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SHORT REPORT

Factors of primary dysmenorrhea in junior high school students in South Tangerang City, Indonesia, 2018.

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ABSTRACT

Primary dysmenorrhea is painful menstruation that occurs without the gynecological disease, and it can spread towards the waist and thighs, along with pain, nausea, vomiting, headaches, diarrhea and can interfere with daily activities. In Indonesia, it is estimated that about 72.89% of adolescent experienced primary dysmenorrhea. This study aimed to prove the factors of primary dysmenorrhea in Junior High School Students in South Tangerang City, Indonesia, 2018. The design of the study was cross-sectional. Two hundred and forty-six students were taken by proportional random sampling. Data were collected by a questionnaire including personal information, prevalence, symptoms, degrees, handling and risk factors of primary dysmenorrhea. The result of this study showed that the prevalence of dysmenorrhea had 80.9%. The most characteristics of the students at age of menarche ≥ 12 years old (61.0%), length of menstruation ≤ 7 days (75.6%), with family history (69.1%), the less physical activity (58.5%), severe-extremely of the stress levels (52.0%), normally BMI (41.1%). There was a statistical correlation between dysmenorrhea to an age of menarche, stress levels, physical activity and family history of dysmenorrhea. There was no statistical correlation between dysmenorrhea to BMI and length of menstruation. The conclusion is dysmenorrhea commonly happen in junior high school students in South Tangerang City, which are determined by several factors, and it interferes with daily activities. Recommended for female students and the schools are more in-depth education related to reproductive health, especially to primary dysmenorrhea.

Keywords: dysmenorrhea, risk factors, junior high school students, Indonesia

INTRODUCTION

Adolescence is a transition from childhood to adulthood which is marked by several biological, physical and psychological changes. These changes are known as puberty. One sign of adolescents, especially women who have experienced biological changes, is menstruation. During the menstrual cycle, almost every woman experience complaints of pain or what is called dysmenorrhea.[23] Primary dysmenorrhea is a menstrual pain without pathological abnormalities and usually occurs from 6 to 12 months after menarche and may continue until menopause.[1] Symptoms that occur when dysmenorrhea are nausea, vomiting, headache, diarrhea, irritability and so on.[2]

WHO have reported high prevalence of dysmenorrhea in the world, on average more than 50% of women in each country affected by dysmenorrhea. The prevalence of dysmenorrhea in Indonesia does not have a definite number. Previous epidemiologic studies have reported 67% of K. Harapan Denpasar junior high school students experienced dysmenorrhea.[4] In a study of junior high school students in Natar District of South Lampung, 87.7% of female students experienced an incident of dysmenorrhea during menstruation.[5]

Based on a preliminary study conducted by researchers of students in grade three of the 2017-2018 school year in one of the junior high schools in South Tangerang, obtained from interviews with 30 female students, 22 of them experienced dysmenorrhea when they menstruated. Symptoms that accompanied with primary dysmenorrhea among the female students included stiffness (53.3%), back pain (43.3%), dizziness (33.3%), headache (26.7%), nausea (10%), diarrhea (10%) and fainted (6.7%).

Some previous studies have shown several factors that can cause dysmenorrhea such as menarche at an early age, menstrual duration, family history, stress level, BMI and several other factors. Wang L et al. proved that there was a relationship between stress and an increase in severe symptoms of dysmenorrhea.[6] Another study stated that there was a significant relationship between regular exercise and primary dysmenorrhea pain. [7-8]

Dysmenorrhea has different adverse effects on individuals and society. For example, schools and work absences, disruptions to daily life activities, restrictions on socialization.[1] Female students who experienced dysmenorrhea at Boyolali Middle School obtained results that students asked for permission to go home because they could not stand with dysmenorrhea. From the absent list of female students in school, it was found that almost 10% every month there were always female students who were absent due to illness or dysmenorrhea. They also said that they could not do learning activities properly during menstruation.[9]

Based on the results of a preliminary study conducted by researchers, of 22 female students who experienced primary dysmenorrhea, they stated that there was a decrease in concentration when studying and until there were those who did not attend learning activities at school. Treatment of dysmenorrhea can use Nonsteroidal Anti-Inflammatory Drugs (NSAIDs), which are inhibitors of the release of Prostaglandin hormones such as *Aspirin*, *Endomethacin*, and *Mefenamic Acid*. The risk of chronic NSAID use is very significant. They can cause life-threatening and gastrointestinal bleeding, side effects that occur more frequently and with a more severe severity with age.[24]

For that reason, it is necessary to examine the factors of the prevalence of primary dysmenorrhea in the junior high school students, because the prevalence of primary dysmenorrhea mostly occurs in the

first 6-12 months after menarche and the average age of a woman having menstruation for the first time is 12 years, where the age of 12 years is at the level of junior high school so that the junior high school student is more susceptible to dysmenorrhea and her experience and knowledge is still little related to dysmenorrhea so that with this research students can make prevention efforts early on the event of dysmenorrhea so that student activity is not disrupted even when menstruation and dysmenorrhea are not sustained until menopause, .

In addition, the students do not take medication for menstrual pain that can cause side effects. In addition, this research was conducted at a junior high school in South Tangerang City because there were no previous studies related to the factors of primary dysmenorrhea, and the results of a preliminary study showed the high prevalence of primary dysmenorrhea (73.3%) which exceeded the rate of primary dysmenorrhea at the national level.

METHODS

Study Setting

The population used in this study was in the 8th and 9th-grade students of the 2018-2019 school year in several junior high schools in South Tangerang City. South Tangerang City is located in the province of Banten, Indonesia. This city has a number of junior high schools around 174. Altogether has a total student of grade 8 and 9 students of approximately 61,720 among that students around 16,632 were female students.[10]

Study Design

The cross-sectional study design was carried out to prove the associated factors with the prevalence of primary dysmenorrhea in female junior high school students in South Tangerang City in 2018 from July 17-24, 2018. this research was conducted at a junior high school in South Tangerang City because there were no previous studies related to the factors of primary dysmenorrhea, and the results of a preliminary study showed the high prevalence of primary dysmenorrhea (73.3%) which exceeded the rate of primary dysmenorrhea at the national level. Besides, Novitasari's study in one school in South Tangerang shows that there is still a lack of adolescent knowledge related to dysmenorrhea where students' knowledge and understanding will influence the prevention and treatment of dysmenorrhea so that the lack of prevention can lead to high rates of primary dysmenorrhea at junior high school students in the City of South Tangerang.

Researcher calculate the size or minimum number of samples found using the formula of different proportions, as follows:

$$n = \frac{\left\{Z_{1-\alpha/2}\sqrt{(2P(1-P))} + Z_{1-\beta}\sqrt{(P1(1-P1)) + P2(1-P2)}\right\}^2}{(P1-P2)^2}$$

From the above calculation, the minimum sample obtained from the different proportions test is required as many as 224, grade 8 and grade 9 students in several junior high schools in South Tangerang City. To anticipate the loss of the questionnaire or the sample that dropped out, the sample was added by 10% to 246 samples.

Sampling Method

Sampling was using by Multistage Sampling where the first stage was Junior High School in South Tangerang City, then the second stage was Junior High School in sub-district in South Tangerang City. The researcher took a sample of each of the junior high schools every sub-district by using Simple Random Sampling and the

sample selection in each school has been done by proportional random sampling.

For the selection of junior high school using this method, researchers take one school in each district with the assumption that they can describe all schools in each district. The list six schools selected by simple random sampling. Systematic random sampling has been used for select a list of a number of students in each school from the absence list.

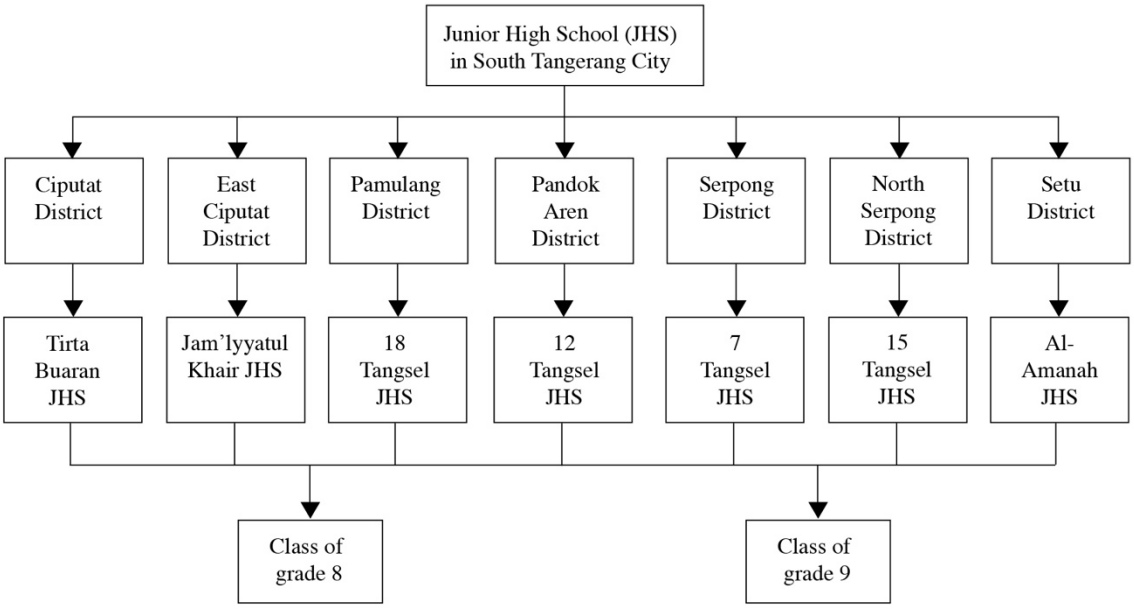

Figure 1: Flow in Sampling

Data Collection Process

Data were collected using a questionnaire which was designed for this research. The students were asked to provide information about their personal information, prevalence, symptoms, degrees, handling and risk factors of primary dysmenorrhea such as the age of menarche, length of menstruation, family history of dysmenorrhea, physical activity, stress levels and they measured body weight and height by the researcher.

Questionnaires have been tested for validity and reliability in Cendrawasih 2 Junior High School, Pondok Aren, South Tangerang City. Validity and reliability tests were performed on 30 female students. Validity test has been done by comparing the value of Corrected Item-Total Correlation with r-table. Whereas for reliability test comparing Cronbach's Alpha value with Cronbach's Alpha Based value on Standardized Items.

Statistical tests were carried out on the stress section questionnaire and some physical activity parts. The Cronbach's Alpha value obtained was 0.946 and the Cronbach's Alpha Based value on Standardized Items was 0.939. Because the value of Cronbach's Alpha is greater than the value of Cronbach's Alpha Based on Standardized Items, the instrument has been said to be reliable.

The value of Corrected Item-Total Correlation was greater than r-table (0.3610) and it was mean that the questionnaire has valid. However, several questions whose values were below the r-

table, including the questions on the stress section, which are items number D2, D6, D10, D23, D31, D37, D41, D42 and in the physical activity section in items number C2 to C6. Therefore, the researcher corrects the words in the question item to make it easier to understand.

Another question, the validity test has been done by observing the responses of students' answers. After the interview, some students said there were some difficulties in the language. As in section A1, D6, D31. The researcher also changed the words into a language that was easier to understand so that the students did not experience difficulties in completing the questionnaire.

Data analysis

Statistical package for social science (SPSS) version 22 was used to address the specific objectives of the research. The questionnaire was labeled and coded by the researcher Data processing consists of several stages including editing, coding, entry, cleaning, saving. Descriptive analysis conducted to determine the distribution of the prevalence of primary dysmenorrhea and each variable related to the primary dysmenorrhea.

In this study, researchers examined the relationship of several variables to the prevalence of dysmenorrhea using Chi-Square analysis. The Chi-Square test is used to analyze the relationship between categorical and categorical variables. Variable factors and the prevalence of primary dysmenorrhea in this study were determined as categorical variables.

RESULTS AND DISCUSSIONS

Out of 246 distributed questionnaires, all of the female students returned the questionnaires after completing the required information.

The Prevalence of primary dysmenorrhea and its severity

According to this study, 199 (80.9%) of the female students reported they were suffering from primary dysmenorrhea. Researches asked and classified female students having menstrual pain that hindered with daily activities but they don't do any treatment when dysmenorrhea (66.3%) and just leave it. Most students have moderate degrees of dysmenorrhea (73.4%). Regarding symptoms associated with dysmenorrhea, the most common symptoms reported was aches (49.2%), back pain (31.3%), dizziness (24.8%), headaches (13.8%) and diarrhea (8.1%). these symptoms often accompany dysmenorrhea due to the entry of prostaglandins into the systemic circulation. (Table 1).

Table 1. The Prevalence of Primary Dysmenorrhea and it's Severity in Female Students Junior High School in South Tangerang City in 2018

Variables	Frequency	Percentage
The Prevalence of Primary Dysmenorrhea		
Yes	199	80,9
No	47	19,1
Degrees of Primary Dysmenorrhea		
Severe	27	13,6
Moderate	146	73,4
Mild	26	13,1
Symptoms Associated with Primary Dysmenorrhea		
No Symptoms	35	14,2
Nausea	18	7,3
Gag	3	1,2
Diarrhea	20	8,1
Back Pain	77	31,3
Aches	121	49,2
A headache	34	13,8
Dizzy	61	24,8
Fainted	2	0,8

Univariate and Bivariate Analysis

Primary dysmenorrhea is a menstrual pain without pathological abnormalities in the pelvis, and primary dysmenorrhea usually occurs the first few years after menarche, has a characteristic pain.[25] Women with primary dysmenorrhea have higher prostaglandin levels compared to women without dysmenorrhea. This increase occurs approximately the first 48 hours during menstruation. During menstruation, due to increased prostaglandins causes vasospasm (spasms of blood vessels) of uterine arterioles which causes ischemia (inadequate blood supply to organs) and cramping in the lower abdomen which stimulates menstrual. [1]

Female students reported they were suffering from primary dysmenorrhea. The results showed that 80.9% of junior high school students in South Tangerang City experienced primary dysmenorrhea during menstruation. It was consistent with previous studies that also reported that primary dysmenorrhea was a common problem.11,12,13 This study shows that there were several factors associated with the prevalence of dysmenorrhea in South Tangerang City.

Menarche (first menstruation) is the first menstrual period that occurs in the uterine wall and was known as menstruation which is a sign of biological readiness and the sign of the fertile cycle has begun.[14] Menarche is the first menstruation, varying in width between 10-16 years, but the average age is 12-13 years. The age category of menarche, which is the most owned by junior high school students in South Tangerang City based on the results of the study is <12 years, around 90.6%. Menarche age <12 years is considered risky and can cause primary dysmenorrhea.[26] In an earlier age of menarche (<12 years old), the reproductive organs have not developed optimally and there is still a narrowing in the cervix, there will be pain during menstruation because

the female reproductive organs are not functioning optimally.[15]

Age of menarche that is too fast can also cause anxiety because mentally, there is no readiness to experience menstruation. Hence, adverse psychic reactions arise when menarche and cause feelings of anxiety, fear, anxiety and depression where negative emotions cause feelings of inferiority that result in girls will feel pain during menstruation.[27] The results of this study indicate that there is a relationship between the age of menarche and the prevalence of primary dysmenorrhea.

The second factor is length of menstruation, it is the time needed in one menstrual phase. Menstrual periods each period generally lasts around 3 to 6 days. But some experience menstruation for only 1-2 days and some are for seven days, and this is still considered healthy if every menstrual period does occur like that,[18] but if more than 7 days during menstruation is a risk factor for dysmenorrhea.[16] This is because the longer the duration of menstruation, the more frequent the uterus to contract as a result the more prostaglandin is released so that menstrual pain arises. In addition, continuous uterine contractions also cause the blood supply to the uterus to stop temporarily resulting in primary dysmenorrhea.[17] Menstrual pain will decrease levels of prostaglandin.[1]

Although based on the theory explained that the duration of menstruation affects the prevalence of primary dysmenorrhea, but the results of the study did not show any relationship between the period of menstruation with the prevalence of primary dysmenorrhea. The researcher assumes that there is no relationship in this study because the results of menstruation lengths owned by junior high school students in the City of South Tangerang are more at ≤ seven days compared to those with periods of > seven days. Also, because in the results of this study the difference in the percentage of respondents who experienced primary dysmenorrhea in various categories of menstrual duration was not very apparent, so after testing statistically, there was no significant effect. In the results, it can be seen that those who have menstrual periods ≤ seven days are also many who experience primary dysmenorrhea.

The third factor is family history/gene. Family history is a risk factor that can increase the likelihood of dysmenorrhea. This is due to genetic factors that can affect the condition of the respondent so that if there is a family of respondents who experience dysmenorrhea tends to affect the psychic respondent. Family history (mother or sibling) is a risk factor for dysmenorrhea. Anatomical and physiological conditions of a person in general are almost the same as parents and siblings.

The results showed there was a relationship of family history with the prevalence of primary dysmenorrhea with a value of P. Value 0.036. Most respondents who experience dysmenorrhea and have a positive family history, this shows that there must be genetic factors. A study from rural China evaluated the metabolic gene polymorphism and the risk of dysmenorrhea. They provide evidence of their genetic susceptibility with a family history of dysmenorrhea, as well as lowering their daughters to dysmenorrhea.[19]

Table 2: Factors Associated with Prevalence of Primary Dysmenorrhea

Independent Variables	Primary Dysmenorrhea				Total		*p-value*
	Yes		No				
	n	%	n	%	n	%	
Age of Menarche							
< 12 years old	87	90.6	9	9.4	96	100.0	**0.003***
≥ 12 years old	112	74.7	38	25.3	150	100.0	
Length of Menstruation							
> 7 days	50	83.3	10	16.7	60	100.0	0.716
≤ 7 days	149	80.1	37	19.9	186	100.0	
Family History							
Yes	144	84.7	26	15.3	170	100.0	**0.036***
No	55	72.4	21	27.6	76	100.0	
Physical Activity							
Low	123	85.4	21	14.6	144	100.0	**0.048***
High	76	74.5	26	25.5	102	100.0	
Stress Levels							
Severe – Extremely severe	117	91.4	11	8.6	128	100.0	**0.000***
Mild-Moderate	60	81.1	14	18.9	74	100.0	
Normal	22	50.0	22	50.0	44	100.0	
Body Mass Index (BMI)							
Overweight	48	81.4	11	18.6	59	100.0	0.981
Underweight	69	80.2	17	19.8	86	100.0	
Normal	82	81.2	19	18.8	101	100.0	

* *p-value* <0.05

The fourth factor is physical activity. The prevalence of dysmenorrhea will increase with a lack of physical activity during menstruation and lack of exercise, this can cause blood circulation and oxygen to decrease. The impact on the uterus is that blood flow and oxygen circulation are reduced and cause pain. This is because when exercising the body will produce endorphins. Endorphin hormones are produced in the brain and the spinal nervous system functions as a natural sedative produced by the brain so that it can cause comfort.[20] Statistical test results show that there is a relationship between physical activity and the prevalence of primary dysmenorrhea with a 0.048 P. Value.

Teens with low physical activity tend to like indoor activities such as watching TV for hours, playing the computer, sleeping for a long time, and spending time to play gadgets. Outdoor activities are not very desirable because the weather outside is hot or cold so that too much sweat and easily tired.

Next is stress level. Stress is a condition or state of the body that is disturbed due to psychological pressure. When a person is stressed, the body will produce excessive levels of adrenaline, estrogen, progesterone, and prostaglandin. Estrogens can cause an increase in uterine contractions excessively, whereas increased progesterone is inhibiting contractions. Excessive increase in uterine contractions during stress provides a greater risk of primary dysmenorrhea. In addition, the adrenaline hormone is also increased, causing tense body muscles including the uterine muscles and can make pain when menstruating.[21]

The results showed that most students had severe-very severe stress levels. Statistical test results also indicate

that stress level is one of the factors associated with the prevalence of primary dysmenorrhea with a value of P. Value 0,000. Stress that occurs in students, among others, students can become angry because of small or trivial things, tend to overreact to situations, quickly feel upset, feel anxious, impatient, irritable, irritable, difficult to rest and difficult to tolerate disturbances on what is being done. These symptoms are described following the questionnaire used in determining the level of stress that is DAAS 42. This stress level affects the occurrence of dysmenorrhea.[28]

The last is body mass index (BMI). A person's BMI status is known to affect the prevalence of primary dysmenorrhea. BMI owned by the majority of junior high school students in South Tangerang City showed a normal BMI status of 41% and the second was underweight at 35%. Low nutritional status (underweight) can be caused due to lack of food intake, where lack of food intake is one of the constitutional factors that cause a lack of resistance to pain so that dysmenorrhea can occur during menstruation.[14] While over nutritional status (overweight) can also result in dysmenorrhea because there is excessive fat tissue that can lead to hyperplasia of blood vessels or pressure of blood vessels by fat tissue in the female reproductive organs, so that blood that should flow during menstruation is disrupted and results in menstrual pain.[22]

In those with normal BMI, frequent consumption of junk food is also a risk factor for dysmenorrhea. The results of the research conducted showed that there was no relationship between BMI and primary dysmenorrhea. Statistical test results show the value of P. Value > 0.05. Students with normal nutritional status, fat and thin have the majority of primary dysmenorrhea. Adolescent normal BMI does not rule out the possibility of menstrual disorders because besides hormonal imbalances, nutritional intake, psychology, etc.

RECOMMENDATIONS

The results showed that most students experienced primary dysmenorrhea. Some related factors include age of menarche, family history, physical activity, and tress level. We recommend that more students look for some information related to efforts that can prevent the occurrence of primary dysmenorrhea and make these efforts such as increase physical activity. Students can increase physical activity with regular exercise and multiply activities such as playing outdoors during recess. The next is Reducing Stress. Things that can be done include students should be more able to open up and tell stories when there are problems both with friends at school, parents, teachers and people around them.

In addition, controlling nutritional status by paying attention to the food consumed. In addition, students should be able to handle the occurrence of primary dysmenorrhea so as not to interfere with their daily activities. Students with severe levels of dysmenorrhea and even fainting should immediately go to health services because primary dysmenorrhea can be a sign of secondary dysmenorrhea so that early prevention and treatment can be carried out.

Schools should work together with Primary Health Care or related parties to disseminate and provide relevant information dysmenorrhea events. The school can also create a special School health team in the field of reproductive health. The school is also expected to encourage students to be outside the classroom when resting, or to do gymnastics together at least two times a week and require students to take

extracurricular activities engaged in sports so that student activity can be increased.

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