

## Research Article

### The Relationship Between Use of Gadgets and Sleep Quality on Nursing Students

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#### ABSTRACT

**Introduction:** The proliferation of information and communication technology, particularly handheld electronic devices, has resulted in a significant portion of the population becoming ensnared in a perpetual reliance on smartphones. The prevalence of technological devices has led to a significant dependency among students. Approximately 30 million individuals, constituting approximately 80% of the user population in Indonesia, are students. This behaviour frequently leads individuals to lose track of time during late hours, as they habitually resort to incessantly monitoring their electronic devices as a means of evading social interactions on online platforms. The objective of this study was to investigate the correlation between gadget usage and sleep quality. **Methods:** The present study employed a quantitative approach utilizing a cross-sectional design. This study employed comparative statistical analysis to examine the correlation between gadget usage and the sleep quality of students at STIKes Karsa Husada Garut. **Results:** The data analysis using the Chi-square test yielded a p-value of less than 0.05, suggesting a significant association between the utilization of Gadgets and the quality of sleep among nursing students at STIKes Karsa Husada Garut. **Conclusion:** the utilization of electronic devices had a notable impact on the sleep quality of final-year students at STIKes Karsa Husada Garut. A negative correlation can be interpreted as indicating an inverse relationship between the use of gadgets and sleep quality, such that an increase in gadget usage is associated with a decrease in sleep quality and vice versa.

**Keywords:** *Gadget, Sleep Quality, Students*

#### Introduction

Globalization accelerates the development of information technology very rapidly. Various findings and innovations in communication technology have led to a new civilization, namely a very modern digital era that makes

technology a communication tool as well as an information medium. The development of information and communication technology, namely gadgets, causes many people to be trapped in always using smartphones [1,2].

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The number of gadget (smartphone) users globally is increasing in 2019, there were at least 3.2 billion gadget users or an increase from the previous year. Meanwhile, the number of active devices used reached 3.8 billion units [3]. In 2022, smartphone users are predicted to reach 3.9 billion users, including in Indonesia [4]. 30 million users in Indonesia are students who frequently use gadgets and can easily access the internet via gadgets [5].

Sleep is one of the essential needs because when this need is not met, the body will not have the ability to meet the next need [6]. Good quality sleep will cause the body to be fresh and fit when you wake up; conversely, if sleep is inadequate and of poor quality, it can result in various physiological disorders such as feeling tired, weak, decreased daily activities, poor neuromuscular conditions, reduced immune system, the slow healing process, irritability, stress quickly, anxiety, lack of concentration and ineffective coping [7,8]. Poor sleep quality can also cause abnormal blood pressure and disrupt routine daily activities, feel less happy, more depressed, and feel very tired physically and mentally [9,10].

Poor sleep quality can also cause abnormal blood pressure and disrupt routine daily activities. In addition, if each individual has problems sleeping, there will be problems in other aspects. For example, Nashori & Wulandari [11] stated that sleep quality affects self and individual control, poor sleep quality can also cause individuals to feel less happy, more depressed, and feel very tired physically and mentally. Non-medical factors affect sleep quality, such as gender, puberty, sleeping habits, environment, and lifestyle. One lifestyle that affects sleep quality nowadays is smartphone addiction [12].

Activities carried out at home are continuously bringing a person closer to the internet, gadgets, and digital platforms. Gadgets make it easier to access and obtain information and entertainment simultaneously and are used as learning media and communication tools [13]. With the sophistication provided by gadgets, many students are addicted to gadgets. As many as 30 million, or around 80% of users in Indonesia, are students [14]. This makes them

often forget the time late at night, and they constantly check their gadgets to avoid conversations with other people on social media [15].

The use of gadgets certainly affects sleep quality, which is most found among early adults, especially students. Changes in health status in early adulthood are influenced partly by genes but also by behaviour, diet, sleep quality, and physical activity. Hurlock stated that early adulthood begins at the age of 18 years and until approximately 40 years [16]. With the physical and psychological changes that accompany reduced reproductive capacity, early adulthood is a period of adjustment to new life patterns and new social expectations. Early adults are expected to play new roles, new desires, and develop new attitudes and new values according to new tasks. Meanwhile, Mappiare stated that early adulthood is a transition physically, intellectually, socially, and psychologically as well as reduced reproductive abilities [16].

A previous study by Umar (2021) stated that there are many impacts caused by the long use of gadgets, one of which is the effect of light from gadgets which can affect biological mechanisms that delay sleep due to excitement over using gadgets so it becomes difficult to sleep. Young people have a more emotional connection with social media, finding it difficult to relax at bedtime for fear of missing a message. This contributes to anxiety and affects sleep quality. Previous studies stated that one of the effects of using gadgets for too long will affect sleep quality, even students will feel sleepy during the day, feel tired, and affect mood so that it disrupts the sleep process and increases sleepiness during activities [17].

Based on interviews, observations, and a questionnaire on May 25, 2022, at STIKes Karsa Husada Garut, researchers found that all final-year nursing students have gadgets (smartphones). The results of the study found that 8 students were excessive smartphone users for up to 3-8 hours/day and 2 students for up to 2-3 hours/day. 8 respondents stated that they used gadgets (smartphones) before going to bed which caused them to forget the time, so they slept late after 10 pm, while 2 other respondents stated that they rarely used gadgets

before going to bed and went to sleep earlier under 10 pm.

The results of other observations obtained information that most students often play online games through gadgets for more than 1 hour every day. Games often played are PUBG and Mobile Legend as well as several applications such as WhatsApp, Instagram, Youtube, and TikTok. High intensity in playing online games and using online applications makes students addicted.

The results of interviews with 10 final-year students at STIKes Karsa Husada Garut showed that 8 students experienced stress because they had to divide their time between doing their thesis, online lectures, homework, limited references, and also difficulties in contacting lecturers. 8 students experienced sleep disturbances as a result of stress due to busy activities from morning to evening so students chose to work on their thesis at night, 2 students did not experience sleep disturbances because according to them stress made them sleep fast. Regarding the way students deal with stress, they do fun things such as worship, sharing, playing games, and opening social media. The constant burdens and stressors faced by students in completing their thesis can result in disturbed sleep quality, difficulty concentrating, difficulty motivating oneself, and the emergence of feelings of anxiety, sadness, and physiological frustration, including health problems, decreased immune system, and disturbed sleep patterns. Therefore, this study aimed to determine the relationship between the use of gadgets and sleep quality in nursing students.

### **Materials and Methods**

This study used a quantitative method with a cross-sectional design. In this study, The research was done at the STIKes Karsa Husada Garut in June 2022. The number of samples in this study was 51, and this study used convenience sampling with inclusion criteria as follows: students have gadgets (Android or iOS), students use one of the available applications (games, YouTube, TikTok, etc.), and final-year nursing students. The exclusion criteria were that the respondents were not present at the time of the study.

### **Instruments**

This study used the PSQI (Pittsburgh Sleep Quality Index) questionnaire to measure sleep quality. It is consisting of 7 question components with a rating scale of 0-3 [18]. The subsequent inquiries pertain exclusively to respondents' typical sleep patterns within the preceding month. The responses reflect the most reliable answer for the majority of days and nights within the previous month. The possible range of points is from 0 to 21. Inadequate sleep is indicated by a high total score. In general, a PSQI total score above 5 is taken as indicative of poor sleep. Component 1 of the PSQI measures how satisfied you are with the quality of your sleep; Component 2 measures how long it takes you to fall asleep; Component 3 measures how long you actually sleep; Component 4 measures how efficient your sleep is on average; Component 5 measures sleep disturbances; Component 6 measures medication use for sleep; and Component 7 measures how impaired you are during the day. The first section examines general sleep quality over the past 30 days. The second part of the survey inquires about how long it took you to nod off the night before and how often you struggled to do so within 30 minutes. The third section inquires as to how many nighttime hours were logged in the last 30 days. Questions about the time of day they go to bed and wake up, as well as the total number of hours they slept each night, are asked in Component 4 of the survey. Component 5 probes for details about how often and under what circumstances you awake at odd times, whether you need to get up to take a shower, whether you have trouble breathing, whether you cough or snore loudly, whether you feel excessively cold or hot, whether you have nightmares, and so on. Component 6 inquires as to the frequency with which they have taken a sleeping aid within the past 30 days. Component 7 probes the extent to which they are fatigued during the day, asking if they have trouble staying awake while driving, eating, or engaging in social activities. Based on Setyowati and Chung, the Indonesian version of PSQI has high validity and reliability, with Cronbach's alpha for the PSQI-I was 0.72, and that for each item ranged from 0.69 to 0.72 [19].

Meanwhile, using gadgets questionnaire was adopted from the previous study [20] with Cronbach's alpha was 0.623.

**Data Analysis**

The data obtained were tabulated and edited. The data were then analysed univariately and bivariate. The univariate analysis aimed to describe the characteristics of the respondents (age and gender), the independent variable, namely the use of gadgets, and the dependent variable, namely sleep quality, were presented in the form of a percentage distribution. Meanwhile, the bivariate analysis aimed to see the relationship between the independent and dependent variables using chi-square. All the statistical analyses were carried out using SPSS 26 for Windows.

**Ethical consideration**

This investigation was carried out after receiving ethical approval from the Institutional Review Board of Universitas Bakti Tunas Husada (No.185/ec.01/kepk-bth/VI/2022). Participants were provided with information about the study, which included both risks and potential benefits. After completion of the informed consent form, questionnaires were distributed. During the data collection process, respondents have the option of refusing or withdrawing.

**Result and Discussion**

Based on the results, most respondents or specifically 41 respondents (80.4%) aged  $\geq 21$  years. In addition, 30 respondents (58.8%) are female. This is in line with a study by Umar, "The Relationship Between Use of Gadgets and Sleep Disorders in Medical Students of Mula-warman University," that the majority of subjects were female and aged  $< 21$  years [21].

Even though males have a tendency to express themselves online compared to females, females are also very expressive in expressing their opinions. In an era dominated by gadgets with a lot of expressions and opinions from their users, there will be more females who use gadgets than males. In addition, the results of the questionnaire obtained an average of respondents born in 1999-1996. Thus, there are many respondents aged  $\geq 21$  years compared to those aged  $< 21$  years.

In addition, STIKes Karsa Husada Garut as a nursing college is more in demand by females than males with an age range of  $\geq 21$  years old. This is in line with a study by Irfan, entitled "The Relationship Between Use of Gadgets and Sleep Quality of SMA Negeri 2 Majene Students," that of 100 respondents, 55 respondents often use gadgets, while 45 respondents rarely use gadgets [1].

Table 1. Characteristics of Respondents

Characteristic	F	%
<b>Age</b>		
< 21 years old	10	19.6%
$\geq 21$ years old	41	80.4%
<b>Gender</b>		
Male	21	41.2%
Female	30	58.8%
<b>Use of Gadgets</b>		
Rarely	24	47.1
Often	27	52.9
<b>Sleep Quality</b>		
Good	20	39.2%
Poor	31	60.8%

Gadget users are dominated by early adults or most of them are students. Gadgets are used to interact and share information between

friends. Respondents often use gadgets to find entertainment and other applications, to publish their activities and feelings because they

want to provide information to their friends about it. Frequent use of gadgets is also related to the activities they do. According to them, this will increase their presence in cyberspace. This

makes frequent use of gadgets by final year nursing students of STIKes Karsa Husada Garut.

Table 2. The Relationship Between Use of Gadgets and Sleep Quality on Final-Year Nursing Students

Use of Gadgets	Sleep Quality				Total	$\chi^2$	P Value
	Poor		Good				
	f	%	f	%			
Often	20	74.1%	7	25.9%	27	4.251	0.03
Rarely	11	45.8%	13	54.2%	24		
Total	31	60.8%	20	39.2%	51		

Based on Table 2, 20 respondents (74.1%) who often use gadgets had poor sleep quality, while 11 respondents (45.8%) who rarely use gadgets had good sleep quality. Therefore, there were more respondents who had poor sleep quality and often use gadgets than respondents who had good sleep quality and rarely used gadgets.

There is a relationship between the use of gadgets and sleep quality on final-year STIKes Karsa Husada Garut students in 2022 (p-value = 0.03). This is in line with a study by Jarmi & Rahayuningsih, "The Relationship Between Use of Gadgets and Sleep Quality of SMP Negeri 1 Banda Aceh students," that of 92 respondents, 49 respondents (53.3%) had poor sleep quality while 43 respondents (46.7%) had good sleep quality [22].

Students tend to still do activities before going to sleep such as watching television or playing cellphones to chat on other social media. The majority of them sleep from 23.00 or later than midnight and wake up at 05.00 in the morning. This will affect learning achievement, lack of concentration during learning, and sleepiness during class hours because they experience sleep disorders and have poor sleep quality.

Excessive use of gadgets will greatly affect sleep quality, resulting in poor sleep quality. Enthusiasm in using gadgets makes the respondents very exposed to light, while light is one of the factors affecting sleep. The average respondent starts sleeping at 10 to 12 pm and some even just start sleeping past midnight so it is often found that students fall asleep in class or are late due to sleeping too late and

continuing to sleep in the morning causing them to wake up late. If they are required to get up early they will feel tired and sleepy in class, whereas if they are required to study during the day they will continue to sleep and be active with gadgets again to communicate and seek entertainment, play games, or seek information about activities on campus.

Based on the results, most respondents or specifically 41 respondents (80.4%) aged  $\geq 21$  years. In addition, 30 respondents (58.8%) are female. Even though males tend to express themselves online compared to females, females are also very expressive in expressing their opinions. In an era dominated by gadgets with many expressions and opinions from their users, more females will use gadgets than males [23]. In addition, STIKes Karsa Husada Garut as a nursing college is more in demand by females than males with an age range of  $\geq 21$  years old. Similarly, Ahmad stated that gadget users are dominated by early adults or most of them are students, and gadgets are used to interact and share information with friends, respondents often use gadgets to find entertainment and other applications, to publish their activities and feelings, because they want to provide information to their friends about it and frequent use of gadgets is also related to the activities they do [24].

Based on the results, 20 respondents (74.1%) who often use gadgets had poor sleep quality. This is in line with a study by Irfan (2020), Teenagers' use of technology and their quality of sleep are significantly related [1]. Students continue to engage in activities such as viewing television or using their devices to

communicate on other social media before going to bed, and the majority of them fall asleep between midnight to dawn due to sleep disorders and poor sleep quality. This will have a negative impact on academic performance, lack of concentration during learning, and drowsiness during class hours [25,26].

Based on the results of analysis using chi-square, P Value =  $0.03 < 0.05$  meaning there is a relationship between the use of gadgets and sleep quality in nursing students. This is in line with the previous study [27] that stated that There is a relationship between behaviour and frequency of gadget use with sleep quality in Islamic Mosque adolescents [27]. The excessive use of electronic devices will significantly impair sleep quality, resulting in poor sleep quality, the respondents' enthusiasm for using electronic devices exposes them to a great deal of light, which is one of the factors affecting sleep and the average respondent begins sleeping between midnight to dawn so it is common for students to fall asleep in class or be tardy as a result of sleeping too late and continuing to sleep in the morning, which causes them to wake up late [28]. If they are required to get up early, they will be exhausted and drowsy in class, whereas if they are required to study during the day, they will continue to slumber and use their electronic devices to communicate, seek entertainment, play games, and research campus events [29].

## Conclusion

A correlation exists between the utilization of electronic devices and the quality of sleep among nursing students. A negative correlation can be interpreted as indicating an inverse relationship between the use of gadgets and sleep quality, such that an increase in gadget usage is associated with a decrease in sleep quality, and vice versa. The aforementioned factors are likely to exert a detrimental influence on academic achievement, as they encompass diminished focus during educational activities and increased somnolence during instructional periods.

## Limitations of The Study

The study has several limitations. First, the sample size is slightly small, perhaps, the results could not generalize of population. Further study needs a bigger sample size. Second, time using a gadget questionnaire is not a specific application. The questionnaire should talk about specific applications and benefits that might influence the results.

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