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RESEARCH ARTICLE

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Relationship between Sleep Duration and Stress Level with Menstrual Cycle on Young Women at Senior High School 10 Semarang

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ABSTRACT

During the Covid-19 pandemic, adolescents experienced many things, one of which was a decrease in productivity. In adolescents, among others, lack of productivity, menstrual disorders, decreased appetite, stress levels and sleep disorders. Factors that affect the menstrual cycle include nutritional status, physical activity, stress levels and sleep duration. The problem in adolescents at this time is the duration of sleep and high levels of stress caused by online learning systems. The data used was the result of filling out the Menstrual Cycle questionnaire, the Pittsburgh Sleep Quality Index (PSQI) and the Depression Anxiety Stress Scales (DASS 42). This research using Chi Square test obtained test results: p -value = 0.038 (there was a relationship between sleep duration and the menstrual cycle). In the stress level research test obtained p -value of 0.005 (there was a relationship between stress levels and the menstrual cycle). It could be concluded that there is a relationship between sleep duration and stress levels with the menstrual cycle in adolescent girls at SMA N 10 Semarang.

Keywords: sleep; stress; menstruation; adolescent

INTRODUCTION

Adolescence is a period of transition from childhood to adulthood. In adolescent girls, this period is marked by the arrival of the first menstruation (menarche) as a sign of the maturity of the reproductive organs⁽¹⁾. Adolescents have experienced many changes from before the pandemic and during the pandemic, namely, a lack of productivity by 2.4%, menstrual disorders 19%, decreased appetite 54.8%, stress levels 61.9%, sleep pattern disturbances 73.8%⁽²⁾. Research conducted by Bieniasz al in 2017 found that among 23 adolescents who experienced menstrual cycle disorders, it was 86.7% higher. Factors that affect the menstrual cycle include hormonal, psychological/stress factors, activity, nutrition, eating disorders, Body Mass Index (BMI), sleep duration.⁽³⁾ Factors that affect the menstrual cycle include sleep duration and stress levels. Sleep duration is one of the factors that affect the menstrual cycle. Sleep duration is a component of sleep patterns. A study says that losing sleep or lack of sleep will affect the secretion of reproductive hormones. Less sleep duration often occurs in adolescents and can affect the well-being of life. In a study conducted by Ga Eun Nam⁽⁴⁾ in women who slept 6-7 hours (3.08%) and <5 hours per day (6.58%) was associated with an increased risk of irregular menstrual cycles compared with those who slept >9 hours per day (1.87%).

In addition to sleep duration that can affect the menstrual cycle, stress levels can also cause menstrual cycle irregularities in women. Stress can affect menstrual cycle irregularities, both mild stress and severe stress. This is because stress conditions affect the production of the hormone prolactin which is directly related to increased levels of the hormone cortisol and decreased levels of the hormone LH (Leuteinizing Hormone) which affects the menstrual cycle where when the Leutinizing Hormone decreases it will affect the decrease in the estrogen hormone which will cause the menstrual cycle to be shorter⁽³⁾.

Data on the number of adolescents in Semarang City according to the Central Statistics Agency in 2019 was 243,826 people with a male population of 124,014 people (50.8%) and a female adolescent population of 119,811 people (49.1%)⁽⁵⁾. Meanwhile, data from the Youth Information and Services Center (PILAR) of the

Indonesian Family Planning Association (PKBI) in 2017, a survey was conducted randomly on 3,617 young women in junior high and high schools in Semarang City who have disorders with the menstrual cycle as many as 1,266 young women (35%).

The results of a survey on teenage girls in class 12 at 15 Senior High Schools in Semarang City on 10 young girls. The results of the researcher's interview that 7 people (70%) said stress caused the menstrual cycle to be not smooth (menstrual cycle < 21 or > 35 days) and 3 people (30%) of them said that stress did not affect the menstrual cycle (menstrual cycle 21-35 days). With this research, it can prevent menstrual cycle disorders which will cause some restrictions on activities, especially teenagers who are still studying. Restrictions on activity and physiological responses as a result of the arrival of menstruation will reduce the productivity of adolescents, so that the longer menstruation, the more unproductive time will be for adolescents. ⁽²⁾

The problem that adolescents are currently experiencing is the lack of sleep duration and the high level of stress caused by the online learning system. Therefore, based on the description above, researchers are interested in examining the relationship between sleep duration and stress levels for students of Senior High School 10 Semarang in class XII in order to determine sleep disorders and stress levels associated with the menstrual cycle.

METHODS

This study used an observational analytic research method using a cross sectional approach. This research was conducted at Senior High School 10 Semarang in February-May 2022. The subjects in this study were active female students aged 16-19 years at Senior High School 10 Semarang. Students who take part in the study are students who can meet the research criteria and are willing to become respondents after being given an explanation and filling out an informed consent form.

The population in this study were all class 12 students at Senior High School 10 Semarang, totaling 193 young women. Sampling in this study using the Slovin that meets the inclusion and exclusion criteria for the respondents, the results are 130 young women. The inclusion criteria in this study were: 1) a class 12 student of Senior High School 10 Semarang who was already menstruating, 2) was undergoing education and became an active student at Senior High School 10 Semarang, 3) willing to become a respondent and follow the research procedure. While the exclusion criteria in this study were: 1) female students who had menstrual cycle disorders, 2) female students who had diseases related to reproductive health. Statistical analysis used in this research was descriptive statistics and Chi Square test.

RESULTS

Based on table 1, it can be seen that most (50.8%) of the young women in this study were 17 years old. The age of menarche experienced in adolescent girls almost entirely (80%) experienced a normal age, namely the age of 10-13 years.

Table 1. Characteristics of young women

Characteristics	Frequency (f)	Percentage (%)
Age (years)		
16	7	5.4
17	66	50.8
18	41	31.5
19	16	12.3
Menarche Age		
Normal	104	80
Early menarche	16	12.3
Late menarche	10	7.7

Table 2. Relationship between sleep duration and menstrual cycle

Sleep Duration	Menstrual Cycle				Total		Score <i>p</i> *)
	Normal		Abnormal		f	%	
	f	%	f	%			
Short	21	41.2	30	58.8	51	100.0	0.038
Normal	14	23	47	77	61	100.0	
Long	9	50.0	9	50.0	18	100.0	

*) Chi Square Test

Based on table 2, the p value = 0.038 (there was a relationship between sleep duration and the menstrual cycle).

Table 3 Relationship between stress levels and menstrual cycle

Stress level	Menstrual Cycle				Total		Score (p*)
	Normal		Abnormal		f	%	
	f	%	f	%			
Normal	29	54.7	24	45.3	53	100.0	0.000
Light	11	27.5	29	72.5	40	100.0	
Medium, Heavy and Very Heavy	4	10.8	33	89.2	37	100.0	

*) Chi Square Test

From the results of the Chi Square test, the p value = 0.000 (there was a relationship between stress levels and menstrual cycles in adolescent girls at Senior High School Negeri 10 Semarang).

DISCUSSION

Relationship between sleep duration and menstrual cycle

Sleep duration is related to the menstrual cycle, in line with research conducted by Ga Eun Nam⁽⁴⁾ about the relationship between sleep duration and menstrual cycle, adolescents whose sleep time is only 6-7 hours or even <5 hours are associated with an increased risk of irregular menstrual cycles compared to adolescents whose sleep hours are >9 hours. Another study on the relationship between sleep duration and menstrual cycle was conducted by⁽⁶⁾ showed that there was a relationship between sleep duration and menstrual cycle in adolescents aged 18-22 years. In his research, there is a relationship between sleep duration and the menstrual cycle.

Less sleep duration can inhibit the synthesis of the hormone melatonin which influences the synthesis and production of the hormone estrogen, which in this way causes poor sleep duration to disrupt the menstrual cycle. This disorder occurs when the normal menstrual cycle changes to oligomenorrhea or polymenorrhea. The clinical symptoms that arise depend on the degree of secretion of the hormone estrogen. These symptoms are generally temporary and will usually return to normal if the duration of sleep is good (7-9 hours)⁽⁷⁾. The short sleep duration experienced by adolescents is caused by several things, including internal factors and external factors. Internal factors experienced by teenagers can be caused by frequent overthinking at night, often playing smartphones until late at night to external factors that cause sleep disturbances, namely school assignments that pile up but because they are not done early and environmental factors around that can interfere with teenagers' sleep. This is obtained from the results of a questionnaire that has been given regarding other reasons that can interfere with the sleep process at night.

The result of this study indicate that adolescents who have a short sleep duration are more likely to have an abnormal menstrual cycle than adolescents who have a normal sleep duration of 7-9 hours. The short sleep duration experienced by adolescents is mostly due to disturbing environmental factors, the environmental factors in question can be due to a noisy environments, the room is too hot, this is what causes teenagers to have difficulty sleeping because of the lack of a quiet environment for the teenager to sleep comfortably without anyone disturbance.

Relationship between Stress Level and Menstrual Cycle

Stress levels are related to the menstrual cycle. This is in line with research conducted by Saneba⁽⁹⁾ which states that there is a relationship between stress levels and the menstrual cycle. The existence of this relationship is because stress is one of the factors that affect the menstrual cycle. This is in accordance with the theory that there are many causes of abnormal menstrual cycles other than stress factors such as disruption of hormone function, systemic disorders (too fat or thin body, history of disease), thyroid dysfunction which causes the body's hormonal system to be disturbed. The relationship between stress levels and the menstrual cycle is further strengthened by the theory that one of the common causes of abnormal or stopped menstrual cycles is emotional tension, because the stress center in the brain is very close to the menstrual regulation center in the brain⁽¹⁰⁾.

This is also in line with research conducted by Sutomo⁽¹¹⁾ that stress affects menstrual cycle disorders. In this case, stress triggers the release of the hormone cortisol in the hypothalamus of the brain and pituitary gland. The start of activity in the hypothalamus, the pituitary secretes FSH, if FSH is disturbed it will affect the production of high estrogen and result in disruption of the menstrual cycle. This research is also in line with research conducted by Saneba⁽⁹⁾. Regarding the relationship between stress levels and menstrual cycles in SMA

N Yogyakarta, it was found that 38 respondents (57.6%) experienced mild stress with details of 23 respondents (34.8%) with normal menstrual cycles and 15 respondents (22.7%) with abnormal menstrual cycles (polymenorrhea and oligomenorrhea) with p -value = 0.012.

Adolescents who are stressed are often prone to anxiety, but they must also be vigilant if experiencing anxiety too often accompanied by other signs and symptoms can cause mental disorders. Stress experienced by adolescents if it cannot be controlled properly will affect the hormone cortisol which is directly related to the hypothalamus of the brain which produces the hormone Gonadotropine Releasing Hormone which can produce the hormone estrogen. This can be proven by the incident experienced by adolescents that adolescents who experience stress experience more menstrual cycles that are not normal than adolescents who do not experience stress. For this reason, adolescents who experience stress have a greater chance of experiencing abnormal menstrual cycles than adolescents who do not experience stress.

CONCLUSION

There is a relationship between sleep duration and stress levels with the menstrual cycle. It is expected that adolescents can maintain sleep patterns and can manage stress well in order to reduce menstrual cycle disorders. It is hoped that this research will become a reference for health workers, especially midwives in the field of reproductive health, in order to provide good services to prevent menstrual cycle disorders. The results of this study are expected to be used as a source of basic data to develop further research, especially those related to adolescent reproductive health and can improve further research that has not been included in this study.

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