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FACTORS RELATED TO THE INCIDENCE OF PRIMARY DYSMENORRHOEA IN CONGGEANG STATE HIGH SCHOOL STUDENTS IN 2022

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ABSTRACT

Primary dysmenorrhoea is menstrual pain that occurs without being accompanied by abnormalities in the pronounced genital apparatus. Factors associated with the incidence of primary dysmenorrhoea are menarche age, length of menstruation, and exercise activity. The purpose of this study is to analyze factors related to the incidence of primary dysmenorrhoea in Conggeang State High School students in 2022. This study used a quantitative method with case control in determining samples using the Probability Sampling technique with the Proportianate Stratified Random Sampling method. Data analysis used Chi-Square to prove whether or not there was a relationship between menarche age, menstrual length and exercise activity with the incidence of primary dysmenorrhea and odds ratio to determine the magnitude of the risk of primary dysmenorrhea. The total sample of the study was 35 respondents of the case group and 35 respondents of the control group. The results of the analysis showed that there was an association between menarche p-value age 0.004 OR 4,231 (95% CI 1,550-11,546), menstrual duration p-value 0,009 OR 3,674 (95% CI 1,369-9,858), sports activity p-value 0,002 OR 4.889 (95% CI 1,759-13,586) with the incidence of primary dysmenorrhea. The conclusion is that there is a relationship between menarche age, menstrual duration and sports activities with the incidence of primary dysmenorrhoea in Conggeang State High School students in 2022. The suggestions in this study are expected to increase students' understanding of reproductive health, especially in dealing with the problem of primary dysmenorrhea events.

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1. INTRODUCTION

Adolescence is a dynamic phase of development in a person's life. One of the signs of biological youthfulness is the beginning of young women having menstruation. Menstruation is a physiological thing that happens to every woman. But in reallity many women experience menstrual problems, including primary dysmenorrhoea. In Indonesia, 64,25% are adolescent girls who have menstrual problems. One of the problems of menstruation is primary dysmenorrhoea which usually occurs at the time of the early age of menstruation (menarche) in the absence of a specific cause of the disease. The incidence of primary dysmenorrhoea has an impact on daily activities, absenteeism rates, and concentration while studying. Primary dysmenorrhea is often overlooked and even considered normal, but if not addressed immediately it can become a serious problem and a fatal outcome (Yusuf, *et al* 2021).

WHO (World Health Organization) data obtained an incidence of 1,769,425 people (90%) women who experienced dysmenorrhoea. The prevalence rate of dysmenorrhoea in Indonesia is 107,673 people consisting of 59,671 people of primary dysmenorrhoea and 9,496 people of secondary dysmenorrhoea. The incidence of dysmenorrhoea ranges from 45-95% among women of productive age (Oktorika *et al*, 2020). In West Java, 72.89% experienced primary dysmenorrhoea and 27.11% had secondary dysmenorrhea (Andriyani, 2016). The percentage of primary dysmenorrhoea in West Java is influenced by several things, such as menarche age, length of menstruation, sports activities and family history. Accordding to the research journal Gadis, *et al* showed that at Tanjungsari State High School, almost 55% of female students have dysmenorrhoea, the incidence of dysmenorrhoea is quite high where they consider dysmenorrhoea to be a common thing experienced by every pereumpuan who has experienced menstruation. The impact of dysmenorrhoea itself if not addressed will be fatal (Gadis, et al 2022).

The results of a preliminary survey at Conggeang State High School conducted on May 5, 2022 on 10 students of Conggeang State High School found that 60% of students had primary dysmenorrhoea and 40% of students did not experience primary dysmenorrhea. 50% of female students experience early menarche age, and 50% of female students experience menarche. 70% of normal menstrual length and 30% of menstrual length is abnormal. 10% of female students who do routine sports activities and 90% do non-routine sports activities. And some respondents mentioned that they often experience unstable emotions, it is difficult to carry out daily activities, and some even cannot go to school.

2. METHOD

The type of research used for this study is quantitative with a case control approach. A control case study is a design of an epidemiological study that studies the relationship between exposure (research factors) and disease by comparing case groups and control groups based on their exposure status. The purpose of this control case study is to determine factors related to incidence of primary dysmenorrhoea in high school students.

3. RESULTS AND DISCUSSION

3.1. Results

a. Univariate analysis

Table 1. Frequency distribution of primary dysmenorrhoea events in High School Students

Characteristics of Respondents	Incidence of Primary Dysmenorrhea				Total	
	Case		Control			
	f	%	f	%	f	%
Age						
16	15	42,9	10	28,6	25	35,7
17	20	57,1	21	60	41	58,6
18	0	0	4	11,4	4	5,7
Total	35	100,0	35	100,0	70	100,0
Class						
X	15	42,9	15	42,9	30	42,9
XI	20	57,1	20	57,1	40	57,1
Total	**35**	**100,0**	**35**	**100,0**	**70**	**100,0**

Based on table 1 showed that the most cases of primary dysmenorrhoea occurred in female students aged 17 years 20 0rang (57,1%) and the most who had primary dysmenorrhoea were class XI as many as 20 people (57,1%).

Table 2. Frequency distribution menarche age factors in Conggeang State High School students

Menarche age	Frequency (f)	Percentage (%)
EarlyMenarche (< 12 years old)	32	45,7
Normal (≥ 12 years old)	38	54,3
Total	**70**	**100,0**

Based on table 2 it can be seen that the most frequency is female students who experienced not early menarche as many as 38 respondents (54.3%).

Table 3. Frequency distribution menstrual duration factors in Conggeang State High School students

Duration of menstruation	Frequency (f)	Percentage (%)
Normal (3-7 days)	37	52,9
Abnormal (< 3 days, > 7 days)	33	47,1
Total	**70**	**100,0**

Based on table 3 it can be seen that the most frequency is female students who have a normal menstrual period as many as 37 respondents (52,9%).

Table 4. Frequency distribution of sports activities in Conggeang State High School students

Sports activities	Frequency (f)	Percentage (%)
Routine (at least 3 times / week, 30 minutes)	39	55,7
Not Routine (< 3 times / week, < 30 minutes)	31	44,3
Total	**70**	**100,0**

Based on table 4 it can be seen that the most frequency is female students who do routine sports activities as many as 39 respondents (55,7%).

b. Bivariate analysis

Table 5. Relationship of menarche age factor with the incidence of primary dysmenorrhea in Congeang State High School students in 2022

Age *Menarche*	Primary Dysmenorrhea				OR 95% CI	*-P-value*
	Case		Control			
	f	%	f	%		
Early Menarche (< 12 years old	22	62,9	10	28,6	4,231 (1,550-11,546)	0,004
Normal	13	37,1	25	71,4		
Total	**35**	**100**	**35**	**100**		

Based on table 5 it can be seen that in the case group of female students who experienced the age of early menarche were more (62,9%) compared to the control group (28.6%). The results of the Chi-square statistical test obtained a value of p = 0.004 (p < 0.05), thus it can be concluded that Ho was rejected and Ha was accepted, then there was a meaningful relationship between the age of menarche and the incidence of primary dysmenorrhoea in class X and XI students at Conggeang State High School. Hasil or calculations also showed that students who experienced early menarche age had 4,231 times experienced primary dysmenorrhoea compared to students who did not have early menarche (95% CI = 1,550-11,546).

Table 6. The relationship between menstrual length factors and the incidence of primary dysmenorrhoea in Congeang State High School students in 2022

Duration of Menstruation	Primary Dysmenorrhea				OR 95% CI	*P-value*
	Case		Control			
	f	%	f	%		
Normal (3-7 days)	14	40	23	65,7	3,674 (1,369-9,858)	0,009
Abnormal (< 3 days, > 7 days)	21	60	12	34,3		
Total	**35**	**100**	**35**	**100**		

Based on table 6 it can be seen that in the group of cases of female students who experienced abnormal menstrual periods more (60%) compared to the control group (34,3%). The results of the Chi-square statistical test obtained a value of p = 0.009 (p < 0,05), thus it can be concluded that Ho was rejected and Ha was accepted, then there was a meaningful relationship between the length of menstruation and the incidence of primary dysmenorrhoea in class X and XI students at Conggeang State High School. The OR calculation also showed that female students who experienced abnormal menstrual periods were at risk of 3,674 times experiencing primary dysmenorrhoea compared to female students who experienced normal menstrual periods (95% CI = 1,369-9,858).

Table 7. The relationship between sports activity factors and the incidence of primary dysmenorrhoea in Congeang State High School students in 2022

Sports Activities	Primary Dysmenorrhea				OR 95% CI	*P-value*
	Yes		Not			
	n	%	n	%		
Routine (at least 3 times / week, 30 minutes)	13	37,1	26	74,3	4,889 (1,759-13,586)	0,002
Not Routine (< 3 times / week, < 30 minutes)	22	62,9	9	25,7		
Total	**35**	**100,0**	**35**	**100,0**		

Based on table 7 it can be seen that in the group of cases of female students who performed non-routine sports activities more (62,9%) compared to the control group (25,7%). The results of the Chi-square statistical test obtained a value of p = 0.002 (p < 0,05), thus it can be concluded that Ho was rejected and Ha was accepted, then there is a meaningful relationship between sports ol activities and the incidence of primary dysmenorrhoea in class X and XI students at Conggeang State High School. Theor calculation also showed that students who carried out non-routine sports activities were at risk of 4,889 times experiencing primary dysmenorrhoea compared to female students who did routine sports activities (95% CI = 1,759-13,586).

3.2 Discussion

In this section, the author explains the results of research based on the results of data processing and questionnaires from 70 respondents in a statistically univariate and bivariate statistics regarding the relationship between menarche age, menstrual duration and sports activity with the incidence of primary dysmenorrhea in Conggeang State High School students in 2022

From the table of the distribution of the frequency of primary dysmenorrhoea events in Conggeang State High School students based on age, it can be seen that in the group of primary dysmenorrhoea cases, there are more students aged 17 years (57.1%) then female students aged 16 years (42.9%) and aged 18 years (0%). Meanwhile, according to class, primary dysmenorrhoea cases in female students mostly occurred in class XI (57.1%) compared to class X (42.9%). Dysmenorrhea generally occurs about two to three years after menarche. If the ideal age of menarche is 12-14 years, then dysmenorrhea usually occurs a lot at the age of 15-17 years. Not only that, this age is a time when the development of reproductive organs and hormonal changes occur significantly. The effect of age on pain perception and pain tolerance is theoretically not widely known because it is based solely on reports of pain and pain relief. The older a person is, the more menstruating will often be and will cause the cervix to get wider (Abdul, 2016).

This is in line with research conducted by Sirait et al (2014) conducted at SMA Negeri 2 Medan found that 60.9% were aged 16-18 years. Similar to other studies, Sophia's (2013) research, in students of SMK Negeri 10 Medan, found that the most (83%) were aged 15-17 years. Dysmenorrhea generally occurs 2-3 years post-menarche. *Menarche* age is ideally in the range of 12-14 years. Therefore the incidence of dysmenorrhea generally occurs in adolescents aged 15-17 years.

According to the researcher's assumption, age can be a factor causing primary dysmenorrhoea because the older a person is, the more often he will have menstruation. So that the cervix will increase in width. So that the older a person's age the incidence of primary dysmenorrhoea will rarely occur.

The distributionof *menarche* age frequency in Conggeang State High School students based on univariate analysis is that 32 female students who experienced early *menarche* age (45.7%). Meanwhile, there were 38 female students who experienced an early *age* (54.3%). *Menarche* age is the first menstruation that usually occurs in women aged 12-13 years in the age range of 10-16 years (Sukarni, 2013). *Menarche* at an early age (<12 years) causes the reproductive organs not to function optimally and are not ready to undergo changes so that pain arises during menstruation (Kiky, 2013).

The results of this study are supported by research conducted by Eka and Lasma (2013), that out of 80 respondents, as many as 34 respondents (54%) who *menarche* at the age of 12-14 years, and as many as 4 respondents (33.3%) who *menarche* at the age of ≤ 12 years. This is in line with the results of research conducted by Sophia., Muda., and Jemadi in 2013 with the title of factors related to dysmenorhea in students of SMK Negeri 10 Medan *aged menarche* < 12 years, namely 83.70%. to researchers, 45.7% of female students who experience early *menarche* age at Conggeang State High School are caused by reproductive organs that are not functioning optimally and are not ready to experience changes, so that when women have menstruation at a young age, it will cause pain during menstruation.

The distribution of menstrual length freuence in Conggeang State High School students based on univariate analysis is that 37 female students who experience normal menstrual clerics (52.9%). Meanwhile, there were 33 female students who experienced abnormal periods (47.1%). The duration of mentruation is

between 3-7 days, there are also women who have menstruation 1-2 days, then bleeding little by little follows it. Some women have longer periods, which is 7-10 days. The amount of blood secreted during menstruation is about 20-40 ml (Sadiman, 2017). The results of this study are supported by a study conducted by Nurul and Siska in 2016 with the title Relationship of Cycle and Duration of Menstruation with the incidence of Dysmenorrhea in FKM UNISKA Banjarmasin Students, most of the students experienced mentruation pain (76%) compared to not experiencing pain (24 %), with a normal duration of mentruation of 65% and a normal cycle of 74%. There is a relationship of the length of menstruation and the mentruation cycle with the incidence of dysminorrhea (P. Value 0.000).

This research is also in line with the research of Shopia (2013), which states that there is a meaningful relationship between the length of menstruation and the incidence of dysminorrhea, the longer the mentruation, the more /often the uterus contracts, as a result, the more prostaglandin hormones are secreted. Due to excessive progstaglandin hormone, it causes pain in menstruation (Nurul and Siska, 2016). Researchersassumed researchers that a person's length of time during menstruation would have an impact on pain during menstruation. When a person experiences mentruation, the uterine muscles will experience muscle contractions, where when this muscle contraction occurs, the prostaglandin hormone will be active. Prostaglandin hormone is a pain *receptor hormone* produced by the body.

The distribution of menarche age frequency in Conggeang State High School students based on univariate analysis is 39 students whose routine sports activities are 39 people (55.7%). Meanwhile, there were 31 female students who carried out non-routine sports activities (44.3%). According to Tjokropawiro et al in Kamil, 2015 exercise is the movement of limbs that can improve the quality of life, physique, and psychology, because exercise causes energy expenditure so that the body remains healthy and fit throughout the day. Regular exercise such as walking, *jogging*, cycling, swimming, or aerobic gymnastics can improve general health and help maintain a regular menstrual cycle. Respondents were said to have the habit of exercising regularly if they did exercise at least 3 times a week with a duration of at least 30 minutes once doing, and not routinely if they did exercise less than 3 times a week or even not at all (CDC, 2012) Sports activities carried out can be used as relaxation to reduce pain that occurs in women who have dysmenorrhea. This is because when a person does sports, the body will produce endorphin hormones. It is this hormone that will function as a mediation of the joints in the hypothalamus gland (Sirait et al, 2014).

This study is in line with Sugiharti's research (2018) found that students who had good exercise habits mostly did not experience menstrual pain, namely 12 people (40%), while students who did not have good exercise habits mostly experienced primary menstrual pain, namely as many as 28 people (93.4%). Exercise can reduce menstrual pain when a person performs sports activities regularly endorphin hormones will increase, so it will have a good impact on the body, namely providing a sense of comfort, relaxation and can reduce the pain that is experienced.

Based on the results of the analysis obtained from this study, it shows that there is a meaningful relationship (*p-value*<0.05) statistically between the age of menarche and the incidence of primary dysmenorrhoea in female students. The proportion of early menarche age was more in the case group (62.9%) compared to the control group (28.6%). Early menarche is likely to have a 4,231-time risk of developing primary dysmenorrhoea compared to female students who do not *have early menarche*. In this study, the combination of the normal *menarche* age group (12-14 years) and tarda (>14 years) was carried out into the non-early *menarche* age group (≥ 11 years).

The association of menarche age <12 years with dysmenorrhea in women who had their first menstruation is often made restless due to mentally poorly prepared and hormonal changes. One of them is influenced by age. Menarche can cause various problems, one of which is complaints of pain during menstruation or what is commonly called dysmenorrhea. Generally women feel primary dysmenorrhea. As many as 90% of women in the world experience dysmenorrhea, more than 50% of whom experience discomfort during menstruation and 10-20% experience severe discomfort (Wardani, 2021). Meanwhile, according to Widjanarko, 2014 stated that if menarche occurs at an earlier than normal age where the reproductive apparatus is not ready to undergo changes and there is still a narrowing in the cervix, pain will arise during menstruation. This study is in line with the research conducted by Wardani, 2021 with the results of 91,2% (62 respondents) who have a menarche age of < 12 years and suffer from primary dysmenorrhea with *p-value* = 0.000 or *p value* < α (0,05) which means there is a relationship between menarche age < 12 years with primary dysmenorrhea. The *odds ratio* value is 28,933 which means that female students who have a *menarche* age of < 12 years are at risk of 28,933 times for primary dysmenorrhea compared to students who have a *menarche* age of > 12 years (Wardani, 2021). This study shows that women with early *menarche* age (< 12 years) can cause primary dysmenorrhoea. This happens because the reproductive organs are not functioning optimally and are not ready to undergo changes so that pain arises during menstruation.

Based on the results of the analysis obtained from this study, it shows that there is a meaningful relationship (*p-value*<0.05) statistically between the length of menstruation and the incidence of primary dysmenorrhoea in female students. The proportion of abnormal menstrual duration was more in the case

group (60%) compared to the control group (34.3%). Abnormal menstrual duration is likely to have a risk of 3,674 times experiencing primary dysmenorrhoea compared to female students who have a normal menstrual period. Menstruation that is longer will result in longer contractions of the uterine muscles due to the increasing secretion of prostaglandins, resulting in primary dysmenorrhea. Risk factors for dysmenorrhea due to the length of menstruation can cause the work of the uterus to increase and contract for longer and longer. Psychological and physiological factors can affect the duration of menstruation, psychologically influenced by the emotional level of adolescent girls who are unstable when experiencing menstruation while physiologically, excessive uterine muscle contractions will increase hormone sensitivity so that the endometrium in the secretion phase produces prostaglandin hormones. These prostaglandins are formed due to the presence of unsaturated fatty acids and synthesized all cells in the body. Increased prostaglandin production results in menstrual pain that is affected by the duration of menstruation and also the frequent contraction of the uterus. The duration of menstruation is usually experienced by adolescents with stress, where the stress experienced by young women results in menstrual disorders such as irregular menstrual periods (Raemon et al, 2020).

The results of Sophia's research (2013) on young women at SMK Negeri 10 Medan, obtained *a p-value* of 0.046 (less than the value of α 5%). This means that there is a relationship between the duration of menstruation and the incidence of dysmenorrhea. This study is also in accordance with the research of Hormono, 2012 on the Relationship Between Exercise Habits, menarche, and Menstrual Duration with the incidence of Dysmenorhea in Adolescents at SMA Muhammadiyah 1 Purbalingga, research shows that there is a meaningful relationship between the length of menstruation and the incidence of dysmenorhea with a p value = 0.003. The relationship between the length of menstruation and the incidence of primary dysmenorrhoea is caused by stress experienced by young women which results in menstrual disorders, one of which is irregular menstrual duration disorders.

According to researchers, based on the theory that has been elaborated the length of abnormal menstruation can cause primary dysmenorrhoea because in respondents with a menstrual duration of more than 7 days will lose more blood than in respondents with a short menstrual length. The longer menstruation occurs , the more prostaglandin hormones are secreted, causing pain during menstruation.

Based on the results of the analysis obtained from this study, it shows that there is a meaningful relationship (p-value<0.05) statistically between sports activities and the incidence of primary dysmenorrhoea in female students. The proportion of non-routine exercise activity was more in the case group (62.9%) compared to the control group (25.7%). Non-routine exercise activities are likely to have a risk of 4,889 times experiencing primary dysmenorrhoea compared to female students who do regular exercise activities. The relationship between exercise habits and the incidence of primary menstrual pain can be caused because exercise is one of the relaxation techniques that can be used to prevent the onset of pain. This is because when doing sports the body will produce endorphin hormones. Endorphin hormones are produced by the brain and spinal nervous system (Sugiharti, 2018).

The incidence of dysmenorrhoea will increase in women who do less exercise. Kethics women experiencing primary dysmenorrhoea oxygen cannot be channeled into the blood vessels of the reproductive organs at which time vasocontriction occurs. If the woman regularly does exercise, then the woman can provide almost 2 times the oxygen so that oxygen is delivered to the vasocontriction blood vessels, it will cause a decrease in the incidence of dysmenorrhoea by regularly exercising (Tjokronegoro, 2014).

Women who do sports regularly for at least 30-60 minutes every 3-5 times per week can prevent the occurrence of dysmenorrhoea. Every woman can just take a leisurely walk, light jogging, swimming, gymnastics or cycling according to their respective conditions The relationship of exercise habits to the incidence of dysmenorrhea can be caused because exercise is one of the relaxation techniques that can be used to reduce pain (Manuaba, 2012).

Sports habits are physical sports activities carried out by respondents including gymnastics, running/jogging, cycling, swimming, healthy walking. Regular exercise is believed to be beneficial for reducing endometrial hyperplasia and lowering prostaglandin production. Practicing physical exercise causes receptors inside the hypothalamus and limbic system that serve to regulate emotions to capture the hormone β-endorphins that can be produced after a person performs physical activity. Increased β-endorphins have been shown to be closely related to decreased pain, improved memory, improved appetite, sexual abilities, blood pressure and breathing (Temesvari, 2019).

This study is in line with Sugiharti's research (2018) found that students who had good exercise habits mostly did not experience menstrual pain, namely 12 people (40%), while students who did not have good exercise habits mostly experienced primary menstrual pain, namely as many as 28 people (93.4%). When viewed from the results of the Chi Square analysis, it shows that the p value is 0.002 which means that there is a relationship between exercise habits and the incidence of primary menstrual pain in adolescents. Based on the results of this study and some of the theories that have been described, it can be concluded that sports activities that are not carried out regularly can cause the occurrence of primary dysmenorrhoea in young

women. Sports activities can reduce the symptoms of primary dysmenorrhoea, because when doing sports activities can provide oxygen almost 2 times per minute so that the oxygen is conveyed to the blood vessels of the reproductive organs that are vasoconstriction (narrowing of blood vessels). By doing sports activities can make a good relaxation therapy against the pain felt at the time of primary dysmenorrhoea. Good exercise can be done regularly 1 week 3-5 times for 30-60 minutes.

4. Conclusion

From the results of research that has been carried out regarding factors related to the incidence of primary dysmenorrhoea in students of Conggeang State High School in 2022, the results were obtained:

a. An overview of the incidence of primary dysmenorrhoea in Conggeang State High School students based on age, it can be seen that in the group of primary dysmenorrhea cases, it is more common in female students who are 17 years old (57,1%) then students aged 16 years (42,9%) and aged 18 years (0%). Meanwhile, according to class, primary dysmenorrhoea cases in female students mostly occurred in class XI (57,1%) compared to class X (42,9%).
b. Menarche age frequency distribution there were 22 people (62,9%) who experienced early menarche age.
c. The distribution of the frequency of menstrual length there were 21 people (60%) who had abnormal menstrual periods.
d. The frequency distribution of sports activities there were 22 people (62,9) who carried out non-routine sports activities.
e. There is a relationship between the age of menarche (0,004), duration of menstruation (0,031), and sports activity (0,002) with the incidence of primary dysmenorrhoea.

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