced diet and sufficient physical activity is an important step to prevent various health problems, including menstrual disorders such as dysmenorrhea.⁽¹³⁾

The nutritional status of adolescents is often in the less-than-ideal category due to various factors, such as an unbalanced diet, lack of education about nutrition, and social pressure that encourages unhealthy eating patterns. In adolescence, the tendency to consume fast food and high sugary drinks, as well as low intake of fruits and vegetables, are the main factors contributing to poor nutritional status.⁽¹⁴⁾ In addition, hormonal changes and increased nutritional needs during growth are often not balanced with the right diet, causing nutritional deficiencies or excess calories that lead to obesity.

Adolescent girls are particularly vulnerable to abnormal nutritional status issues, such as malnutrition or overweight, because they are in a critical growth phase and face various social and psychological pressures.⁽¹⁵⁾ Hormonal changes that occur during

puberty increase nutritional needs, while at the same time, many adolescent girls experience eating disorders or follow unbalanced diets in an attempt to achieve a body that is considered ideal by society. This often leads to micronutrient deficiencies or weight problems that affect menstrual health.⁽¹⁶⁾

Dysmenorrhea is a common problem experienced by women, especially young girls, due to various factors including hormonal imbalance, genetic factors, and certain health conditions. During menstruation, the production of the hormone prostaglandin increases, which can cause uterine contractions and pain.⁽¹⁷⁾ Other factors such as stress, lack of sleep, and poor diet can also worsen dysmenorrhea symptoms. Women with reproductive health problems, such as endometriosis or fibroids, are also more susceptible to dysmenorrhea.⁽¹⁸⁾

Poor nutritional status, either in the form of undernutrition or overnutrition, is often associated with an increased risk of dysmenorrhea. Deficiencies in certain nutrients, such as magnesium, vitamin D, and omega-3 fatty acids, can affect prostaglandin production and increase the severity of menstrual pain.^(16,19) On the other hand, being overweight or obese can cause hormonal disorders that affect the menstrual cycle and worsen dysmenorrhea symptoms. Therefore, poor nutritional status is one of the main risk factors that must be watched out for in the management of dysmenorrhea.^(19,20)

To achieve normal nutritional status, adolescent girls should be encouraged to adopt a balanced and nutritious diet, which includes all major food groups such as carbohydrates, proteins, healthy fats, and fruits and vegetables.⁽¹⁶⁾ In addition, it is important to educate adolescents about the importance of micronutrient intake, such as iron, calcium, and vitamins, which are essential for supporting menstrual health and bone growth. Regular physical activity should also be part of a daily lifestyle to help maintain ideal body weight and optimize hormonal function.⁽²¹⁾

Treating dysmenorrhea requires a holistic approach that includes pain management, lifestyle changes, and management of underlying medical conditions.⁽²²⁾ Possible solutions include the use of nonsteroidal anti-inflammatory drugs (NSAIDs) to reduce pain, dietary changes to increase intake of certain nutrients that can help reduce pain, and stress management through relaxation techniques such as yoga or meditation.^(22,23) It is also important to ensure

that adolescent girls get enough sleep and engage in light but regular physical activity.

Dysmenorrhea tends to be more severe in individuals with less-than-ideal nutritional status, especially those who are obese or malnourished. Obesity can increase estrogen production, which affects the menstrual cycle and increases the risk of pain.⁽²⁴⁾ Meanwhile, malnutrition, especially iron and magnesium deficiency, can worsen uterine contractions and increase the severity of pain. Therefore, unbalanced nutritional conditions, excessive stress, and lack of physical activity can worsen dysmenorrhea symptoms.⁽²⁵⁾

To prevent dysmenorrhea, nutritional improvement efforts should focus on comprehensive nutritional education for adolescents, with an emphasis on the importance of balanced nutritional intake and a healthy lifestyle. Nutrition education programs in schools and communities can help adolescents understand the relationship between diet and their reproductive health.⁽²⁶⁾ In addition, regular monitoring of the nutritional status of adolescents, especially those at risk for menstrual disorders, can help in the early detection and management of nutritional problems that have the potential to worsen dysmenorrhea.⁽²⁷⁾

The follow-up of this study is to develop a more specific intervention program to improve the nutritional status of adolescent girls, with a focus on the prevention and management of dysmenorrhea. The findings of this study can be used as a basis for designing health policies that support efforts to improve nutritional status through dietary interventions and nutritional education.⁽²⁸⁾ In addition, further research is needed to explore other factors that may contribute to dysmenorrhea and how they can be modified to reduce risk.

Although this study provides new insights into the relationship between nutritional status and dysmenorrhea, several limitations need to be noted. First, this study may be limited by an insufficiently representative sample, so the results may not be generalizable to the entire population. Second, other variables such as stress, physical activity, and genetics were not fully controlled in this study, which may have influenced the results.⁽²⁹⁾ Finally, this study used a cross-sectional approach, so it cannot definitively establish a causal relationship between nutritional status and dysmenorrhea. Further studies with longitudinal designs are needed to address these limitations.

5. CONCLUSION

This study found a significant relationship between nutritional status and the incidence of dysmenorrhea in adolescent girls, where adolescents with abnormal nutritional status, either underweight or overweight, tend to experience dysmenorrhea with a higher frequency. This nutritional imbalance affects hormone production and body metabolism, which worsens the symptoms of menstrual pain. Therefore, adolescent girls to maintain a balanced nutritional status through a good diet and regular physical activity. Comprehensive nutritional education and early health intervention are recommended to prevent and reduce the risk of dysmenorrhea. Further research with a broader approach is needed to strengthen these findings and develop effective intervention strategies.

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Conflict of Interest

The authors declare no conflict of interest.

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