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Article

The Relationship Between Menstrual Length and Menstrual Cycle with Dysmenorrhea in High School Students

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A B S T R A C T

Menstruation can cause various problems including pain during menstruation or what is commonly known as dysmenorrhea. Dysmenorrhea can interfere with daily activities, including school activities for adolescents. Dysmenorrhea can occur 2-3 years after menarche. The average duration of menstruation is 3-6 days, followed by reduced blood loss from the 2nd day to the end. This causes women to feel pain on the 2nd day of their cycle due to the unmaximized detachment of the endometrium. Puberty is an important phase of life, followed by development and growth. Good knowledge will shape behavior that supports maximum growth and development. Dysmenorrhea is the number one reason why female students are absent from school. Absences lead to missing information and an impairment. The aim of this study is to determine the relationship between menstrual length and menstrual cycle with dysmenorrhea in female students. This study uses a quantitative method with a cross-sectional approach. The sample in this study consisted of 106 female students drawn by the total sampling method. Inclusion criteria were female students with menarche, and exclusion criteria were PCOS. Analysis using the Chi-Square test. The results showed that the prevalence of female students with dysmenorrhea was 71.1%. The results of the bivariate analysis test showed that there was no significant association between menstrual cycle (p value = 1.000) and menstrual length (p value = 0.852) with dysmenorrhea.

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I. INTRODUCTION

According to the World Health Organization (WHO), adolescence is a period of individual development that begins between the ages of 12 and 24 years old. Health Minister's Regulation Number 25 of 2014 on Health Efforts states that a teenager is someone between the ages of 10 and 18 years old, while the National Agency for Population and Family Planning called BKKBN classifies adolescents in the age range 10 to 24 years old and have never married (Suhaid et al., 2021).

Adolescence is a developmental period that is expected to grow and develop optimally because it is the future of a country that is changing. This stage is a transitional phase from children to adults, where good knowledge, attitudes, and behavior changes are expected to result in a positive character. The beginning of the development of organs in the body leads to several changes that adolescents are expected to be well adapted to. One of them is the change related to puberty.

During the developmental stages of adolescents there are physical and psychological changes. Both require optimal adaptation so that growth and development will make adolescents become responsible adults who understand their own needs. Due to the influence of hormonal changes, physical changes can occur that lead to the growth of the reproductive organs. This growth can be divided into primary sex characteristics and secondary sex characteristics.

The primary sex signs of adolescents include menarche and nocturnal emission. Secondary sex characteristics in adolescent boys can be identified by voice changes, growth of the Adam's apple, enlargement of the penis and scrotum, erections and ejaculations, enlargement of muscles, and growth of mustache, sideburns, and pubic and armpit hair. Secondary sex signs in female adolescents include enlargement of the breasts, hips, and hair growth around the pubic and axillae (Ekawati, Sabur, Umar, & Gasma, 2021; Rokom, 2018).

Menarche is defined as the point at which a woman gets her first menstrual period. Generally, menarche occurs between the ages of 10 and 16, with an average of 12 years. Several studies have found that menarche is influenced by multiple factors, including socioeconomic conditions, genetics, general health, nutritional status, and daily activities. Menarche is usually painless and has no symptoms when it occurs. The first cycle to occur is usually an anovulation, with cycle length and menstrual length being different for every woman. Menarche is a sign that someone already has the ability to reproduce (Lacroix, Gondal, Shumway, & Langaker, 2022; Marques, Madeira, & Gama, 2022).

Menarche occurs in Indonesia on average at the age of 12-15 years with a prevalence of 60%. In Indonesia and Southeast Asian countries, on average, a teenage woman will have menarche at the age of 12, and there are also who are 8 years old whom have started their menstrual cycle, but this number is very small. The longest age to get menarche is 16 years old. A person's age of menarche is uncertain or varies, but there is a tendency for teenage women to have their first menses at a younger age from year to year.

Menarche can cause various problems, one of which is complaints of menstrual pain, commonly known as dysmenorrhea. Dysmenorrhea, a condition that occurs before or during menstruation and is characterized by pain or spasms in the lower abdomen caused by contractions of the myometrium in the form of pain rather than a specific disease such as endometriosis (Bakhsh, Algenaimi, Aldhuwayhi, & AboWadaan, 2022; Coco, 1999; Trimayasari & Kuswandi, 2015). Dysmenorrhea is one of the most common problems of young women, namely pain during menstruation, the prevalence of dysmenorrhea is 50%-90% (Bakhsh et al., 2022).

These condition can be divided into primary and secondary dysmenorrhea. Primary dysmenorrhea is a spasmodic abdominal pain often accompanied by symptoms such as gastrointestinal pain, nausea, vomiting and headache, while secondary dysmenorrhea is menstrual cramps associated with the pathology and the events can occur many years after menarche (Aboushady & El-saidy, 2016). The initial onset of primary dysmenorrhea usually occurs within

6 to 12 months after menarche, with a pain duration of generally 8 to 72 hours. Primary dysmenorrhea is related to uterine muscle contractions (myometrium) and prostaglandin secretion, while secondary dysmenorrhea is caused by pathologic problems in the pelvic cavity. Primary dysmenorrhea occurs due to an increase in prostaglandin (PG) F2-alpha, which is a cyclooxygenase (COX-2), leading to hypertension and vasoconstriction in the myometrium, leading to ischemia and pain in the lower abdomen. There are strong and long contractions in the uterine wall, high levels of prostaglandin hormones, and expansion of the uterine wall when draining menstrual blood, so pain occurs during menstruation. Various risk factors for primary dysmenorrhea have been identified in the literature with different prevalence results. These risk factors are associated with an increased incidence of primary dysmenorrhea (Bakhsh et al., 2022; Coco, 1999).

Menarche that occurs in young women leads to multiple influences such as anxiety and physical disorders such as dysmenorrhea. Dysmenorrhea can lead to reduced quality of life in adolescents, especially those related to the education system or school. Pain causes teenage girls to stay away from school and ask for extra rest time, resulting in a lost opportunity to receive the same information as their friends who do not have the condition. Ultimately, this condition leads to impairment in young women. Complaints of dysmenorrhea will be difficult to deal with when young girls are unaware of the knowledge and treatment related to this incident. This unpreparedness will provoke various reactions leading to uncontrolled medication behavior.

The incidence of dysmenorrhea is very high worldwide, with an average of more than 50% of women in each country suffering from menstrual pain. The prevalence of dysmenorrhea in Indonesia reaches 45%-90%, with 50% of them causing disorders felt by women during the reproductive period and 60-85% during adolescence. The incidence of primary dysmenorrhea was 72.89% and secondary dysmenorrhea 21.11%. Meanwhile, in East Jakarta, 63.2% of young women were diagnosed with dysmenorrhea. Primary dysmenorrhea is experienced by 60-75% of adolescents, with three quarters experiencing mild to severe pain and one quarter experiencing severe pain. Primary dysmenorrhea begins 1-3 years after menarche and lasts until their mid-20s or until they have children (Wulanda, Luthfi, & Hidayat, 2020).

Up to 75% of adolescents suffer from menstrual disorders. Complaints such as irregular menstruation, menstrual pain and heavy bleeding during menstruation are problems that teenagers complain about when they come to health care facilities. The major menstrual disorders were dysmenorrhea at 89.5%, complaints of irregular menstruation at 32.5% and followed by prolongation of bleeding time during menstruation at 5.3%. This disorder can impair quality of life and daily activities. Reported complaints of dysmenorrhea can result in a 50% reduction in learning ability and a 54% reduction in the need for prolonged rest (Sianipar et al., 2009).

Preliminary study conducted on 15 female students at SMA Budhaya II St. Augustine, East Jakarta and found that 13 female students experienced pain during menstruation. Therefore, the aim of this study was to analysed between the length of menstruation and the menstrual cycle with the dysmenorrhea seen in female students at Budhaya II St. Augustine Senior High School.

II. METHODS

This study used a cross-sectional approach with a total sample of 106 female students at Budhaya II St. Augustine. The inclusion criteria in this study were menstruating and willing to become respondents, while the exclusion criteria included female students with PCOS. Considering the ethical aspect that the subjects were people aged <18 years, the signing of the informed consent form was performed with the consent of the legal guardian. Data collection used primary data obtained by distributing questionnaires to students containing identity data, dysmenorrhea pain scale, menstrual length and menstrual cycle. After the data has been collected, a cross check is carried out to ensure that the data is complete and then the data is encoded. Coded data are analyzed using the computerized Chi-Square test.

III. RESULT

The research was conducted on 106 selected respondents using the research method through a parent-witnessed informed consent form and the available questionnaires. The results of the analysis showed that 71.7% of the respondents suffered from dysmenorrhea during menstruation.

Table 1. Distribution frequency of dysmenorrhea, menstrual length and menstrual cycle

Variable	Frequency	Percentage
Dysmenorrhea		
Yes	76	71.7
No	30	28.3
Menstrual length		
Abnormal	71	67.0
Normal	35	33.0
Menstrual cycle		
Abnormal	65	61.3
Normal	41	38.7

Based on table 1, it is known that most respondents suffered from dysmenorrhea during menstruation (71.7%). A pain scale with a value range of 1-10 is used to measure the intensity of the perceived dysmenorrhea pain. The respondent category suffered from dysmenorrhea or not with a cut-off of 5 on the pain scale. If the score is 1-5, it is not classified as dysmenorrhea, while if the response is 6-10 on the pain scale, it is classified as dysmenorrhea.

It is known that most respondents had abnormal menstruation (67%). The category considered abnormal is duration of menstrual lasting < 3 days or > 7 days. If the respondent experiences menstruation between 3 and 7 days, this is considered normal. It is known that most respondents had abnormal menstrual cycles (61.3%). The normal cycle when the interval between the first day of menstruation and the onset of the next menstruation is within 21-35 days. If the cycle lasts < 21 or > 35 days, it is called an abnormal cycle.

Table 2. Relationship between menstrual period and menstrual cycle with dysmenorrhoea

Variable	Dysmenorrhea		P value	OR (95% CI)
	Yes	No		
Menstrual length				
Abnormal	50 (70.4%)	21 (26.9%)	0.852	0.824
Normal	26 (74.3%)	9 (25.7%)		0.331-2.055
Menstrual cycle				
Abnormal	47 (72.3%)	18 (27.7%)	1.000	1.080
Normal	29 (70.7%)	12 (29.3%)		(0.455-2.565)

Analysis with *chi square*

Based on Table 2, it is known that the majority of respondents with unusually long menstrual periods suffer from dysmenorrhea (70.4%). Even among those surveyed with normal menstruation, only a few did not experience dysmenorrhea (25.7%). The results of the bivariate analysis showed that the value of p = 0.852 >0.05. This means that there is no significant association between menstrual length and dysmenorrhea.

Describing respondents who have abnormal menstrual cycles, most also suffer from dysmenorrhea (72.3%). Similar to these conditions, the majority of respondents with normal cycles also suffered from dysmenorrhea (70.7%). Menstrual cycle has a value of p = 1.000 >0.05. This means that the menstrual cycle has no significant association with dysmenorrhea.

IV. DISCUSSION

Normal menstrual cycle range from 21 to 35 days. It is being counted from the first day of period until the next period coming. Normal menstrual length is around 3 to 7 days and it is being counted from the first day of period until it stops (Wiknjosastro, 2008).

Every women is unique and menstruation is a natural proccess whose occurrence is greatly affected by reproductive hormones. This is why women's menstrual cycle and length varies in every women and different conditions. Menstrual pain is a common symptoms. However it's becoming abnormal if prolonged and induce sleep disorder, pre menstrual pain, swollen breast, nausea, vomitting and irritable. Those lead to over use of painkiller which is not accompanied by regular and balanced diet. 50- 60% women takes analgetics to reduce dysmenorrhea (Anugoro & Wulandari, 2011).

Our study showed there is no significant association between menstrual length and cycle and dysmenorrhea. The same results found on a study in Jakarta to 72 college students which is there was no association between the menstrual cycle interval and the incidence of dysmenorrhea with (p value > 0.05). But, this study indicated the relationship between menstrual duration and the incidence of dysmenorrhoea ($p < 0,05$) (Dewajanti, Kurniawan, & Mau, 2020). Other research in Riau to 150 teenage girls showed the same results that there were no significant association of dysmenorrhea and menstrual cycle and length. Related factor that found significants was family history of dysmenorrhea (Herawati, 2017).

This results differs with study in Banjarmasin to 100 college students that showed a significant relationship between menstrual cycle and length with dysmenorrhea (Qoriaty & Dhewi, 2016). Other study in Manado showed severe menstrual pain suffered the most by those who had oligomenorrhea (52.6%) whereas moderate pain happened more often in polymenorrhea (37.9%). They also concluded that dysmenorrhea are mostly caused by prolonged menstrual cycle (more than 35 days). Dysmenorrhea in abnormal cycle may caused by multiple factors such as physical activity, nutritional status and stress while menstrual length were more likely influenced by increased BMI, late menarche age, heavy physical activity and stress (Juliana, Rompas, & Onibala, 2019).

Dysmenorrhea may also happens without being influenced by menstrual cycle itself. F2-alpha prostaglandin's (PGF2α) rising induce primary dysmenorrhea. A cyclooxigenase (COX-2) pathway generates a hypertonic and vasoconstriction in myometrium which eventually led to ischemic and painful condition in lower abdomen. Intense and constantly contraction caused an increase on the level of prostaglandin and cervix's broadening when secretes menstrual blood may ended in a painful conditions. Study in Surakarta showed 85% of 96 female students had dysmenorrhea with lower than 7 days menstrual cycle. Life style, society patterns, mental, social and economy play an important role in dysmenorrhea. The increasing prostaglandin led to a prolonged period and steadily uterus muscle contraction that lead to primary dysmenorrhea (Agustina, 2015).

Psychologic disorder can also caused a longer period. Unstable emotional state in adolescent induce an excessive uterus muscle contraction which accelerated hormonal sensitivity in capturing the prostaglandin. Prostaglandin is made of unsaturated fatty acid an being synthesized by all cells in the body. Stress that occurs in adolescents can result to menstrual disorder such as irregular cycle and prolonged menstrual days (Dewajanti et al., 2020).

Factors that were significantly associated with dysmenorrhea found on a research to 347 female students in West Java were sleep quality, exposure to smoke, fast food consumption and family history. Lack of sleep decreased serotonin level so that it elevates pain sensitivity, induces anxiety, stress and depression. Nicotine is a vasoconstrictor that leads to ischemia and trigger prostaglandin secretion. Free radicals contained in trans fatty acid on fast food damage cell

membrane and increase prostaglandin level. Whilst two-thirds women with dysmenorrhea had family history of dysmenorrhea (Nurfadillah, Maywati, & Aisyah, 2021).

V. CONCLUSION

There were no significant relationship in menstrual cycle and length with dysmenorrhea on our study. However, a subjective assesment of menstrual pain and other confounding variable which has not been measured in this study may lead a biased results. A mixed method study are reccomended for similar research to construct sample's subjectivity to an assessed variable.

Reproductive health education at the early stage are important things to prepare women in facing menstrual cycle which will continue throughout reproductive age. A good practice to reduce dysmenorrhea were also needed to achieve optimal health status during menstruation.

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