



## The Relationship between the Intensity of Tahajud Prayer and the Stress Level of Medical Students of Muhammadiyah University of Malang, Class of 2021

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### ABSTRACT

Stress can be defined as a condition or feeling that occurs when a person feels that his or her demands exceed the resources that he or she has, resulting in a gap between the demands of daily life and the person's ability to respond to them. An obvious imbalance exists. Research has found that medical students, especially first-year medical students, experience high levels of stress due to the life change from high school to college. Sustained stress can trigger memory and cognitive impairment, gastrointestinal disorders, reduced immunity, and cardiovascular system disease. Tahajud prayers, if performed seriously and consistently, can produce positive emotional responses and increase the effectiveness of stress management. The purpose of this study was to determine the relationship between Tahajud prayer intensity and stress levels among medical students at Muhammadiyah University, Malang. This study used an analytical observational design with a cross-sectional approach. This study adopted the total sampling technique with a sample size of 94. Data on stress levels were collected using the Depression, Anxiety and Stress Scale (DASS-42) and the Tahajud Prayer Intensity Questionnaire through validation testing. The results showed that the intensity of Tahajud prayer was low for 51 respondents (54.3%) and moderate for 48 respondents (51.1%). There is a significant relationship between the intensity of Tahajud prayers and stress levels among students at the Faculty of Medicine at Muhammadiyah University.

**Keywords :** stress, Tahajud prayer, First-year medical students

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### INTRODUCTION

Stress is an occurrence that cannot be separated from all aspects of life, including medical students who are highly susceptible to experiencing stress. Stress is a condition experienced by individuals when they perceive that the demands placed on them exceed their capabilities or resources, resulting in an imbalance between the demands encountered and their ability to respond to those demands (Priya et al., 2020).

The prevalence of stress among medical students worldwide reaches 36.5% (Karami et al., 2023). Several studies have shown an increase in stress during the first year of medical school. For instance, a research conducted in Iraq by Shawi et al. (2018) indicated the highest prevalence of stress among first-year medical students (11.5) compared to final-year students (0.37). Similar research has been

carried out in Germany and Malaysia, with the highest prevalence of stress observed among first-year students (Riad et al., 2022).

The high prevalence of stress among first-year medical students is attributed to the transition or change in life due to the shift from high school to becoming new college students. This transition involves changes in academic goals, learning styles, a heavy workload of coursework, and other challenges. These challenges are compounded by various factors such as financial conditions of students, adapting to a new environment, living far away from or being separated from parents for the first time, and other issues that every student must face (Jiang et al., 2020).

Continuous or chronic stress can trigger memory and cognitive impairments, gastrointestinal disorders, weakened immune system, and cardiovascular system disturbances. Stress also affects students' academic success. The higher the level of stress among students, the lower their academic achievements (Koskinen et al., 2020). Therefore, interventions are needed to address and manage this stress.

There are several ways to minimize stress. For example, through meditation and relaxation, listening to music, and recreational activities (Van Orden et al., 2021). Handling stress with a religious approach, known as psychoreligious, can be one way to manage stress, such as by performing Tahajud prayer. Tahajud prayer serves as the highest form of meditation when performed with a calm and sincere heart. Tahajud prayer is also a highly recommended voluntary prayer (sunnah) (Van Orden et al., 2021). Tahajud prayer, when performed earnestly, sincerely, accurately, and continuously, can generate positive emotional responses and enhance coping effectiveness, thereby reducing stress levels (Zamarkhsyari Baharuddin et al., 2021). A decrease in psychological stress can be detected through cortisol hormone levels. In other words, cortisol hormone is used as a biomarker for stress. This is because various stressors, including psychological stress, stimulate the activity of the hypothalamus-pituitary-adrenal Axis (HPAA), ultimately leading to an increase in cortisol hormone levels (Zamkah et al., 2020). Tahajud prayer can evoke positive emotions. Positive emotions include feelings of happiness, joy, optimism, enthusiasm, a tendency to stay calm, relaxation, and tranquility. (Albayrak, 2022). Positive emotions can influence the stability of corticotropin-releasing factor (CRF) secretion, leading to controlled secretion of adrenocorticotrophic hormone (ACTH). The control of ACTH secretion affects the balance of the adrenal cortex in releasing cortisol, resulting in more stable cortisol levels, or in situations of high stress, cortisol levels decrease (Lightman et al., 2021). Tahajud prayer also enhances coping effectiveness (Sakinah binti Aziz et al., 2020). When effective coping occurs, signals in the brain inhibit the release of CRF, leading to reduced cortisol secretion, indicating a decrease in stress (Herman et al., 2020).

## METHODS

This research employed an analytical observational research method with a cross-sectional approach. The research was conducted at the Faculty of Medicine, Muhammadiyah University of Malang. The research was carried out in March 2022. The population in this research consisted of students from the Faculty of Medicine at Muhammadiyah University of Malang. The sample for this research included students from the 2021 cohort at the Faculty of Medicine, Muhammadiyah University of Malang, who met the inclusion criteria. The sample size in this research corresponds to the total population that meets the inclusion criteria for the research, which is 143 samples. The sampling technique used in this research is total sampling. This research was conducted by collecting primary data through the completion of questionnaires. The data collection procedure in this research involved distributing questionnaires to the respondents, who are students of the Faculty of Medicine at Muhammadiyah University of Malang, 2021 cohort. The questionnaire for the variable of stress level used the Depression Anxiety Stress Scale 42, which consists of 14 questions. This measurement tool is internationally accepted and has undergone validity and reliability testing, so the researcher did not need to conduct validity and reliability testing again. Respondents were asked to read the questionnaire filling instructions before answering the questions in the questionnaire. Then, respondents were instructed to answer all the questions in the questionnaire, and subsequently, the researcher collected the responses from the respondents. For the variable of Tahajud prayer intensity, a questionnaire from a previous research was used, which was modified by the researcher and therefore required validity and reliability testing. Validity and reliability testing of the questionnaire with respondents was conducted using SPSS 24.00 for Windows. Validity testing was carried out on 30 respondents as a minimum requirement for validity testing. The data analysis of the research consists of univariate and bivariate analysis. Bivariate analysis was conducted to determine the correlation between the two variables using the Spearman correlation test.

## RESULTS AND DISCUSSION

In the research on the relationship between the intensity of Tahajud prayer and the level of stress among medical students at Muhammadiyah University of Malang, the observed characteristics of respondents are age, gender, intensity of Tahajud prayer, and the level of stress.

**Table 1.** Characteristics of Respondents Based on Age and Gender

Characteristics	Category	Frequency	Percentage (%)
Age	17	1	1,1
	18	35	37,2
	19	42	44,7
	20	14	14,9

	21	2	2,1
Gender	Male	35	37,2
	Female	59	62,8

(Research Outcomes Data, 2022).

Table 1 displays the results of respondents' characteristics based on age and gender. Regarding age characteristics, the majority of respondents are 19 years old, accounting for (44.7%), while the fewest respondents are 17 years old, with only 1 respondent (1.1%). Based on gender characteristics, the most common gender among respondents is female, with 59 respondents (62.8%), while male respondents total 35 (37.2%).

**Table 2** Characteristics of Respondents Based on the Intensity of Tahajud Prayer

Intensity of Tahajud Prayer	Frequency	Percentage (%)
Low	51	54,3
Moderate	39	41,5
High	4	4,3
Total	94	100

(Research Outcomes Data, 2022).

Table 2 shows the characteristics of respondents based on the intensity of Tahajud prayer. It reveals that the majority of respondents have a low intensity of Tahajud prayer, totaling 51 respondents (54.3%), while the fewest have a high intensity of Tahajud prayer, amounting to 4 respondents (4.3%).

**Table 3** Characteristics of Respondents Based on the Level of Stress

Intensity of Tahajud Prayer	Frequency	Percentage (%)
Normal	16	17
Mild	37	18,1
Moderate	48	51,1
Severe	12	12,8
Very severe	1	1,1
Total	94	100

(Research Outcomes Data, 2022).

Table 3 shows the characteristics of respondents based on the level of stress. Out of 94 respondents, the majority had a moderate level of stress, with 48 respondents (51.1%), and the fewest were students with a very severe level of stress, totaling 1 respondent (1.1%).

**Table 4.** Cross-tabulation of the Intensity of Tahajud Prayer with the Level of Stress

Intensity of Tahajud Prayer	Tingkat Stres					Total
	Normal	Mild	Moderate	Severe	Very Severe	
Low	6 11,8%	4 7,8%	36 70,6%	4 7,8%	1 2%	51 100%
Moderate	9 23,1%	10 25,6%	12 30,8%	8 20,5%	0 0%	39 100%
High	1 25%	3 75%	0 0,0%	0 0,0%	0 0,0%	4 100%
Total	16 17%	17 18,1%	48 51,1%	12 12,8%	1 1,1%	94 100%

(Research Outcomes Data, 2022).

Table 4 presents the results of cross-tabulation between the intensity of Tahajud prayer and the level of stress. It is found that the majority of medical students from the 2021 cohort at Muhammadiyah University of Malang have a low intensity of Tahajud prayer and a moderate level of stress.

**Table 5.** Spearman Test

	<i>Correlation Coefficient</i>	Sig. (2-tailed)	Conclusion
The Relationship Between the Intensity of Tahajud Prayer and the Level of Stress	-0,235	0,022	Significant

(Research Outcomes Data, 2022).

Table 5 shows the results of the Spearman correlation test, which yielded a significance level (sig) of 0.022. This value does not exceed 0.05 ( $0.022 < 0.05$ ). It indicates a significant relationship between the intensity of Tahajud prayer and the level of stress. The magnitude of the Spearman correlation coefficient between the intensity of Tahajud prayer and the level of stress is -0.235, which falls into the weak category and indicates a negative direction. In other words, as the intensity of Tahajud prayer decreases, the level of stress tends to increase. Conversely, as the intensity of Tahajud prayer increases, the level of stress tends to decrease.

Based on Table 2, it is evident that the majority of respondents have a low intensity of Tahajud prayer, with a prevalence of 54.3%. This is consistent with research conducted by medical students at the Islamic University of Bandung, which showed that the majority had a low intensity of Tahajud prayer (Supendi et al., 2020). Based on the responses in this research questionnaire, 54 out of 94 respondents mentioned that they were unable to perform Tahajud prayers due to staying up late at night (overnight), thus preventing them from waking up early for Tahajud prayer.

According to Table 3, it shows that the majority of respondents experienced a moderate level of stress, with a prevalence of 51.1%. This aligns with research conducted on first-year medical students at Andalas University and Riau University, which indicated that the majority of first-year medical students experience a moderate level of stress (Machbub et al., 2019). Medical students have a higher level of stress compared to students in other faculties. This is because medical students undergo a different educational system compared to students in other faculties, namely the Concept-Based Learning (CBL) and Problem-Based Learning (PBL) systems. The CBL and PBL systems require medical students to be able to explain the concepts they need to learn so that they can conceptualize the management of clinical problems they encounter. Medical students also have a fairly dense class schedule, which includes expert lectures, tutorials, practical sessions, skills labs, consultations with experts, evaluations, and final research projects. Medical students also need to have the ability to manage their time as effectively as possible between researching, family, and friends. Medical students are more likely to experience stress when they struggle to adapt to a dense and high-pressure learning system ((Gruber et al., 2021). Stress among medical students primarily occurs in the first year of medical school. This is due to factors related to intrapersonal and interpersonal relationships, academic factors, issues related to the teaching-learning process, social relationship issues, desires and control-related issues, and group activity-related issues. Stress related to intrapersonal and interpersonal relationships is caused by the varying personality factors among students. These personality differences play a significant role in both self-relationships and relationships with others. For example, someone with an extroverted personality is more likely to be sociable and communicative with others compared to an introverted personality type, which is more self-oriented, focusing on internal thoughts, moods, and reactions. Academic-related stress occurs due to pressure related to the abundance of exams in their coursework, a dense academic schedule, and the numerous assignments that need to be completed. The level of stress related to the teaching-learning process among students is attributed to several factors, including the lack of feedback provided by professors, the volume of research materials to be covered, the quality of teaching by professors, and the number of assignments assigned by professors. Stress related to social relationships arises from issues in interactions, whether with friends, family members, or neighbors. The level of stress related to desires and control can occur due to conflicting demands from parents or others that contradict a student's own desires. Family pressures on students to make a particular choice can also lead to students not choosing according to their own preferences. Certainly, this can generate stress for the students. Stress related to group activities occurs because of demands from

group members to perform better, requiring additional skills, and active participation in the group's activities (Ricks & Warren, 2021).

Based on Table 5, the results of the Spearman correlation analysis indicate statistically significant values between the intensity of Tahajud prayer and the level of stress, demonstrating a meaningful relationship. The Spearman correlation analysis results between the intensity of Tahajud prayer and the level of stress show a negative direction of the relationship. This means that as the intensity of Tahajud prayer increases, the level of stress tends to decrease, and conversely, as the intensity of Tahajud prayer decreases, the level of stress tends to increase. Which involved a sample of health science students at the Jakarta III Health Polytechnic of the Ministry of Health (Faizah, 2021). Their research examined the influence of Tahajud prayer on reducing student stress and employed a quasi-experimental design with a non-equivalent control two-group pretest-posttest design. The sample consisted of 15 students in the experimental group and 15 students in the control group at the second level of the Jakarta III Health Polytechnic of the Ministry of Health. The intervention provided was Tahajud prayer, and stress levels were measured using the DASS-42 questionnaire. The results of their research showed that in the experimental group, stress decreased from 17.2 to 6.47 after performing Tahajud prayer. Meanwhile, in the control group, there was an increase in the average stress levels from 13.0 to 16.4 (Sanusi, 2022).

The research outcomes are in line with the hypothesis that stress activates the hypothalamus-pituitary-adrenal (HPA) axis and the sympathetic-adrenal-medullary (SAM) axis. Activation of the HPA axis leads to the secretion of corticotropin-releasing hormone (CRH) from the hypothalamus, which in turn can stimulate the secretion of adrenocorticotropic hormone (ACTH) from the anterior pituitary gland, leading to the secretion of cortisol from the adrenal cortex (Mohammadi et al., 2019). Tahajud prayer results in a more balanced or reduced secretion of cortisol hormones because it can promote positive emotional responses and effective coping (Tengku Kasim & Abdul Majid, 2020). Positive emotions encompass feelings of happiness, enthusiasm, joy, optimism, and tend to be calm and relaxed (Sice et al., 2020). The positive emotional responses received by the brainstem are transmitted to the thalamus, which then stimulates the hippocampus and amygdala to release gamma-aminobutyric acid (GABA). The thalamus can also stimulate the left and right prefrontal cortex, responsible for emotion regulation, by secreting dopamine (Zhang et al., 2021). Positive emotions can lead to an increase in serotonin produced by the central nervous system and acetylcholine from the parasympathetic neurons. (Capellino et al., 2020). The reciprocal interactions between the thalamus, amygdala, hippocampus, left and right prefrontal cortex, will stimulate the hypothalamus, leading to the secretion of corticotropin-releasing factor (CRF) (Smulders, 2021). CRF is stimulated by the serotonergic and cholinergic systems and inhibited by Gamma-aminobutyric acid (GABA) (Hou et al., 2020). GABA is predominantly found in the hippocampus and serves as an emotional regulator that can control the hypothalamus-pituitary-adrenal (HPA) axis (Neis et al., 2020). In stressful conditions, substances similar to beta-carbolines, which are GABA antagonists, can reduce

the number of GABA receptors. A decrease in GABA receptors can lead to reduced resistance to the emergence of anxiety and can alleviate stress reactions. Therefore, it can be understood that in a calm, optimistic, happy, and hopeful state (influenced by Tahajud prayer), the secretion of cortisol hormones can decrease, while GABA levels increase (Sarkar & Palo, 2019).

Therefore, it can be concluded that the positive emotions transmitted to the limbic system and cerebral cortex can influence the balance between the synthesis and secretion of neurotransmitters, such as GABA and GABA antagonists by the hippocampus and amygdala, dopamine, serotonin, and norepinephrine produced by the prefrontal cortex, as well as acetylcholine, enkephalins, and endorphins by the hypothalamus (Kami et al., 2022). The balance in the synthesis and secretion of these neurotransmitters will affect the stability of CRF secretion by the PVN in the hypothalamus. Controlling the secretion of CRF also regulates the secretion of ACTH. The controlled secretion of ACTH affects the balance of adrenal cortex in secreting cortisol and several neurotransmitters, such as catecholamines, adrenaline, and noradrenaline (Rahmani et al., 2021). When an individual's emotional state is stable, coping mechanisms become more effective. Subsequently, signals in the brain inhibit the release of CRF, leading to a decrease in ACTH production, which in turn results in a reduction in cortisol levels, indicating a decrease in stress levels (Chaves et al., 2021). This is in line with what is mentioned in Surah Ar-Ra'ad, verse 28, which translates to "Those who have believed and whose hearts are assured by the remembrance of Allah. Unquestionably, by the remembrance of Allah hearts are assured." This is also supported by a hadith narrated by Tirmidhi, where the Prophet Muhammad (peace be upon him) said, "The Tahajud prayer erases sins, brings tranquility, and prevents illness." Allah is the only entity that can bring true tranquility to a person's heart. Therefore, we can understand that the Tahajud prayer performed at night has benefits from both a religious and a health perspective (Machbub et al., 2019).

The limitations of this research are attributed to the presence of several confounding variables that influence the weak strength of the relationship found in this research. This is due to factors affecting the level of stress, such as the quality of sleep and the gender of medical students in the 2021 cohort. The researcher faced difficulty in excluding these variables as it would result in a reduced number of respondents for the research. One of the confounding variables in the research is the quality of sleep among students. Based on the responses in the research questionnaire, 54 out of 94 respondents reported that they were unable to perform Tahajud prayers due to staying up late at night (overnight), consequently making it difficult to wake up early for Tahajud prayers. This is primarily because medical students have a heavy academic workload, contributing to poor sleep quality among them. The causes of sleep disturbances among medical students include concerns about exams, relationships with classmates, irregular class schedules, the learning environment, and health conditions. In general, there are four fundamental sleep characteristics that affect the academic performance of students: sleep quality, sleep quantity, sleep regularity, and sleep phase scheduling. Undiagnosed sleep disturbances can exacerbate mental stress among medical students (Azad et al., 2015)<sup>35</sup>. Sleep disturbances can impact individual emotional reactivity, resulting in a significant



increase in negative emotional reactivity and a decrease in positive emotional reactivity in individuals. Sleep disturbances are a risk factor for various mental disorders such as anxiety, mood disorders, and depression in individuals (Ben Simon et al., 2020).

Another factor that serves as a confounding variable in this research is gender. As we are aware, gender plays a role in the occurrence of stress. Women tend to be more prone to experiencing stress compared to men. This is due to differences in the responses between men and women when facing conflicts. The female brain tends to exhibit negative vigilance towards conflicts and stress. In women, conflicts can trigger negative hormones, leading to feelings of restlessness, stress, and fear. On the other hand, men generally enjoy conflicts and competition, and they tend to perceive conflicts as providing positive motivation. In other words, when a woman faces pressure, she is generally more susceptible to experiencing stress compared to men. The differential stress response between women and men is closely related to the activity of the HPA axis, which is associated with the regulation of cortisol hormone and the sympathetic nervous system, affecting heart rate and blood pressure. HPA and autonomic responses are found to be higher in men compared to women, thus influencing an individual's performance in facing psychosocial stressors. Additionally, sex hormones in women can attenuate the HPA and sympathoadrenal responses, which can lead to a decrease in negative cortisol feedback to the brain, making women more susceptible to experiencing stress (Jentsch et al., 2022).

## CONCLUSION

Based on the data from the results and discussions that have been presented earlier, it can be concluded that there is a significant relationship between the intensity of Tahajud prayers and the level of stress among medical students of Muhammadiyah University of Malang. The strength of this relationship falls into the weak category. The majority of the 2021 cohort of medical students at Muhammadiyah University of Malang had low intensity of Tahajud prayers, with 51 individuals comprising 54.3% of the sample, while the majority experienced a moderate level of stress, with 48 individuals comprising 51.1% of the sample. The recommendation that can be given based on this research is the need for further studies, taking into consideration other factors that can affect the level of stress, such as the quality of sleep and the gender of medical students.

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