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Original Research

Relationship between Stress Level and Academic Grade in Medical Students of Universitas Airlangga

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Abstracts

Introduction: Medical students have higher psychological pressure compared to students from other majors. Excessive levels of stress can cause physical and mental problems, lower self-esteem, and interfere with academic achievement. Stress has a significant correlation with academic grades. This study aims to determine the relationship between stress levels and academic scores among preclinical-phase medical students at Universitas Airlangga in 2021–2022. **Methods:** This research is an observational analytic study with a cross-sectional design to analyze the relationship between the perceived stress scale and academic scores. The perceived stress scale was used to determine stress level, and spearman correlation was used to correlate stress level with GPA (grade point average). **Results:** The results of the study showed that the average stress level was 17.92, ±5.513, and the median grade point average was 3.68. No variable with a Spearman correlation coefficient above 0.2 was found, so it can be seen that none of the variables has a correlation with the grade point average. But income per capita has a significant p-value. **Conclusion:** In this study, no correlation was found between stress levels and academic scores.

Keywords: Stress Scale, Grade Point Averag, Medical Student

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Introductions

Medical students have higher psychological pressure compared to students from other majors [1]. This is due to the high workload, academic pressure, and the need to master large amounts of information for medical students [2]. In general, the highest level of stress is experienced by medical students during the preclinical phase, with the biggest cause of stress being pressure at lectures [3]. The imbalance between the external environment's demand and individual perceptions of fulfilling those demands can cause stress [4, 5]. First-year medical students have the highest stress level [6]. Other than the first year, the second year also has a high level of stress [2]. There are many sources that can cause stress for students, such as academic demands, financial problems, excessive use of the internet, and addiction to games [2, 7–9]. Especially in medical students who have causes of stress from academic demands such as high workload, busy time schedule, dissection of corpses, contact with patients who are seriously ill, suffering, and dying [10]. Another source that can cause stress in college students is self-esteem. The relationship between students, especially female students, and their mothers also plays an important role in shaping self-esteem, which greatly affects the stress level of students [11]. The usage of foreign languages in study and procrastination in task completion might also cause stress [12]. Excessive levels of stress can cause physical and mental problems, lower self-esteem, and interfere with academic achievement [11, 13]. There are significant differences in academic results between students with stress and students without stress. High stress levels in medical students can be associated with low academic performance [2]. Therefore, it is important to examine the relationship between stress levels and academic grades among Airlangga University medical faculty students to find out whether intervention is necessary for students to maintain academic grades or not.

Methods

This research is an observational analytic study with a cross-sectional design to analyze the relationship between the perceived stress scale and academic scores. The research was conducted in the Faculty of Medicine at Universitas Airlangga. The research design and protocol have been approved by the Ethics Committee of the Faculty of Medicine, Universitas Airlangga, Surabaya (Number: 25/EC/KEPK/FKUA/2023). The population studied consisted of 154 Airlangga University first- and second-year medical students (2022 and 2021). A perceived Stress scale questionnaire was used to measure the stress level of medical students. The Perceived Stress Scale is a self-reported questionnaire that is able to evaluate stress levels one month ago in student life and has 10 question items [14]. The results of the questionnaire can then be classified as low stress levels (0–13), medium stress levels (14–26), and high stress levels (27–40). The characteristic questionnaire includes age, gender, origin of high school, whether it is private or public, the source of motivation to enroll in medical school, whether it is purely from self, recommendation from parents, forced by parents, or other reasons, the condition of the family, whether it is harmonious or not, how much the parents earn and the number of people the parents need to sustain, how many hours they spend studying in a day and how many days a week, how often they get distracted when studying, and lastly, how much GPA they have achieved. The SPSS program was used to calculate the Spearman correlation between all variables and GPA.

Results

The amount of the acquired sample was 154. Data collection was done online by sharing a Google Form questionnaire link through social media and offline by visiting classes during break time to distribute the questionnaire in paper form. From the results, it was found that 60.1% of the par-

ticipants were female and 74% of the participants originated from public high schools. The median income or capital of the parents of the study samples was 5.000.000 rupiah. The results also suggest that most of the research samples entered the medicine major by their own decision. The average stress level was 17.92; ±5.513, and the median GPA was 3.68. Most of the research samples were under moderate stress, and only 6.5% were under high stress. Even with the high numbers of research samples with moderate stress, they still managed to produce a good result, with the highest category of GPA as the most achieved grade by the research samples.

Table 1. Subjects Characteristic Relationship B tween Stress Level and Academic Grade in Medical Students of Universitas Airlangga

Variable	n (%)
Age (Years) *mean (±SD)	18.4 (±0.787)
Gender	
Male	61 (39.9)
Female	93 (60.1)
Highschool Origin	
Public	114 (74)
Private	40 (26)
Family Harmony	
Very Harmonious	57 (37)
Harmonious	84 (54.5)
Less Harmonious	12 (7.8)
Not Harmonious	1 (0.6)
Degree of Disturbance for Study Concentration	
Never	1 (0.6)
Sometimes	84 (54.5)
Often	69 (44.8)
Despair when Faced with Difficulty (Stress tolerance)	
Never	28 (18.2)
Sometimes	99 (64.3)
Often	27 (17.5)
Motivation to Enroll	
From Self	106 (68.8)
Parents Suggestion	45 (29.2)
Parents Coercion	1 (0.6)
None of the choices	2 (1.3)

The table above shows the characteristics of research subjects. It is shown that most of the subjects motivation to enroll came from themselves.

Table 2. Subjects Characteristic 2 Relationship Between Stress Level and Ac demic Grade in Medical Students of Universitas Airlangga

Variable	Median (range)
Income/Capita (in rupiah)	5,000,000 (0-150,000,000)
Study per Week (days/week)	6 (0-7)
Study per Day (hours/day)	4 (0-24)
Total Study Hours (Hours/Week)	21 (0-168)

The table above shows the income/capita of their parents and the amount of time they spent on studying. The median of total study hours in a week is 21 hours.

Table 3. GPA and Stress in Medical Students of Universitas Airlangga

Variable	Median (range)
GPA	3.68 (2-4)
Category *n (%)	
Satisfying (2-2.75)	1 (0.6)
Very Satisfying (2.76-3.5)	32 (20.8)
With Praise (3.51-4)	121(78.6)
Stress Level	
Perceived Stress Scale *mean (±SD)	17.92 (±5.513)
Category *n (%)	

Variable	Median (range)
Low (0-13)	33 (21.4)
Moderate (14-26)	111 (72.1)
High (27-40)	10 (6.5)

The table above shows the research subjects GPA and perceived stress level. Most subjects perceived their stress as moderate.

Table 4. Variables Correlation with GPA in Medical Students of Universitas Airlangga

Variable	Correlation with GPA (spearman correlation)	Correlation Significance (p)
Age	0.023	0.582
Gender	0.193	0.106
Highschool Origin	-0.054	0.453
Income/Capita	-0.169	0.029
Family Harmony	0.093	0.713
Motivation to Enroll	-0.116	0.542
Degree of Disturbance	-0.103	0.385
Study per Day	0.099	0.491
Study per Week	0.165	0.51
Total Study Hours	0.118	0.304
Stress Tolerance	-0.097	0.611
Stress Level	-0.089	0.16

The table above shows the spearman correlation between GPA and various variables that we hypothesized will affect GPA. Stress level was found to have low correlation with GPA in this research.

There are no variables that have a Spearman correlation with a GPA higher than 0.2, so none of them have a correlation with GPA, including stress level. However, income/capita has a p-value lower than 0.05, which indicates it has significance as a variable. The program that was used for calculations was SPSS.

Discussions

Several studies have shown that stress has some effects on academic grades. Stress could affect physiological conditions and intellect, which will affect academic grades [15]. Some research also suggests that stress can also disrupt learning and memory retrieval and, in the long term, might also affect the brain's learning and memory regions. The neural behavioral change induced by psychological stress disrupts the neural replay of memory [13, 16].

One hundred and fifty-four research samples were obtained from questionnaires distributed online and offline, with the majority being female or as much as 60.1% of the total sample. For Airlangga students in the 2022 and 2021 batches, it was found that 74% of the total sample came from public high schools. The median of the total duration of study hours in 1 week for the study sample was 21 hours, with an average of 28 hours. This number is different from the study by Kind et al., who found that medical students have an average total duration of study hours in one week of 5.6 hours [17]. The research sample questionnaire also showed that the median per capita income was 5 million rupiah, with a p value of 0.029. This means that per capita income is a significant variable, but it doesn't have a strong relationship with GPA (the Spearman correlation coefficient with GPA is only -0.0169). In a study by Ekwochi et al., similar results were found for medical students, with a significant P value in student monthly allowance of 0.01 but a low correlation with academic performance of -0.281 [18].

From the results of the research sample, it was found that 72.1% experienced moderate stress, 21.4% experienced low stress, and 6.5% experienced severe stress. The result is similar to the research conducted by Seedhom et al., who still have moderate stress dominating at 70.1%; however, the research sample with severe stress outnum-

bers the one with low stress [19]. Another research by Alda et al. also shows moderate stress majority [20]. Then the average result of the research sample's perceived stress scale was 17.92, which is a moderate stress level with a standard deviation of ±5.513. This result is lower than the study by Alsaleem et al., who got an average of 19.45, which is moderate stress with a standard deviation of ±6.49 [21].

The stress level score and the GPA score have a Spearman correlation of -0.089. The correlation shows an insignificant relationship. This shows that the level of stress shown through the Perceived Stress Scale does not have a significant effect on the academic scores of Airlangga University medical students. Among the 10 students that have high stress, 3 of them managed to achieve an above-average GPA compared with other research samples; 5 of them were below average but within a 0.2 point difference from average; 1 of them had a GPA that was above 3 points; and 1 of them achieved the lowest GPA among the research samples. A study by Alsaleem et al. found that a certain level of stress has a positive impact on helping students become energetic and improve student performance [21].

At first glance, the result after conducting the spearman correlation test via SPSS shows that there is no significant correlation between stress level and academic grade. However, the lowest GPA achievers within the research samples have a high level of stress, and among the only 4 research samples that achieved a perfect GPA, 3 of them have a low level of stress and 1 of them has a moderate level of stress. But other than the top and bottom positions of the GPA ranking among the research samples, there are no patterns. One of the students with a high level of stress achieved a ranking of 33 from the top of the GPA ranking and ranks 2.5, and six from the bottom of the GPA ranking have a low level of stress. The lack of willing participants in this study and the limitation of the perceived stress scale range, which can only capture the perceived stress of the participant up to 1 month ago, may result in an uncommon outcome compared to similar studies.

Conclusions

From the results of the study, it was found that the average first- and second-year Airlangga University medical students had moderate levels of stress, and after conducting the Spearman correlation test via SPSS, it was found that there was no significant correlation between stress levels and academic grades in first- and second-year Airlangga University medical students.

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Conflict of interest

The authors has no conflict of interest.

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