

## The Relationship between Gender, Smartphone Addiction, and Sleep Quality among High School Students at Adventist Schools in Jakarta

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### ABSTRACT

Smartphone addiction is one of the crucial problems that is happening among teenagers. This habit may lead to various problems such as lower sleep quality. Hence, this study aimed to investigate the relationship between smartphone addiction and sleep quality. This study applied quantitative analysis to investigate the correlation between gender, smartphone addiction, and sleep quality among 270 students in levels 10-12 from 8 Adventist High Schools in Jakarta. The study used simple random sampling technique. The study used the Pittsburgh Sleep Quality Index (PSQI) and the Smartphone Addiction Scale (SAS). Both descriptive and inferential analyses were performed using the SPSS statistical program. The hypotheses of the study were tested using Pearson correlation. The study found a correlation between high school students' sleep quality and smartphone addiction, as well as a higher rate of smartphone addiction among female students than male students. The study found that students' rates of smartphone addiction decreased with improved sleep quality. Addressing smartphone addiction and inadequate sleep is essential for raising high school students' academic achievement.

**KEYWORDS:** Smartphone addiction, sleep quality, high school student

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### I. INTRODUCTION

In the 21st century, communication technology advances rapidly. Wired and wireless internet connections have made it easy for people to connect, followed by the invention of applications on social media that can be accessed via cell phones. As technology advances, people can utilize mobile phones not just as a communication tool, but also as a smart or digital tool to access various things, including entertainment and games through an internet network known as smartphones (Staffing, 2023).

According to Mobile Network Subscriptions Worldwide 2028 | Statista," 2023, the number of smartphone users has increased dramatically; by 2022, more than 6.64 billion people, or 83.32% of the world's population, will have access to wireless phones and the internet. The Asia-Pacific region has seen a dramatic increase in smartphone usage, and experts predict this trend will continue until 2026. By 2022, there will be 326.3 million smartphone users in Southeast Asia, and experts expect that number to continue

to rise (Cheung, 2022). The widespread use of smartphones makes internet access easier and cheaper while traveling.

Furthermore, in Indonesia, it has been recorded that by 2023, 190 million people will be smartphone users, making Indonesia the fourth-most smartphone-using country in the world. In Indonesia, there is a significant correlation between smartphone ownership and the growth of mobile internet users. ("Indonesia: Smartphone Users 2028 | Statista," 2023)

Smartphone addiction is a behavioral problem characterized by individuals spending a significant proportion of time using their smartphones or having difficulty controlling their use, resulting in adverse impacts on their daily activities. Pew Research Center conducted a global survey to understand mobile phone usage habits and revealed that social activities such as texting, recording pictures or videos, and sharing content on social media were the most prevalent behaviors (Rosenberg & Rosenberg, 2024). Research links smartphone addiction (SA) to a range

## The Relationship between Gender, Smartphone Addiction, and Sleep Quality among High School Students at Adventist Schools in Jakarta

of health complications, including neurological, cognitive, and physical health problems. (Ratan, Parrish, Zaman, Alotaibi, & Hosseinzadeh, 2021)

According to a study conducted by Bhandari, Pandya, & Sharma (2021), 83.9% of the world's population uses smartphones. Age, neighborhood, discipline, use of hands-free devices, parental income, and education level were all considered. The study further revealed that 37% of individuals suffer from smartphone addiction. The researchers found a relationship between age, location, education level, number of years using smartphones, number of hours used daily, belief that using mobile phones is bad for health, and parental income and education level.

Excessive reliance on smartphones can lead to both physical and psychological negative effects, such as depression, disrupted sleeping habits, anxiety, difficulties in maintaining relationships, digital eye strain, neck problems, and car accidents caused by incorrect smartphone usage (Rathakrishnan et al., 2021).

Junco & Cotten (2012) stated that students who use social media regularly do worse academically and are less likely to participate in group projects. Additionally, a student's reliance on a mobile phone may reduce their drive to study, as the severity of their addiction negatively correlates with their ability to control their learning and achieve a state of concentrated absorption in the learning process.

Several studies have found that females are more likely to use problematic mobile phones than males (Chiu et al., 2013). However, there is also evidence suggesting that, among adolescent populations, males may spend more time utilizing smartphones than females. In other words, both genders are equally susceptible to experiencing problematic smartphone usage (Davey et al., 2018).

t Depression, lower work productivity, workplace accidents, and a general fall in the standard of living are all serious effects of poor sleep quality. Sleep quality is defined as feeling satisfied with the beginning, maintenance, quantity, and sensation of rejuvenation upon awakening from sleep. This is the definition of high-quality sleep (Rathakrishnan et al., 2021). If an individual can fall asleep in thirty minutes or less, sleep through the night without waking up, and, if woken, return to sleep in twenty minutes or less, experts regard their sleep to be of good quality (Cherry, 2023).

Adolescents in the 13–18 age range should sleep eight to 10 hours every night. This suggestion relates to how much sleep they ought to acquire. However, Echevarria et al. (2023) discovered that adolescents enrolled in secondary schools had restricted sleep duration.

Furthermore, high school students may experience sleep deprivation, which can have a negative impact on their mental and physical well-being (Uccella et al., 2023). Sleep is essential for developing mentally and physically. For

impulse control, decision-making, and academic achievement, getting enough sleep is crucial. Additionally, it can help kids kick their addiction to social media and stop them from using electronics in class for prolonged periods. Sleep enhances academic performance by fostering improved focus, memory, and attention (Mehta, 2022).

Wang, Chen, Yang, & Lin (2019) stated that students need to emphasize getting enough sleep and learn more healthy coping methods for handling stress because sleep loss leads to social media addiction. Students who get enough sleep are more likely to communicate with one another and participate in physical activities, which improves their concentration and involvement in the classroom.

Smartphone addiction can negatively impact learning, memory, focus, and decision-making, perhaps leading to lower academic performance. Research has shown that using a smartphone shortly before bed results in lower sleep quality, a longer wake-up time, and a longer period between sleep and awakening. (Kheirinejad, Visuri, Ferreira, & Hosio, 2022) Therefore, further investigation is necessary to ascertain the correlation between the quality of sleep and the academic achievement of high school students.

Hence, the purpose of this study is to collect empirical data, test two correlations, specifically the effect of gender on smartphone addiction behavior, and investigate the relationship between smartphone addiction and sleep quality among high school students attending Adventist schools in Jakarta. It is hoped that through this study, educational institutions will be able to make decisions and provide guidance for the treatment and prevention of smartphone addiction among high school students.

## II. METHODS

This study employs a quantitative research design that is based on survey research methodology. For this purpose, we collected answers from senior high school students on a self-administered questionnaire using Google Form. There were two tools utilized in this study; the Pittsburgh Sleep Quality Index (PSQI) and the Smart Phone Addiction Scale (SAS).

SAS has used this tool to investigate smartphone addiction (Kwon, Kim, Cho, & Yang, 2013). On this scale, the six factors were overuse, tolerance, withdrawal, positive anticipation, daily-life disturbance, and cyberspace-oriented relationships. Each factor had ten items, and the ratings were based on a four-point Likert scale (1 being strongly disagreed, 2 disagreed, 3 agree, 4 strongly agree). According to Buysse et al., the PSQI provided a valid, consistent, and reliable assessment of sleep quality by distinguishing between test takers who slept well and poorly. The seven components of the PSQI, each derived from 19 items, included subjective sleep quality, sleep latency, length, habitual sleep efficiency, sleep disruptions, use of sleep

## The Relationship between Gender, Smartphone Addiction, and Sleep Quality among High School Students at Adventist Schools in Jakarta

mediation, and daytime dysfunction. Every one of the seven elements had an equal weight on a scale from 0 to 3.

### III. RESULTS

According to Table 1, among the 270 respondents, 133 were female (49.3%) and 137 were male (50.7%). Based on Table 2, 50 respondents (18.5%) were 15 years old, 105 respondents (38.9%) were 16 years old, 79 respondents (29.3%) were 17 years old, 33 respondents (12.2%) were 18 years old, and 3 respondents (1.1%) were 19 years old.

**Table 1. Gender and Age of the Respondents**

	Frequency	Percent	Valid Percent	Cumulative Percent
<b>Gender</b>				
Male	133	49.3	49.3	49.3
Female	137	50.7	50.7	50.7
Total	270	100	100	
<b>Age</b>				
15	50	18.5	18.5	18.5
16	105	38.9	38.9	57.4
17	79	29.3	29.3	86.7
18	33	12.2	12.2	98.9
19	3	1.1	1.1	100.0
Total	270	100	100	

There were 12 respondents (4.4%) from Kramat Pulo Adventist High School, 15 respondents (5.5%) from Sukabumi Adventist High School, 27 respondents (10%) from Ciracas High School, 11 respondents (6.50%) from Bogor Adventist High School, 100 respondents (37.1%) from Salemba Adventist High School, 4 respondents (1.5%) from Bekasi Adventist High School, 24 respondents (8.9%) from Makarios Adventist High School, and 77 respondents (28.5%) from Dharma Putra Adventist High School.

**Table 2. PQSI and SAS Score of the Respondents**

	Frequency	Percent	Valid Percent	Cumulative Percent
<b>PQSI Interpretation</b>				
Good Sleep Quality	237	87.8	87.8	87.8
Poor Sleep Quality	33	12.2	12.2	100.0
Total	270	100	100	
<b>SAS Score</b>				
Not Addicted	129	47.8	47.8	47.8
Addicted	141	52.5	52.5	100
Total	270	100	100	

This study showed that most of the respondents have good sleep quality and only 12.2% of the respondents have poor sleep quality. On the other hand, more than half of the respondents are addicted to smartphones and less than half of the respondents were not addicted.

**Table 3. Gender and Smartphone Addiction**

		Smartphone Addiction			P-Value
		No Addictive	Addictive	Total	
<b>Gender</b>	Woman	Cou 56 % of 20,7% Total	Cou 77 % of 28,52% Total	133 49,26%	0.043
	Man	Cou 73 % of 27,03% Total	Cou 64 % of 23,70% Total	137 50,74%	
<b>Total</b>		Cou 129 % of 47,78% Total	Cou 141 % of 52,22% Total	270 100.0%	

**Table 3. Sleep Quality and Smartphone Addiction**

		Addiction to Smartphone			P-Value
		Not Addictive	Addictive	Total	
<b>Sleep Quality</b>	Good	Cou 120 % of 44,44% Total	Cou 117 % of 43,33% Total	237 87,78%	0.009
	Poor	Cou 9 % of 3,33% Total	Cou 24 % of 8,89% Total	33 12,22%	
<b>Total</b>		Cou 129 % of 47,78% Total	Cou 141 % of 52,22% Total	30 100.0%	

According to the output table 2, the Pearson Chi-Square test's Asymp. Sig. (2-sided) is 0.043. Because the value of Asymp. Sig. (2-sided) is 0.009 < 0.05, then based on the decision-making above, it can be concluded that there is a relationship between gender and the incidence of

## The Relationship between Gender, Smartphone Addiction, and Sleep Quality among High School Students at Adventist Schools in Jakarta

smartphone addiction among high school students of Adventist schools in Jakarta. We can also interpret this as indicating that females are more likely than males to develop smartphone addiction.

According to the output table above, the Pearson Chi-Square test's Asymp. Sig. (2-sided) is 0.009. Because the value of Asymp. Sig. (2-sided) value of  $0.009 < 0.05$ , then based based on the decision-making above, it can be concluded that there is a relationship between sleep quality and the incidence of smartphone addiction among high school students in Adventist schools in Jakarta. We can also interpret this as indicating a decrease in the rate of smartphone addiction among teenagers as their sleep quality improves.

### IV. DISCUSSION

The first objective of this study was to evaluate the relationship between gender and smartphone addiction among Adventist high school students in Jakarta. The results showed that females are more likely to experience mobile phone addiction than males. It has also been found in several studies that girls show higher levels of smartphone addiction compared to boys. Due to the increasing popularity of social apps, female users tend to have more online activities and allocate less time for face-to-face interaction (Wu & Chou, 2023). For this reason, schools need to design significant activities for female students so that the strong desire to use smartphones, especially during school time, can be diverted so that students, especially female students, can follow their education optimally.

The findings indicated a correlation between the quality of sleep and the prevalence of smartphone addiction among high school students at Adventist schools in Jakarta. This may also be seen as evidence of a decline in the prevalence of smartphone addiction among teenagers as their sleep quality improves.

Sleep quality is important for all individuals. Optimal sleep quality has a substantial influence on both physical and mental well-being. Nevertheless, a significant number of school students suffer from insufficient sleep as a result of their addiction to smartphones, leading to late nights and a decline in the quality of their sleep. Another similar study conducted in Makkah, Saudi Arabia, likewise revealed a correlation between smartphone addiction and poor sleep quality (Alahdal, Alsaedi, Garrni, & Alharbi, 2023).

The use of sophisticated gadgets, such as smartphones and other forms of media, has a significant impact on the pattern of sleep, eventually leading to a decline in overall health and disruption of daily routines. Moreover, several studies have indicated a correlation between the blue light emitted by smartphones and the quality of sleep. Silvani, Werder, & Perret (2022) found that the presence of blue light has the potential to impact sleep patterns.

Exposure to blue light during the night disrupts the body's circadian rhythm. This is due to the blue light from smartphones impeding the brain's ability to produce melatonin, a hormone that promotes sleep. Therefore, it can be inferred that the duration of time spent using screens has an impact on the quality of our sleep. Adolescents who utilize smartphone devices at night will experience diminished sleep quality (Alam, Abbas, Sharf, & Khan, 2024).

### V. CONCLUSIONS

This study showed that most of the students have good sleep quality and more than half of the respondents are addicted to smartphones. Further, there is a relationship between gender and the incidence of smartphone addiction among high school students of Adventist Schools in Jakarta. The results also showed that there is a relationship between sleep quality and the incidence of smartphone addiction among high school students in Adventist schools in Jakarta.

This research has important and beneficial implications for teachers, parents, and students. This study found that secondary school students in Adventist schools in Jakarta have significant levels of smartphone addiction, and female students have higher levels of smartphone addiction compared to male students.

Furthermore, this study also shows the relationship between smartphone addiction and students' sleep quality, where the quality of sleep for students is very important for students' health and the improvement of their cognitive abilities. Schools need to take concrete steps to help students overcome their smartphone addiction.

The results of this study will be useful for school policymakers to create regulations and activities that can help students overcome smartphone addiction so that they have good cognitive abilities during their secondary school education.

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## The Relationship between Gender, Smartphone Addiction, and Sleep Quality among High School Students at Adventist Schools in Jakarta

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**The Relationship between Gender, Smartphone Addiction, and Sleep Quality among High School Students at Adventist Schools in Jakarta**

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