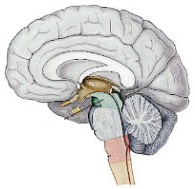
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THE RELATIONSHIP BETWEEN STRESS LEVELS AND THE MENSTRUAL CYCLE AMONG LATE ADOLESCENT GIRLS AT MA AL-HUDA WAJAK

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ABSTRACT

Irregular menstrual cycles in late teenage girls can occur due to stress. Stress in adolescence is something that must be considered in current conditions. The aim of this research was to determine the relationship between stress levels and the menstrual cycle in late adolescents. The research uses a correlative (non-experimental) design. The research subjects were young women aged 15 to 18 years. The sample was 68 respondents using a purposive sampling technique on March 11, 2024. The measuring tool used the Depression Anxiety Stress Scale (DASS) questionnaire and the Menstrual Cycle Questionnaire. The data analysis technique uses the Spearman rank test. Research results: stress levels were in the moderate category (50%) and menstrual cycles were in the irregular category (66.2%). There is a relationship between stress levels and the menstrual cycle in late adolescence with a p-value of 0.001 (< 0.05), meaning that H1 is accepted, the correlation coefficient value is 0.868 (very strong) with a positive direction. The conclusion of this research is that stress conditions in young women can affect their menstrual cycle, it can be caused by personal, academic or social environments. It is hoped that nurses will provide assistance to students to provide health education related to stress and the menstrual cycle. The school and parents are expected to provide mental assistance to students by facilitating service areas such as the Guidance Counselling (BK) room.

ABSTRAK

Siklus menstruasi yang tidak teratur pada remaja putri akhir dapat terjadi karena stres. Stres pada masa remaja merupakan sesuatu yang harus mendapat perhatian dalam kondisi saat ini. Tujuan penelitian ini adalah untuk mengetahui hubungan antara tingkat stres dan siklus menstruasi pada remaja akhir. Penelitian ini menggunakan desain korelasional (noneksperimental). Subjek penelitian adalah remaja putri berusia 15 sampai 18 tahun. Sampel terdiri atas 68 responden yang dipilih dengan purposive sampling pada 11 Maret 2024. Instrumen yang digunakan adalah kuesioner Depression Anxiety Stress Scale (DASS) dan Kuesioner Siklus Menstruasi. Data dianalisis menggunakan uji peringkat Spearman. Hasil penelitian menunjukkan bahwa tingkat stres sebagian besar berada dalam kategori sedang (50%) dan siklus menstruasi sebagian besar berada dalam kategori tidak teratur (66.2%). Terdapat hubungan antara tingkat stres dan siklus menstruasi pada remaja akhir, dengan nilai p sebesar 0.001 (< 0.05), yang berarti H1 diterima, dengan koefisien korelasi sebesar 0.868 (sangat kuat) dan arah hubungan yang positif. Kesimpulan penelitian ini adalah kondisi stres pada remaja putri dapat memengaruhi siklus menstruasi mereka, yang dapat disebabkan oleh lingkungan pribadi, akademik, atau sosial. Perawat diharapkan memberikan dukungan kepada siswa melalui pendidikan kesehatan tentang stres dan siklus menstruasi. Sekolah dan orang tua diharapkan memberikan dukungan mental kepada siswa dengan memfasilitasi sarana pelayanan seperti ruang Bimbingan Konseling (BK).

Kata Kunci: Remaja putri, Siklus menstruasi, Stres

1. INTRODUCTION

Adolescence spans the ages of 12 to 24 years. Physical maturation in adolescents is generally shorter than their psychological maturation, so adolescents are more vulnerable and prone to stress. Stress is a physical and psychological reaction that creates tension and disturbs stability in life, and it affects the body's hormonal system. The effect of stress can disturb the monthly cycle of adolescent girls, because perceived stress is linked to the menstrual complaints they experience (Yaşar, 2024). The menstrual cycle is a series of monthly changes marked by the discharge of blood from the uterine wall together with the shedding of the

endometrium. A normal menstrual cycle length is 21 to 35 days with an average of around 28 days, and only about 10 to 15% of women have a cycle of exactly 28 days (Ansong et al., 2019; Hu et al., 2020).

Menstrual cycle disorders are a common reproductive health complaint among adolescents. The systematic review and meta-analysis by Armour et al. (2019) showed that menstrual pain and disorders have a large impact on the academic lives of young women. A large-scale survey in the Netherlands of 32,748 women also showed that menstruation-related symptoms caused reduced productivity and absence from school and work (Schoep et al., 2019). Conceptually, menstrual disorders include oligomenorrhoea (a lengthened cycle), polymenorrhoea (a shortened cycle) and amenorrhoea (absence of menstruation), which are linked to ovarian dysfunction, anovulation and luteal phase failure (Ansong et al., 2019). Menstrual disorders are also linked to poorer sleep quality in adolescents (Kocabey et al., 2024), so their impact does not stop at the reproductive aspect alone.

Various factors can cause changes in the menstrual cycle, one of which is stress. When experiencing stress, the hypothalamus increases production of corticotropin-releasing hormone (CRH), which stimulates the release of adrenocorticotropic hormone (ACTH) and raises cortisol levels in the blood. Increased cortisol suppresses gonadotropin-releasing hormone (GnRH), which controls ovulation in women, so the menstrual cycle is disturbed (Maedy et al., 2022). This mechanism of the hypothalamic-pituitary-adrenal axis explains why prolonged psychological stress can cause a menstrual cycle that is longer, shorter, or even irregular (Fitri Kumalasari et al., 2019). In addition, dysmenorrhoea, the most frequent menstrual complaint, is also rooted in hormonal and inflammatory mechanisms influenced by the psychological condition of the sufferer (Itani et al., 2022).

A number of studies in Indonesia have found a similar pattern. Armayanti et al. (2021) reported factors affecting the regularity of the menstrual cycle in adolescent girls at SMA Negeri 2 Singaraja, while Fadillah et al. (2022) found a relationship between stress levels and the menstrual cycle in grade X female students at SMA 12 Kota Depok. The study by Martini et al. (2021) during the Covid-19 pandemic also showed a relationship between academic stress and the menstrual cycle, and Larasati (2023) found a relationship between stress levels and menstrual cycle regularity in adolescents. Among school-age groups, academic stress is a prominent source of stress because of examination demands, study pressure and classroom performance demands (Sun et al., 2025). Cognitive-behavioural interventions have even been shown to reduce test anxiety in adolescent students (Putwain & von der Embse, 2020), which shows that adolescent stress can be managed if recognised early.

Menstrual cycle problems can be prevented by managing stress, including getting enough sleep and setting aside time to relax. Based on preliminary survey data, of 20 female students at MA Al-Huda Wajak, 19 experienced menstruation and 6 of the 20 adolescents reported experiencing stress during menstruation. The researchers were interested in conducting the study at MA Al-Huda Wajak because the factors causing a tendency towards menstrual cycle disorders need to be minimised to prevent negative effects on oneself and on those around them. This study therefore aimed to determine the relationship between stress levels and the menstrual cycle in late adolescent girls at MA Al-Huda Wajak.

2. METHODS

This study used a correlational (non-experimental) design with a cross-sectional approach. The study was conducted at MA Al-Huda Wajak on 11 March 2024. The subjects were late adolescent girls aged 15 to 18 years. The sample comprised 68 respondents selected by purposive sampling. The instruments used were the Depression Anxiety Stress Scale (DASS) questionnaire to measure stress levels and the Menstrual Cycle Questionnaire to measure menstrual cycle regularity. The statistical test used was the Spearman rank test with IBM SPSS 23 to examine the correlation between stress levels and the menstrual cycle.

3. RESULTS AND DISCUSSION

The results obtained from the study are presented in tables of characteristic distribution, frequency and analysis. Respondent characteristics are presented in Table 1, while a summary of the study flow and main results is presented in Figure 1.

Table 1. Frequency Distribution of Characteristics of Late Adolescent Girls at MA Al-Huda Wajak

Category		Frequency (F)	Percentage (%)
Age	15-16 years	29	42.6
	17-18 years	39	57.4
Grade	Grade 10	22	32.4
	Grade 11	21	30.9
	Grade 12	25	36.8
	Total	68	100

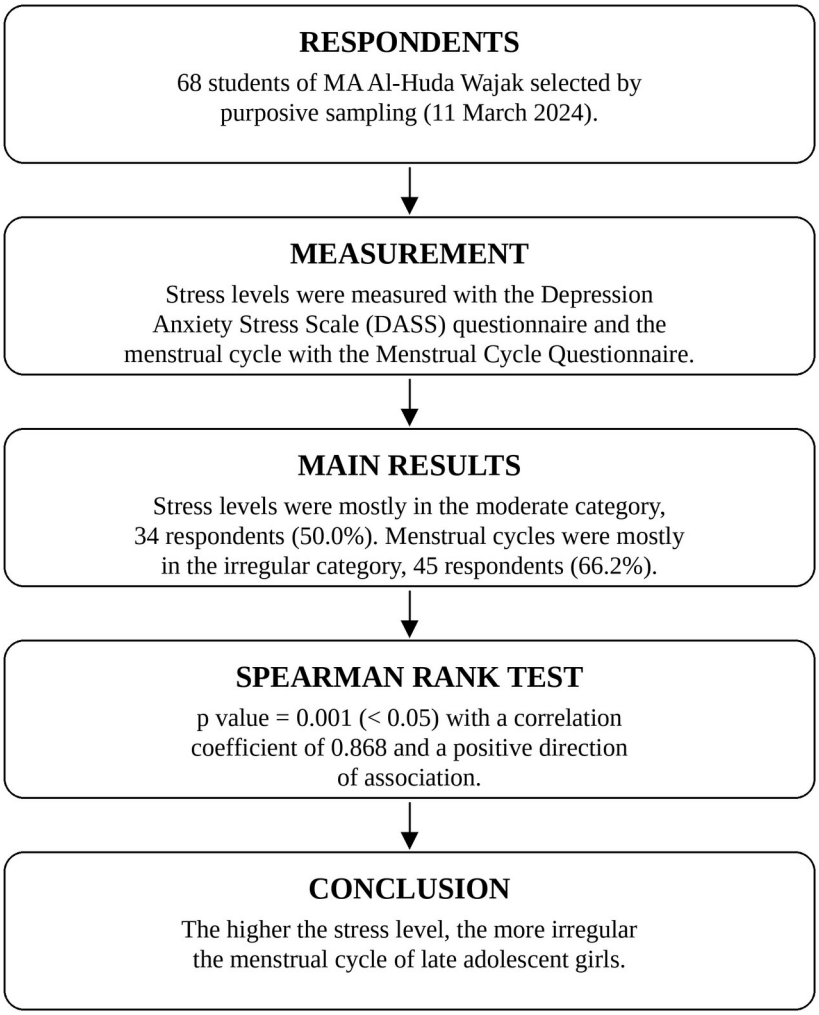


Figure 1. Summary of the Study Flow and Results on the Relationship between Stress Levels and the Menstrual Cycle

Based on Table 1, most late adolescent girls at MA Al-Huda Wajak were aged 17 to 18 years, totalling 39 students (57.4%), with most in grade 12, totalling 25 students (36.8%). The results showed that the stress levels of late adolescent girls at MA Al-Huda Wajak were mostly in the moderate category, totalling 34 respondents (50.0%). The menstrual cycles of the female adolescents at MA Al-Huda Wajak were mostly in the irregular category, totalling 45 respondents (66.2%). The Spearman rank test gave a p value of 0.001 (< 0.05), so H1 was accepted, meaning there was a significant relationship between stress levels and the menstrual cycle. The correlation coefficient of 0.868 indicates a very strong correlation with a positive direction: the higher the stress level, the more irregular the menstrual cycle of late adolescent girls at MA Al-Huda Wajak; conversely, the lower the stress level, the more regular the menstrual cycle.

This finding of mostly moderate stress is in line with the study by Armayanti et al. (2021), which stated that most respondents had moderate stress levels at 44.6%. Many things influence this, such as pressure arising from work, family, school, social life and other external contexts, which cause physiological and psychological stress. In this study, 43.2% of respondents experienced stress psychologically. Stress in adolescents is a fairly common problem and often has complex factors, so a comprehensive approach will help manage their stress well. Stress experience during the menstrual cycle

has also been reported in adolescent girls in India, showing that menstrual complaints and psychological pressure go hand in hand during adolescence (Krishnaveni et al., 2019).

The results showed that respondents with the most stress were in grade 12, at the final stage of SMA/MA schooling. Academic stress is thought to arise from the learning process of facing examinations, pressure while studying, classroom performance demands, and the need to master a large amount of material in a short time, which can make some students emotionally vulnerable. The researchers assume that grade 12 activities are often a significant cause of psychological stress for adolescents, because the various activities and demands faced during the final school year can affect their mental well-being. This finding is strengthened by the study of Sun et al. (2025), which showed that students' academic stress is closely linked to self-efficacy and the coping styles used. Adolescent stress is also influenced by social and personal variables, including the death of relatives or friends, inability to form positive relationships with teachers and peers, lack of attention and support, and avoidance or exclusion by peers. Understanding that these factors are interrelated, managing stress in adolescents with moderate to high levels requires appropriate solutions and support from family, schools and mental health professionals.

Participants suffering psychological stress showed symptoms including excessive anxiety in a situation but relief when the situation ended, pessimism, difficulty resting, often feeling lost and hopeless, trembling, and being easily restless. Students usually experience stressful periods lasting from a few hours to a few days as a result of various challenging problems. This results in mild stress symptoms such as heartburn, stomach ache, tense muscles, restless nights and dizziness. Compared with mild stress, moderate stress symptoms last longer (Maedy et al., 2022). Sleep disturbance accompanying menstrual complaints in adolescents (Kocabey et al., 2024) can worsen these symptoms, because lack of sleep lowers the tolerance threshold for stress on the following day. Nursing follow-up involves a holistic approach and strategies tailored to the individual, until adolescents are able to manage their stress well. This can be achieved by providing health information on stress reduction strategies, encouraging healthy lifestyle choices, and, if necessary, teaching relaxation techniques.

The results showed that the menstrual cycles of late adolescent girls at MA Al-Huda Wajak were mostly in the irregular category. This finding is in line with the study by Martini et al. (2021) at SMA Muhammadiyah 2 Palembang, where respondents with abnormal menstrual cycles totalled 26 students (59.1%), and with the study by Indriyani and Aniroh (2023), which found a relationship between stress levels and the menstrual cycle in adolescent girls. The study participants were adolescents aged 17 to 18 years, a stage of life with rapid psychological and physical change, and one of the changes in adolescent girls is the onset of menstruation. In general, menstruation follows a cycle; on the other hand, some adolescents experience irregular menstruation due to disorders in their cycles. Cycle irregularity can cause discomfort and other health problems, such as pain or stress arising from worry (Nurhayati & Yuliwati, 2023).

The findings showed that the menstrual cycle lasted between three and seven days. The influence of reproductive hormones is one of many problems that can cause irregular menstrual periods. The menstrual cycle can lengthen or shorten due to fluctuations in progesterone and oestrogen (Armayanti et al., 2021). Based on the study data, menstrual cycles fell outside the normal range of 21 to 35 days, which can indicate an imbalance or disorder in the hormonal system or reproductive health. An irregular cycle can be

categorised as a cycle that is too long (more than 35 days) or too short (less than 21 days). Stress, excessive exercise, body weight, reproductive problems and nutritional conditions all affect the menstrual cycle. Cycle irregularity can be caused by emotional problems or stress, while cycle abnormality does not occur directly in women who are stressed, but rather through hormonal dysregulation that progresses gradually (Mayasari & Fauziah, 2022).

Based on data analysis, the results of the study at MA Al-Huda Wajak showed a very strong positive relationship between stress levels and menstrual cycle irregularity in late adolescents. This study supports the results of Fadillah et al. (2022), who found a significant relationship between stress levels and the menstrual cycle at SMA N 12 Depok, with a Spearman correlation test result of 0.302 at a significance level of 0.004 < 0.05. Differences in coefficient size between studies can be understood from differences in respondent characteristics, stress measurement instruments, and observation time spans. The majority age range of respondents, 17 to 18 years, is linked to a person's ability to handle stress, because adolescents are often very sensitive to stress and have strong emotions. This result is also consistent with the study by Fitri Kumalasari et al. (2019), which showed that stress-induced hormonal dysregulation can affect the menstrual cycle, and with the studies by Angrainy et al. (2020) at SMAN 5 Pekanbaru and Ignasia et al. (2024) at SMPN 17 Malang, which likewise found a relationship between stress levels and menstrual cycle patterns in adolescent girls.

Mechanistically, menstrual cycle abnormalities have been shown to be more common in adolescents with high stress levels than in those with low or moderate stress levels. This implies that menstrual cycle control can be negatively affected by high stress levels. When experiencing a stressful situation, the autonomic nervous system (sympathetic and parasympathetic) and the hypothalamic-pituitary-adrenal (HPA) axis are activated; the amygdala activates the limbic system, which stimulates the synthesis of corticotropin-releasing hormone (CRH) in the hypothalamus and inhibits GnRH synthesis in the arcuate nucleus. In response to increased CRH levels, adrenocorticotropic hormone (ACTH) and endorphins are released, which also raise blood cortisol levels. Changes in luteinising hormone (LH) and follicle-stimulating hormone (FSH) then become factors that can cause irregular cycles (Maedy et al., 2022). The study by Perović and Mack (2025) adds evidence that menstrual cycle phase and perceived stress together predict cognitive performance, showing that the link between stress and the menstrual cycle is two-way and affects adolescents' daily functioning.

This finding is in line with international evidence. Yaşar (2024) found that perceived stress affected menstrual complaints in female university students, while Batubara et al. (2022) found a relationship between menstrual stress levels and the menstrual cycle in female medical students. Ansong et al. (2019) identified various risk factors linked to menstrual disorders in international female students in China, including psychological factors. The consistency of the direction of findings across countries and education levels strengthens the suspicion that the stress and menstrual cycle relationship is not peculiar to one school, but a pattern that recurs in adolescent and young female populations. Nevertheless, the very strong association in this study (0.868) needs to be read with care, because both variables were measured at the same time with self-report questionnaires, so the possibility of common method bias cannot be ruled out.

Factors other than stress also need to be considered. Silva (2021) showed that nutritional status, eating habits and stress are jointly linked to the menstrual cycle of female university students during the

academic season. In Indonesia, Maedy et al. (2022) and Aisyah et al. (2025) also found a link between nutritional status and stress and the menstrual cycles of adolescent girls. Deficiencies of minerals, including iron, magnesium, fatty acids, vitamin B (especially B6), vitamin E and vitamin C, as well as poor dietary patterns, can also contribute to irregular menstrual cycles. Nursing interventions and more focused research can therefore be carried out by considering stress and nutritional status together, not one or the other alone.

The implications of these findings for nursing practice and school health are quite direct. Revankar et al. (2025) showed that a nurse-led intervention on menstrual health management affected stress and menstrual parameters in adolescent girls. This means nurses have an evidence base for providing support to students through health education on stress and the menstrual cycle, including stress reduction strategies, healthy lifestyle choices and relaxation techniques. Schools and parents are expected to provide mental support to students, facilitated by service facilities such as the Guidance Counselling (BK) room. For adolescents with irregular menstrual periods, finding a balance between stress management techniques, a healthy lifestyle and emotional support is very important.

Several limitations need to be noted so that these findings are read proportionately. The cross-sectional design does not allow causal conclusions, because stress and the menstrual cycle were measured at a single point in time; the relationship found could also run in the opposite direction, with an irregular cycle causing worry and stress. The study was conducted in a single school with purposive sampling, so generalisation to female adolescents in other schools needs to be done with care. Measurement of stress and the menstrual cycle relied on self-report questionnaires without hormonal measurement or prospective menstrual calendar records. Confounding factors such as nutritional status, physical activity and history of reproductive disorders were not controlled in the analysis, even though these factors have been shown to be linked to the menstrual cycle (Aisyah et al., 2025; Silva, 2021).

4. CONCLUSION AND SUGGESTIONS

The conclusion of this study is that stress conditions in female adolescents can affect their menstrual cycles, which can be caused by personal, academic or social environmental factors. The stress levels of late adolescent girls at MA Al-Huda Wajak were mostly in the moderate category (50.0%) and menstrual cycles were mostly in the irregular category (66.2%), with a significant and very strong relationship between the two variables ($p = 0.001$; correlation coefficient 0.868). The higher the stress level, the more irregular the menstrual cycle of late adolescent girls.

Nurses are expected to provide support to students through health education on stress and the menstrual cycle. Schools and parents are expected to provide mental support to students, facilitated by service facilities such as the Guidance Counselling (BK) room, so that adolescents are able to manage their stress well through stress reduction strategies, a healthy lifestyle and relaxation techniques.

For future researchers, a longitudinal design with menstrual calendar records over several cycles is recommended, controlling for confounding factors such as nutritional status and physical activity, and involving samples from several schools so that the relationship between stress levels and the menstrual cycle can be understood more fully, including its causal direction.

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