

CORRELATION BETWEEN THE AMOUNT OF CIGARETTE RODS CONSUMED WITH SLEEP QUALITY IN ENGINEERING FACULTY STUDENTS AT UDAYANA UNIVERSITY

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Abstract: College students are a group of undergraduate candidates who are taking education at college level, whose daily life is faced with a wide range of demands and responsibilities that can potentially cause students to feel exhausted. This exhaustion will have effects on their health, one of them is in the aspect of sleep quality. Sleep quality is the ability to maintain a good and adequate sleep condition. The purpose of this research is to know whether there is a correlation between the number of cigarettes rods that is consumed to sleep quality in college students. This research is a cross sectional analytic study conducted at Engineering Faculty in Udayana University. Data obtained is primary data using the *Pittsburgh Sleep Quality Index (PSQI)* questionnaire that has been modified and analyzed with *spearman* test. The number of samples was 55 out of five courses. The results showed that respondents fall into mild smokers and moderate smokers category. Most respondents had poor sleep quality (87.3%). In addition to smoking habits, other common habits that can be found in respondents are alcohol consumption (83.6%) and caffeine consumption (81.8%). In some respondents the habit of using drugs also can be found even though the number of its users aren't many. The more cigarette rods are consumed, the amount of nicotine entering into the body will also increase and lead to disturbance of sleep stages, resulting in overall decrease of sleep quality. Based on this study, it can be concluded, there are correlation between the amount of cigarette rods consumed and the sleep quality of the students ($p < 0.05$).

Keywords: cigarette rods, sleep quality, engineering students, nicotine.

I. INTRODUCTION

College students according to KBBI, defined as students who nurtured an education in college level where in Indonesian's education structure occupies the highest level of education Unit¹. These students are faced to a wide variety of demands, hopes, risks, and temptations which are many and complex and potentially causing fatigue in students. Some researchers found that sleep disorders tend to be easily experienced by students who are experiencing stress and fatigue².

Sleep disorders itself are one of many factors that contribute to affect one's sleep quality. Sleep is a process experienced by each individual and is a fundamental necessity. While the quality of sleep is defined as a condition where the sleep process that someone has gone through giving results in the form of a body that feels fit and fresh when awake³. There are several factors affecting one's sleep quality, including environmental conditions, activities, lifestyles, and the physical condition. One form of lifestyles that can affect sleep quality is smoking behaviour.

Smoking is a bad habit common to people and has become a problem all over the world. Indonesia, according to WHO, ranked 3rd after China and India as the country with the largest number of smokers, as well as the 5th place in the world

as the country with the biggest cigarette consumption after China, the United States, Russia, and Japan in the year 2007⁴. The health research of DASA shows the prevalence rate of active smokers in adults around 64.9% for men, and 2.1% for women. Among tobacco users, 34.6% is a cigarette user, with clove cigarettes ranked first as the preferred cigarette type with a percentage of 36.3⁵.

In some studies, subjective measurements have been conducted regarding nicotine consumption and sleep. In a study researching smokers and non-smokers, the results showed smokers have twice the risk of having sleep disorders⁶. In other study using *Polysomnography* (PSG) to examine how smoking affects sleep, results that show smokers have a short sleep period, increased sleep latency, higher REM sleep density, and increased incidence of sleep apnea and leg movements while sleeping compared to non-smokers⁷. In other studies, high degrees of nicotine dependence and smoking intensity also reported consistently related to a short sleep duration⁸.

Some researches about negative influence of smoking and its relation to some diseases in the environment of Udayana University students have already done before, but for research that aims to know the correlation between smoking habit with sleep quality among Engineering Faculty students in Udayana University has not been implemented. Although there has been much research done to know the influence of smoking to health, but the influence of smoking against sleep quality has not been extensively researched⁷. Therefore, researchers find it necessary to do some research to find out whether there is a correlation between the influence of smoking habit to sleep quality in students at the Engineering Faculty at Udayana University.

II. MATERIALS AND METHODS

A. Subject

Analytical methods with cross-sectional approach were used in this study. Data collection is done using a questionnaire filled out by the respondents and the results will later be used to see if there is a correlation between smoking and sleep quality in Engineering Faculty students at Udayana University school year 2018/2019. This study was carried out in August – September 2019.

The subjects selected for this study were all students at the Engineering Faculty in Udayana University who were still recorded as an active student members in academic year 2018/2019 and has the behavior of smoking habits that meet the criteria of inclusion and does not meet exclusion criteria. Inclusion criterias for this study are male individuals who have smoking habits using cigarette sticks and is in the age range of 18-25 years, and willing to become a participant in the study. Meanwhile, the exclusion criterias for this study are male individual who are using electric cigarette. Added with *drop out* criteria in the form of an incomplete questionnaire by the respondents.

The sampling technique is taken using non-probability sampling techniques by consecutive sampling where researchers choose respondents in accordance with predefined criteria of inclusion and exclusion as a member of the sample in the study. Based on calculations, using a formula, the minimum number of samples to be met is 55 people. With the addition of 20% to anticipate the *drop out* criteria, the final number of samples that should be taken is 66 people.

The collection of data on this research uses the questionnaire that is shared to Engineering Faculty students of Udayana University which has become the subject of research in the form of website link address and also in the form of questionnaire sheet. *Pittsburgh Sleep Quality Index* (PSQI) was used in this research with a few modification.

In this research, *data coding* was conducted on collected data from the questionnaire. *Data Coding* is a grouping of data based on predefined variables. The variables consist of a independent variable that is the number of cigarettes consumed per day, dependent variable that is of sleep quality, control variable consisting of electric cigarettes, age, and gender. Its random variables consist of physical conditions, psychological conditions, and body mass index (BMI). Furthermore, the data was put into *Statistical Package for Social Science* (SPSS) and analyzed using multivariate analysis. Previously, this research has been approved by the Research Ethics Commission of Udayana University's Faculty of Medicine/General Hospital Sanglah Denpasar with the number 2452/UN14.2.2.VII. 14/LP/2019 dated in September 13th, 2019.

III. RESULT AND DISCUSSION

The results of the study obtained samples from each course that became part of the Faculty of Engineering, Udayana University, so that it can be declared samples that were obtained representing the entire faculty of Engineering Udayana University. Research is conducted in two different campus areas to obtain adequate and thorough samples. From 66

respondents, there was 55 respondents remained whose data is worth to be used in this research, that amount also fits the minimum sample number. Results of the questionnaires on sample characteristics are showed in Table 1.

Table 1: Sample Characteristics

Characteristic	f	Percentage (%)
Department		
Electro Engineering		
Architecture	8	14,5
Civil Engineering	13	23,6
Machine Engineering	4	7,3
Information Technology	24	43,6
	6	10,9
Caffein intake	45	81,8
Alcohol intake	46	83,6
Drugs use		
	4	7,3
Sleep quality		
Good	7	12,7
Bad	48	87,3

The majority of respondents came from the Mechanical Engineering Study Program (43.6%). While respondents from the Civil Engineering Study Program became the least contributor to the number of respondents in this study (7.3%). Other unhealthy habit that seems to be more popular among the respondents other than smoking is the habit of consuming alcohol (83.6%).

Kolmogorov-Smirnov normality test was used because of the samples in this study is 55 which is bigger than 50. From the test, the value of p obtained is below 0.05 which means that the data has abnormal distribution. Mean number of cigarette rods consumed by respondents in a day can be observed in table 2.

Table 2: Number of Cigarette Rods and Sleep Quality Score

Variabel	n	Rerata	SB	p
Numbers of ciggarettes	55	7,91	5,056	0,011
Quality of sleeps score		8,25	2,503	

From data processing on the number of cigarettes, obtained cigarette rods consumed by respondents in a day are varying, with the most number of cigarettes are 24 rods in a day consumed by 1 respondents (1.8%). While the number of the fewest cigarettes is 1 rod in a day consumed by 3 respondents (5.5%). Meanwhile, most of the respondents consumed 10 rods per a day (25.5%). If calculated using the Brinkman index, the majority of respondents were in mild smoking degrees. Only 1.8% of the respondents fall in the medium smoker category.

In Table 1 from 55 respondents, most of the respondents (87.3%) have poor sleep quality. This data was obtained from the sleep quality scoring using the PSQI questionnaire by categorizing it into good sleep quality if the PSQI score is below or equal to 5, and into poor sleep quality, if the PSQI score is above 5. In the data processing, the lowest score received by the respondent was 3 as much as 1 person (1.8%) And the highest score is worth 14 as well as 1 person (1.8%). A common score for respondents is 7 to 11 people (20%) Followed after, 8 from 10 people (18.2%). While in Table 2, the average sleep quality score from the entire respondent was 8.25.

Based on the number of cigarette bars and sleep quality scores displayed on the Table 2, obtained the result that the value $P = 0.011$. This value is smaller than 0.05, which means that there is a correlation between the number of cigarettes that is consumed with sleep quality in Engineering Faculty students in Udayana University. There are many variables that can affect the quality of sleep in the Engineering Faculty students at Udayana University, some of which were successfully controlled in this study are age, gender, and the type of cigarette used. In this study, the amount of cigarettes rods consumed correlates with someone's sleep quality.

The results showed that after smoking, the habit of consuming alcohol is also the most favored by respondents. Alcohol in some studies previously known to make a person sleep easily, but may also cause asleep disorder⁹. Unfortunately, in this study, the link of alcohol with sleep quality was not studied extensively.

The number of cigarette rods consumed by someone in a day can determine the degree of a person's smoking habit. There are several indicators that can be used to determine the smoking degree. In this study, the indicator used was Brinkman Index. The degree of smoking according to Brinkman Index itself is the result of the multiplication between the number of how many years someone has been smoking and the average number of cigarettes that person smoked per day. A person is expressed as a mild smoker if the value of an index obtained less than 200, is categorized as a moderate smoker in the case of index number is in between 200-599, and is expressed as a heavy smoker if the result is 600 or more. The longer a person smokes, the more number of cigarette rods are consumed, and the heavier their smoking habit degree¹⁰. Based on this calculation, the majority of respondents in this study fall into the category of mild smokers.

In the meantime, the calculation of sleep quality was using PSQI, which consists of 7 dimensions to thoroughly determine the sleep quality of respondents. These dimensions consist of subjective sleep quality, duration of sleep, sleep latency, sleep disturbance, efficiency of sleep habits, disruption of daytime activities, and the use of sleep medications. Its measurements use the *Likert* scale, where each question has a score range of 0-3¹¹.

Nicotine in cigarettes has effect as a stimulant. Nicotine will stimulate and activate *nicotinic acetylcholine receptors* (nAChRs) which is widely distributed on *presynaptic neurons* to release neurotransmitters such as acetylcholine, *gamma amino butyric acid*, norepinephrine, dopamine, and serotonin. Dopamine levels are increased when consuming nicotine, causing *rewarding effects* in the mesolimbic system. This *reward system* causes the desire to re-use nicotine and trigger dependence. After the *reward pathway* active, if the use of nicotine is discontinued, symptoms such as restlessness, headache, and can not sleep will appear¹².

Sleep regulation can be interrupted by the nicotine content that enters the body through cigarettes. The more quantity of cigarettes consumed will also increase the amount of nicotine that enters the body and leads to increased activity of the nAChRs activation in neurons, so that normal sleep stages will be disrupted and lead to a decrease in overall sleep quality of a person.

The results of this study are aligned with some research which has done before. As in the research conducted at the University of Muhammadiyah in Jember, in a group of nursing students. In that study, the results showed a relation of the smoking habit with sleep quality in students¹³. Another supportive study was the discovery of a significant relation between active smoker and sleep pattern disorder (insomnia) in a large group of samples that were smokers with a positive correlation¹⁴.

But there is a study that expresses a different view, as in the research ever conducted in the Civil Engineering male students at University Udayana regarding the relation between smoking habit with insomnia. In that study, the result that was It was found that there is no connection between the habit of smoking to insomnia. These differences in results are caused by differences in the sample characteristics used. In that study, samples were taken from a homogeneous population and consisted of smokers and non-smokers, with more than half the number of respondents are non-smokers¹⁵.

Other research that uses non-smokers samples was held at Sebelas Maret University, the results also showed that there is a difference in sleep quality in students who are smokers and non-smokers. Students who smoke tend to have poor sleep quality compared to their fellow students who do not smoke¹⁶.

IV. CONCLUSION

Based on the research, it is obtained that there is a correlation between the number of cigarette rods consumed with sleep quality in the Faculty of Engineering students at Udayana University. This research examines the relationships of the number of cigarettes consumed to sleep quality in students without further researching on alcohol, caffeine, drugs consumption and their relation to sleep quality. This research can also be continued with a more focused look at the type of bar cigarettes used. Other aspects such as the psychological aspect, body mass index (BMI), physiological aspects, and things that might affect the quality of sleep on students are also more noted in subsequent research with similar themes.

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