



THE RELATIONSHIP BETWEEN SMARTPHONE USE AND ADOLESCENT SLEEP QUALITY AT MOJOAGUNG STATE SENIOR HIGH SCHOOL

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ABSTRACT

A factor substantially influencing the stability of Muslim faith is the rapid development of digital technology, which has led to an increase in smartphone use among young people. Analyzing the relationship between smartphone use and sleep quality is the primary objective of this study. This study was conducted at Mojoagung State Senior High School, which has high academic standards. Methods: This study used a cross-sectional design for its analysis. The study population was 315 adults from Mojoagung State Senior High School, with 76 respondents randomly selected using a sampling technique. The SASSV questionnaire was used to collect smartphone usage data. Sleep quality was assessed using the PSQI. The results and analysis showed that the majority of respondents (57.9%) were high-income smartphone users, and the majority (71.1%) reported poor sleep quality. With a correlation coefficient of 0.360, the Spearman's Rho test yielded a significance value of $p=0.001$. This indicates a relationship between smartphone use and sleep quality. Women's sleep quality is negatively affected by their increasing dependence on smartphones. Discussion: This study recommends specific smartphone usage strategies, including white noise masking and at least 60 minutes of social media use before bedtime, to prevent eyestrain. Furthermore, collaboration between schools and parents is essential to facilitate high-quality programs for students to address attention deficits and optimize academic performance.

Keywords: Smartphone, Sleep Quality, Adolescent

Introduction

In the era of globalization, technological advancements are occurring at a rapid pace. The advent of smartphones has greatly simplified daily life; however, excessive smartphone use can lead to adverse effects such as addiction and sleep disorders (Tantan Hadiansyah 2020). Smartphone usage continues to rise every year. With this rapid growth, Indonesia is projected to become the fourth-largest country in the world in terms of active smartphone users (Sembiring and Harahap 2021). The number of people using smartphones reached 3.2 billion in 2019, a 5.6% increase from the previous year. This market is enormous.

According to 2021 Susenas data, smartphone ownership among youth in East Java is notably high, reaching 91.75%. A 2022 survey in Jombang showed that users aged 13–18 had the highest percentage, at 99.16%. Based on a preliminary study conducted on November 10, 2025, at Mojoagung State High School, it was found that 8 out of 10 students used smartphones for extended periods (Sari, Handayani, and Herliana 2023).

Smartphone addiction has been shown to reduce students' sleep quality. Various engaging features often keep them awake until late at night. As a result, teenagers who use their smartphones for too long before bed take about an hour longer to fall asleep (Bitin 2023). Sleep disturbances are harmful to health because they can impair cognitive function and lead to behavioral changes. Sleep deprivation in adolescents can lead to difficulty concentrating and a decline in academic performance.

Light, sound, and notifications from smartphones provide excessive stimulation to the brain, making it difficult for a person to fall asleep. Prolonged smartphone use causes adolescents to tend to experience delayed sleep onset (Sutisna, Tohri 2024). To improve sleep quality, students should use smartphones wisely at night by avoiding screens that emit blue light, relaxing their minds, and keeping smartphones away from the bed (Permana 2024). This phenomenon serves as the basis for the researcher's desire to explore the topic further through a study titled "The Relationship Between Smartphone Use and Sleep Quality Among High School Students at Mojoagung State High School."

Methods

This study used a cross-sectional observational design to evaluate the relationship between the independent and dependent variables. Adolescent sleep quality was the dependent variable, measured using the PSQI questionnaire. Smartphone use was the independent variable, measured using the SAS-SV questionnaire. The study population consisted of 315 twelfth-grade students at

SMAN Mojoagung, with a sample of 76 students selected via random sampling. The criteria included adolescents who owned a smartphone and were able to communicate effectively.

The operational steps began with submitting a research recommendation letter to STIKES PEMKAB Jombang. The researcher provided an explanation to potential respondents, asked them to sign an informed consent form, and then have them fill out the questionnaire. Data processing techniques included editing, coding, scoring, processing using SPSS statistical software, cleaning, and tabulating. Meanwhile, bivariate analysis used the Spearman Rank correlation test to determine the relationship between smartphone usage and adolescents' sleep quality, while univariate analysis was used to generate an overview of the variables.

Research ethics were adhered to through the use of informed consent, anonymity, and confidentiality. In addition to providing snacks as an incentive to respondents, the researchers adhered to the principles of beneficence, justice, and respect for human dignity. The limitations of this study include the fact that the sample size was restricted to a single school, meaning that the findings may not be widely generalizable. Since this design cannot establish a cause-and-effect relationship, the relationships between variables are described only at a single point in time.

Results and Discussions

Research findings on the relationship between smartphone use and sleep quality among adolescents at Mojoagung State High School.

General Data

1. Respondent Characteristics by Gender at Mojoagung State High School

Gender	Frequency	Percentage %
Male	25	32,9%
Female	51	67,1%
Total	76	100%

2. Frequency Distribution of Respondents' Sleep Quality at Mojoagung State High School

Reasons For Use Smartphone	Frequency	Percentage%
Influence of advertising	0	0%
Advanced smartphone features	25	32,9%
Easy to access	28	36,8%
Affordable price	4	5,3%
Environmental influence	10	13,2%
Cultural trends / Fomo	9	11,8%
Total	76	100%

As shown in Table 1, the majority of respondents at Mojoagung State High School are female, totaling 51 students (67.1%). Table 2 shows that nearly half (32.9%) of the respondents

use smartphones because of their advanced features (25 students), while 36.8% (28 students) use smartphones because they are easy to access.

Specific Data

1. Frequency Distribution of Smartphone Use Among Adolescents at Mojoagung State High School

No	Smartphone Use	Frequency	Percentage %
1	Low dependence	15	19,7%
2	Moderate dependence	44	57,9%
3	Hight dependence	17	22,4%
Total		76	100%

2. Frequency Distribution of Respondents' Sleep Quality at Mojoagung State High School

No	Sleep Quality	Frequency	Percentage
1	Good	28	22,9%
2	Poor	54	71,1%
Total		76	100%

3. Cross-Tabulation and SPSS Analysis of the Relationship Between Smartphone Use and Sleep Quality Among Adolescents at Mojoagung State High School

Smartphone Use	Sleep Quality		Total	Uji Spearman Rank
	Good	Poor		
Low dependence	11 (45,8%)	13 (54,2%)	24 (100%)	P= 0,001 dan r=0,360
Moderate dependence	9 (32,1%)	19 (67,9%)	28 (100%)	
Hight dependence	4 (16,7%)	20 (83,3%)	24 (100%)	
Total	24 (31,6%)	52 (68,4%)	76 (100%)	

Most respondents (71.1%) experienced poor sleep quality, and 44 individuals in the moderate dependence category (57.9%) used smartphones, as shown in Table 2.

In the cross-tabulation in Table 3, it is evident that 20 individuals (83.3%) experienced a decline in sleep quality due to higher smartphone usage. The Spearman's rank correlation test yielded a correlation coefficient of $r=0.360$, indicating that the relationship between smartphone usage and adolescents' sleep quality is moderate.

The significance level of 0.05 is greater than the significance value of 0.001. Therefore, the hypothesis that there is a relationship between adolescents' smartphone use and their sleep quality is accepted. The direction of the relationship indicates a positive value, suggesting a positive correlation between the two variables. This means that adolescents' smartphone use has a negative correlation with their sleep quality.

Discussion

1. Smartphone Use Among Adolescents at Mojoagung State High School

Most respondents (57.9%) fell into the moderate dependence category, as shown in Table 1. This indicates that most 10th-grade students at Mojoagung State High School are beginning to lose control over how long they use their devices. Students tend to experience mild anxiety when away from their devices and begin to have difficulty focusing due to preoccupation with online activities. Smartphone use is increasingly popular due to advanced features and ease of access.

This aligns with the sleep displacement theory, where respondents tend to delay rest time for digital activities that disrupt the stability of nighttime sleep patterns. Device use at the moderate dependency level still triggers excessive brain arousal before sleep, thereby disrupting melatonin production due to screen light exposure. According to researchers, moderate dependency occurs because many tasks must be completed with the help of a smartphone. The advanced features offered make respondents prefer playing with their smartphones over getting sleep.

2. Sleep Quality Among High School Students at Mojoagung State High School

Table 2 shows that the majority of respondents (71.1%)—54 students—have poor sleep quality. Sleep quality reflects an individual's satisfaction and adequacy of rest.

Several factors that influence sleep quality include age, gender, daily activities, medical history, and lifestyle. This is consistent with the findings of the study, which showed that the majority of adolescents—48 individuals (60.8%)—had poor sleep quality.

In the researchers' opinion, the high rate of poor sleep quality indicates a failure to achieve optimal sleep quality. Insufficient nighttime rest is a negative consequence of high levels of activity before bedtime. Many adolescents spend their time playing games and watching movies late into the night, which cuts into their rest time. The researchers assess that this condition is highly concerning because poor sleep quality can reduce adolescents' focus when receiving information or learning in the morning.

3. The Relationship Between Smartphone Use and Sleep Quality Among Adolescents at Mojoagung State High School

Based on the results of the cross-tabulation in Table 3, it shows that the higher the smartphone usage, the poorer the adolescents' sleep quality (83.3%), involving 20 individuals. The Spearman Rank correlation test yielded a correlation coefficient of $r=0.360$, indicating a moderate relationship. The significance level was 0.001, so the hypothesis stating that there is a relationship between smartphone use and sleep quality in adolescents is accepted. The positive direction of the relationship indicates a direct correlation; the higher the smartphone use, the poorer the adolescents' sleep quality.

Interaction with smartphone content triggers emotional and cognitive responses that keep the brain on high alert. The Fear of Missing Out (FoMo) keeps individuals awake to check notifications. The effects of excessive smartphone use include insomnia, reduced alertness in the morning, and physical complaints such as headaches. This study aligns with findings showing a strong link between the intensity of smartphone use and the sleep quality of adolescents.

Researchers argue that smartphones are the primary factor disrupting the stability of adolescents' sleep patterns. Poor sleep quality is attributed to spending excessive time playing games, watching movies, or exchanging messages late into the night. Exposure to blue light and the intensity of social media at night disrupt the sleep-wake cycle, forcing the central nervous system to remain active when the body should be relaxing. This pattern confirms that the harder it is for adolescents to disconnect from their smartphones at night, the more difficult it becomes for them to achieve good sleep quality. Poor sleep quality can threaten their physical health as well as their academic concentration.

Conclusion

1. Most teenagers at Mojoagung State High School exhibit moderate smartphone dependence.
2. Most of them have poor sleep quality.
3. There is a moderate correlation between smartphone use and sleep quality, with higher smartphone dependence negatively correlated with poorer sleep quality.

Recommendations

Based on the above conclusions, the researchers propose several recommendations for relevant parties, starting with students: implement a "Digital Curfew" by stopping smartphone use 60 minutes before bedtime, activate the "Blue Light Filter" feature, and place the phone out of reach of the bed.

Parents are encouraged to establish a "Device-Free Zone" in the bedroom to ensure their children's restful sleep and to establish agreements on time limits for technology use within the family environment. Schools can also incorporate "Sleep Hygiene" education into Guidance and Counseling (BK) materials and display posters highlighting the importance of 8 hours of sleep for concentration and academic performance.

For future researchers, it is recommended to expand the number of respondents and investigate other factors to broaden the scope of the data. Additionally, it is hoped that future researchers will employ different research methods to yield more detailed results in explaining this phenomenon.

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