

# Relationship between Smartphone Screen Time and Sleep Quality (PSQI) on Preclinical Medical Students of Airlangga University, Surabaya

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## Abstract

**Background:** Based on a global survey conducted by Phillips who interviewed about 13,000 respondents representing 13 countries in 2020, only 55% of them got satisfaction in their sleep. As many as 70% of respondents reported a sleep disorder since the start of the COVID-19 pandemic. During quarantine or isolation due to COVID-19, several empirical studies have reported a trend of increasing screen time during this pandemic, it is critical to assess the adverse health outcomes that may arise as its long-term consequences globally. **Methods:** This is a cross sectional study using data taken online using the PSQI questionnaire and several other role variable questionnaires from preclinical students of the faculty of medicine at Airlangga University in 2021. **Result:** From 100 respondents who fill out the questionnaire online, most of the respondents (70%) had a screen time of >6 hours / day and as many as 52% of the respondents experienced sleep disorders. Based on the results of testing the relationship between smartphone screen time and sleep quality using the chi square test, it was found that screen time affects a person's sleep quality. **Conclusion:** In students who have a screen time of more than 6 hours per day, they have a risk of sleep disorders 2.44 times greater than students who have a screen time of 2-6 hours per day.

Keywords : Screen time ; Sleep Quality ; Medical Student

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## 1. Introduction

Sleep is a basic need for each individual. Sleep quality is one way to assess a person's sleep. However sleep quality is the ability of an individual to be able to stay asleep, not only reaching the amount or duration of sleep[1]. Research conducted by LeBourgeois in Europe, Asia, & the United States explained that 6-37% of samples reported difficulty on more than one criteria assessed from sleep quality[2]. This shows that sleep quality is still a problem in the general population of the world. In another study conducted by Almojali with a sample consisting of medical students in Saudi Arabia stated that about 76% of samples experienced poor sleep quality as evidenced by the Pittsburgh Sleep Quality Index (PSQI) score  $\geq 5$ [3]. So we can conclude that medical students are an important population to pay attention to, especially the issue of sleep quality.

Therefore it is necessary to know the factors that can affect the quality of a person's sleep. Some factors that can affect sleep quality include screen-based activity, physical activity, anxiety levels, sleep hygiene,

bedroom lighting, bedroom temperature, and noise in the residence. Other studies have also linked reduced sleep duration and sleep quality to lifestyle changes, increased work, and social demands [4]. As already mentioned, screen time is a factor that affects sleep quality. In a study conducted by Parent it was stated that the increase in screen time in adolescents experienced a significant increase starting from 5 hours / day in 1999 and increasing to 8 hours / day in 2016[5]. This may continue to increase over time and is also related to a life that is increasingly integrated with technology

Previous studies have shown results that connect screen time and sleep quality, as in the research of Nurfadilah, where the results of screen-based activity with a duration of use of more than 2 hours per day can cause poor sleep quality[6]. Another study conducted in China also showed that high screen-time was associated with poor sleep quality [7]. Low sleep quality is an indicator of many medical diseases and there is a strong relationship between physical, psychological and sleep health [8]

Based on the data presented above, it is behind the researchers to dig deeper into the topic, coupled with the absence of research that links screen time with sleep quality (PSQI) in medical preclinical students at Universitas Airlangga. So researchers are interested in conducting research on the relationship between smartphone screen time and sleep quality (PSQI) in preclinical medical students of Universitas Airlangga.

## 2. Methods

This study use a cross sectional study using a stratified random sampling technique to collect data. Data was obtained from preclinical students of the Faculty of Medicine, Airlangga University using an electronic questionnaire. The inclusion criteria of this study are the preclinical students themselves, can understand the instructions and are willing to be a sample there is this study, while the exclusion criteria are the population who are not willing, living in areas with high temperature differences and noise, as well as populations that have other jobs besides being students. Sample measurement using slovin calculation with the minimum sample size obtained is 100 samples. This study was analyzed with IBM SPSS version 20 software with a chi square statistical test.

## 3. Results

From a total of 100 samples that have been selected through inclusion and exclusion criteria, the distribution of samples from several preclinical forces was obtained as follows which is shown in table 1.

Table 1 Distribution of Semesters of Research Subjects

Variable	Frequency (N)	Percentage (%)
<b>Semester 2</b>	33	33
<b>Semester 4</b>	35	35
<b>Semester 6</b>	32	32

From the existing sample, we took data on the average duration of screen time on smartphone samples for the last 1 week which were divided into 3 categories, namely < 2 hours per day, 2-6 hours per day, and > 6 hours per day and we also collected data on sample sleep quality using the PSQI (Pittsburgh Sleep Quality Index) questionnaire whose results were divided into good sleep quality and poor sleep quality which will be displayed in table 2.

Table 2

Variable	Frequency (N)	Percentage (%)
<b>Screen time</b>		
>6 hours per day	35	35
2-6 hours per day	32	32
<b>Sleep Quality (PSQI)</b>		
Good Sleep Quality	52	52
Bad Sleep Quality	48	48

After getting the above two data from the sample, we performed a chi square test on both variables. The following are the results of the chi square test conducted on independent variables, namely screen time and dependent variables, namely sleep quality, which were assessed through the PSQI (Pittsburgh Sleep Quality Index) questionnaire (Table 3):

Table 3

		Sleep Quality (PSQI)		P Value	Odd Ratio
		Poor Sleep Quality	Good Sleep Quality		
<b>Screen Time</b>	> 6 hours per day	41 (58,6%)	29 (41,4%)	0,045	2,44
	2 – 6 hours per day	11 (36,7%)	19 (63,3%)		

Of the total 100 respondents who filled out the questionnaire through the google form, as many as 70 respondents (70%) who had a screen time of > 6 hours per day, there were 41 respondents (58.6%) who had poor sleep quality while the remaining 29 respondents (41.4%) had good sleep quality. This is in contrast to the remaining 30 respondents (30%) who had a screen time of 2-6 hours per day, there were 11 respondents (36.7 had good sleep quality while the remaining 19 respondents (63.3%) had poor sleep quality. This shows that it is true that the screen time of smartphones on students of the Faculty of Medicine, Airlangga University affects the quality of sleep of these students.

Supported by the results of chi square on dependent variables, namely sleep quality and independent, namely screen time with an Asymptotic Significance value ( 2- sided) of 0.045 where the result is <0.05, then the two variables above are related.

#### 4. Discussion

Sleep is an important thing for our body, one way to judge sleep is by the quality of sleep. One of the things that can affect sleep is screen time. In this study, it was found that there were more samples of female sex than male samples with a difference of 30 samples. Similar to previous studies, samples of female sex have a higher risk of having poor sleep quality than male samples [9].

Most of the samples (70%) in this study had a screen time of > 6 hours per day, not even a single sample had a screen time of < 2 hours per day. In a study by Saadeh, data was obtained that the majority of the samples experienced an increase in smartphone use of around 84.8% with 42% of them having a smartphone

screen time of >6 hours / day[10]. A survey also noted about a 50-70% increase in internet use during the COVID-19 pandemic and 50% of that time was spent on social media[11].

In this study, the results of the PSQI (Pittsburgh Sleep Quality Index) obtained that the sample of sleep disorders was 52 respondents while the remaining 48 did not experience sleep disorders. This is in line with a study by Ahmed on medical students in Egypt that about 58% of respondents had poor sleep quality which was significantly related to the difficult academic atmosphere, and worried about exams so that respondents needed to sleep shorter[12].

Based on the results of the hypothesis test on the effect of smartphone screen time or the length of time the device views on sleep quality, the length of screen time >6 hours / day is significantly correlated with poor sleep quality, this is evidenced by the P value result which < 0.05. Risk of the occurrence of sleep disorders increased by 2.4 times compared to people who had a screen time of under 6 hours per day. These results are in line with research by Muhammad who examined the relationship between screen time and sleep quality in students in Karachi that the total screen time of more than 2 hours / day on respondents, both on weekdays and weekends, has a significant influence on poor sleep quality with an odds ratio of 4.3 times for weekdays to 24.2 times for weekends[13]. Students can spend about 9 hours per day accessing smartphones[14]. Similarly, research conducted by Boonluksiri states that excessive smartphone use in medical students as respondents has a significant influence on sleep quality[15].

## 5. Conclusion

Of the total 100 respondents, semester 4 had the highest screen time compared to other semesters, in line with the results of the group of respondents with the most sleep disorders found in semester 4. Based on the results of testing the relationship between smartphone screen time and sleep quality using the chi square test, it was found that screen time affects a person's sleep quality. In students who have a screen time of more than 6 hours per day, they have a risk of sleep disorders 2.44 times greater than students who have a screen time of 2-6 hours per day.

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