The correlation between sleep quality and levels of stress among students in Universitas Indonesia☆

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Abstract
Objective: This study estimated the prevalence of and the correlation between sleep quality and levels of stress among college students.
Method: Design of this study is analytical with the cross-sectional approach. There are 450 college students who participated and chosen by a stratified random sampling technique in the University of Indonesia. A self-administrated questionnaire is distributed to assess sleep quality used the Pittsburgh Sleep Quality Index (PSQI), and the stress level by used the Perceived Stress Scale (PSS). The study samples came from three clusters are health, science and technology, and social humanities.
Result: The result is analyzed using Chi-square test and showed a significant relationship between sleep quality and level of stress among Students of the University of Indonesia ($p = 0.001$; $\alpha = 0.05$). Students are with poor sleep quality 4.7 times more likely to have higher stress than students who have a good sleep quality.
Conclusion: The results showed that poor sleep quality most widely owned by a grove social humanities have strong relationship with cluster and stress level. Students with poor sleep quality 4.7 times more likely to have higher stress than students who have a good sleep quality. Stress experienced due to poor sleep quality ratings. This research recommend to applied stress management in order to increase sleep quality.
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Introduction

Sleep is a basic human needed. Abraham Maslow showed that sleep as part of your physiological needs in the hierarchy of five basic human needs.[1] According to Stores, sleep categorized into: satisfactory and unsatisfactory. Good sleep is sleep that has satisfactory (sufficient in duration and good quality), while bad sleep is sleep that makes individuals feel unsatisfactory.[1,17] Unsatisfactory sleep that occurs on an continued that cause × more serious effects like; often feel very tired, uncontrolled emotion, difficult to concentrate, difficult to remembering or thinking clearly, unsatisfactory work, depression, and difficult to solve problems.[12,17] The long-term effects such as cardiovascular disease, obesity, and cancer.

Students including early adult age groups, so they take time to sleep for 7–8 h per night.[1] But in reality, not all of the students keep their sleep needs optimally. This is because students have a lot of activity and stressors, both academic and nonacademic. The condition causes students to have a risk of poor sleep quality.

Based on the research by Almojali et al. against 756 medical students of King Saud bin Abdul Aziz University, Saudi Arabia, showed 76% (575) students had poor sleep quality and 53% (401) students had stress symptoms.[9] The study also supported earlier research by Ahrberg et al. in 2012 among 144 medical students of Ludwig Maximilian University Munich, Germany showed 59% of respondents had poor sleep quality and lower academic performance is correlated with lower sleep quality and higher stress levels.[2]

Some research showed that the majority of students had poor sleep quality. Sleep as one of the basic human need important to restore stamina and function of the body. Quality sleep affects mental health. Sleep is not sufficient to cause increased stress hormones, namely cortisol.[3] And conversely, high levels of stress can interfere with sleep quality individuals.

Poor sleep quality leads to feelings of anxiety, tension, fatigue, decreased intellectual, cognitive disorders, and depression.[16] The result of Lemma et al. studied among 2.551 students from Haramaya University and the University of Gondar, Ethiopia showed 55.8% (1424) had poor sleep quality, 50.8% (1294) were depressed, 58% (1369) had anxiety and 34.1% (864) had stress.[12]

University of Indonesia (UI) consists of three clusters there are Health, Science and Technology, and Social and Humanities cluster. Students of the University of Indonesia who came from three different clusters have different characteristic. Stress experienced by students not only from the academic aspect, but also nonacademic. This condition is a contributor to the tendency of students who have poor sleep quality.

Method

This research uses descriptive-analytic design with a cross-sectional approach. Samples to be studied are regular undergraduate study program the students of Universitas Indonesia, amounting to 450 people (stratified random sampling) with each cluster contained 150 samples. Instruments in this study were questionnaires. The questionnaire consists of three parts: part A for demographic data, to assess sleep quality B and C to measure the level of stress. The instrument used to measure the quality of sleep is the Pittsburgh Sleep Quality Index (PSQI) and the Perceived Stress Scale (PSS) to assess the level of stress.

PSQI in Indonesian has been tested and found valid and reliable with a Cronbach's alpha of 0.83. PSQI questionnaire consisted of 18 questions grouped into seven components in the range of 0–3. Seven of these components is sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbances, use of sleeping pills, and impaired activities. PSQI total score between 0 and 21, which means the higher the total score the worse the quality of one's sleep and more sleep problems were experienced. Total score of more than 5 indicating poor sleep quality.

PSS in Indonesian has been tested and found valid and reliable with Cronbach's alpha coefficient of 0.96. PSS is based on the assessment results, the stress is categorized into three groups: mild stress with a total score of 0–13; moderate stress with a total score of 14–26; and severe stress with a total score of 27–40.

Result

Demographic characteristics of students were classified into two groups, numeric and category group. The characteristics of age, gender, class, non-academic activities and sports. The mean age of students was 19.68 with the proportion of female students is almost twice as large as many as 289 female students (64.2%) and 161 male students (35.8%). Male students are mostly from Science and Technology clusters and female students are mostly from social humanities cluster.

As by force, most respondents are younger students from 2016 to 2017. 2014–2015 Forces mostly from social humanities cluster. Batch 2016–2017 that proportion was similar between the cluster of health and Science Technology. The results also showed the majority of students have nonacademic activity (82.0%) and exercise (70.9%). Students are with activity and exercise the highest nonacademic are from social humanities cluster, although the difference between the proportions of the three clusters are not much different.

Table 1 shows each component of sleep quality ratings based on the mean and standard deviation. Poor sleep quality is said if the PSQI total score of more than 5. The PSQI total score in this study had a mean value of 8.40 (±3.641). Components that have the highest score is the disruption activity and sleep duration showed high activity disorders and lack of sleep duration sleep group of students from the needs of adults. While the component with the lowest score is the average use of sleeping pills is 0.08. It showed that almost all the students never sleeping pills. Unlike the other components which have a mean score was not much different.

Figure 1 shows that the majority of students from each cluster had poor sleep quality, is more than 70%. Overall, students with poor sleep quality were 76.4%. The cluster of health and science technology proportions of poor sleep quality is almost the same, namely 75.3% and 74%. While the

Table 1 Statistical analysis PSQI components.

No.	Variables	Mean	SD	Modus	Min−max	95% CI
1.	Subjective sleep quality	1.40	0.71	1	0−3	0.03;0.07
2.	Sleep latency	1.29	1.02	1	0−3	0.03;0.07
3.	The duration of sleep	1.44	1.08	2	0−3	0.53;0.62
4.	Sleep efficiency	0.53	0.92	0	0−3	0.73;0.81
5.	Sleep disorders	1.37	0.62	1	0−3	0.14;0.21
6.	The use of sleeping pills	0.08	0.32	0	0−3	0.33;0.42
7.	Impaired activity	1.89	0.79	2	0−3	0.03;0.06
	PSQI total	8.40	3.64	6	2−18	0.29;0.37
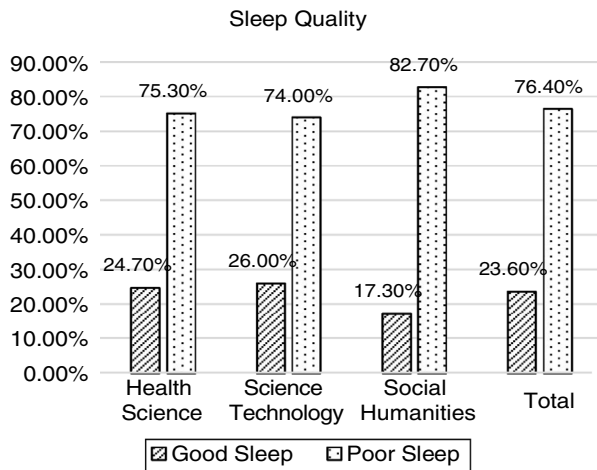
Figure 1 Comparison overview students per cluster sleep quality sciences ($N = 450$).
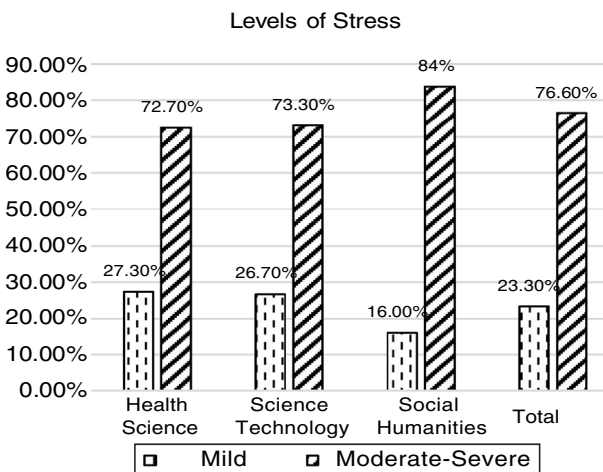
Figure 2 Comparison overview stress levels per cluster science students ($N = 450$).

highest poor sleep owned by a social humanities cluster with the proportion of 82.7%.

Figure 2 shows the results of research related to the stress level overview possessed by students at the Universitas Indonesia. The level of stress is not much different from sleep quality assessment results. The mean rate of moderate to severe stress is also more than 70% of each cluster.

Overall, students with moderate to severe stress levels as much as 76.6%. Similarly, poor sleep quality, moderate to severe stress level is also dominated by a grove social humanities cluster is 84%, and the proportion of health and science technology cluster differ only 0.6%.

The combination of Images 1 and 2 showed that poor sleep quality in line with the proportion of students who have moderate to severe levels of stress. Here are the results of the analysis of the relationship between sleep quality with the level of stress on students at the University of Indonesia. Test analysis of the relationship using chi-square test.

Table 2 shows the results of analysis of the relationship between sleep quality with the stress level p-value = 0.001 and the value of $\alpha = 0.05$. $p \leq \alpha$ value, then there is a relationship between sleep quality with levels of stress. Table 2 can be seen high enough difference between good and bad sleep quality with mild and moderate levels of stress-heavy. Students with good sleep quality showed mild stress levels. While students with poor sleep quality experienced higher stress levels, the level of stress-weigh as much as 84%. Students with poor sleep quality are 4.7 times higher risk of experiencing moderate to severe levels of stress compared to students who have a good sleep quality.

Discussion

The average age of respondents was 19.68 (± 1.12), which shows the age of the transition between late adolescence and early adulthood. More than half of the respondents are students from as many as 64.2% of women. This is consistent with the results of research by Ginting and Gayatri which states that the majority of UI students are women, according to the data obtained student. 2014−2015 Proportion of the amount of force as many as 161 students (35.8%). Respondents were dominated by the 2016−2017 generation because affordability is easier to invite as respondents as many as 289 students (64.2%).[10]

A total of 82.0% of the students have off-campus activities. The results support previous statement that the student is one of the social groups that the majority have activities outside the lecture.[4] Density of student activities is a natural thing because the need for development and acceleration in preparing the post-college.[5] The activities performed by students based on the research data among other campus organizations, communities, committees, tutoring/courses, teaching, working part-time, religious activities and social activities.

Table 2 Sleep quality relationships with students stress level ($N = 450$).

Sleep quality	Stress level		Total	x^2	p-value	OR(CI 95%)
	Light N (%)	Moderate–severe N (%)	N (%)			
Good	50 (47.2%)	56 (52.8%)	106 (100%)			
Bad	55 (16.0%)	289 (84.0%)	344 (100%)	42.316	0.001[*]	4.7 (2.9;7.6)
Amount	105 (23.3%)	345 (76.7%)	450 (100%)			

[*] Connect significant ($\alpha = 0.05$).

The condition according to research by Bik and Afifah which states that as many as 93% of the students have activities outside the lecture.[4] Activities outside the lecture would require more time than those required for academic activities. According to our analysis, this is an option many students in the process of developing their potential through a variety of activities to support the process of self-actualization, increase knowledge, skills and networks. In addition to the activities, most students also exercise (70.9%).

In addition to the activities, most students also exercise (70.9%). The type of exercise usually performed by students include running, jogging, gymnastics, Zumba, swimming, hockey, volleyball, basketball, futsal, badminton, cycling, tennis, and archery. It can be said that this year student awareness of the importance of exercise increase. The findings are in contrast to the results of this study were obtained mostly students exercising. Sport is one of the important things implemented due to the density of activity owned so it takes time to activities that can support health care students.[6]

In this study, it was shown that the majority of students had poor sleep quality (76.4%). This is in line with research conducted by Almojali et al. in 2017 i.e. the majority of students (76%) in King Saud bin Abdul Aziz University, Saudi Arabia, have poor sleep quality.[9] The same condition also occurs in Indonesia, including research conducted by at the University of Andalas. A similar study conducted by the UI student respondents from three cluster of science that each cluster is represented by one faculty, the research Ginting and Gayatri on the students, showing 83.75% of UI students had poor sleep quality.[10]

The mean total score of PSQI in this study (8.0) experienced a slight increase compared to a similar study by Annisa and Kuntarti that is equal to 7.9. The seventh component of PSQI, disruption activity and sleep duration is the component with the highest score.[5] Both components are the highest experienced by social humanities cluster with a mean of 2.01 (± 0.76) and 1.53 (± 1.07).

The results of this study states the length of time shorter sleep UI students than students in Ethiopis based research Lemma, et al. and students Eastern Illinois University by Davidson (2012).[12] Lemma research results et al. and Davidson stated mode for components sleep duration is 1 (sleep 6–7 h) and 0 (sleep >7 h).[12,15] It has linkages with the proportion of students at the University of Indonesia is Muslim. Muslims have a habit of Qiyamullail prayer (night prayer) and Fajr prayers in the morning so as to have a shorter sleep time in general. Although there is no significant relationship between sleep quality sleep habits with Muslim students, the results showed that sleep duration is shorter because of Muslim students liabilities Fajr prayers.[7] So the most reasonable move nuisance experienced by many students of social humanities cluster revisited if the highest average score of all components owned by a grove social humanities cluster.

The poor sleep quality in students occurs to the students with the high level of stress experienced. The highest proportion of students with level moderate to severe stress as many as 345 students (76.7%) and students who experience mild stress were 105 students (23.3%), similarly, the quality of sleep, severe stress levels experienced by cluster social humanities cluster. The results support previous research that high-stress levels in students as much as 61.6%.[8]

Stress and sleep affect each other. Poor sleep can increase stress, otherwise high-stress can also cause sleep disturbances.[11] Another study showed that changes in sleep in a long time could exacerbate stress conditions that can develop into depression.

This study supports previous studies such as Waqas et al. claimed 59.7% of the students suffered severe stress with 77% of students have poor sleep quality.[13] Knutson et al. suggest stress has a major contribution and cause poor sleep.[22] Kotronoulas et al. with the results of the study 65% of students have stress and 69.9% experienced sleep quality, and a variety of other studies reveal that stress has an influence in causes poor sleep quality.[13,14,18]

Thus, the quality of sleep and stress levels become things that must be considered given the research that has been declared poor quality of sleep in college students. In addition, students also have the task of self-development as an easy adult who is developing the capacity of self through various activities. So that health becomes very important to note.

The results showed that poor sleep quality most widely owned by a grove social humanities have strong relationship with clusterand stress level. Students with poor sleep quality 4.7 times more likely to have higher stress than students who have a good sleep quality. Stress experienced due to poor sleep quality ratings. This research recommend to applied stress management in order to increase sleep quality.

Conflict of interests

The authors declare no conflict of interest.

Acknowledgement

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