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The Relationship Between Stress Levels and Menstrual Cycles Among Pre-Clinical Students of the Faculty of Medicine, Alkhairaat University Palu

Alda Wahyuni[1], Abdurrahman Hasymi[1*], Salmah Suciaty[1]
[1] Department of Medical Education, Faculty of Medicine, University of Alkhairaat, Palu, Jl. Diponegoro 94221, Central Sulawesi
[*]Authors Correspondence: abdurrahmanhasymi@gmail.com

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ABSTRACT

Menstruation is a physiological and periodic discharge of blood and mucous tissue from the uterus through the vagina. The menstrual cycle is defined as the period from the first day of menstruation to the start of the next cycle. Stress is one of the factors that can affect the menstrual cycle. Irregular menstrual cycles can impact both current and future conditions, indirectly influencing students' academic performance. According to RISKESDAS 2018, 13.7% of women experienced irregular menstrual cycles in the previous year. This study aims to examine the relationship between stress levels and the menstrual cycle in pre-clinical medical students at Alkhairaat University, Palu. This is a quantitative analytical observational study using a cross-sectional approach. Data were collected via interviews using the Depression Anxiety Stress Scale (DASS) 42 questionnaire. The sampling technique was total sampling with 118 respondents from the 2020, 2021, and 2022 cohorts who met the criteria. Results: 55 respondents (46.6%) had normal stress levels, while 63 (54.4%) experienced stress. Regarding menstrual cycles, 60 students (50.8%) had normal cycles. The Kruskal-Wallis test showed a significant relationship between stress levels and menstrual cycles ($p = .000$ or $p < 0.05$), indicating that higher stress levels increase the risk of oligomenorrhea.

INTRODUCTION

Menstruation is the physiological and periodic release of blood and mucus tissue from the uterus through the vagina. The menstrual cycle is defined as the period from the first day of menstruation to the start of the next menstrual cycle, with a typical cycle lasting between 21 and 35 days.[1]

According to the 2018 RISKESDAS survey in Indonesia, the majority of Indonesian women aged 15 to 49 reported having regular menstruation, with 13.7% reporting irregular menstrual cycles in the previous year.[2]

Irregular menstrual cycles can affect a woman's fertility in the future and may indirectly impact her learning process, as hormonal changes during the menstrual cycle can affect mood, energy, focus, and anemia resulting from prolonged or excessive menstruation, leading to fatigue and poor concentration.[3]

Stress is one of the factors that can impact the menstrual cycle. Stress is defined as the body and mental response experienced by a person when they feel there is an imbalance between the demands placed on them and their ability to meet those demands.[4]

The aim of this study is to examine the relationship between stress levels and the menstrual cycle in pre-clinical medical students at Alkhairaat University, Palu.

MATERIAL AND METHOD

This research is quantitative observational analytic with a cross-sectional approach.

Location: Faculty of Medicine, Alkhairaat University, Palu, Central Sulawesi.

Population and Sample: All active pre-clinical female medical students. Total sample size: 118 (30 from 2020, 29 from 2021, 59 from 2022).

Data Collection: Primary data using the DASS-42 questionnaire.

Analysis: Univariate and bivariate statistical analysis.

RESULTS AND DISCUSSIONS

Table 1. Level of Stress Events

Stress Levels	N	%
Normal	55	46.6 %
Mild	30	25.4 %
Moderate	22	18.6%
Severe	8	6.8 %
Very Severe	3	2.5 %
Total	118	100%

Based on Table 1 above, it shows that out of 118 respondents, 55 (46.6%) did not experience stress, 20 (25.4%) experienced mild stress, 22 (18.6%) experienced moderate stress, 8 (6.8%) experienced severe stress, and 3 (2.5%) experienced stress.

Based on the research conducted at the Faculty of Medicine, it was found that of the 118 respondents, 55 respondents (46.6%) did not experience stress, and the majority experienced stress, totaling 63 respondents (53.4%). This is consistent with a study conducted by Fitriani on medical and health students at the Muhammadiyah University of Jakarta, class of 2019, which reported that 44.5% of students did not experience stress, while 55.5% did experience stress.[5]

This can be caused by various factors, including high academic pressure, the demands to study and understand complex material within a limited time, pressure from exams, high expectations both from themselves and their parents, and tight schedules that may result in a lack of personal time and insufficient rest. These factors can contribute to an increase in stress among medical students. The researcher suggests that various internal and environmental factors may also contribute to the stress faced by students. The researcher believes that participation in counseling and religious activities is also needed as a coping mechanism to reduce extreme stress.

Academic pressure is one of the main causes of stress among students, such as the desire to achieve high grades and the anxiety that arises from students' efforts to avoid failure. Students who do not have the ability to adjust to academic demands tend to have higher stress levels, while students who are able to adjust to academic

demands generally experience lower stress levels.[6]

Table 2. Stress Levels Based on Batch

Stress Levels	2020	2021	2022
Normal	46.7 %	51.7%	44.1%
Mild	23.3%	13.8%	25.4%
Moderate	16.7%	24.1%	18.6%
Severe	10.0%	6.9%	6.8%
Very Severe	3.3%	1.7%	2.5%

Based on Table 2 above, it shows that the highest incidence of stress by batch is found in the 2022 batch, with 19 (32.2%) respondents experiencing mild stress, followed by 10 (16.9%) respondents with moderate stress.

This could be due to the adjustment process of first-year students from the school environment to the university environment, coupled with a tight class schedule that includes practicals and clinical skill tutorials, which they experience for the first time after entering the classroom. These are some of the factors that contribute to a higher stress level. The results of this study align with a study by Maulana et al. in 2014, which stated that the tight schedule and time-consuming demands on first-year students are among the factors that cause stress, leaving students with little time for themselves, their families, and hobbies.[7]

It can also be seen that the highest incidence of severe stress is in the 2020 batch, which means that stress is not only influenced by the year of entry or the length of study, but also by other factors. One such factor is how an individual reacts to pressure or stress triggers, which can affect their stress level. Cognitive, emotional, behavioral, and physiological responses are different categories of responses. Moreover, because coping techniques impact stress levels, individuals may experience varying levels of stress. Other aspects influencing stress levels include the ability to anticipate stressful situations, the capacity to manage stress, self-confidence in one's ability to withstand pressure, and support from people around them.[8]

Table 3. Menstrual Cycle

Menstrual Cycle	N	%
Normal	60	50.8%
Polymenorrhea	34	28.8%
Oligomenorrhea	24	20.4%
Total	118	100%

Based on Table 3 above, it shows that out of 118 respondents, 60 (50.8%) have a normal menstrual cycle, 34 (28.8%) experience polymenorrhea, and 24 (20.4%) respondents experience oligomenorrhea.

This aligns with a study conducted by Fitriani, which states that medical and health students at Muhammadiyah University of Jakarta, class of 2019, predominantly experience normal menstrual cycles, with 63 (57.3%) respondents reporting this. A similar finding was also reported by Damayanti, who stated that the majority of female students had regular menstrual cycles (57.0%).[9]

In theory, menstruation in women is a natural process. Continuous bleeding from the uterine organ during menstruation indicates the maturity of the gynecological organs. The menstrual cycle refers to the physiological changes in the endometrium that occur during regular periods throughout the reproductive years. The actual menstrual cycle typically lasts between 21 and 35 days, from the first day of one period to the first day of the next period. If it falls outside this range, it can be classified as a menstrual cycle disorder, such as polymenorrhea, oligomenorrhea, or amenorrhea. Several factors, including stress, diet status, BMI, physical activity, medications, and others, can cause menstrual cycle problems.[1]

Table 4. The Relationship Between Stress Levels and Menstrual Cycles

Cycle Type	N	Mean Stress Score	p-Value

Normal	60	40.17	
Polymenorrhea	24	78.37	.000
Oligomenorrhea	34	81.08	

Based on Table 4 above, it shows that out of 118 respondents studied, 60 respondents had a normal menstrual cycle with an average stress level of 40.17, followed by 24 respondents experiencing polymenorrhea with an average stress level of 78.37, and 34 respondents experiencing oligomenorrhea with an average stress level of 81.08.

The correlation test used was the Kruskal-Wallis test, based on statistical analysis performed using SPSS software version 26. The results of the Kruskal-Wallis test showed a significant p-value of .000, or $p < 0.05$, indicating a significant relationship between stress levels and menstrual cycles in this study. Therefore, the null hypothesis (H0) is rejected and the alternative hypothesis (H1) is accepted, meaning there is a relationship between stress levels and menstrual cycles in pre-clinical medical students at Alkhairaat University, Palu.

The results of this study showed that the average stress level among medical students at Alkhairaat University, Palu, who experienced oligomenorrhea was higher at 81.08, indicating that students with oligomenorrhea had higher stress levels compared to students with normal and polymenorrhea menstrual cycles.

This is reinforced by a study conducted by Soewangsa in 2022 on 32 female students at the Faculty of Medicine, Widya Mandala Catholic University Surabaya, which found a significant relationship between academic stress and oligomenorrhea. [10]

According to theory, when a person experiences stress, it triggers the release of cortisol hormone, which is a response to stress and used as a measure to assess the level of stress. High cortisol levels can disrupt the HPA axis, which may affect the production of reproductive hormones, such as FSH and LH. When there is a disruption in the production of FSH and LH, it can impact the production of estrogen and progesterone. This hormonal imbalance can alter ovarian function and disrupt the ovulation process, potentially leading to a longer menstrual cycle that was previously normal.[11]

CONCLUSION AND RECOMMENDATION

The stress levels of pre-clinical medical students at Alkhairaat University, Palu, were predominantly categorized as normal, with 55 (46.6%) respondents, and the fewest experienced severe stress, with 3 (2.5%) respondents. As for the menstrual cycles, the majority had a normal cycle, with 60 (50.8%) respondents, and the least experienced oligomenorrhea, with 24 (20.4%) respondents. A significant relationship was found between stress levels and menstrual cycles among pre-clinical medical students at Alkhairaat University. As the stress level increases, the risk of experiencing oligomenorrhea also increases.

For the respondents, the researcher hopes that students can effectively manage their stress and avoid disruptions to their menstrual cycles. For future researchers, it is recommended to identify other factors that are related to those that may influence the menstrual cycle, in order to obtain more complex and accurate research findings.

AUTHOR CONTRIBUTIONS

Conceptualization, A.W., A.H., S.C; Methodology, A.W.,; Validation, A.H., S.C.; Formal Analysis, A.W.; Investigation, A.W., Resources, A.W.; Data Curation, A.W.; Writing-Original Draft Preparation, A.W., A.H., and S.C.; Visualization, A.W. All authors have read and agreed to the published version of the manuscript.

CONFLICTS OF INTEREST

The authors declares that there is no conflict of interest.

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