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Stress Level with Menstrual Cycle in XI Class Girl Students at State Vocational High School

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ABSTRACT

This study discusses the relationship between stress levels and the menstrual cycle in 11th grade girls at SMK Negeri 1 Bagor Nganjuk. Stress is known to be one of the factors that cause disturbances in the menstrual cycle, as high cortisol hormone levels can affect the balance of reproductive hormones. This study uses a correlational design with a cross-sectional approach and was conducted on July 19, 2025. The population in this study consists of all 11th-grade female students totaling 232 individuals, with a sample size of 147 respondents selected using proportional random sampling technique. The independent variable in this study is the stress level measured by the DASS 42 questionnaire, while the dependent variable is the menstrual cycle measured by a specific menstrual cycle questionnaire. Data analysis is conducted using the Spearman-Rank Correlation statistical test with SPSS at a significance level of 0.05. The results of the study show that nearly half of the respondents experienced mild stress (34.7%), and from this group, 16.3% had menstrual cycles characterized by polymenorrhea. Statistical analysis showed a value of $\rho = 0.00 < \alpha = 0.05$, which indicates a significant relationship between stress levels and menstrual cycles. The correlation coefficient value of $r = 0.508$ indicates that this relationship is in the moderately strong category. It is concluded that the higher the stress level, the greater the risk of disturbances in the menstrual cycle. Therefore, good stress management becomes an important effort in preventing menstrual irregularities.

Keywords: menstrual cycle, stress, teenage girls

BACKGROUND

Adolescence is a transitional period from childhood to adulthood, encompassing all the changes that occur in preparation for adulthood (Wahyuni, 2016). The World Health Organization (WHO) divides adolescents into four categories based on their age: the first (pre-adolescence, ages 10-12), the second (early adolescence, ages 12-15), the third (middle adolescence, ages 15-18), and the fourth (late adolescence, ages 18-21) (Anjarsari & Sari, 2020). Menstruation is the initial sign of sexual maturity that first occurs during a woman's reproductive period (Kementerian RI, 2018). Menstruation occurs regularly every month during the reproductive phase, which is regulated by hormones, except during pregnancy and breastfeeding (Maulana & Tanjung, 2021). The menstrual cycle typically has a standard timing of 28 days, but the cycle or regularity varies for each woman. In humans, a normal cycle usually occurs every 21 to 35 days. Short menstrual periods are known as polymenorrhea, prolonged menstrual cycles or oligomenorrhea, and amenorrhea occurs when there is no menstruation for three months, which are three types of menstrual cycle disorders (Pasphariny, 2017). Based on the preliminary data collection by the researcher on July 22 through interviews with teenage

girls at SMK, it was found that out of 10 teenage girls, 3 experienced a menstrual cycle of 21-28 days, 7 experienced a menstrual cycle of less than 21 days, and some experienced more than 35 days.

According to WHO, there were 450 million people in the world suffering from stress in 2017. About 75% of individuals in the United States experienced severe stress, and this number is expected to increase in the coming years. Meanwhile, stress affects about 10% of the population in Indonesia, with acute stress levels ranging from 1 to 3% and severe stress levels ranging from 7 to 10%. According to statistics, stress is universal, meaning everyone can experience it, but the way it is expressed varies (Nurlina & Haerati, 2020). Menstrual periods can be disrupted or irregular due to stress (Musmiah, 2019). Stress, as a stimulus for the nervous system, is communicated through nerve transmission to the central nervous system, particularly the limbic system, and then through the autonomic nerves to the hormonal glands (endocrine), which release neurohormonal secretions that are then forwarded to the pituitary gland. These hormones are controlled by RH (Releasing Hormone), which is transmitted from the hypothalamus to the pituitary and releases gonadotropins in the form of FSH (Follicle Stimulating Hormone) and LH (Luteinizing Hormone, second production) through the frontal system. RH is influenced by the feedback mechanism of estrogen to the hypothalamus (Sandra Ayu Putri, P., & Aisa, 2018). According to the Basic Health Research (Rikesdas) regarding the incidence or emotional mental problems in Indonesian society, there has been a significant increase from 2013 to 2018, rising from 6% in 2013 to 9.8% in 2018. Previous studies have been conducted by Irma and Yosi in 2019 and research by Diani and Ega in 2022. The results show that 38% of adolescents experience severe stress, and 66% experience abnormal menstrual cycles. (Irma, Yosi Okrira. 2019). The results also indicate that the majority of female students experience normal stress levels with 81 respondents (33.2%) and irregular menstruation with 135 respondents (57%) (Diani, Ega Adelinge, 2022).

Several factors that cause a long or short menstrual cycle include an unhealthy lifestyle, stress, health problems, physical activity, hormonal imbalances, and nutritional conditions that lead to irregular menstruation. Blood loss during menstruation allows iron stores in the body to deplete quickly. The longer adolescent girls experience menstruation, the more blood is lost and the more iron is lost (Suhariyanti et al., 2020). An abnormal menstrual cycle is one of the triggering factors for the occurrence of anemia, due to the significant loss of blood during menstruation. The impact of short menstrual cycle disturbances and prolonged menstruation, if not properly addressed, can lead to more frequent blood discharge, potentially causing anemia in adolescents (Dyah and Adiningsih, 2019).

Unhealthy lifestyle, stress, health problems, physical activity, hormonal imbalance, and nutritional conditions are all factors that cause irregular menstruation. Stress is a common cause of menstrual cycle disorders. Stress induces the pituitary to release ACTH (Adrenocorticotropic Hormone). The level of cortisol increases as a result of this hormone, thereby disrupting the menstrual cycle (Safitri et al., 2020).

Efforts to prevent menstrual cycle disturbances include good stress management through effective coping mechanisms, regulating diet and nutrition, ensuring adequate rest and sleep, exercising, avoiding alcohol, managing weight, and good time management. If necessary, consult a doctor for medication therapy if needed. Based on the above background, the researcher is interested in conducting a study titled 'The Relationship Between Stress Levels and Menstrual Cycles in Eleventh Grade Female Students at Vocational School'.

METHODS

The type of research design used is correlational with a cross-sectional approach. The population consists of all female adolescents in grade XI of vocational school totaling 232

people, with proportional random sampling technique. The sample included 147 respondents from female adolescents in grade XI of vocational school. The independent variable is the level of stress, and the data collection instrument used is the Depression Anxiety Stress Scale 42 (DASS 42) questionnaire. The dependent variable is the menstruation cycle using the menstruation cycle questionnaire. Data analysis used the Spearman-Rank Correlation test with a significance level of 0.05 (α = 0.05) (Nursalam, 2018).

RESULTS

Stress Levels in Adolescent Girls and Menstrual Cycle in Adolescent Girls

Table 1. Frequency Distribution Based on Stress Levels and Menstrual Cycle in Adolescent Girls

Stress level	**Frequency**	**Percentage (%)**
Normal	28	(19%)
Mild stress	51	(34,7 %)
Moderate stress	50	(34 %)
Severe stress	17	(11,6 %)
Very severe stress	1	(0,7%)
Menstrual cycle		
Normal	64	43,5%)
Polimenorea	69	(46,9%)
Oligomenorea	14	(9,5%)

Based on the research results, Table 1 shows that out of 147 respondents, nearly half have a mild stress level, which is 51 respondents (34.7%). Data on menstrual cycle disorders indicate that almost half experienced polymenorrhea, which is 69 respondents (46.9%).

Stress Level With Menstrual Cycle In XI Class Girl Students At State Vocational High School

Table 2. Cross-Tabulation Of Data Stress Level With Menstrual Cycle In XI Class Girl Students At State Vocational High School

		Menstrual Cycle							
		Normal		*Polimenorrhea*		*Oligomenorrhea*		Amount	
		F	%	*F*	%	*f*	%	*Σ*	%
Stress Level	**Normal**	26	17,7	2	1,4	0	0	28	19
	Mild stress	22	15	24	16,3	5	3,4	51	34,7
	Moderate stress	16	10,9	31	21	3	2	50	34
	Severe stress	0	0	12	8,2	5	3,4	17	11,6
	Very severe stress	0	0	0	0	1	0,7	1	0,7
	Amount	64	43,6	69	46,9	14	9,5	147	100
Spearman rank ρ-value = 0.00 r = 0, 508									

Based on table 2 above, it can be explained that out of 51 respondents (34.7%) who experienced mild stress, 24 respondents (16.3%) had polymenorrhea menstrual cycles. Based on the data analysis results using the Spearmen-Rank Correlation statistical test, it was found that the ρ-value is (0.00) < α (0.05), so H_o is rejected and H_1 is accepted, and the conclusion is that there is a relationship between stress levels and menstrual cycles in Grade XI female students at SMK Negeri 1 Bagor. The coefficient of correlation value r = 0.508, meaning there is a moderate relationship between stress levels and menstrual cycles in Grade XI female students.

DISCUSSION

Stress Levels in Adolescent Girls and Menstrual Cycle in Adolescent Girls

Based on the research results in table 4.1, it can be seen that from 147 respondents, almost half of them, which is 51 respondents (34.7%), stated that teenage girls experience mild stress. From the statistical test results on the general data of the respondents, it was found that there is no significant relationship with the level of stress. Meanwhile, based on the cross-tabulation of stress levels with the menstrual cycle, it was found that 31 out of 69 respondents (21%) with moderate stress were experiencing a polymenorrhea menstrual cycle. Stress is the psychological, physiological, and behavioral response of an individual to pressure, whether the pressure comes from within (internal) or from outside (external). Stress can impact every aspect of a person's life, creating mental tension, behavioral changes, interpersonal difficulties, and physical complaints (Manurung, 2017). Teenage girls often encounter stressors that include physical, psychological, and social aspects, and in certain situations, their coping mechanisms are often uncontrollable, leading them to perceive incoming stressors as burdens or threats that can disrupt their activities. In this state, they may fall into stress due to these uncontrolled coping mechanisms. From this condition, it is hoped that teenage girls will prepare themselves to face stressors by improving themselves mentally, physically, and socially, which includes further self-discovery, setting clearer life goals, and managing their time well.

From the table it is obtained, it can be observed that out of 69 respondents, the majority, 41 respondents (59.4%), experienced polymenorrhea menstrual cycles. The statistical test results of the menstrual cycle with general data such as residence (ρ-value = 0.038 <= 0.05) show a significant relationship between menstrual cycles and the respondents' place of residence. The research findings reveal that respondents living with their parents almost entirely (98.5%) experience polymenorrhea menstrual cycles. An increase in ACTH will lead to an increase in blood cortisol levels. These hormones directly and indirectly cause a decrease in GnRH levels in the form of Follicle Stimulating Hormone (FSH) and Luteinizing Hormone (LH), which subsequently affect the occurrence of the menstruation process (Sugiharto, 2018). In polymenorrhea, the menstrual cycle is shorter than normal (less than 21 days). Polimenorrhea can be caused by hormonal disorders that lead to ovulation disturbances, or by a shortened luteal phase. Another 50 causes include ovarian congestion due to inflammation, endometriosis, and so on. This is in line with research conducted by Redaksi et al. (2005) on adolescents living in slum areas of Surabaya, where most or 14 respondents (35.0%) answered that they first menstruated at the age of 13, and 13 respondents (32.5%) answered that they experienced their first menstruation at the age of 12. Looking at the age of first menstruation (menarche), it is evident that the majority are between the ages of 10 and 15, which is generally the age of menarche. Despite the fact that some respondents still experience early or late menarche, this issue may be related to the nutritional status of the adolescents or psychosocial problems affecting their physical growth (Astuti, 2016). Menstrual disorders are a health issue for women Women of reproductive age often experience problems with irregular menstruation, as research results show that nearly half (46.94%) of respondents experience polymenorrhea cycle disturbances and they are concerned about this condition. In such cases, they feel afraid that their reproductive health is not normal.

Stress Level With Menstrual Cycle In XI Class Girl Students At State Vocational High School

Based on the table above, it can be explained that out of 51 respondents, 34.7% experienced mild stress, and 24 respondents (16.3%) had polymenorrhea menstrual cycles. Based on the analysis of data using the Spearman-Rank Correlation statistical test, it was found that the ρ-value was (0.00) < α (0.05), thus H_o is rejected and H_1 is accepted, concluding that there is a relationship between stress levels and menstrual cycles in 11th-grade female students

at SMK Negeri 1 Bagor. The coefficient of correlation value r = 0.508, which means there is a moderate relationship between stress levels and menstrual cycles in female students. Stress is a physical and mental response of a person to environmental changes that require adjustment (Fitri Kumalasari, 2019). Stress is also a normal non-specific reaction of the self to anything that threatens to exceed its capacity for compensation to protect homeostasis. According to The American Institute of Stress, stress is a condition that can occur when personal and social pressures exceed what a person can manage (Rumahorbo, 2021). In a state of stress, the Hypothalamic-Pituitary-Adrenal (HPA) axis is activated, causing the hypothalamus to secrete Corticotropin-Releasing Hormone (CRH). Corticotropin-Releasing Hormone (CRH) has a negative effect on the regulation of GnRH (Gonadotropin-Releasing Hormone) secretion, and an imbalance of Corticotropin-Releasing Hormone (CRH) affects the suppression of human reproductive function during stress. The secretion of Corticotropin Releasing Hormone (CRH) will stimulate the release of ACTH (Adrenocorticotropic Hormone) by the anterior pituitary, which in turn will stimulate the adrenal glands to secrete cortisol (Pratiwi, 2017). Cortisol suppresses LH (Luteinizing Hormone) by inhibiting the anterior pituitary's response to GnRH (Gonadotropin Releasing Hormone). During the menstrual cycle, the role of LH (Luteinizing Hormone) is essential in producing the hormones estrogen and progesterone. These two hormones, estrogen and progesterone, play crucial roles during the cycle.

CONCLUSION

Based on the study, 34.7% of eleventh-grade girls experience mild stress, and 46.9% experience polymenorrhea. The Spearman Rank test results show a significant relationship between stress levels and menstrual cycles (ρ-value = 0.00 < 0.05) with a correlation coefficient of r = 0.508, indicating a moderate relationship between the two.

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