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Correlation between stress and primary dysmenorrhea at SMAN 4 Kediri

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ABSTRACT

Introduction: The physiological disorder experienced by most women in Indonesia every month is primary dysmenorrhea (60-70%). The incidence of primary dysmenorrhea was experienced by female students at SMAN 4 Kediri City, as many as (90.8%) of all female students. One factor is stress.

Objective: Determine the relationship between stress and the incidence of primary dysmenorrhea at SMAN 4 Kediri City.

Methods: This research used the Analytical research design correlation with a cross-sectional approach, a population of 258 students, and a simple random sampling with a sample of 39 female students. The instrument used was questionnaires, with Spearman rank correlation analysis.

Result: The results of this study were moderate stress 28.2% and moderate pain dysmenorrhea 53.8%. Statistical tests showed the correlation coefficient of Spearman rank sig value was 0.030; there was a significant relationship with a reasonably strong relationship strength of 0.347. Stress is the cause of dysmenorrhea to prevent dysmenorrhea can be minimized by preventing stress.

Conclusion: the higher the stress, the higher the risk of dysmenorrhea in female students at SMAN 4 Kediri City. The higher the stress level experienced by female students, the greater their risk of experiencing dysmenorrhea (menstrual pain). This suggests that psychological factors such as stress can affect physical health conditions, particularly related to menstrual disorders in adolescent girls. To reduce the risk of dysmenorrhea, it is important to pay attention to stress management in students.

Keywords: dysmenorrhea, primary dysmenorrhea, stress.

INTRODUCTION

Menstruation in women or adolescents is a natural process; The sign is the regular discharge of bleeding every month. Usually, complaints are felt during menstruation, especially in adolescents or women of productive age (Hamvas, P Hegyi, *et al.*, 2023). Menstrual pain can interfere with reproductive health problems and the productivity of daily activities in women, especially adolescents. Menstrual pain is often even almost experienced by teenagers. One of them is dysmenorrhea.

Dysmenorrhea occurs when a woman who is menstruating will feel abdominal pain, and severe abdominal pain is felt in the lower extremities. The pain felt during dysmenorrhea is like cramps (Fernández Macedo *et al.*, 2023). It is felt up to the lower spine and can also be accompanied by headaches, vomiting, back pain, feeling tired, and experiencing dysmenorrhea. Menstrual pain without gynecological abnormalities is called primary dysmenorrhea. Primary dysmenorrhea occurs in women between the ages of 15-25, which means that teenagers mostly experience it (Iannuzzo *et al.*, 2024). Primary dysmenorrhea occurs every 8 to 72 hours, and dysmenorrhea is most severe during menstruation on the first or second day. Symptoms experienced when dysmenorrhea occurs are dizziness, vomiting, feeling tired, and difficulty sleeping. Other symptoms felt when experiencing dysmenorrhea are pain or discomfort in the lower abdomen, headaches, nausea, and fainting before or during menstruation (D. Zhang *et al.*, 2024).

Primary dysmenorrhea is one of the health problems that are often experienced by adolescent girls, especially during the early menstrual period (menarche). Primary dysmenorrhea is defined as menstrual pain that occurs in the absence of an underlying gynecological abnormality, usually starting to be felt from 6-12 months after menarche (Hearn-Yeates *et al.*, 2024). This condition is characterized by pain that comes from excessive contraction of the uterine muscles, generally appearing on the first or second day of menstruation. According to research, about 50-90% of adolescent girls experience primary dysmenorrhea of varying severity, which often interferes with their daily activities, quality of life, and academic achievement (Sultana *et al.*, 2024). Factors that can cause dysmenorrhea, such as hormonal factors due to increased levels of prostaglandins in the body, occur during menstruation and can cause contractions in the myometrium. In addition to hormonal factors, menarche age late or too early can also be a factor in dysmenorrhea. Other factors such as menstrual length, menstrual cycle, nutritional status, stress, activity, and area lived in can be factors in the occurrence of dysmenorrhea (Verberkt *et al.*, 2024). The risk factors associated with dysmenorrhea include biological factors such as early age during menarche, more menstrual blood flow, and a history of dysmenorrhea in the family. Other causes can occur due to psychological factors, including stress, anxiety, and feeling depressed. Social factors are also factors in dysmenorrhea, such as lower social levels. Lifestyle factors are also factors in the occurrence of dysmenorrhea, including smoking and not maintaining a regular diet (Uchibori *et al.*, 2023). The increase in academic stress is directly proportional to the incidence of primary dysmenorrhea in high school students. The pressure to achieve good academic results, conflicts with peers, and uncertainty about the future are some factors that add to the stress burden in teens. In a competitive environment, these stress levels can be very high and directly impact physical health, including the menstrual cycle (Su *et al.*, 2024).

The human body's response to the sensors is the definition of stress. Stress can occur in everyone, including a female student or teenager. Dysmenorrhea has a close relationship with stressful conditions, the cause of which is the neuroendocrine response to increased prostaglandins, which is the cause of increased myometrial contraction and uterine blood vessel contraction, causing hypoxemia and dysmenorrhea (Klein Meuleman *et al.*, 2023). The impact of dysmenorrhea can cause missing school and not coming to work in women of childbearing age, especially adolescents. Other problems experienced by women due to dysmenorrhea are disruption of the teaching and learning process, the cause of not entering school, decreased

achievement, and difficulty concentrating because they feel uncomfortable while menstruating can cause emotional conflicts, resulting in tension and anxiety (Hamvas, P. Hegyi, *et al.*, 2023). Dysmenorrhea must be treated immediately. Otherwise, it will have an impact on exercises or activities. Dysmenorrhea can be the cause of not being able to carry out activities usually, so it requires handling prescription drugs (Kazemi *et al.*, 2024). Dysmenorrhea must be treated because, scientifically, it can cause adverse effects such as often feeling weak and tired. Dysmenorrhea pain can affect school exams, inability to concentrate while studying, disruption during sports activities, and adolescent social life. The impact of dysmenorrhea also causes limitations in daily activities, absence from school/lessons, prevention from association, and decreased academic achievement (Yin, Wang, and Zhang, 2024).

There is a correlation between stress levels and primary dysmenorrhea. Recent studies confirm that adolescent girls who experience high-intensity stress are more likely to experience more severe primary dysmenorrhea (Wang *et al.*, 2023). This is due to the effect of stress on the production of prostaglandins, which are compounds involved in uterine contractions during menstruation. Excessive prostaglandins can cause more intense menstrual pain. In addition, stress can also affect an individual's sensitivity to pain, so the pain experienced during menstruation can be felt more severely by those who are in a high-stress condition (As-Sanie *et al.*, 2024). Prevention of dysmenorrhea can be done through stress or avoiding stress, maintaining a regular and healthy diet by paying attention to balanced nutritional intake, meeting the 4 Healthy Five Perfect standard, avoiding or not consuming acidic and spicy foods before menstruation, maintaining sleep patterns, avoiding fatigue and reducing activities that can drain excess energy, doing light and regular exercise. That there is a relationship between stress levels and dysmenorrhea. This study aims to explore the correlation between stress and the incidence of primary dysmenorrhea in adolescent girls, as well as provide insight into the importance of stress management in the management of primary dysmenorrhea. Furthermore, this research is expected to be the basis for preventive efforts and more effective interventions in dealing with primary dysmenorrhea among adolescents, especially in the school environment.

RESEARCH METHODOLOGY

This study was an observational analytical study with a cross-sectional approach carried out at SMAN 4 Kediri City on March 2-May 22, 2023. The variables in this study were stress and dysmenorrhea. The population in this study were students of grades X, XI, and XII SMAN 4 Kediri City. A simple random sampling technique makes a sample selection. Samples are selected according to inclusion criteria. Samples were also given explanations related to the objectives and strategies of research implementation. Stress measurement was carried out using the Depression Anxiety Stress Scale (DASS) questionnaire, and the measurement of dysmenorrhea scores using the NRS (Numeric Rating Scale) questionnaire with Spearman rank correlation analysis to determine the relationship of stress to the incidence of primary dysmenorrhea in SMAN 4 Kediri.

RESULTS

Univariate results in this study showed the highest percentage of stress was moderate stress with the amount (28.2%), and the highest rate of dysmenorrhea experienced moderate pain with the amount (53.8%).

Table 1. Frequency Distribution Stress in Students at SMAN 4 Kediri City

		Frequency	Per cent	Valid percent	Cumulative percent
Valid	Moderate stress	11	28.2	28.2	28.2
	Severe stress	8	20.5	20.5	48.7
	Mild stress	8	20.5	20.5	69.2
	Normal stress	10	25.6	25.6	94.9
	Hefty stress	2	5.1	5.1	100.0
	Total	39	100.0	100.0	

Source: *Primary Data*

Table 1. Frequency Distribution Dysmenorrhea in Students at SMAN 4 Kediri City

		Frequency	Percent	Valid percent	Cumulative percent
Valid	Moderate pain	21	53.8	53.8	53.8
	Severe pain	9	23.1	23.1	76.9
	Mild pain	8	20.5	20.5	97.4
	Very severe pain	1	2.6	2.6	100.0
	Total	39	100.0	100.0	

Source: *Primary Data*

Results in the Spearman rank test showed the sig value was 0.030 < 0.050 (there was a significant relationship), with the strength of the relationship being 0.347 (the relationship was strong enough).

Correlations

			Stress	Dysmenorrhoea
Spearman's rho	Stress	Correlation Coefficient	1.000	.347*
		Sig. (2-tailed)	.	.030
		N	39	39
	Dysmenorrhoea	Correlation Coefficient	.347*	1.000
		Sig. (2-tailed)	.030	.
		N	39	39

Source: *Primary Data*

The results of the Spearman rank test through a computer showed the sig value was 0.030 < 0.050 (there was a significant relationship), with the strength of the relationship being 0.347 (the relationship was strong enough). The relationship between the two variables was unidirectional because the value was positive 0.347. Thus, it can be interpreted that the more stress, the more influential the occurrence of dysmenorrhea. Ha accepted it means that there was a significant relationship that's quite strong and in the same direction of stress with the incidence of primary dysmenorrhea at SMAN 4 Kediri City.

DISCUSSION

Researchers revealed that there was a strong significant relationship between stress levels and the incidence of primary dysmenorrhea in female students. This relationship moves in the same direction, meaning that when stress levels increase, the incidence of primary dysmenorrhea also increases. In other words, the higher the level of stress experienced, the more likely a person is to experience primary dysmenorrhea. This significant association suggests that stress is one of the factors that strongly contribute to the emergence of primary dysmenorrhea in adolescent girls. Dysmenorrhea is a gynecological disorder in the form of pain during menstruation, generally in the form of cramps and centered in the lower abdomen (Selamioğlu *et al.*, 2024). Various risk factors for primary dysmenorrhea have been identified in multiple literature with diverse prevalence outcomes. This risk factor is associated with an increased incidence of primary dysmenorrhea. The risk factors include menarche at an earlier age, more prolonged menstruation than usual, nutritional status, stress, family history, and exercise habits. Primary dysmenorrhea, known as menstrual pain without gynecological abnormalities, is a common condition experienced by adolescent women (Fortún-Rabadán *et al.*, 2023). Although primary dysmenorrhea can be considered a normal part of the menstrual process, the intensity of the pain felt is often significant enough to interfere with daily activities and quality of life. In recent decades, reproductive health researchers have increasingly focused on the link between psychological factors, such as stress, and primary dysmenorrhea (Chen *et al.*, 2024).

In times of stress, a person's body produces excessive hormones such as adrenaline, estrogen, and prostaglandins. An excess of the hormone estrogen causes an excessive increase in uterine contractions (Liu *et al.*, 2024). The same thing happens to the hormone adrenaline; the

hormone adrenaline will also increase, causing muscle tension in the body, including in the uterine muscles. This condition can increase contractions excessively during menstruation and cause pain during menstruation. An increase in the hormone prostaglandin will result in uterine muscle contractions. It can cause vasospasm of the uterine arterioles, resulting in ischemia and cramps in the lower abdomen, which will stimulate pain (Esan *et al.*, 2024).

Stress is a biological and psychological response to the stress that an individual experiences in daily life. In the context of primary dysmenorrhea, stress is known to have an effect that worsens menstrual pain conditions (Homam Safiah *et al.*, 2024). According to the latest literature, the underlying biological mechanisms of the relationship between stress and primary dysmenorrhea are primarily related to the endocrine and central nervous systems, which influence hormonal regulation and response to pain. Stress can activate the hypothalamic-pituitary-adrenal axis (HPA axis), which affects the production of the hormone cortisol (Zhu *et al.*, 2024). An increase in cortisol caused by prolonged stress can disrupt the balance of reproductive hormones, such as estrogen and progesterone, which play an essential role in the menstrual cycle. This hormonal imbalance can trigger an increase in the production of prostaglandins, chemical compounds responsible for uterine contractions, which are the main factor in causing pain during menstruation. Excessive prostaglandins result in more muscular contractions of the uterus, which causes more intense pain during menstruation. This is supported by research published in the Journal of Women's Health, which found that women with high levels of stress tend to experience higher levels of prostaglandins, which are directly related to an increase in the severity of primary dysmenorrhea (J. Zhang *et al.*, 2024).

In addition, stress can also increase pain sensitivity. Women who experience psychological stress have a lower pain threshold, so they are more susceptible to more intense pain sensations during menstruation. This phenomenon is known as hyperalgesia, in which the central nervous system becomes more responsive to pain stimuli, which worsens the perception of pain during dysmenorrhea (Lazzeri *et al.*, 2023). Dysmenorrhea will undoubtedly have an impact on daily activities. Dysmenorrhea affects concentration in class, sports, class participation, socialization, homework, skill tests, and grades. Dysmenorrhea is significantly associated with absenteeism, learning achievement, involvement in sports, and socialization with friends. The impact of dysmenorrhea is very influential on daily activities and teaching and learning activities at school and even causes a decrease in school achievement (Martins *et al.*, 2024). The cause of Dysmenorrhea is exercise, which can cause moderate pain in students because students rarely or never do physical activity, especially exercise. Students who experience academic stress will experience an increase in prostaglandin hormones in the body, causing hypoxemia and abdominal pain in the lower part when the student menstruates (Djimbula, Kristiarini and Ananti, 2022).

Stress plays a significant role in worsening the symptoms of primary dysmenorrhea. Both through biological and psychological mechanisms, stress contributes to the intensity and frequency of menstrual pain. Interventions to manage stress, whether through psychological, educational, or physical therapy approaches, can provide positive results in reducing the impact of dysmenorrhea on adolescent girls (Marbun and Sari, 2022). A comprehensive approach to managing primary dysmenorrhea should include stress management as a critical component in efforts to improve the reproductive health and well-being of adolescent girls. Stress plays a significant role in increasing the risk and severity of primary dysmenorrhea. Stress not only affects the hormonal balance associated with the menstrual cycle but also increases pain sensitivity, exacerbating pain experienced during menstruation. International research from different countries has consistently shown that interventions to manage stress, such as physical exercise, relaxation techniques, and social support, can effectively reduce the symptoms of primary dysmenorrhea (Bala *et al.*, 2024). Thus, a multidisciplinary approach that involves active stress management is essential in the management of primary dysmenorrhea. This kind of intervention can not only reduce physical pain but also improve mental well-being and overall quality of life in adolescent girls with dysmenorrhea. Further research is needed to identify the most effective

stress management approaches that can be applied broadly across various social and cultural contexts (X. Zhang *et al.*, 2024).

CONCLUSION

It can be concluded that the higher the stress, the higher the risk of dysmenorrhea in female students at SMAN 4 Kediri City. The higher the stress level experienced by female students, the greater their risk of experiencing dysmenorrhea (menstrual pain). This suggests that psychological factors such as stress can affect physical health conditions, particularly related to menstrual disorders in adolescent girls. Paying attention to stress management in students is essential to reduce the risk of dysmenorrhea.

Conflicts of Interest

The authors declare no conflict of interest.

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