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ASSOCIATION BETWEEN ANXIETY AND MENSTRUAL CYCLE IRREGULARITY AMONG ADOLESCENT GIRLS IN PUBLIC SENIOR HIGH SCHOOL 15 SEMARANG: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Menstrual disorders are a major reproductive health issue frequently experienced by adolescents. These issues generally include menstrual cycle instability, changes in menstrual flow, including abnormal or prolonged bleeding, and pain or discomfort often associated with dysmenorrhea or premenstrual syndrome. Irregular menstrual cycles are an indication of menstrual problems. Menstrual problems can be triggered by various factors, including psychological factors (stress, life pressures, anxiety, and physical exhaustion), hormonal imbalances, nutritional conditions, and organic abnormalities (such as inflammation, tumors, and injuries). Lifestyle, learning patterns, and psychological factors are some of the factors that can influence anxiety. Purpose to determine the relationship between anxiety levels and the menstrual cycle among female students at Public Senior High School 15, Semarang.
Methods: The research method used was an analytical cross-sectional study. A sample of 65 female students was obtained using proportional stratified random sampling. This study utilized an anxiety questionnaire based on the Zung Self-Rating Anxiety Scale (ZSAS) and a menstrual cycle questionnaire.
Results: The results of the study showed that most female students aged 17 years were 32 female students (49.2%), and 42 female students experienced moderate levels of anxiety (64.6%), 29 female adolescents (44.6%) experienced irregular menstrual cycles, and 36 female adolescents (55.4%) had regular menstrual cycles.
Conclusion: There is a significant relationship between anxiety levels and menstrual cycles in female adolescents at SMA Negeri 15 Semarang, with a correlation coefficient value of - 0.599 and a significance value <0.001.
Keywords: adolescent, anxiety, menstrual

INTRODUCTION

Adolescence is a transitional phase from childhood to adulthood. According to the Indonesian Minister of Health, the age range for adolescents is between 10 and 19 years old and unmarried. In adolescent girls, puberty is marked by the onset of menarche, the first menstruation. Menstruation is regular, cyclical bleeding caused by the shedding of the endometrium due to the influence of decreasing ovarian hormones (estrogen and progesterone), particularly progesterone, at the end of the ovarian cycle, usually starting

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approximately 14 days after ovulation. Although menstruation is a natural process experienced by girls, it can be a major problem for adolescent girls if there is a disruption in the menstrual cycle (Wisma et al., 2024).

An inconsistent menstrual cycle, if not addressed promptly and appropriately, can lead to fertility problems. Furthermore, menstrual irregularities can also indicate reproductive system problems that can increase the risk of various diseases, such as uterine cancer and infertility. Therefore, changes in the menstrual cycle are important to consider, as they can impact the quality of life of the younger generation in the future(Safriana & Sitaresmi, 2022). An inconsistent menstrual cycle is an indication of problems with menstruation. Menstrual problems can be triggered by various factors such as psychological aspects (stress, life pressure, anxiety, and physical fatigue), hormonal imbalances, nutritional conditions, and organic anomalies (such as inflammation, tumors, injuries), and others(Silalahi, 2021).

Adolescents are the group most at risk for mental health issues. The time when someone grows from being a child into an adult is called the second growth stage. During adolescence, people go through changes in their bodies, brains, and thoughts (Muslimahayati & Rahmy, 2021). When teens start going to secondary school, they often feel socially anxious. This is because adolescence brings challenges that require more direct interaction with others. These social challenges make teens responsible for more things, which can make them nervous and worried about how others might judge them (Poetry et al., 2024). Anxiety is one of the most common mental health problems around the world, including in Indonesia. According to the World Mental Health Survey, anxiety is among the most widespread mental illnesses in both wealthy and poorer countries(Anggun hilda et al., 2024).

Around the world, including in Indonesia, anxiety is one of the most common mental health issues. An estimated 20% of the global population is affected by anxiety, and 47.7% of adolescents report experiencing it frequently. The World Mental Health Survey shows that mental disorders are very common in both developed and developing countries, with anxiety being the most prevalent (Anggun hilda et al., 2024).

Lifestyle, how people learn, and their mental state can all affect anxiety. Things like not getting enough sleep, eating badly, and not exercising enough can make anxiety worse. The way someone studies can also cause anxiety, such as staying up late before exams, not understanding what is being taught, and not going over material regularly. Other mental factors that can lead to anxiety include thinking badly about exams and feeling afraid that you can't control what happens during a test(Abeputri et al., 2023).

Anxiety is something that normal people can feel because fear can happen anytime. Anxiety disorder is when someone's mind is troubled by fear and worry. This isn't something that happens to everyone, and it usually happens because of a mix of things like biology, mental state, and social factors (Sherlina, 2024). According to the 2018 Basic Health Research (Riskesdas) survey, anxiety disorders are pretty common in Indonesia. About 14 million people, or 6% of people over 15 years old, have mental health issues that include depression and anxiety. In Indonesia, around 37,000 teenagers and young adults aged 15 or older have anxiety disorders, and the highest number of cases is found in Central Java, where it's about 4.7%(Shanti Dewi et al., 2024).

Changes in anxiety levels in women are connected to estrogen levels. Estrogen is a hormone that plays an important role in female sexuality and helps control emotions. This anxiety happens because women often feel worried and keep thinking about the results of future exams, even when they haven’t put in enough effort yet. It’s important to deal with this anxiety to avoid bad effects on mental growth. When female students are preparing for exams, their worries can affect their chances of getting into the colleges or universities they

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want to attend. Anxiety often shows up before exams, as students worry about whether they will meet the required standards or graduate, which determines if they can move on to the next level of education. Also, anxiety can come in many forms, like worry, fear, pressure, feeling threatened, and concerns about uncertain situations or not meeting personal goals (Rizqi Animah et al., 2024). Before big exams, students often feel a lot of pressure from various sources, which can make them anxious about taking the tests. Anxiety occurs when someone faces certain situations or problems (Kita & Wilani, 2024).

It's really common for girls in school to feel nervous before exams, and students are often the ones who feel this worry most. There are many reasons they might feel this way, such as being scared of getting bad marks, not being able to concentrate during the test, or thinking the exam is really important (Wisma et al., 2024). The pressure on girls can cause a lot of anxiety, such as worrying about not getting into their top choice university, making their parents upset, not understanding the subjects being tested, and the tough competition to get into a state university. If anxiety becomes really high, it can make it hard to think clearly and solve problems. It can also make students feel worse about themselves. When people are stressed, they see the situation as a threat to their self-respect, which makes them feel anxious (Rizqi Animah et al., 2024).

Other factors that can influence anxiety include lifestyle, study habits, and psychological factors. Lifestyle issues such as sleep deprivation, inadequate nutrition, and minimal physical activity can exacerbate anxiety. Additionally, ineffective study habits such as pulling all-nighters before exams, lacking a solid grasp of the material, and rarely reviewing the content are significant contributors to anxiety. Other psychological factors that can trigger anxiety include negative and irrational thoughts regarding exams, as well as a fear of being unable to control the situation during the test (Fatmawati et al., 2024)Anxiety causes systemic changes in the body, particularly within the nervous system; it can trigger the release of cortisol, which suppresses and disrupts hypothalamic function including the secretion of hormones related to the menstrual cycle (Putriyani et al., 2023).

RESEARCH METHOD

This study used a quantitative descriptive research method with a cross-sectional design. The population in this study comprised all 12th-grade female students at SMA Negeri 15 Semarang, totaling 182 students. A sample of 65 female students was obtained using the proportional stratified random sampling technique. The instruments used were two questionnaires. The first questionnaire was used to measure menstrual cycle regularity. The second questionnaire was used to measure the Zung Self-Anxiety Scale (ZSAS). This study was conducted in January 2025 and has met the requirements of the ethics committee under number 367/KE/05/2025.

RESULTS

Based on the distribution of respondent characteristics by age among 12th-grade female students at Public Senior High School 15 Semarang, out of 65 respondents, the majority were 17 years old, with 32 students (49,2%), and 18 years old, with 27 students (41,5%), while the smallest group was 16 years old with 6 students (9,2%).

Table 1. Frequency Distribution of Respondent Characteristics

Age	Frequency (f)	Percentage (%)
16 years	6	9,2%
17 years	32	49,2%
18 years	27	41,5%
Total	65	100,0

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Tabel 2. Distribution of Menstrual Cycle Frequency in Adolescent Girls

Menstrual Cycle Frequency	Frequency (f)	Percentage (%)
Irreguler	29	44,6%
Reguler	36	55,4%
Total	**65**	**100,0**

Based on Table 2., above, it is known that 29 teenage girls (44.6%) experience irregular menstrual cycles and 36 teenage girls (55.4%) have regular menstrual cycles.

Based on Table 3., it is known that from 65 respondents, 42 female adolescents (64.6%) experienced a moderate level of anxiety, while 23 female adolescents (35.4%) experienced a mild level of anxiety.

Table 3. Frequency Distribution of Anxiety Levels in Female Adolescents

Anxiety Level	Frequency (f)	Percentage (%)
Mild	23	35,4%
Moderate	42	64,6%
Total	65	100,0

Table 4. The Relationship Between Anxiety And Irregular Menstrual Cycles Among Adolescent Girls At Semarang State High School No. 15

			Anxiety Level	Menstrual Cycle Frequency
Spearman's rho	Anxiety Level	Correlation Coefficient	1.000	-.599**
		Sig. (2-tailed)	.	<,001
		N	65	65

The Spearman correlation test shows that there is a significant relationship between anxiety levels and menstrual cycles, with a correlation coefficient of -0.599 and a significance value of <0.001.

Table 5. Cross-tabulation of the relationship between anxiety levels and menstrual cycles in adolescent girls

Anxiety Level	Menstrual Cycle Frequency		
	Irreguler	Reguler	Total
Mild	1	22	23
Moderate	28	14	42
Total	29	36	65

Based on the table above, it can be seen that of the 65 female adolescents studied, 23 female adolescents experienced mild levels of anxiety, with 1 person having an irregular menstrual cycle and 22 people having a regular menstrual cycle, while of the 42 people who experienced moderate levels of anxiety, 28 had an irregular menstrual cycle and 14 had a regular menstrual cycle

DISCUSSION

Young teenagers often judge themselves based on their own feelings instead of looking at things realistically, which can cause them to feel anxious in social situations (Damayanti

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& Hamid, 2023). Teenagers between the ages of 15 and 18 are more likely to feel very anxious, as this time in their lives is when anxiety is more likely to start and can affect their everyday activities. Students who feel this way still have to meet all the requirements to graduate, which can make their anxiety worse (Khofifah & Amalia, 2024). As people get older, anxiety and depression become more common, probably because they start to notice their emotions more and are better at telling others how they feel. While the exact reasons for differences between boys and girls are not clear, it's likely that changes after puberty, along with physical, hormonal, and social influences, play a big role (Chowdhury & Chakraborty, 2017)

Adolescence is an important time for growing in many ways, especially when it comes to emotions while studying. Students often feel stressed during school, especially when they are taking exams, which can cause test anxiety. Test anxiety is when someone feels too much worry before, during, and even after an exam (Prasetya et al., 2023). As people get older, they usually become better at managing their emotions and dealing with challenges (Kita & Wilani, 2024). Since age is connected to school level and grade, high school students, especially those in the final years before university, often feel more test anxiety. This is because the academic pressure increases, making test anxiety worse(Torrano et al., 2020). Most people in this study had anxiety that was either moderate or mild. This is because adolescence is a time when a person's personality is still developing, making them more likely to feel emotional changes quickly. The stress from school work, family duties, and feeling unable to deal with life's challenges can lead to mental health issues, especially anxiety. Moderate anxiety means someone focuses on important things and ignores less important ones, making their attention more selective. But with help from others, they can learn to focus better(Mayasari, 2021). Anxiety happens when someone feels a threat, especially when there's uncertainty. For students taking the UTBK test, anxiety might come from not knowing the test results, and this uncertainty can make them feel uneasy and anxious (Rismadiyanti, 2022).

Anxiety makes it hard for a person to focus and concentrate because their mind keeps thinking about possible future problems. For students, anxiety can lower their motivation and make them feel more hopeless or unsure about their ability to do well on tests. Anxiety is an emotion that comes with feelings of fear and a sense that something dangerous might happen, even if it's not clear what the danger is (Lauditta & Ariana, 2021). Signs of an anxiety disorder include fear, worry, and changes in how someone acts. Anxiety is a response to possible future dangers, whether they are real or just imagined. Fear, on the other hand, is a reaction to something dangerous that is happening right now, whether it's real or not(Putri & Widiyawati, 2025).

Students' feelings and mental state have a big impact on how ready they are for the national exam. Because of this, there are two main reasons for stress before the exam. One is the emotional stress students feel, like worrying about failing, getting bad grades, or not knowing the answers. The other comes from outside, especially the national exam itself, which affects both families and schools. Preparing for the exam also brings a sense of responsibility, which can make it hard for students to keep up with the changes and updates about the exam process, as the requirements for graduation keep getting higher every day(Kita & Wilani, 2024)

During exams, people with anxiety may experience physical signs like headaches, feeling sick, stomach pain, sweating a lot, trouble breathing, a fast heartbeat, feeling dizzy or faint, nail-biting, chewing on pen caps, shaking fingers, and sweaty palms. They may also feel emotions like anger, worry, fear, being stuck in thoughts, confusion, disappointment, and a faster heartbeat. Other signs include trouble focusing, sleepiness during the test, crying, being restless, comparing themselves to others, lack of confidence,

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and other anxious behaviors (Prasetya et al., 2023).This anxiety happens because students are worried about what might happen if they don't do well on the National Exam. Some of the risks they might face if they fail include feeling ashamed, losing time, spending money, having to take the exam again, and not being able to go on to the next level of education(Maisaroh & Falah, 2011). Students often feel different kinds of worry before exams. One feeling is that the exam seems hard and they are afraid they won't do well. Another is that they are too focused on getting a good score, which makes them nervous when the exam comes. They also get worried because they are unsure if their answers are correct, and they lose confidence when they are trying to answer questions (Sitti Rahmi et al., 2024).

Based on the questionnaire results, many people reported feeling a lot of anxiety. One common symptom they mentioned was heart palpitations, which is often the first sign of anxiety. This feeling can make someone uncomfortable and may lead to more panic, trapping them in a cycle of fear that's hard to break. Also, several people said they had to go to the bathroom more often. This can happen when someone is under stress, as the body reacts to emotions in different ways. The urge to urinate might show how stressed they really are. This shows that anxiety can affect both the mind and the body.

Anxiety can be explained as a feeling of fear that doesn't have a clear reason. It happens when someone feels scared even though there's no real danger. Students may develop anxiety disorders if they can't handle their anxiety well. But students who believe in themselves or feel confident in their abilities are more likely to feel calm and know they can do what they need to achieve their goals. This is true for students who have strong self-belief or self-confidence(Lauditta & Ariana, 2021). In female students, anxiety often shows up through their emotions, so the actions they take are usually meant to reduce the uncomfortable feelings caused by anxiety, like praying(Mukminina & Abidin, 2020)

Anxiety plays a role in increasing hormone fluctuations during the menstrual cycle, with women exhibiting a more sensitive response to stress, particularly during the luteal phase. When negative emotions or moods related to anxiety or stress arise, this can affect the smoothness of the menstrual cycle. When experiencing anxiety, the brain responds by releasing Corticotropin-Releasing Hormone (CRH), which inhibits Gonadotropin-Releasing Hormone (GnRH). GnRH is a key hormone in the reproductive system that regulates the release of other reproductive hormones. The inhibition caused by CRH also affects Luteinizing Hormone (LH), which is essential for ovulation. When GnRH is inhibited, the secretion of estrogen from the ovaries, which functions to regulate the menstrual cycle, is disrupted. This disruption in GnRH production can affect the duration of the menstrual cycle. If disruption occurs in the proliferative and secretory phases, these phases can be shortened, resulting in shorter menstrual cycles (polymenorrhea). Conversely, if disruption occurs in the follicular and luteal phases, these phases can be lengthened, resulting in longer menstrual cycles or oligomenorrhea.(Perdoman et al., 2023)

An irregular menstrual cycle indicates an imbalance in the endocrine and metabolic systems. This can lead to difficulties in achieving pregnancy (infertility), especially when the menstrual cycle becomes shorter, resulting in insufficient mature eggs for fertilization and disrupting ovulation. Conversely, a longer menstrual cycle indicates a low number of eggs being produced. Irregular menstrual cycles also make it difficult for women to determine their fertile period (Izzah et al., 2024). Irreguler menstrual cycle disorders can lead to serious consequences such as anemia, difficulty conceiving, and an increased risk of reproductive system diseases (Rahmawati et al., 2025). Physiologically, anxiety can affect the endocrine system specifically the hypothalamic pituitary ovarian (HPO) axis, which plays a role in regulating the menstrual cycle. Excessive stress or anxiety can disrupt the release of gonadotropin-releasing hormone (GnRH), which regulates luteinizing

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hormone (LH) and follicle-stimulating hormone (FSH). Disruptions to this hormonal balance can interfere with regular ovulation, thereby leading to menstrual cycle irregularities (Purwati & Muslikhah, 2021).

If an irregular menstrual cycle is left unaddressed, it can lead to various issues, such as fertility problems and a blood deficiency resulting in anemia. Anemia typically manifests with symptoms such as fatigue, weight loss, and difficulty concentrating, among others. Such conditions negatively impact a woman's quality of life, particularly for adolescents, making it crucial to take menstrual irregularities seriously to prevent them from interfering with daily activities. Adolescent girls often experience fluctuations in their menstrual cycles, ranging from normal patterns to conditions like oligomenorrhea. These changes can stem from several factors, including an unhealthy diet (often due to rarely bringing packed meals from home), an excessive school workload, academic stress, and personal anxieties.

CONCLUSION

The study results, based on 65 respondents, revealed that 28 respondents experiencing moderate anxiety had irregular menstrual cycles; this indicates a tendency for a relationship between anxiety levels and menstrual cycle regularity, where adolescents with higher levels of anxiety tend to have irregular menstrual cycles. The conclusion of this study is that there is a significant relationship between anxiety levels and menstrual cycles in female adolescents at Public Senior High School 15, Semarang, with a correlation coefficient of 0.599 and a significance value of <0.001.

RECOMMENDATIONS

Recommendations for future researchers include expanding research beyond the menstrual cycle in adolescents.

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