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CORRELATION BETWEEN ANEMIA AND THE INCIDENCE OF DYSMENORRHEA IN ADOLESCENT GIRLS

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Abstract

Background: Anemia, characterized by a low number of red blood cells or hemoglobin levels, can be one of the factors that play a role in the occurrence of dysmenorrhea during menstruation. Hemoglobin is unable to fulfill its function of transporting adequate amounts of oxygen to peripheral tissues. This causes women who experience anemia to experience frequent dysmenorrhea. The purpose of this study was to determine the relationship between anemia and the incidence of dysmenorrhea. **Methods:** This research method was observational analytic with cross sectional research design. The sample in this study were 132 adolescent girls in grades 11 and 12 at Mambaus Sholihin Islamic Boarding School, Gresik District, East Java. Data analysis in this study was chi square test. **Results:** The results showed that 34.1% were anemic and 65.9% were not anemic. Adolescents who experienced dysmenorrhea were 91.7% and 8.3% did not experience dysmenorrhea. Statistical tests to analyze the relationship between anemia and the incidence of dysmenorrhea using chisquare obtained pvalue = 0.01**. Conclusion:** There is a relationship between anemia and the incidence of dysmenorrhea at Mambaus Sholihin Islamic Boarding School.

keyword : Dysmenorrhea; anemia; adolescent girls

INTRODUCTION

Anemia is a deficiency of hemoglobin (Hb) in the blood caused by a lack of nutrients necessary for the formation of hemoglobin. The normal Hb level in adolescent girls is 12 gr/dl. The prevalence of anemia in women of productive age (14-49 years) globally continues to increase. In 2019, the global prevalence of anemia was 29.9% in women of reproductive age, equivalent to more than half a billion women aged 15-49 years. Prevalence was 29.6% in non-pregnant women of reproductive age (WHO, 2021). The proportion of anemia in the age group of 15-24 years was 18.4% in 2013 (Balitbangkes RI, 2013 ; Simanungkalit, 2019) . Based on the 2018 Riskesdas data, the proportion of anemia in women (27.2%) was higher

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than in men (20.3%). The proportion of anemia in the age group of 15-24 years was 32% in 2018 (Balitbangkes RI, 2018 ; Simanungkalit, 2019) . The high prevalence of anemia in adolescents is caused by various factors such as menstruation, iron tablet consumption, physical activity, nutritional status, bleeding outside menstruation, low socioeconomic status, obesity, kidney failure disease, tuberculosis, and helminth infection. Anemia in adolescent girls can have many negative impacts, including stunting growth, lowering fitness levels, memory and the immune system making them more susceptible to infections and can cause dysmenorrhea. (Mustaghfiroh, 2019).

According to research conducted by Nana Aldriana and Afriliana at Pasir Pengaraian University students (2018), there was a significant relationship between hemoglobin levels and the incidence of dysmenorrhea. The results showed that female students with hemoglobin levels ≤12 g/dl had a greater chance of experiencing dysmenorrhea compared to female students whose hemoglobin levels were ≥12 g/dl.

According to data from the World Health Organization (WHO), the prevalence of menstrual pain worldwide is very high. It is estimated that the incidence of dysmenorrhea reaches 1,769,425 people (90%), where 10-15% of these cases fall into the category of severe dysmenorrhea (Deby, 2017 ; Aya 2019). In Indonesia, the incidence of dysmenorrhea is quite high, with an estimated number of sufferers reaching 60-70% of the female population in Indonesia. The prevalence of primary type dysmenorrhea in Indonesia is around 54.89%, while the remaining 45.11% are categorized as secondary type dysmenorrhea.(Pupitasari, 2018 ; Lail, 2019).

Dysmenorrhea in adolescent girls can have impacts such as impaired comfort, decreased activity, disturbed sleep patterns, decreased appetite, impaired interpersonal relationships, difficulty concentrating on work, and can trigger depression. (Juniar, 2015; N. R. Putri et al., 2023). Both health problems, anemia and dysmenorrhea, have adverse effects on adolescent health. Allegedly, these two health problems are interrelated so research is needed to find out more about The Relationship between Anemia and Dysmenorrhea in Adolescent Girls at Mambaus Sholihin Islamic Boarding School.

METHOD

This research design used an quantitative observational analytic with cross sectional. The population and samples used were adolescent girls at the Mambaus Sholihin Islamic Boarding School in grades 11 and 12 with a sample size of 132 respondents. The technique used total sampling technique with inclusion criteria, there were: 15-18 years old, already experiencing menstruation, not suffering from chronic or infectious diseases (AIDS, cancer, malaria, tuberculosis, liver and inflammation), signed an informed consent sheet. Each population was given the same opportunity to become respondents who meet the inclusion criteria, Research Instruments respondents fill out a WaLIDD score questionnaire sheet containing questions about dysmenorrhea and check hemoglobin levels using the Easy Touch GCHb hemoglobin test kit. Data analysis was carried out, univariate to determine the distribution and percentage results of each variable and bivariate to determine the relationship between dependent and independent variables. In this study using the chi-square statistical test.

RESULT AND DISCUSSION

The sample size in this study was 132 respondents. There were no dropout samples because each sample taken met the inclusion and exclusion criteria and the respondents filled out the questionnaire completely. The following is the age of the respondent. Complete data can be seen in the following table:.

Tabel 1 Age Characteristics of Respondents

Criteria	Frequency (f)	Percentage (%)
15 years old	9	6,8
16 years old	88	66,7
17 years old	33	25,0
18 years old	2	1,5
Total	**132**	**100,0**

Table 1 shows the characteristics of respondents in terms of the highest age, namely 16 years old as many as 88 respondents (66.7%).

Tabel 2 Frequency Distribution of Anemia Status

Anemia Status	Frequency (f)	Percentage (%)

Non Anemia	87	65,9
Anemia	45	34,1
Total	**132**	**100,0**

Based on the results of the study as shown in Table 5.2, 45 (34.1%) adolescents who experienced anemia and 87 (65.9%) adolescent girls who did not experience anemia. In several other studies, the incidence of anemia in boarding schools tends to be high due to the lack of nutritional intake from the food provided in boarding schools. The food they receive tends to contain a lot of carbohydrates, but less protein and iron. This condition is exacerbated by the busy schedule at the boarding school.

This lack of nutrition and high physical activity causes the energy expended by adolescent girls to be disproportionate to the nutrition they get (Alyani, 2024). According to Mansjoer (2001), this occurs due to the lack of protein and iron content obtained. Iron is needed in the formation of hemoglobin, so anemia that occurs due to lack of iron nutrition will cause the formation of smaller red blood cells and low hemoglobin content. Anemia can cause oxygen transport in the body to be disrupted. This is due to reduced levels of hemoglobin and red blood cells (erythrocytes) in the body, causing inadequate oxygen to be carried to all tissues and developing hypoxia. The body will replace such a situation by increasing the number of red blood cells, redistributing blood from tissues that have low oxygen demand to tissues that have high oxygen demand, increasing cardiac output by increasing heart rhythm (Nurbadriyah, 2019).

Tabel 3 Frequency Distribution of Dysmenorrhea

Dysmenorrhea Incidence	**Frequency (f)**	**Percentage (%)**
Non Dysmenorrhea	11	8,3
Dysmenorrhea	121	91,7
Total	**132**	**100,0**

Tabel 4 Distribution of Dysmenorrhea Level

Tingkat Dismenore	**Frequency (f)**	**Percentage (%)**
Mild Dysmenorrhea	50	37,9
Moderate Dysmenorrhea	55	41,7
Severe Dysmenorrhea	18	13,6
Total	**132**	**100,0**

From table 3 of 132 respondents, the majority of respondents experienced dysmenorrhea, namely 121 respondents (91.7%). Table 4 shows that out of 121 respondents who experienced mild dysmenorrhea as many as 50 respondents

(37.9%), moderate dysmenorrhea as many as 55 respondents (41.9%), and severe dysmenorrhea as many as 18 respondents (13.6%).

Dysmenorrhea is a symptom associated with several diagnoses of pelvic pain; it appears before the menstrual period and sometimes extends up to 72 hours after the completion of menstruation. Dysmenorrhea appears up to 6-12 months after menarche, mainly affecting young women, often those in university or work activities. At this stage of life it is known as primary dysmenorrhea and is usually caused by physiological causes, which are associated with nutritional disorders, menstrual cycle irregularities, menarche before the age of 12, excessive menstruation, and other factors that characterize the university population between 20 and 25 years old, such as nulliparity, stress, depression, smoking, and lack of social support. Adolescents commonly experience primary dysmenorrhea.(Teherán,2018)

The peak incidence of dysmenorrhea is in the late adolescent age group, namely 17-25 years of age (Safira, 2021).Adolescent girls at Pondok Pesantren Mambaus Sholihin have a busy schedule that can cause stress, diet and lack of rest so that it can affect Hb levels which are risk factors for dysmenorrhea.

On the WaLIDD questionnaire there are scale types (workability, location, intensity, pain days, dysmenorrhea score [WaLIDD]) is designed, which integrates dysmenorrhea features such as the number of anatomical pain locations (no body parts, lower abdomen, lumbar region, lower limbs, inguinal region),Wong-Baker pain range (no pain, little pain, a little more pain, more pain, more pain, more pain), the number of days of pain during menstruation (0, 1-2, 3-4, 5) and the frequency of disabling pain to perform their activities (never, almost never, almost always, always) (Rianita, 2019).

Pathophysiologically, the condition of dysmenorrhea occurs due to increased secretion of prostaglandin F2 alpha in the luteal phase of the menstrual cycle. The increased secretion of prostaglandin F2 alpha causes an increase in the frequency of uterine contractions, causing vasospasm and ischemia in the uterine arteries. The ischemic response that occurs in dysmenorrhea conditions causes pain in the lumbar region, pain in the lower back, weakness, edema, diaphoresis,

anorexia, nausea sometimes to vomiting, diarrhea, headache, decreased concentration, emotional lability, and other symptoms. (Fajrin, 2023)

Tabel 5 Frequency Distribution of Anemia Relationship with Dysmenorrhea

Anemia Status	Dysmenorrhea Incidence				Total		p. vaule	CC
	Non Dysmenorrhea		Dysmenorrhea					
	f	%	f	%	f	%		
Non Anemia	11	12,6	76	87,4	87	100,0	0,01	0,212
Anemia	0	0,0	45	100,0	45	100,0		
Total	**11**	**8,3**	**121**	**91,7**	**132**	**100,0**		

Table 5.1 shows that out of 87 respondents who were not anemic, 76 respondents (87.4%) experienced dysmenorrhea and 11 respondents (12.6%) did not experience dysmenorrhea, while 45 respondents (100%) experienced dysmenorrhea and 0 respondents (15.2%) did not experience dysmenorrhea.

The results of statistical tests using chi square obtained a value of p = 0.01 (p < 0.05). The results of this test indicate a significant relationship between anemia and the incidence of dysmenorrhea in adolescent girls at Pesantren Mambaus Sholihin. The Contingency Coefficient value of 0.212 means that the closeness of the relationship between anemia and dysmenorrhea is in the weak category.

Based on the results of the study, there is a relationship between anemia and the incidence of dysmenorrhea which obtained a p value of 0.01 < α (0.05). This phenomenon is in accordance with the theory that the condition of anemia is one of the factors that affect the level of dysmenorrhea during menstruation, due to the occurrence of ischemia which is a temporary and reversible state of oxygen deficiency in tissues. The molecule that functions to bind and carry oxygen throughout the body is hemoglobin. The more hemoglobin that binds and carries oxygen in red blood cells, the more oxygen needs in the tissues will be met.

A study from Aldriana (2018) found a significant relationship between hemoglobin levels and the incidence of dysmenorrhea in female students at Pasir Pengaraian University (p=0.001), with an OR value = 2.900, which means that female students with hb levels <12gr/dl have a 2.900 times chance of experiencing dysmenorrhea compared to female students with hb levels ≥12 gr/dl.

The research that is in line with this research is research conducted by Nana Aldrianaetal (2019), the results show that there is a significant relationship between hemoglobin levels and the incidence of dysmenorrhea with a value of p=0.001.

Another study conducted by Ana Wigunantiningsih, the results of the study also found that there was a significant relationship between anemia and the incidence of dysmenorrhea.

One of the factors influencing the occurrence of dysmenorrhea is hemoglobin deficiency. Hemoglobin deficiency causes red blood cells to be pale in color and the ability of these cells to carry oxygen is low, resulting in other organs receiving less oxygen supply. This can lead to anoxia in these organs, and over time, individuals will easily feel tired even if they are not doing any activity. The effects of hemoglobin deficiency vary depending on the sensitive organ. If the brain is affected, symptoms may include dizziness and lack of concentration. In the heart, symptoms may include palpitations, which can even lead to heart failure. Similarly, if the uterus is affected, lack of oxygen supply to the uterus may cause pain in the organ (Nana, 2018).

Based on the discussion above, several solutions are needed to reduce the number of respondents suffering from anemia and dysmenorrhea. Islamic boarding schools can partner with local health centers to provide education about anemia and dysmenorrhea. Puskesmas can also offer a work program to provide iron tablets to pesantren. This is to increase the knowledge of female students about the importance of blood-filling tablets to prevent blood deficiency. The pesantren may also offer activities to relieve stress.

CONCLUSION AND SUGGESTION

The frequency of adolescent girls at Mambaus Sholihin Islamic Boarding School who did not experience anemia was 87 people (65.9%) and those who experienced anemia were 45 people (34.1%). The frequency of adolescent girls at the Mambaus Sholihin Islamic Boarding School who experienced dysmenorrhea was 121 respondents (91.7%) while 11 respondents (8.3%) did not experience dysmenorrhea. There is a relationship between anemia and the incidence of dysmenorrhea in adolescent girls at the Mambaus Sholihin Islamic Boarding School.

DECLARATION

Conflict of Interest

Author declare there is no conflict of interest in this research

Authors' Contribution

All author contribute from concept until writing draff article.

Ethical Approval

Research Ethics Committee of Faculty o Medicine, Universitas Airlangga.

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Data Availability

The data supporting this research are available from the authors on reasonable request.

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