
The Relationship Between Body Mass Index (BMI) And The Incidence Of Primary Dysmenorrhea Among Female Adolescents At La Tansa 2 Senior High School In 2025

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Abstract

Dysmenorrhea is menstrual pain that is often experienced by adolescent girls and can interfere with daily activities. One factor that is thought to be related to dysmenorrhea is Body Mass Index (BMI), because being underweight or overweight can affect the balance of reproductive hormones. This study aims to determine the relationship between Body Mass Index (BMI) and the incidence of dysmenorrhea in adolescent girls at La Tansa 2 High School. This study used a descriptive analytical design with a cross-sectional approach. The study population consisted of all female students at La Tansa 2 High School who were menstruating, with a simple size of 77 respondents using total sampling that met the inclusion criteria. Data were collected through questionnaires and measurements of weight and height to determine BMI. Data analysis was performed using univariate and bivariate analysis with the chi-square test. The results showed that of 77 respondents, 34 respondents (44.2%) had abnormal nutritional status, including underweight, overweight, and obesity. Of those with the abnormal nutritional status, 25 respondents (73.5%) experienced dysmenorrhea. Based on the chi-square results, a p-value of 0.568 ($p > 0.05$) was obtained, indicating no significant relationship between Body Mass Index (BMI) and the incidence of dysmenorrhea among female adolescent at La Tansa High School in 2025. In conclusion, there is no significant relationship between Body Mass Index (BMI) and the occurrence of dysmenorrhea among female adolescent at SMA La Tansa 2 in 2025. It is hoped that female adolescent will continue to manage stress and maintain a balanced diet to help reduce dysmenorrhea complaints.

Keywords: *Dysmenorrhea, Body Mass Index, Adolescent Girls.*

INTRODUCTION

Adolescence is a transitional period from puberty to adulthood or a process of growth toward maturity that includes mental, emotional, social, and physical maturity. Puberty is one of the developmental stages characterized by the maturation of sexual organs and the achievement of reproductive capability. One of the signs of puberty in females is the occurrence of menstruation (menarche) (Rihardini, 2019). Menstruation is the shedding of the endometrial lining along with blood, which occurs periodically and is influenced by reproductive hormones. Menstruation can cause disturbances in women. One of the menstrual disorders that commonly occurs in most women is dysmenorrhea (Munthe, 2021, in Febrianti Susanti, 2024).

Dysmenorrhea is a discomfort or pain in the lower abdomen before and during menstruation. Dysmenorrhea occurs due to the excessive release of prostaglandins, which results in increased uterine contractions and causes pain during menstruation (Yulandasari, 2022, in Febrianti Susanti, 2024).

Dysmenorrhea is classified into primary dysmenorrhea and secondary dysmenorrhea. Primary dysmenorrhea is very painful menstruation without identifiable pelvic pathology and usually occurs at the time of menarche, whereas secondary dysmenorrhea is menstrual pain associated with abnormalities in the genital organs, usually resulting from certain pathological conditions (Puspita, 2019).

Generally, dysmenorrhea that occurs in adolescents is primary dysmenorrhea. This is evidenced by the highest prevalence of primary dysmenorrhea occurring in the adolescent age group, with the prevalence gradually decreasing with increasing age (Salamah, 2021). Meanwhile, according to data from the World Health Organization (WHO) in 2020, the incidence of dysmenorrhea reached 1,769,425 cases (90%) among adolescents suffering from dysmenorrhea, with 10–16% experiencing severe dysmenorrhea. The prevalence of dysmenorrhea worldwide is very high, with more than 50% of women experiencing dysmenorrhea (WHO, 2020). In Sweden the prevalence is 72%, in Saudi Arabia 85.4%, in

Mexico 89.10%, and in the United States nearly 90% of women experience dysmenorrhea (Djimbula, 2022).

In Southeast Asia, the prevalence of primary dysmenorrhea varies, with Malaysia reaching 69.4%, Thailand 84.2%, and Indonesia 64.25%, consisting of 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea. Primary dysmenorrhea generally occurs 1–3 years after menarche (Tsamara, 2020). A study conducted by Wahyuni (2018) reported that approximately 14% of female adolescents who were absent from school and unable to perform daily activities were caused by primary dysmenorrhea.

According to the Indonesian Demographic and Health Survey (SDKI), in Indonesia 58% of female adolescents discuss menstruation, while 45% discuss it with their mothers. One in five adolescents does not discuss menstruation with anyone before experiencing their first menstruation. About 76% of female adolescents experience menstrual pain, while 58% do not experience menstrual pain during menstruation (SDKI, 2022).

The incidence of dysmenorrhea in Indonesia in 2021 was relatively high, with 60–70% of women experiencing dysmenorrhea. The incidence of primary dysmenorrhea in Indonesia was 54.89%, while the remaining 45.11% were secondary dysmenorrhea (Ministry of Health of the Republic of Indonesia, 2021). The prevalence of dysmenorrhea in Indonesia reached 107,673 cases (64.25%), with 59,671 cases (54.89%) experiencing primary dysmenorrhea and 9,496 cases (9.36%) experiencing secondary dysmenorrhea (Risksdas, 2021).

According to Rahayuningrum (2021), the incidence of dysmenorrhea is 64.25%, consisting of 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea. The incidence of primary menstrual pain reaches 54.89%, while the rest are secondary cases, which cause sufferers to be unable to carry out activities, thereby reducing their quality of life. The overall incidence of dysmenorrhea ranges from 40–80%, and about 20–25% of women experience severe or unbearable dysmenorrhea. Adolescents with severe dysmenorrhea experience lower academic scores (7.5%), decreased concentration (87.1%), and school absenteeism (80.6%) (Indonesia, 2021).

According to Risksdas (2020), it is estimated that about 30–45% of adolescents experience menstrual pain. The Banten Provincial Health Office in collaboration with the Central Bureau of Statistics (BPS) in 2021 reported that the incidence of dysmenorrhea in Banten was recorded at 60.19% of 10,000 adolescents surveyed. The highest number of cases was found among adolescents aged 14–24 years, with the incidence of primary dysmenorrhea at 52.61% and secondary dysmenorrhea at 7.58%, with mild dysmenorrhea at 47%, moderate at 38%, and severe at 15% (Banten Provincial Health Office, 2021). The Lebak District Health Office in collaboration with BPS Lebak in 2021 also reported dysmenorrhea cases among adolescents, with a prevalence of 62.4% among 5,000 adolescents surveyed. The highest cases occurred in female adolescents aged 14–24 years, with 35% reporting that their activities were limited due to dysmenorrhea (Lebak District Health Office, 2021).

Based on the adolescent report from the Lebak District Health Office in 2022, there were 1,178 cases of dysmenorrhea among adolescents. Based on reports from the adolescent program at the Inpatient Health Center (UPTD Puskesmas Rawat Inap) Binuangeun until November 2022, 43.5% of adolescents experienced dysmenorrhea. According to data from the Lebak District Health Office (2023), 6 out of 10 female adolescents accessing school health services or adolescent health centers reported having experienced disturbing menstrual pain. However, only 15% had received education on how to manage dysmenorrhea. This indicates that reproductive health education interventions at the school level are still low, especially in regions such as Lebak District.

The theoretical impacts of primary dysmenorrhea in female adolescents include malaise (a general feeling of discomfort), fatigue, nausea, vomiting, lower back pain, headaches, and sometimes accompanied by vertigo or a sensation of falling, feelings of anxiety, restlessness, fainting, and other illnesses (Aksari, 2022).

Research conducted by Wurdiana (2021) showed that the impact of primary dysmenorrhea includes about 28.6% of respondents being unable to concentrate in class, while 16.2% of respondents

were unable to attend school, resulting in decreased academic achievement. Although dysmenorrhea is not a life-threatening condition, the recurrence of symptoms every month is an important issue that requires appropriate management (Wurdiana, 2021).

This is in line with research conducted by Ervianti (2021), which states that the prevalence and morbidity of dysmenorrhea are quite high but receive little attention from the health sector. This is because menstrual pain in women is often considered normal and psychological in nature, even though it can hinder adolescents' daily activities and reduce their quality of life. Therefore, this condition should not be ignored because it may have serious consequences. The causes of primary dysmenorrhea vary, one of which is the menstrual cycle (Wayan, 2019) and the duration of menstruation (T. M. Sari et al., 2023). In addition, according to Romlah et al. (2020), several factors are associated with the incidence of primary dysmenorrhea in female adolescents, such as family history, physical activity, and nutritional status.

Nutritional status refers to the condition of nutrition in the body. Poor nutritional status can affect growth and organ function and can also lead to menstrual disorders. Nutritional status is one of the risk factors for dysmenorrhea (Lail, 2019). A study conducted by Savitri (2019) obtained a p-value of 0.008; since $p < 0.05$, there is a relationship between nutritional status and the incidence of dysmenorrhea.

Based on the results of the instrument validity test, the researcher conducted interviews using the Numeric Rating Scale (NRS) questionnaire to determine the intensity of respondents' pain. The data obtained showed that 88.2% or 30 out of 34 respondents experienced pain during menstruation. This relatively high number indicates that most female adolescents face dysmenorrhea problems. This condition can affect their daily activities, learning concentration, and quality of life.

Based on the background above, the researcher is interested in conducting a study on the relationship between nutritional status and the incidence of dysmenorrhea.

RESEARCH METHODS

This study is a quantitative observational research using a cross-sectional design. The quantitative approach was chosen because it focuses on collecting and analyzing numerical data to determine the relationship between two main variables, namely Body Mass Index (BMI) and the incidence of dysmenorrhea among female adolescents at La Tansa 2 Senior High School.

The cross-sectional design was used to observe and analyze the relationship between independent and dependent variables at a specific point in time without any direct intervention on the respondents. In the context of this study, this design is appropriate to obtain a general overview while analyzing the relationship between BMI and the incidence of dysmenorrhea among female adolescents at La Tansa 2 Senior High School in 2025.

The use of a cross-sectional design is also considered efficient in terms of time and resources because the data are collected only once during a specific period. Thus, the researcher can identify whether there is a significant relationship between BMI and the incidence of dysmenorrhea.

According to Sugiyono (2017), population is a generalization area consisting of objects or subjects that have certain qualities and characteristics determined by the researcher to be studied and from which conclusions are drawn.

The population in this study consisted of all female students in grades X–XII at La Tansa 2 Senior High School who had experienced menstruation, totaling 78 students.

A sample is a part of the number and characteristics possessed by the population. If the population is large and it is not possible for the researcher to study all members of the population due to limitations of funds, manpower, and time, then the researcher may use a sample taken from the population (Sugiyono, 2017). Therefore, the sample taken from the population must truly be representative (Sugiyono, 2020).

This study used a total sampling method, which is a sampling technique in which the entire population that meets the inclusion criteria is used as the research sample.

The sample in this study consisted of all female students who had experienced menstruation at La Tansa 2 Senior High School, totaling 77 students. One student did not meet the criteria because she was absent during the research. Considering that the population size was relatively small and accessible, all members of the population were included as the research sample.

This research was conducted at La Tansa 2 Senior High School using questionnaires filled out by respondents after class hours in their respective places. The research period started from the preparation of the scientific paper proposal until the completion of the research accountability in August 2025.

The independent variable in this study was Body Mass Index (BMI), which was measured based on the respondents' body weight and height. The dependent variable was primary dysmenorrhea, which refers to menstrual pain experienced by female adolescents. Dysmenorrhea was measured based on whether the respondents experienced dysmenorrhea or not.

The data used in this study were primary data, collected through face-to-face questionnaires as well as direct measurements of body weight and height.

RESULTS AND DISCUSSION

A study was conducted at SMA La Tansa 2 Rangkasbitung from September 22, 2025, to September 28, 2025, with a sample size of 77 respondents. The results were described using univariate and bivariate analyses. The following results were obtained:

Univariate Analysis

The results of the univariate analysis of each variable in the study generally only produced frequency distributions and percentages for each variable, as shown in the following table.

Body Mass Index

The study found a relationship between BMI and the incidence of dysmenorrhea.

Table 1.

Frequency distribution of adolescent girls based on BMI at SMA La Tansa 2 in 2025

Nutritional status	Frequency	Percentage
Normal	43	55,8%
Abnormal	34	44,2%
Total	77	100,0%

Table 4.1 shows that the majority of respondents were in the normal weight category (55.8%). Meanwhile, respondents in the abnormal weight category, including underweight, overweight, and obesity, accounted for 44.2%.

Incidence of Dysmenorrhea

The results of this study were obtained for adolescent girls based on the incidence of dysmenorrhea at SMA La Tansa 2 in 2025.

Table 2.

Frequency distribution of dysmenorrhea incidence among adolescent girls at SMA La Tansa 2 in 2025

Dysmenorrhea Occurrence	Frequency	Percentage
Dismenore	59	76,6%
No Dysmenorrhea	18	23,4%
Total	77	100,0%

Based on Table 4.2, the majority of respondents (76.6%) experienced dysmenorrhea, while 23.4% did not experience dysmenorrhea.

Bivariate Analysis Results

This study analyzed the relationship between the independent variable, Body Mass Index (BMI), and the incidence of dysmenorrhea in adolescent girls at SMA La Tansa 2 in 2025.

Table 3.

Relationship between BMI and the incidence of dysmenorrhea in adolescent girls at SMA La Tansa 2 in 2025

Nutritional status	Dysmenorrhea Occurrence			P-Value	OR
	Dismenore	No Dismenore	Total		
	N(%)	N(%)			
Normal	34 (79,1%)	9 (20,9%)	43 (100,0%)	0,568	1,36
Abnormal	25 (73,5%)	9 (26,5%)	34 (100,0%)		
Total	59 76,6%	18 23,4%	77 100,0%		

Based on table 4.3 above, it shows that of the 43 respondents with normal nutritional status, 34 respondents (79.1%) experienced dysmenorrhea and 9 respondents (20.9%) did not experience dysmenorrhea. In the abnormal category which includes underweight, overweight, obesity I and obesity II, 25 respondents (73.5%) experienced dysmenorrhea and 9 respondents (26.5%) did not experience dysmenorrhea.

Discussion

Based on the results of the study, the distribution of respondents' nutritional status can be seen in Table 4.1. Most respondents had a normal nutritional status, totaling 43 respondents (55.8%). Meanwhile, respondents classified as abnormal nutritional status, including underweight, overweight, obesity I, and obesity II, totaled 34 respondents (44.2%).

These results indicate that the majority of respondents fall into the normal nutritional status category, reflecting a balance between energy intake and the body's needs. However, there were still respondents with excess nutritional status (overweight, obesity I, and obesity II) amounting to 37.2%, which indicates a tendency toward increased body weight among respondents. Factors that may influence this condition include high-calorie dietary patterns, frequent consumption of fast food, and lack of physical activity. Meanwhile, the proportion of respondents with underweight nutritional status was relatively low at 4.2%, which may be caused by insufficient energy intake to meet the body's needs.

The results of this study are consistent with research conducted by Pithaloka (2020), which states that most adolescents have normal nutritional status due to balanced dietary consumption and physical activity. In addition, research by Handayani (2021) also showed that more than half of the respondents had normal nutritional status, while a smaller proportion experienced obesity. Therefore, it can be concluded that normal nutritional status still dominates among most respondents, although the tendency toward excessive nutritional status needs to be considered as a preventive effort against future health problems.

Based on the results presented in Table 4.2, it shows that most respondents experienced dysmenorrhea, namely 59 respondents (76.6%), while 18 respondents (23.4%) did not experience dysmenorrhea out of a total of 77 respondents.

These results illustrate that the incidence of dysmenorrhea among female adolescents at La Tansa 2 Senior High School is still relatively high. Dysmenorrhea is menstrual pain that is generally caused by an increase in the hormone prostaglandin, which triggers excessive contractions of the

uterine muscles. This condition can interfere with adolescents' daily activities, including learning processes, concentration, and productivity.

The high incidence of dysmenorrhea in this study is consistent with research conducted by Ningrum (2020), which showed that most female adolescents experienced dysmenorrhea with a percentage of 70%. This condition is caused by various factors such as hormonal imbalance, stress, insufficient sleep patterns, and low physical activity. Furthermore, research by Sari (2021) also stated that more than half of adolescents experience mild to severe dysmenorrhea, which is related to lifestyle and nutritional status.

Therefore, it can be concluded that dysmenorrhea remains a common reproductive health problem among female adolescents. Thus, attention and education regarding menstrual pain management, healthy lifestyles, and preventive efforts through balanced nutrition and physical activity are necessary.

Relationship Between Body Mass Index and the Incidence of Dysmenorrhea

Based on the results presented in Table 4.3, it shows that among 40 respondents with normal nutritional status, 34 respondents (79.1%) experienced dysmenorrhea and 9 respondents (20.9%) did not experience dysmenorrhea. In the abnormal nutritional status category (including underweight, overweight, obesity I, and obesity II), out of 34 respondents, 25 respondents (73.5%) experienced dysmenorrhea and 8 respondents (26.5%) did not experience dysmenorrhea.

Based on the results of statistical analysis using the Chi-Square test, a p-value of 0.568 (>0.05) was obtained, indicating that there is no significant relationship between Body Mass Index (BMI) and the incidence of dysmenorrhea among female adolescents at La Tansa 2 Senior High School in 2025. The Odds Ratio (OR) value of 1.36 indicates that respondents with abnormal nutritional status have a 1.36 times greater chance of experiencing dysmenorrhea compared to respondents with normal nutritional status, although statistically this result is not significant.

The results of this study are consistent with research conducted by Utami (2021), which stated that there is no relationship between nutritional status and the incidence of dysmenorrhea among adolescents because other factors such as stress, hormonal imbalance, sleep patterns, and physical activity also influence the occurrence of menstrual pain. However, these results differ from the study conducted by Rahmawati (2020), which reported a relationship between nutritional status and the incidence of dysmenorrhea, where adolescents with underweight or overweight nutritional status tend to experience more severe dysmenorrhea due to changes in estrogen and prostaglandin hormone levels.

Therefore, it can be concluded that nutritional status or Body Mass Index does not have a significant effect on the incidence of dysmenorrhea among female adolescents at La Tansa 2 Senior High School. However, descriptively there is a tendency that female adolescents at La Tansa 2 Senior High School have relatively homogeneous characteristics. This is suspected to be due to similar dietary consumption patterns, as the students (santri) consume meals from the dormitory kitchen every day. The incidence of dysmenorrhea among these adolescents may be influenced by other factors, such as stress levels and excessive physical activity.

CONCLUSION

Based The majority of respondents (76.6%) experienced dysmenorrhea, while 23.4% did not experience dysmenorrhea. The majority of respondents (55.8%) were in the normal weight category. Meanwhile, respondents (44.2%) fell into the abnormal weight category, including underweight, overweight, and obesity. There was no significant association between body mass index (BMI) and the incidence of dysmenorrhea in adolescent girls ($p = 0.568$).

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