

## Correlation between stress and insomnia with learning outcomes: a cross sectional study



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### ABSTRACT

**Introduction:** Stress can happen anywhere and to anyone. Stress that cannot be controlled causes difficulty in concentration, difficulty remembering lessons, difficulty understanding lessons, frequent dizziness, feeling sluggish, weak and insomnia. Thus, this study aimed to determine the relationship between stress levels and insomnia with student achievement at Pondok Pesantren Tebuireng Jombang.

**Method:** The research design was correlational analytic using a retrospective research approach—the population of all students in class X-XII at Pondok Tebu Ireng Jombang in February 2022. From 620 children, 243 students were taken by stratified simple random sampling. The independent variables were the level of stress and insomnia, and the dependent variable was the learning achievement. Data collection in this study used a questionnaire (DASS), an insomnia rating scale questionnaire, and learning achievement with a learning report book. The data were analyzed by the Spearman Rho test in SPSS 25.

**Results:** Based on a characteristic sample from 243 respondents, it was found that most of them were male (59.26%), by the age were 17 years old (34.16%). Several students experienced stress. Luckily the highest stress level they experienced was moderate (31.3%), and the highest grade of insomnia they experienced was moderate. The correlation analysis of stress level and learning achievement obtained  $r=-0.425$  and  $p=0.001$ . It indicated a significant correlation between stress level and learning achievement, with a moderate correlation. A similar finding was also found in the correlation of insomnia with learning achievement ( $p=0.001$ ;  $r=-0.482$ )

**Conclusion:** In this study, almost all respondents have a mild stress level and sufficient achievement. Meanwhile, nearly all respondents who experienced mild insomnia had acceptable learning achievement. Both variables correlated with the level of achievement of students. Thus, maintaining stress levels and sleep time among students at a normal level is needed.

**Keywords:** stress level, insomnia, student learning achievement.

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### INTRODUCTION

Government Regulation of the Republic of Indonesia Number 55 of 2007 concerning Religious Education states that Islamic boarding schools are community-based Islamic educational institutions providing integrated education with other types. Santri who study in pesantren are called santri. Islamic boarding schools use a curriculum with additional curriculum and religious activities. So students are not only required to adapt to the regulations that apply in Islamic boarding schools, but are also required to be able to adapt to new environments and places, new socio-cultural conditions, and include new people they meet.<sup>1</sup>

Stress can happen to anyone and

anywhere, including teenagers who are still in school, and one of them is students. Santri, during the educational process, can experience stress due to the academic schedule coupled with a program of religious activities. Poor coping mechanisms will result in mental health, eventually triggering depression if not addressed immediately. The number of actions and demands also trigger students to pressure themselves so that they both run within 24 hours. Therefore, students cannot meet the need for sleep rest which can cause insomnia. The cause of poor sleep quality may depend on activities and the ability to manage time well.<sup>2</sup>

Normal teenagers sleep 7-8 hours per day.<sup>3</sup> Insomnia is a nocturnal disorder that greatly affects a person's activities

during sleep, not resting, eliminating physical and cognitive fatigue that sleep.<sup>4</sup> Students can replace with status students can experience stress caused by academic demands, such as the demands of the many school assignments that must be completed within the time determined by the school and also demands academics from Islamic boarding schools that require all student to follow memorization mandatory to be deposited every week, so that it makes students feel anxious from now on depositing the memorization especially when the memorization is being memorized not perfect in remembering a thing. This will make students delay their time for sleeping, makes and the sleep duration less than the normal time, which is 7-8 hours per day.<sup>4</sup>

Internal and external factors influence learning outcomes. Internal factors consist of physical factors (health and disability), psychological factors (intelligence, attention, interests, talents, motives, learning skills, maturity, and readiness), and fatigue factors (physical and spiritual); External Factors consist of 1) a family (how parents educate, parental treatment of children, relationships between family members, atmosphere home, family economic situation, understanding of parents and cultural background), 2) school factor (teaching methods, teacher-student relations curriculum, school discipline, learning tools, school time, standards teaching above the size, condition of the building, learning methods, and homework), and 3) community factors (such as student activities in society, mass media, friends, and forms of community life).<sup>5</sup>

According to research conducted by Rohmah et al., there was a relationship between academic stress and sleep quality in students who have student status at Islamic Boarding Schools. In addition, previous studies had already reported the relationship between spiritual level and the incidence of depression between them.<sup>6</sup>

From the data above, this study aimed to determine the relationship between stress levels and insomnia with student achievement at Pondok Pesantren Tebuireng Jombang.

## METHODS

### Study design

This was a retrospective, cross-sectional study by Ireng Jombang Islamic Boarding School. We retrospectively identified participants from August 2021 to February 2022 who studied at level X levels. The population of this study was 620 students. The inclusion criteria in this study were healthy and lived in boarding school. This study obtained another ethics certificate from the Health Research Ethics Committee of Universitas Nahdlatul Ulama Surabaya No. 025/EC/KEPK/UNUSA/2022.

### Sample of research

Of 620 students, 243 students from 21 qualify to be our sample. The sampling technique was simple random sampling.

**Table 1. The DASS 42 measurement score<sup>7</sup>**

Score	Description
0	It doesn't suit you at all, or never.
1	It suits you to some degree or sometimes.
2	Suit yourself to the limit can be considered passable often.
3	Perfectly suits you, or often very.

**Table 2. The insomnia rating scale measurement score**

Score	Description
1	Never
2	Sometimes
3	Often
4	Always

**Table 3. Respondent's characteristics**

Variable	Frequency (n)	Percentage (%)
<b>Gender</b>		
Female	144	59.26
Male	99	40.74
<b>Age (year)</b>		
16	3	1.23
17	83	34.16
18	78	32.10
19	79	32.51
<b>Stress level</b>		
Normal	10	4.1
Light stress	157	64.6
Moderate stress	76	31.3
Heavy stress	0	0
Very heavy stress	0	0
<b>Insomnia</b>		
Normal	93	38.3
Light insomnia	128	52.7
Moderate insomnia	22	9.1
Heavy insomnia	0	0
<b>Learning achievement</b>		
Need guidance	23	9.5
Enough	170	70
Well	45	18.5
Very good	5	2.1

**Table 4. Correlation analysis between learning achievement with stress level and insomnia**

Variable	Learning Achievement	
	P-value	r
Stress Level	0.001	-0.425
Insomnia	0.001	-0.482

### Instrument and procedures

The independent variables are stress level and insomnia. The dependent variable is student learning achievements. Stress level research instrument using DASS 42 (Depression Anxiety Stress Scale) by Lovibond & Lovibond (1995) The DASS measurement questionnaire consists of 42 statements related to stress, anxiety, and depression of a person. The measurement questionnaire used an ordinal scale. Each

description will transform the results into 4 (1-4). The DASS 42 measurement score can be seen in the following table (Table 1).

Variable insomnia using a questionnaire from the study group of psychiatry biology Jakarta insomnia rating scale (KSPBJ-IRS), which consist of 11 statement items with answers using a Likert scale of 1 – 4 and 4 categories of the total score (Table 2). The learning achievement variable uses

semester report cards with 4 classes of achievement levels.

### Data analysis

All of the data were input and coded in SPSS 25. Data from the research on stress levels with students' learning achievement were analyzed using the Spearman Rank test with a group of significance ( $p = 0.05$ ). The data were analyzed using the Spearman Rank test with a significance level ( $p = 0.05$ ).

## RESULTS

Based on a characteristic sample from 243 respondents, it was found that most of them were male (59.26%) and 17 years old (34.16%). Several students in Tebu Ireng Jombang Islamic Boarding School (grade X-XII) experienced stress. Luckily the highest stress level they experienced was moderate (31.3%). Most of them had light stress levels (64.6%), and the rest was stress levels also in line with the insomnia level. The highest grade of insomnia that they experienced was moderate insomnia. Meanwhile, light insomnia (52.7%) was the most common in this finding. Learning achievements in this study were varied. Most of the students had enough learning achievement, and only a few had very good learning achievement (2.1%).

The correlation analysis using Spearman's rank test on the variables of stress level and learning achievement obtained values of  $r = -0.425$  and  $p = 0.001$ . It indicated a significant correlation between stress level and learning achievement, with a moderate correlation. A similar finding was also found in the correlation of insomnia with learning achievement ( $p = 0.001$ ;  $r = -0.482$ ) (Table 4).

## DISCUSSION

### Stress Level with Learning Achievement

To research results, most female students who experience mild stress have sufficient learning achievement. They are at most 17 years old. Previous research has stated the increase in anxiety in late adolescence (where most respondents are in the late adolescence category). This matter causes a significant increase in cortisol. The hormone cortisol will increase

when a stimulus from the surrounding environment occurs. Thus, adolescence is an age that is prone to stress, including academic focus, because they spend more time in school and tutoring classes than at home.<sup>8</sup>

Stress in adolescence is common and has been increasing for some time. Especially adolescent girls in their middle to late teens report experiencing high-stress levels and stress-related symptoms such as anxiety, depressive symptoms, difficulty sleeping and somatic complaints. Adolescents often say that academic demands at school are a source of stress.<sup>9</sup> Students in secondary education environments face a variety of stressors caused by academic demands. At the high school level, students said they had experienced anxiety related to their education, which we refer to as academic-related stress, such as pressure to achieve high scores and concerns about receiving bad grades. The stress experienced by students will greatly affect students receiving lessons at Islamic boarding schools, and it can impact student learning outcomes.<sup>10</sup>

The demands of Islamic schools are different from other public schools. Where in Islamic schools, apart from students being given general subjects, they are also given a religious curriculum. The schedule at the Islamic boarding school has also been determined, so students are required to follow the program that has been set. If they come from public schools, they are initially shocked by the activities at the Islamic boarding school, and if the coping mechanisms are not supported, it can lead to boredom and stress and end up being stressed. This also has an impact on student learning outcomes.<sup>4</sup>

The results of the study were obtained from students who experienced mild insomnia. Most of them were female and had sufficient learning achievement. During adolescence, a critical period of human development, adequate and good quality sleep is considered the foundation of youth health.<sup>11</sup> The recommended amount of sleep during the teenage period is greater than expected. The National Sleep Foundation recommends 9-11 hours of sleep for children 6-13 years old and elderly and 8-10 hours per night for individuals aged 14-17.<sup>12</sup>

Several factors may be associated with the increased vulnerability of adolescents to insomnia. First, adolescence is associated with a progressive decline in sleep balance during waking time, leading to a decreased urge to sleep. The sleep-wake balance system controls the need for sleep; with the increased pressure, the longer it will make the individual awake and eventually declines when sleep occurs. Accumulated sleep before bed helps to control the quantity and quality of sleep. Second, adolescence is associated with time delays in sleep, which is associated with lengthening the intrinsic rhythm of endogenous oscillators. The endogenous oscillator is an internal system that sets the cycle for 24 hours according to the surrounding time (e.g., dark – the delicate process). Melatonin secretion is consistently associated with the human circulatory system, and in adolescents, the hormone melatonin is released later than in children, so it causes teenagers not to fall asleep easily.<sup>13</sup>

Supported by the Islamic boarding school schedule is from morning to night, so even though it is time for students to rest, it isn't easy to start sleeping because it has been patterned with the schedule in the Islamic boarding school. This will affect the quality and quantity of sleep. Previous research has shown a relationship between stress and sleep quality. It involves many variables of the resulting complex effects. From this process, the products include anxiety and worry, and inhibition processes involve fatigue and depression.<sup>4-6</sup>

One of the internal factors of psychological conditions is stress. Stress can weaken memory and attention in cognitive activities, so if someone gets pressure or stressors from these factors that exceed their ability to tolerate it, it will disrupt their learning process, which is reflected in the academic achievement index of the student. Other things related to psychological factors also have a very important role in the learning process and its results. Feelings of emotions and moods are very decisive. In a stable and normal state, textures help the individual to do the act of learning. Still, the feeling is of such high intensity that the person loses normal control over himself, for example, stress,

anger, fear or joy, all of which will hinder the learning process and the achievements achieved.<sup>4-6,14</sup>

Based on the results obtained from this study, it is shown that the respondent's stress level impacts the value of learning achievement. This indicates a negative relationship between the respondent's stress level and school achievement. This negative relationship means that the higher the stress level experienced, the lower the value of learning achievement in school. Vice versa, the lower the level of academic stress the respondent feels, the higher the value of school achievement will be.

The level of stress experienced by respondents can be caused because students feel tired related to additional activities with a busy schedule. The number of respondents' actions and tasks can cause respondents to become exhausted. This fatigue has an impact on the level of stress, which results in the completion of jobs that are less than optimal. The stress experienced by students who have additional learning activities outside of school also impacts their learning system. Students who experience stress can no longer study optimally, so their achievement scores go down.<sup>9</sup>

### Insomnia with academic achievement

According to Syah (2017), to be able to take a good study, students need to pay attention and maintain their body health. A weak physical condition can hinder students from completing their study program. To maintain physical fitness, students must focus on eating and sleeping patterns to facilitate metabolism.<sup>15</sup>

Based on the study results, insomnia is related to the learning achievement of the respondents. The insomnia experienced by respondents causes changes in activities, such as sleepiness in class and less attention to lessons due to decreased concentration, which impacts respondents' learning achievements. In addition, insomnia will reduce memory, so students find it difficult to remember what they have learned and experienced during the day because of their weak body condition. If the concentration is not disturbed, students will be efficient when studying.<sup>13</sup> Our finding established a significant correlation between insomnia

the learning achievement ( $p=0.001$ ). Thus, we can conclude that insomnia can impact learning achievement. To minimize insomnia, the student should have a good proportion of learning time, playing, and other activities.

This study has several limitations, such as the survey being conducted in one location only and different backgrounds might have different outcomes. Thus, we suggest performing further research in several study centers thus we can compare them. Several variables need to be evaluated, and another design study, such as cohort, so that we can determine the progression in each student's condition.

## CONCLUSIONS

In this study, almost all respondents have a mild stress level and sufficient learning achievement. Meanwhile, nearly all respondents who experienced mild insomnia had sufficient learning achievement. Both insomnia and stress levels correlated with the level of achievement of students. Thus, maintaining stress levels and sleep time among students at a normal level is needed.

## FUNDING

None.

## CONFLICT OF INTEREST

There is no conflict of interest in this manuscript.

## ETHICAL CONSIDERATION

This research passed the ethical approval as evidenced by the issuance of an ethics approval certificate by the Health Research Ethics Committee of Nahdlatul Ulama University Surabaya No. 025/EC/KEPK/UNUSA/2022.

## AUTHOR CONTRIBUTION

Nety Mawarda Hatmanti determines the concept, chooses the design, defines intellectual content, searches the literature, data analysis, manuscript editing, manuscript review, experimental studies and guarantor. Ulfa Mazuzin Zurmida determines the method, doing clinical and experimental studies and

data acquisition. Yurike Septianingrum is doing the literature search, clinical studies, experimental studies, statistical analysis, manuscript preparation, and manuscript review. Nunik Purwanti is doing the experimental studies, data analysis, statistical analysis and manuscripts preparation, searching literature and manuscripts editing. Siti Maimunah is doing the experimental studies, data analysis, manuscript preparation, manuscript editing, manuscript review and literature research.

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