

# Correlation between Stress Level and Menstrual Cycle in Medical Students in Surabaya

Aprilia Mazikhathul Faizah<sup>1\*</sup>, Sulistiawati<sup>2</sup>, Indra Yulianti<sup>3</sup>

\*april.mazikhathul.faizah-2019@fk.unair.ac.id

<sup>1</sup>Faculty of Medicine, Airlangga University, Surabaya 60132, Indonesia

<sup>2</sup>Department of Public Health, Faculty of Medicine, Airlangga University, Surabaya 60132, Indonesia

<sup>3</sup>Department of Obstetrics and Gynecology, Faculty of Medicine, Airlangga University, Surabaya 60132, Indonesia

---

## Abstract

**Background:** Stress has both positive and negative impacts. One of the effects of stress is the irregularity of the menstrual cycle. Irregular menstrual cycles are an important indicator of current and potential reproductive health problems in the future. Various previous studies have shown that there is a relationship between stress levels and menstrual cycle irregularities. **Methods:** This study is a quantitative study, that is observational analytic with cross sectional method using primary data obtained from questionnaires. The population in this study were all female students from a Faculty of Medicine in Surabaya batch of 2019. The sampling technique in this study was non-random sampling, consecutive sampling. The variables in this study are stress levels and menstrual cycles **Results:** The results of this study indicate that the majority of respondents are not stressed or normal (75%) and have menstrual cycles within the normal range (71%). The results of the correlation test show a significance value or Sig. (2-tailed) of 0.169, which means that the relationship between the stress level variable and the menstrual cycle is not significant or not significant. **Conclusion :** There is no significant correlation between stress level and menstrual cycle in medical students in Surabaya.

Keywords : Stress level; menstrual cycle; medical student

---

## 1. Introduction

Stress is the body's generalized non-specific response to any factor that threatens the body's compensatory ability to maintain homeostasis [1]. The acute stress response in young, healthy individuals may be adaptive and usually not detrimental to health. However, if the threat persists, especially in older or unhealthy individuals, the long-term effects of the stressor can be detrimental to health [2]. One study stated that high levels of stress are associated with irregular menstrual cycles [3].

Regular menstrual cycles are an important indicator of the health of the reproductive system [2]. Conversely, menstrual cycle irregularity is an important indicator of current and potential health problems in the future [4]. Research reports obesity, stress, and smoking as factors associated with menstrual cycle irregularities and early menopause. Menstrual disorders require careful evaluation because untreated menstrual disorders can affect the quality of life and daily activities. Data from Basic Health Research the majority (68%) of women in Indonesia aged 10-59 years report regular menstruation and 13.7% experience problems with irregular menstrual cycles. The reasons given by women 10-59 years who have irregular cycles are due to stress and lots of thoughts by 5.1% [5].

Various studies have shown that medical students have a high prevalence of stress [6]. In one study, it was stated that 91% of respondents (students and university students aged 18-20 years) experienced menstrual problems, including 27% experienced irregular menstruation and felt high stress identified in 39% of respondents, and there was a significant positive correlation between stress levels height and menstrual problems [7]. Whereas in other studies it was stated that high levels of stress were associated with irregular menstrual cycles, and were not related to duration, menstrual volume or dysmenorrhea [8]. Based on the description above, the authors are interested in conducting research to determine the correlation between stress levels and the menstrual cycle. This research was conducted on medical students in Surabaya.

## 2. Method

This study is a quantitative study that is observational analytic with cross sectional method using primary data obtained from questionnaires. The population in this study were all female students from a Faculty of Medicine in Surabaya, batch of 2019. The number of samples in this study was calculated using the slovin formula and a minimum sample size of 64 students was obtained. The sampling technique was non-random sampling, that is consecutive sampling technique where all subjects who met the inclusion and exclusion criteria were included in the study. The variables in this study consisted of stress levels as the independent variable and the menstrual cycle of medical students in Surabaya as the dependent variable. The level of stress in this study was measured using the Depression Anxiety and Stress Scale – 21 (DASS-21) questionnaire, while the menstrual cycle was recorded using a questionnaire. Data analysis in this study used the Spearman rank correlation test using the SPSS 23 for windows program.

## 3. Result

### 3.1. Stress Level

The frequency distribution of respondents' stress levels in this study is shown in table 1. Stress levels in this study were measured using the DASS-21 questionnaire (Depression Anxiety Stress Scale – 21 Items) and were divided into 5 levels, namely normal (not stressed), mild stress, moderate stress, severe stress, and very severe stress.

Table 1 Table of frequency distribution of stress levels

Stress Level	Frequency	Percentage (%)
Normal	75	75.0
Mild	15	15.0
Moderate	10	10.0
Severe	-	-
Very severe	-	-
Total	100	100

The results of the research that has been done are shown in table 5.3 and found that 75 respondents (75.0%) were normal, 15 respondents (15.0%) were under mild stress, and 10 respondents (10.0%) were under moderate stress. There were no respondents who were included in the level of severe or very severe stress.

From this study it can be seen that the majority of respondents, namely as many as 75 respondents (75.0%) are included in the normal category (not stressed). Although the results of the study show that most of the respondents fall into the normal category (not stressed), there are quite a number of respondents who fall into

the mild and moderate stress categories, respectively 15.0% and 10.0% (if the sum reaches 25.0%) who need to get attention. Various previous studies have shown that medical students have a fairly high prevalence of stress [6]. A high prevalence of stress can have a negative effect on cognitive function and learning ability in medical students [9]. A study states that stress can affect the performance of medical students. Stress can reduce concentration, inhibit the decision-making process, reduce attention, and reduce students' ability to build good relationships with patients which can result in patient disability and dissatisfaction with future clinical practice [10].

### 3.2 Menstrual Cycle

The menstrual cycle is the time from the first day of menstruation until the arrival of the next menstrual period, while the length of the menstrual cycle is the distance between the start date of the last menstruation and the start of the next menstruation. The distribution of menstrual cycle frequency in this study is shown in table 2. Menstrual cycle length is divided into 2 categories, namely normal and abnormal. It is normal if the menstrual cycle is between 24-38 days, outside this range is considered abnormal.

Table 2 Table of frequency distribution of menstrual cycle length

Menstrual cycle	Frequency	Percentage (%)
Normal	71	71.0
Abnormal	29	29.0
Total	100	100

In this study, data regarding the menstrual cycle were obtained from questionnaires that had been filled out by respondents. The menstrual cycle is divided into 2 categories, namely, normal if the menstrual cycle is between 24 - 38 days and abnormal if the menstrual cycle is < 24 days and > 38 days [11]. The results of this study are shown in table 2, it was found that 71 respondents (71.0%) had menstrual cycles within the normal range. Meanwhile, 29 respondents (29.0%) had menstrual cycles outside the normal or abnormal range.

Irregular menstruation can be a sign that the cycle you are going through is not ovulating (anovulatoir) which can cause infertility. Meanwhile, the impact of too much bleeding and occurring for a long time can cause anemia which is characterized by fatigue, paleness, lack of concentration, and other signs of anemia [12]. Apart from being caused by stress, in one study it was stated that nutritional status, smoking, sleep duration, physical activity, consumption of hormonal drugs and endocrine disorders, and stress also affect menstrual cycle irregularities [13].

### 3.3 Correlation between Stress Level and Menstrual Cycle

Bivariate analysis included cross tables of research variables on stress levels and menstrual cycles as well as statistical test results on the correlation between stress levels and menstrual cycles in medical students in Surabaya.

Table 3 Cross table of stress level and menstrual cycle variables

		Menstrual cycle		Total
		Normal	Abnormal	n (%)
		n (%)	n (%)	
Stress level	Normal	56 (56.0)	19 (19.0)	75 (75.0)
	Mild	9 (9.0)	6 (6.0)	15 (15.0)
	Moderate	6 (6.0)	4 (4.0)	10 (10.0)
Total		71 (71.0)	29 (29.0)	100 (100.0)

Data analysis in this study used the Spearman rank correlation test using the SPSS Statistics 23 program. Data analysis used the Spearman rank correlation test aimed at determining the level of strength (closeness) of the relationship between two variables, knowing the direction (type) of the relationship between the two variables, and knowing whether the relationship is significant or not. The statistical test results in this study are shown in table 4.

Table 4 Table of statistical test results for Spearman's rank correlation stress levels and menstrual cycles

			Stress level	Menstrual cycle
Spearman's rho	Stress level	Correlation Coefficient	1.000	.139
		Sig. (2-tailed)	.	.169
		N	100	100
	Menstrual cycle	Correlation Coefficient	.139	1.000
		Sig. (2-tailed)	.169	.
		N	100	100

From table 4 it can be seen the significance value or Sig. (2-tailed) of 0.169, because the value of Sig. (2-tailed) 0.169 is greater than 0.05 or 0.01, so the relationship between stress level and menstrual cycle variables can be said to be insignificant or not significant. So that the strength and direction of the correlation (relationship) is not meaningful.

The results of this study are in line with research conducted by Fitriani and Hapsari (2021) using a sample of 110 medical students at the University of Muhammadiyah Jakarta class of 2019 using the total sampling technique, and study design using a cross-sectional approach. The stress level data in the study were primary data obtained through the DASS-42 questionnaire and menstrual cycle data were secondary data obtained from the menstrual cycle questionnaire. From this study, the results showed that there was no significant relationship between stress and the menstrual cycle of female students of the Medical Study Program, Faculty of Medicine and Health, University of Muhammadiyah Jakarta class of 2019 [14].

Meanwhile, in the research conducted by Rafique et al. (2018), which involved 738 health students at a

university in Saudi Arabia, found a significant positive correlation between high stress levels and menstrual problems. Menstrual problems examined in this study were amenorrhea, dysmenorrhea, abnormal vaginal bleeding, premenstrual symptoms, menorrhagia, and menstrual cycle length were shown as characteristics in this study. The result is that students who have high levels of stress experience 4 times, 2 times, and 2.8 times increased risk of experiencing amenorrhoea, dysmenorrhea, and premenstrual symptoms [7].

The absence of a significant relationship between stress levels and menstrual cycle length can be influenced by various factors. In this study, stress levels may not have been the main cause of changes in menstrual cycle length. In one study it was stated that nutritional status, sleep duration, physical activity, and stress had an effect on menstrual cycle irregularities [13]. In addition, most of the respondents in this study were included in the normal category (not stressed) and most of the respondents had menstrual cycle lengths within the normal range which might also have influenced the results of this study.

#### 4. Conclusion

After conducting study on the Correlation between Stress Levels and Menstrual Cycles in Medical Students in Surabaya, it can be concluded that : the distribution of stress levels in medical students in Surabaya is mostly normal (not stressed), the distribution of menstrual cycles in medical students in Surabaya mostly has normal menstrual cycles , which is between 24-38 days, and the results of statistical tests showed that there was no significant correlation between stress levels and menstrual cycles in medical students in Surabaya.

#### References

1. Sherwood, L., 2019. Fisiologi Manusia Dari Sel ke Sistem Edisi Bahasa Indonesia. 9th ed. Jakarta: ECG Penerbit Buku Kedokteran, p.804.
2. Schneiderman, N., Ironson, G., & Siegel, S. D. (2005). Stress and health: Psychological, behavioral, and biological determinants. In *Annual Review of Clinical Psychology* (Vol. 1, pp. 607–628). <https://doi.org/10.1146/annurev.clinpsy.1.102803.144141>
3. Bae, J., Park, S., & Kwon, J. W. (2018). Factors associated with menstrual cycle irregularity and menopause. *BMC Women's Health*, 18(1). <https://doi.org/10.1186/s12905-018-0528-x>
4. Kwak, Y., Kim, Y., & Baek, K. A. (2019). Prevalence of irregular menstruation according to socioeconomic status: A population-based nationwide cross-sectional study. *PLoS ONE*, 14(3). <https://doi.org/10.1371/journal.pone.0214071>
5. Kemenkes RI. 2010. Riset Kesehatan Dasar, Riskesdas. Jakarta : Balitbang Kemenkes RI.
6. Wahyudi, R., Bebasari, E., & Nazriati, E. (n.d.). Gambaran Tingkat Stres pada Mahasiswa Fakultas Kedokteran Universitas Riau Tahun Pertama.
7. Rafique, N., & Al-Sheikh, M. H. (2018). Prevalence of menstrual problems and their association with psychological stress in young female students studying health sciences. *Saudi Medical Journal*, 39(1), 67–73. <https://doi.org/10.15537/smj.2018.1.21438>
8. Nagma, S., Kapoor, G., Bharti, R., Batra, A., Batra, A., Aggarwal, A., & Sablok, A. (2015). To evaluate the effect of perceived stress on menstrual function. *Journal of Clinical and Diagnostic Research*, 9(3), QC01–QC03. <https://doi.org/10.7860/JCDR/2015/6906.5611>

9. al Shawi, A. F., Abdullateef, A. N., Khedher, M. A., Rejab, M. S., & Khaleel, R. N. (2018). Assessing stress among medical students in Anbar governorate, Iraq: A cross-sectional study. *Pan African Medical Journal*, 31. <https://doi.org/10.11604/pamj.2018.31.96.16737>
10. Rahmayani, R. D., Liza, R. G., & Syah, N. A. (2019). Gambaran Tingkat Stres berdasarkan Stressor pada Mahasiswa Kedokteran Tahun Pertama Program Studi Profesi Dokter Fakultas Kedokteran Universitas Andalas Angkatan 2017. *Jurnal Kesehatan Andalas*, 8(1), 103-111
11. Taylor, H., Pal, L., Seli, E. and Speroff, L., 2020. *Speroff's Clinical Gynecologic Endocrinology and Infertility*. 9th ed. Philadelphia: Wolters Kluwer, p.1216.
12. Rohan, H. H. (2019). *Kesehatan Reproduksi Pengenalan Penyakit Menular Reproduksi dan Pencegahan*. Malang : Intimedia.
13. Kusmiran, E. (2014). *Kesehatan Remaja dan Wanita*. Jakarta : Salemba Medika
14. Fitriani, H., & Hapsari, Y. (2022). Hubungan Stres dengan Gangguan Siklus Menstruasi Mahasiswi Program Studi Kedokteran Fakultas Kedokteran dan Kesehatan Universitas Muhammadiyah Jakarta Angkatan 2019. *Muhammadiyah Journal of Midwifery*, 2(2), 40. <https://doi.org/10.24853/myjm.2.2.40-46>