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The Relationship Between Body Mass Index (BMI) And The Incidence Of Dysmenore In Female Students At Pgri 37 Jakarta Vocational School

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ABSTRACT

Female students who are menstruating frequently complain about pain, commonly known as dysmenorrhea. Dysmenorrhea cases in each country exceed 50%, with Indonesia having an average of 64.25%. Dysmenorrhea can be caused by a variety of reasons, including nutritional deficiencies, irregular menstrual cycles, menarche before the age of 12, heavy monthly flow, and smoking. Preliminary tests on 10 students at SMK PGRI 37 Jakarta revealed that five of them had severe dysmenorrhea. The purpose of this study was to examine the relationship between Body Mass Index (BMI) and the incidence of dysmenorrhea in female students at SMK PGRI 37 Jakarta. This research is a quantitative study with a cross-sectional design. Sampling was conducted using the total sampling technique, with 58 female student respondents. The results showed that there was a relationship between Body Mass Index (BMI) and the incidence of dysmenorrhea in female students of SMK PGRI 37 Jakarta with a value of (P-value = 0.015). Based on these results, it can be concluded that abnormal BMI in female students impacts the severity of dysmenorrhea, so it is critical to eat nutritious foods and keep BMI within normal ranges.

Keywords : Body Mass Index (BMI), Dysmenorrhea, Female Students

INTRODUCTION

A high school/vocational school student is generally between 15-18 years old, which is included in the middle adolescence period and female students generally experience puberty in the form of menstruation.(Nasution, 2023).Menstruation is a natural process experienced by women. Menstruation is a cyclical and periodic bleeding process originating from the uterus, where the endometrium is shed. Women who are menstruating often complain of pain, also known as dysmenorrhea.(Afrioza & Srimulyati, 2022).

Dysmenorrhea is a common problem experienced by women during menstruation. It is pain that occurs during menstruation and can disrupt daily activities.(Horman et al.,

2021)Dysmenorrhea occurs because cyclooxygenase increases prostaglandin levels, causing the uterus to contract. A contracted uterus will inhibit blood flow and result in the production of metabolism.anaerobic which can stimulate pain receptors(Ferries-Rowe et al., 2020).

Cases of dysmenorrhea in each country reach more than 50%(Mivanda et al., 2023)In France, 92.9% of adolescent girls experience dysmenorrhea.(Hadjou et al., 2022)In Sweden, 89% of women experience dysmenorrhea.(Söderman et al., 2019)In Kuwait, as many as 85.6% of female high school students in grade XII experience dysmenorrhea.(Alrahal et al., 2020). In junior high and high school students in urban areas of Morocco, 78% of students experience dysmenorrhea.(Lghoul et al., 2020)In Ethiopia, 71.69% of adolescent girls experience dysmenorrhea.(Molla et al., 2022). The average case of dysmenorrhea inIndonesia as much as 64.25%(Mivanda et al., 2023)At Madrasah Aliyah Darul Ulum and Miftahul Jannah Palangka Raya, 86% of female students experience dysmenorrhea.(Kusnaningsih, 2020). As many as 74.42% of female students at Saraswati High School, Denpasar, Baliexperiencing dysmenorrhea(Rebecca Mutia et al., 2019).

Dysmenorrhea can be caused by several factors such as nutritional problems, irregular menstrual cycles, age of menarche less than 12 years, excessive menstrual bleeding, never having given birth (nulliparity), stress, smoking, and academic or work activities.(Oktorika et al., 2020). One of the causes of dysmenorrhea is nutritional status. Nutritional status can be determined simply by calculating the Body Mass Index (BMI). Calculating BMI is done by dividing body weight (kg) by height (m2). According toMeiilana et al (2022)There are other factors that can influence BMI values such as age, gender, diet, and physical activity. Pthere is researchSari et al (2023) Of 38 10th grade female students at SMK PGRI 17 Jakarta, 22 (57.9%) students with an abnormal BMI experienced dysmenorrhea and 16 (42.1%) with a normal BMI experienced dysmenorrhea. The research conductedSyafriani et al (2021)Of the 80 female students at SMAN 2 Bangkinang, there were 52 (65%) female students who had an abnormal BMI, 14 (42.4%) of whom experienced dysmenorrhea, while of the 28 (35%) female students who had a normal BMI, 9 (19.1%) of whom experienced dysmenorrhea.

According to a preliminary study conducted by researchers on June 21, 2024, data on 68 female students in grades X and XII were obtained. The preliminary study, which involved 10 female students completing questionnaires, found that 5 female students reported severe

dysmenorrhea, 3 female students reported moderate dysmenorrhea, and 2 female students reported mild dysmenorrhea. In 4 female students, dysmenorrhea had affected their attendance at school by not going to or asking permission to go to the health center.

The purpose of this study is to analyze the relationshipbetween Body Mass Index (BMI) and the Incidence of Dysmenorrhea in Female Students of PGRI 37 Jakarta Vocational School.

METHOD

This research is a quantitative study using a cross-sectional design. Cross-sectional design is used to analyze the impact of independent variables on dependent variables over time. The dependent and independent variables are analyzed simultaneously.(Syapitri et al., 2021).

The research was conducted at SMK PGRI 37 Jakarta, Jl. Pondok Labu 1B No. 29A, RT. 8/Rw. 7, South Jakarta City. The population in this study was 68 female students at SMK PGRI 37 Jakarta. The sample in this study used a total sampling technique of 58 female students, excluding 10 female students who had participated in the preliminary study..

Data was collected by distributing questionnaires to respondents. The questionnaires required for the study included initials and class, followed by a BMI questionnaire categorized according toMinistry of Health of the Republic of Indonesia (2021)by recording body weight (kg) and height (cm) then calculating using the BMI formula, then categorizing the results as abnormal if the value is < 17 and > 25, categorizing the results as normal if the value is < 17 and > 2518.5 – 25.0.The severity of dysmenorrhea was assessed using the WaLIDD Score.byTeherán et al., (2018)The questionnaire asked how much dysmenorrhea affected work performance, the number of pain locations, the intensity of the pain, and the number of days the pain was experienced. All questionnaire points in the WaLIDD Score were summed and categorized into 0 (no dysmenorrhea), 1-4 (mild dysmenorrhea), 5-7 (moderate dysmenorrhea), and 8-12 (severe dysmenorrhea).

RESULTS

A. Respondent Characteristics

Table 1 Distribution of respondent characteristics based on student class at SMK PGRI 37 Jakarta

Class	Frequency	%
XI	27	46.6
XII	31	53.4
Amount	**58**	**100**

Source: Primary Data, 2024

Based on table 1 above, it can be concluded that of the 58 female students of SMK PGRI 37 Jakarta, more than half of the respondents were in class XII, namely 31 (53.3%) female students.

B. Univariate Analysis

Table 2 Distribution of variables based on BMI in female students of SMK PGRI 37 Jakarta

BMI	Frequency	%	Mean	Standard Deviation
Abnormal	32	55.2	1.45	0.502
Normal	26	44.8		
Amount	**58**	**100**		

Source: Primary Data, 2024

Based on table 2 above, it can be concluded that of the 58 female students of SMK PGRI 37 Jakarta, more than half of the female students have an abnormal BMI, namely 32 (55.2%), and have a mean value of 1.45 and a standard deviation value of 0.502.

Table 3 Distribution of variables based on the level of dysmenorrhea in female students of SMK PGRI 37 Jakarta

Dysmenorrhea	Frequency	%	Mean	Standard Deviation
Light	8	13.8		
Currently	23	39.7	2.33	0.711
Heavy	27	46.6		
Amount	**58**	**100**		

Source: Primary Data, 2024

Based on table 3 above, it can be concluded that all female students of SMK PGRI 37 Jakarta experienced dysmenorrhea and the most common level of dysmenorrhea experienced was severe dysmenorrhea, reaching 27 (46.5%) female students with a mean value of 2.33 and a standard deviation value of 0.711.

C. Bivariate Analysis

Table 4 Bivariate Analysis of the Relationship between BMI and Dysmenorrhea

BMI	**Dysmenorrhea**						**Total**			
	Light		Currently		Heavy			***P-value***	***Odds Ratio***	***95% CI***
	f	% Within dysmenorrhea	f	% Within dysmenorrhea	f	% Within dysmenorrhea				
Abnormal	1	1.7	12	20.7	19	32.8	55.2			
Normal	7	12.1	11	19	8	13.8	44.8	0.015	0.316	0.136 – 0.736
Total	8	13.8	23	39.7	27	46.6	100			

Source: Primary Data, 2024

Based on the results of table 4, it shows that out of 58 respondents, more than half of the female students of SMK PGRI 37 have an abnormal BMI, namely 32 (55.2%) female students and more than half of the respondents experience severe dysmenorrhea with a total of 27 (46.6%) female students. The bivariate analysis that has been carried out in this study produces a P-value of 0.015 <0.05, so it can be concluded that there is a relationship between BMI and the occurrence of dysmenorrhea in female students of SMK PGRI 37 Jakarta, the Odd Ratio value is 0.316, which means that female students of SMK PGRI 37 Jakarta who have an abnormal BMI are 0.361 times more at risk of experiencing dysmenorrhea and the value of the confidence interval or Confidence Interval (CI) is 0.136 - 0.736.

DISCUSSION

Respondents

Respondents in this study were female students at SMK PGRI 37 Jakarta with the number of female students in grade XI being 27 (46.6%) and more than half of the respondents were in grade XII, namely 31 (53.3%). Female students who are in adolescence and have experienced menstruation generally experience dysmenorrhea or menstrual pain, dysmenorrhea that occurs in each female student has a different level of severity and can be caused by nutritional status identified by BMI values.

StudySaputra et al (2021) showed that dysmenorrhea can affect students' learning activities, with the results showing that more than half, namely 61.1% of female students, felt disturbed and 38.9% of other female students felt very disturbed by the occurrence of dysmenorrhea during menstruation. The research conductedSaalino et al (2021)In 82 female students of SMAN 4 North Toraja, the results also showed that there was an influence of dysmenorrhea on the students' learning activities with a P-value of 0.000. According toHidayati et al (2023)Each class level has different types of learning activities, the higher the class level, the more learning activities are required. ResearchHidayati et al (2023)In 40 female students from grades VIII, IX, X, XI, and XII, it was shown that dysmenorrhea occurred most frequently in grade XII students, reaching 45%. This was because grade XII students had a greater stress burden than other classes.

According to research, most female students who are menstruating will experience dysmenorrhea. Dysmenorrhea is pain during menstruation and can disrupt daily activities, especially school activities. Disrupted learning activities can impact school attendance and student achievement. Factors associated with dysmenorrhea need to be analyzed to determine the cause and appropriate treatment.

BMI

In this study, consisting of 58 female respondents, there were 32 (55.2%) female students who had an abnormal BMI and (44.8%) female students who had a normal BMI with an average value or mean of 1.45 and the distance between the data value and the mean or called the standard deviation of 0.502. BMI is a tool needed to assess nutritional status by dividing the value of body weight (kg) by height (m)2. If the BMI is high or low it can be a cause of health problems.(CDC, 2024).. StudyLupiana et al (2022)showed that 69.2 percent of adolescents who had poor eating patterns had an abnormal BMI and the results of the

statistical analysis obtained a P-value of 0.049 < 0.05, then it can be stated that there is a relationship between eating patterns and the nutritional status of adolescents.

Adolescent girls with low nutritional status or a low BMI can experience decreased pain tolerance, leading to dysmenorrhea. Women with a high BMI have higher levels of fat, which can stimulate hormone production, disrupting the reproductive system during menstruation.(Pratiwi et al., 2024). StudyKarubuy et al (2023)A study of 58 students at SMAN 105 Jakarta showed that 25 (43.1%) of the students had an abnormal BMI, and those with an abnormal BMI were 52.5 times more at risk of experiencing menstrual pain or dysmenorrhea. The research conductedSunarti & Lestari (2023)There were 27 respondents who had an abnormal BMI and 19 (42.2%) of them experienced dysmenorrhea.

According to research, consuming nutritious foods and managing your diet are crucial for maintaining a normal BMI. An abnormal BMI can impact the immune system, and in menstruating women, BMI can influence the incidence of dysmenorrhea. Maintaining a normal BMI can help women maintain their health and reduce the risk of dysmenorrhea.

Dysmenorrhea

In this study, the results showed that out of 58 female students, 8 (13.8%) experienced mild dysmenorrhea, 23 (39.7%) experienced moderate dysmenorrhea, and 27 (46.6%) experienced severe dysmenorrhea with an average value or mean of 2.33 and the distance between the data value and the mean or called the standard deviation of 0.711. Dysmenorrhea can occur due to increased secretion of prostaglandin F2α (PGF2α) and prostaglandin E2 (PGE2) along with endometrial peeling or menstrual bleeding.(Itani et al., 2022). According toPratiwi et al (2024)Dysmenorrhea can be caused by age of menarche, family history, BMI, duration of menstrual bleeding, and smoking habits.

Research conducted Wulandari et al (2023)The results showed that out of 60 female students of SMAN 01 Pasirian Lumajang, 4 (6.7%) female students did not experience dysmenorrhea, 25 (41.7%) female students experienced mild dysmenorrhea, 16 (28.7%) female students experienced moderate dysmenorrhea and 15 (25%) female students experienced severe dysmenorrhea.Siscadarsih et al (2022)which states that 89.4% of female adolescents experience mild to moderate dysmenorrhea and 10.6% of female adolescents experience severe dysmenorrhea.

According to research, dysmenorrhea can be caused by several factors, including age at menarche, family history, BMI, duration of menstrual bleeding, and smoking habits. Dysmenorrhea experienced by women during menstruation varies in severity, ranging from no dysmenorrhea to mild, moderate, and severe, each of which can impact daily activities.

The Relationship Between Body Mass Index (BMI) and the Incidence of Dysmenorrhea in Female Students of PGRI 37 Vocational School, Jakarta

The chi-square statistical test in the study obtained a P-value of 0.015 <0.05 and stated that there was a relationship between Body Mass Index (BMI) and the incidence of dysmenorrhea in female students of SMK PGRI 37 Jakarta, the odds ratio value was 0.316 which means that female students with an abnormal BMI were 0.316 times more at risk of experiencing dysmenorrhea and the confidence interval value or Confidence Interval (CI) was 0.136 - 0.736. BMI is an assessment of the body's health condition caused by consumption, absorption, and use of nutrients in food, BMI is categorized into thin, normal, and fat, BMI can affect the occurrence of menstrual pain or dysmenorrhea in women(Yulianti & Sugiharti, 2024).

StudyKarubuy et al (2023)found a relationship between BMI and the incidence of dysmenorrhea with a P-value of 0.000 < 0.05. This statement is in line with researchSiscadarsih et al (2022)showed that adolescents who had a thin and fat BMI had a relationship with dysmenorrhea with a P-value of 0.006 < 0.05, and those with a thin BMI were 2.4 times more at risk of experiencing mild to severe dysmenorrhea compared to women with a normal BMI. The research conducted by(Rafique & Al-Sheikh, 2018)In 370 respondents, it was shown that there was a relationship between low BMI and moderate to severe dysmenorrhea with a P-value of 0.03 < 0.05. According toPratiwi et al (2024)The factors that cause dysmenorrhea are not only BMI but can also be caused by other factors such as age of menarche, duration of menstruation, and history of dysmenorrhea in the family.

According to the researcher's analysis, BMI is related to the level of dysmenorrhea, and to reduce the level of dysmenorrhea, it is necessary to maintain a normal BMI by consuming foods containing adequate nutrition and regulating diet. Maintaining a normal BMI is important to overcome dysmenorrhea because dysmenorrhea affects students' activities, especially in learning activities. Therefore, maintaining a normal BMI will help students to reduce the risk of dysmenorrhea.

CONCLUSION

More than half of the female students at SMK PGRI 37 Jakarta have an abnormal Body Mass Index (BMI), namely 55.2%.

The highest level of severe dysmenorrhea occurred in female students at SMK PGRI 37 Jakarta, namely 46.6%.

There is a relationship between Body Mass Index (BMI) and the incidence of dysmenorrhea in female students of SMK PGRI 37 Jakarta with a P-value = 0.015.

SUGGESTION

Female students can pay more attention to the food they consume, whether the food has sufficient nutrition or not so that they can improve or maintain their BMI within normal limits, thereby reducing dysmenorrhea.

Schools can educate female students about the importance of maintaining adequate nutritional intake to maintain BMI within normal limits and educate them about the impact of BMI on dysmenorrhea.

StudyThis study can be used as a reference and foundation for further research on Body Mass Index (BMI) and dysmenorrhea. Future researchers can also explore other factors associated with dysmenorrhea, such as age at menarche, family history, duration of menstrual bleeding, and smoking habits. If future researchers wish to conduct research on BMI, they can use a BMI measurement method with a calibrated instrument and prioritize ways to protect respondent privacy.

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