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The Relationship Between Stress Level and Menstrual Cycle in Final Year Students

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ABSTRACT

Introduction: According to the World Health Organisation (WHO), 38.45% of adolescent problems are related to menstrual disorders. Menstrual disorders are abnormalities that occur in the menstrual cycle. Signs and symptoms of menstrual disorders include too little or too much menstrual blood, menstrual pain, and depression before menstruation or premenstrual dysphoric disorder. One factor that affects the menstrual cycle is stress. Stress impacts overall physical and psychological health such as insomnia, headaches, personality disorders, anxiety disorders, depression. Final year students as academic individuals are also inseparable from stress in their daily activities which can cause menstrual cycle disorders. **Objective:** To determine the relationship between stress level and menstrual cycle in final year students at STIKes Muhamamdiyah Ciamis. **Method:** The research method is quantitative with cross sectional research design. The sampling technique was proportional random sampling using the Slovin formula so that a sample of 63 respondents was obtained, namely final year students at STIKes Muhammadiyah Ciamis. The research instrument was a questionnaire sheet. Data analysis using univariate and bivariate analysis with chi square statistical test. **Result:** The highest frequency stress level was severe stress category as many as 23 respondents (36.5%). The highest frequency menstrual cycle is normal category as many as 34 people (54.0%). Statistical test results with chi square test obtained $p = 0.036 < \alpha = 0.05$ (5%). **Conclusion:** The conclusion of this study is that there is a relationship between stress levels and menstrual cycles in final year students at STIKes Muhammadiyah Ciamis with the results of statistical tests p value < α.

Keywords: final year college student, menstrual cycle, stress level

Introduction

The 2018 Basic Health Research in Indonesia explained that 68% of women aged 15-18 years in Indonesia reported regular menstrual cycles 13.7% experienced irregular menstrual cycles in the past year (Wisniastuti, Adilatri, & Purwanti, 2018). WHO states that the problems of adolescents in the world are around problems regarding menstrual disorders (38.45%), nutritional problems related to anemia (20.3%), learning disorders (19.7%), psychological disorders (0.7%), and obesity problems (0.5%). Menstrual disorders are common and can cause adolescents to see a doctor. Menstrual disorders that are not treatedcan affect quality of life and daily activities (Hapsari, 2019).

These menstrual pattern disorders involve integrative regulatory mechanisms that affect biochemical and cellular processes throughout the body, including the brain and psychology. The brain'sinfluence on hormonal responses occurs through the hypothalamic-pituitary-ovarian pathway. This includes several effects and feedback control mechanisms under pressure from the highly active limbicsystem. This system stimulates the release of a hormone from the hypothalamus called *corticotropin- releasing hormone* (CRH). This hormone directly inhibits the *hypothalamic* secretion of *gonadotropin-releasing hormone* (GnRH) from the strong core production site. This process likely occurs through increased secretion of endogenous opioids (Tombokan, Pangemanan, & Engka, 2017). Menstrual cycle disorders include polymenorrhea, oligomenorrhea and amenorrhea (Suhri, 2022).

The menstrual cycle generally has a standard length of 28 days, but every woman's cycle or regularity is different. Approximately 90% of women have periods or cycles that last 25 days to 35 days, with only 10 to 15% having cycles lasting 28 days. In humans, a normal cycle is usually 21 to 35days. Due to the lack of proper hormonal regulation in adolescents between the ages of 12 to 13, menstrual cycle abnormalities are common. However, when adolescents are 17 to 18 years old, menstruation will begin to normalize at 28 days to 35 days. Menstrual cycle anomalies in adolescents who have reached adulthood can of course be a sign of a problem. Menstrual problems in women are quite common, with a prevalence rate of 30 to 70% (Suhri, 2022).

One factor that affects the menstrual cycle is stress. Stress is the body's non-specific response toexercise demands and is a physiological, psychological, and behavioral response in humans that seeks to regulate and regulate internal and external loads (Kurniawan, Trisetiyono, & Pramono, 2016). Because stress increases a person's ability to cope with life's difficulties, ordinary stress provides useful natural responses, irritability, insomnia, etc. When stress continues, the body tries to adapt the affected person to pathological changes (Wang et al., 2020).

Unhealthy lifestyle, stress, health problems, physical activity hormonal imbalances, and nutritional conditions are all factors that lead to irregular periods. Stress is a common cause of *menstrual* cycle abnormalities*. Stress induces the pituitary to release ACTH (Neurohormonal AdrenocorticotropicHormone*). Cortisol levels increase as a result of this hormone, thus disrupting the menstrual cycle (Safitri, Irsam, & Kurniati, 2020).

According to WHO, the prevalence of stress is ranked 4th in the world where more than 350 million people experience stress. Based on a stress prevalence study conducted by the *health and safetyexecutive* in the UK, it was found that the incidence of stress was greater in women as much as 54.62%,compared to men as much as 45.38% (Ambarwati, Pinilih, & Astuti, 2019). Based on data from the Basic Health Research Riskesdas (2018), it was found that the incidence of stress was greater in women as much as12.1%, compared to men 7.6%. Based on the age group that often experiences stress occurs at the age of 14-24 years as

much as 10%. Research conducted by Koochaki, (2019) found that the prevalence ofstudents in the world who experience stress problems is 38-71%, while in Asia it is 39.6-61.3%. Meanwhile, the prevalence of students who experience stress in Indonesia is 35.7-71.6% (Ambarwati et al., 2019). Continuous stress can experience physical changes such as easy fatigue, drastic weight loss, and even frequent illness, so that metabolism is disrupted. If metabolism is disrupted, the menstrualcycle can be disrupted (Manurung, 2017).

While final year students as academic individuals are also inseparable from stress in their daily activities. Academic activities, especially external tasks and the demands of one's own expectations, can make final year students stressed. External expectations that include doing coursework, study load,parental pressure to succeed in college, and social adaptability on campus are examples of external demands. The increasingly complex course material that is increasingly challenging demands students lecture skills, and the lack of free time or recreation is also one of the demands (Nainggolan & Sukatendel, 2021).

Stress can be overcome by relaxing the soul by using the rules of Tafakkur, which is thinking and thinking about something deeply. Start the tafakkur process by thinking about yourself. Consider all the blessings that Allah has given in terms of health and future self-improvement. Even though we are in a limited situation today, there are greater favors and gifts from Allah SWT so that we can feel and be grateful for the signs of Allah SWT's greatness that we can see today. We can conquer stress and be calmer with this insight (Fadilah, 2021).

Preliminary studies were conducted by questionnaire conducted on November 5, 2022 at the STIKes Muhammadiyah Ciamis campus on 25 final year students, the results showed that 68% of final year students of STIKes Muhammadiyah Ciamis experienced irregularities in the menstrual cycle or abnormal. Therefore, based on the above phenomenon, researchers are interested in conducting researchwith the title "Relationship between Stress and Menstrual Cycle in Final Year Students at Stikes Muhammadiyah Ciamis".

Objective

The research method is quantitative with a cross-sectional research design. The sampling technique is proportional random sampling use formula slovin so that got sample as many as 63 respondents that is student level finally at STIKes Muhammadiyah Ciamis. The research instrument was a questionnaire sheet. Data analysis used univariate and bivariate analysis with the chi square statistical test.

Method

The research design used was quantitative with a *cross sectioanl* research design. The populationused in this study were all final year students of D3 Nursing, D3 Midwifery, D3 Health Analyst, D3 Pharmacy and S1 Nursing study programs at STIKes Muhammadiyah Ciamis as many as 168 people. Sampling using the slovin formula so that a sample of 63 samples was obtained. The sampling techniqueused *simple random sampling* technique in accordance with the inclusion and exclusion criteria. The instruments used were DASS 42 stress questionnaire and questionnaire about menstrual disorders. Theanalysis used was univaritat and bivariate with *chi square* test.

Result

1. Univariate Analysis
   a. Frequency Distribution of Stress Level

Table 1 Stress Level Frequency Distribution

No	Stress Level	Frequency (f)	Percentage (%)
1	Normal	11	17,5
2	Lightweight	14	22,2
3	Medium	12	19,0
4	Severe	23	36,5
5	Very Severe	3	4,8
	Total	63	100,0

Based on the table above, it is found that the level of stress in final year students at STIKes Muhammadiyah Ciamis, the highest frequency result is the severe stress category as many as 23 respondents (36.5%).

   b. Frequency Distribution of Menstrual Cycle

Table 2 Frequency Distribution of Menstrual Cycle

No	Menstrual Cycle	Frequency (f)	Percentage(%)
1	Normal	34	54,0
2	Not Normal	29	46,0
	Total	63	100,0

Based on the table above, it is found that the menstrual cycle in final year students at STIKes Muhammadiyah Ciamis has the highest frequency of normal category as many as 34 people (54.0%).

2. Bivariate Analysis

Table 3 Frequency distribution of the Relationship between Stress Level and Menstrual Cycle in Final Year College Students at STIKes Muhammadiyah Ciamis

No	Stress Lavel	Menstrual Cycle				Total		P value	α
		Normal		Abnormal					
		f	%	f	%	f	%		
1	Normal	7	63,9	4	36,4	11	17,5	0,036	0,05
2	Light	11	78,6	3	21,4	14	22,2		
3	Currently	8	66,7	4	33,3	12	19,0		
4	Critical	7	30,4	16	69,6	23	36,5		
5	Very Serious	1	33,3	2	66,7	3	4,8		
	Total	34	54,0	29	46,0	63	100,0		

In accordance with the research that has been conducted, from 63 respondents at STIKes Muhammadiyah Ciamis, it is found that stress levels affect the menstrual cycle in final year students. The statistical test results obtained a value of $p = 0.036 < \alpha = 0.05$ (5%) can be concluded that there is a relationship between stress levels and menstrual cycles in final year students at STIKes Muhammadiyah Ciamis.

Discussion

1. Stress Level in Final Year College Students

Based on the analysis of the questionnaire, it can be seen that the final level students of the SI Nursing study program who experienced normal stress levels were 4.8%, mild stress was 7.9%, moderate stress was 1.6%, severe stress was 9.5% and very severe stress was 4.8%. Final year students in the D3 Nursing study program who experienced normal stress were 4.8%, mild stress were 4.8%, moderate stress were 1.6%, severe stress were 6.3%. Final year students of the D3 Health Analyst studyprogram who experienced normal stress were 3.2%, mild stress were 3.2%, moderate stress were 6.3%,severe stress were 6.3%. Final year students of the D3 Pharmacy study program who experienced normal stress were 1.6%, mild stress were 3.2%, moderate stress were 7.9%, severe stress were 7.9%. And final year students of the D3 Midwifery study program who experienced normal stress were 3.2%,mild stress were 3.2%, moderate stress were 1.6%, severe stress were 6.3%. Based on the results of thestudy, it is known that the level of stress in final year students at STIKes Muhammadiyah Ciamis obtained the highest frequency of severe stress category as many as 23 respondents (36.5%). The stress experienced by final year students is due to the tasks and demands they experience where at this time final semester students also tend to experience *burnout* or boredom. According to Pines and Aronson in Ambarwati *et al* (2019) *burnout* is physical, emotional, and mental fatigue caused by long-term involvement in demanding situations. In final year students, this demanding situation is caused by the process of compiling a thesis and KTI.

This is in line with research conducted by Ambarwati (2019) who examined the description of student stress levels, the results showed that the average age of students was 22.01 years. The average study period for the Diploma III (D3) program is 6.00 semesters, for the Bachelor program (S1) the average is 8.05 semesters. The level of stress in students shows mild stress as much as 35.6%, moderatestress 57.4%, and severe stress as much as 6.9%. This is due to internal factors, namely not being able to understand and respond to problems properly and from external factors, namely problems in the community, family and related to relationships with other people and also because of the higher level course load, the more difficult the courses they take.

Theoretically, stress as the inability to cope with threats faced by the mental, physical, emotional and spiritual human being. Stress levels are stages of stress symptoms that exist in a person that are often not realized. According to Wisniastuti (2018) this can be caused by internal and external factors.Internal factors can be caused by health or illness experienced, because the level of health that exists ina person will affect the stress experienced, besides that stress can be caused by overload and boredom with the learning process that takes place. If someone is in this condition, then that person will experience feelings of restlessness, anxiety, anxiety, to severe frustration or despair. In a state of stress, free radical cells that previously did not develop now multiply rapidly (Wisniastuti et al., 2018).

This research is reinforced by previous research conducted by Khumainani, (2016) which showsthat the majority of female students experience moderate stress levels because students are a group thatis vulnerable to internal tensions in carrying out their duties and roles at university. Stress in female students can be caused by various factors, including the academic environment, competition, interpersonal interactions, and the way of communication in thinking. College students generally experience stress

in various circumstances such as loneliness, lack of sleep, anxiety, and high doubt (Fidora & Okrira, 2019).

Researchers assume that final year students who experience stress are due to internal factors, namely not being able to understand and respond to problems properly, while from external factors, namely increasing course loads and getting smaller grades than expected.

2. Menstrual Cycle

Based on the results of the study, it was found that the menstrual cycle in final year students at STIKes Muhammadiyah Ciamis had the highest frequency of normal category as many as 34 people (54.0%). This is also in line with research from Yudita *et al* (2017) where from the results of their research the majority of respondents had a normal menstrual cycle, namely 103 respondents (92.0%), this is because the age of the respondents ranged from 20-22 years, where this age is included in the reproductive period, which is around the age of 20-40 years. During the reproductive period, in general,regular menstrual cycles are normal and there are not many changes (Yudita, Yanis, & Iryani, 2017) (Yudita et al., 2017). Likewise, research conducted by Milanti *et al.,* (2017) on students of the Faculty of Medicine, Mulawarman University where out of 194 respondents there were 127 respondents (65.5%) who had a regular menstrual cycle, this was due to the age of respondents ranging from 19-22 years where that age had aregular menstrual cycle (Milanti, Fransiska, & Nugroho, 2017). While research conducted by Ilmiand Selasmi which examined the factors associated with the menstrual cycle in class XI adolescent girlsat SMA Negeri 6 South Tangerang, the results showed that as many as 59.4% of respondentsexperienced irregular menstrual cycles (Ilmi & Selasmi, 2019).

The menstrual cycle in final year students can be influenced by various factors including body weight, body mass index and exercise. Based on the supporting analysis of the questionnaires that havebeen distributed, it is known that the highest frequency of body weight in final year students is between50-60 kg, as many as 37 respondents (58.7%). Judging from the body mass index (BMI), the highest frequency is Normal (18.5-25.0) kg/m2 as many as 37 respondents (58.7%). Body mass index or BMI is the most widely used diagnostic tool to identify weight problems to measure whether someone is saidto be thin, obese or obese. A low BMI illustrates that the fat content in the body is less so that it will affect the regularity of the menstrual cycle. However, excessive fat levels in the body are also not goodfor the reproductive cycle, in this case menstruation. Excess body fat levels cause a person to be obeseand this has an impact on the stability of the hormones produced so that it will affect the regularity of the menstrual cycle (Ruqaiyah, 2020). Research conducted by Norlina (2022) showed that the majorityof respondents' BMI was normal, namely 22 students (55%). Followed by Overweight IMT of 2 students (5%), Obesity of 11 students (27.5%), and Skinny IMT of 5 students (12.5%) (Sri, 2022).

Judging from the frequency of exercise, most of the final year student respondents had a frequency of exercise 1-2 times, namely 27 respondents (42.9%) and never as many as 20 respondents (31.7%). Exercise is generally good for the body, no exception for a woman where exercise that is nottoo heavy can facilitate the process of the menstrual cycle, but if a woman exercises heavily it can cause menstrual cycle disorders (Handayani, 2020).

Menstruation is the regular and cyclic release of the endometrium from the uterus. The hypothalamus, pituitary, ovaries and uterus work together to cause the menstrual period (Bakhri & Wijayanti, 2021).The menstrual cycle is a series of complex processes that occur simultaneously in the endometrium, hypothalamus, pituitary gland, and ovaries, all of which influence each other. The menstrual cycle is the monthly cycle of menstruation. The uterus undergoes significant changes as circulating (plasma) levels of estrogen and progesterone fluctuate throughout the ovarian cycle (Wardani, Fitriana, & Casmi, 2021).

Menstruation usually lasts 3-5 days, although some women may experience longer or even shorter periods. Although it is widely known that most menstrual cycles occur around 21 & 35 days, not all women have periods that last like a normal or typical menstrual cycle. Most periods last arounda few days or at least five days. However, periods can last between 2 to 7 days (Jannah, 2020). According to Mayasari and Fauziah (2022), factors that affect changes in the menstrual cycle arehormonal disorders, stress, obesity, and excessive exercise. These disorders cause hormones that playa role in the menstrual cycle to be disrupted, these hormones are FSH, LH, estrogen and progesterone.If there is a disturbance in the hormones FSH and LH, the egg will not form, if so, the hormones estrogenand progesterone will also not be formed properly. The menstrual cycle will also be disrupted. Estrogen is a hormone that affects the menstrual cycle. The impact if menstrual cycle disorders are not handledproperly will result in impaired fertility (Mayasari & Fauziah, 2022).

3. Relationship between stress level and menstrual cycle in final year female students

The results of the research that has been conducted, from 63 respondents at STIKes Muhammadiyah Ciamis, it is found that stress levels affect the menstrual cycle in final year students. The statistical test results obtained a value of $p = 0.036 < \alpha = 0.05$ (5%) can be concluded that there is a relationship between stress levels and the menstrual cycle in final year students at STIKes Muhammadiyah Ciamis.

This is in accordance with research conducted by Batubara *et al* (2022) which states that stress often makes the menstrual cycle irregular. Stress in a person will trigger the release of the hormone cortisol in a person's body, where this cortisol hormone will work to regulate all systems in the body, in dealing with existing stress. Usually this cortisol hormone is used as a benchmark to see a person's stress level. This is because the stress experienced affects the work of the cortisol hormone which is regulated by the brain's hypothalamus and pituitary gland (Batubara, Sirait, & Achmad, 2022). Jannah, With the start of thishypothalamic activity, the pituitary secretes FSH and the ovarian stimulation process will produce estrogen. If there is a disturbance in the hormones FSH and LH, it causes the egg not to form. If so, theestrogen hormone is also not formed properly and the estrogen hormone also affects the series of menstrual cycles (Wisniastuti et al., 2018).

While research conducted by Islamy and Farida which examined the factors affecting the menstrual cycle in level III adolescent girls, the results showed that there was a relationship between stress levels (RP = 4.7 (95% CI 1.1 - 20.0); p = 0.015) and nutritional status (RP = 2.8 (95% CI 1.6 - 4.8); p = 0.026) with the menstrual cycle. Stress levels cause menstrual cycle irregularities. Stress is a body response that cannot be explained specifically. The response arises due to stressors or stimuli to factors that threaten the homeostatic defense system. The menstrual cycle irregularity must be treated immediately so that it does not occur prolonged. In someone experiencing

stress, it is recommended to reduce factors that can cause stress by controlling emotions. By controlling emotions can affect the production of the hormone cortisol to be normal. That way someone will not experience stress and willaffect their menstrual cycle to be regular (Islamy & Farida, 2019).

Based on the results of the study seen from the cross tabulation where the level of stress is high but the menstrual cycle is normal where the mild stress level is 78.6% normal menstrual cycle, moderatestress level is 66.7% normal menstrual cycle, severe stress level is 30.4% normal menstrual cycle and very severe stress level is 33.3% normal menstrual cycle, this is due to the results of interviews with respondents where respondents who have high levels of stress routinely maintain healthy food patterns, adequate sleep patterns and routine exercise. This is in accordance with research conducted by Kurniawan (2016) the results showed that the relationship between exercise and menstrual cycle disorders in FIK Unnes students with a value of $p < 0.05$ (Kurniawan et al., 2016).

The results of the cross tabulation also showed that a normal stress level of 36.4% experienced an abnormal menstrual cycle, this was due to the weight of respondents who were overweight or obese.In line with research conducted by Pratama et al (2022) excessive body mass index (BMI) by falling into the overweight and obese category can affect the menstrual cycle which makes the menstrual cyclecan lengthen, shorten or not experience menstruation for several months (Pratama, Arifin, Basri, & Hamsah, 2022).

The results of cross tabulation also show that severe and very severe stress levels have abnormalmenstrual cycles, this is due to stress in facing final assignments such as thesis and final assignments. The results of research by Putri (2017), women who experience severe psychological disorders such asstress, will experience menstrual cycle disorders. Stress involves the neuroendocrinology system as a system in female reproduction. In a state of stress there will be activation of the amygdala in the limbic system. This system will stimulate the release of hormones from the hypothalamus, namely CRH, which will inhibit the secretion of GnRH in the hypothalamus from its reproductive site in the arcuate nucleus.When there is a decrease in GnRH levels, stress can cause menstrual cycle disorders. The previously normal menstrual cycle becomes abnormal. Whereas in respondents who experienced normal stress but irregular menstrual cycles, this is in accordance with the theory that irregular menstrual cycles are not only caused by stress, many other factors can affect the menstrual cycle such as nutritional status, BMI, physical activity and others.

Based on the description above, the researcher assumes that the stress felt by respondents can becaused by several factors, for example respondents who experience backgorun stressors such as accumulated tasks, excessive demands and expectations of parents (their children become the best graduates and have good grades), lack of space for movement, social relationship problems with friends and financial problems experienced by respondents (for example, being late in paying tuition fees). Themajority of respondents at STIKes Muhamamdiyah Ciamis themselves felt or experienced stress, as a result triggering menstrual irregularities. Stress experienced by respondents can be overcome or minimized by providing time for adequate rest, joking and telling stories to friends or family, doing funthings, doing physical activities such as exercising, so that the stress felt by respondents can be minimized and their menstruation becomes regular.

Conclusion

Stress level in final year female students, the highest frequency was the severe stress category as many as 23 respondents (36.5%). Menstrual cycle in final year female students, the highest proportion was the normal category as many as 34 people (54.0%). It can be concluded that there is a relationship between stress level and menstrual cycle in final year female students at STIKes Muhammadiyah Ciamis with statistical test results p value < α (p = 0.036 < 0.05).

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