

The Relationship between Smartphone Addiction and Insomnia in Rural Adolescents

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Abstract-- One factor influencing insomnia in adolescents that relating to habits such as lifestyle. They use smartphones for a long time particularly to access social media, chatting, and playing games until late at night. This study aimed to determine the relationship between smartphone addiction and insomnia in adolescents. The research was descriptive correlational with a cross-sectional method. The sample in this research was identified using a purposive sampling technique with 103 samples with the following criteria: 1) 16 to 18 years old, 2) using a smartphone, and 3) able to communicate well. The independent variable in this study was smartphone addiction and the dependent variable was insomnia. The instruments of this research were smartphone addiction and the Kelompok Studi Psikiatri Biologi Jakarta insomnia rating scale (KSPBJ-IRS) questionnaire. This research undertook statistical analysis using the Spearman Rank test with a significance level $\alpha=0.05$. The results of the statistical test gave a p value=0.006, and the r value=0.267. There was a correlation between smartphone addiction with insomnia in adolescents. Moreover, the significant aspects of addiction were salience and relapse. Support from parents, counseling teachers and community nurses can help students reduce smartphone use especially during sleep and can manage sleep so that students can overcome insomnia.

Keywords-- Smartphone Addiction; Insomnia; Adolescent

I. INTRODUCTION

Insomnia is the most common and best-known sleep disorder because it can affect work, activity, and health [1]. Insomnia occurs at all ages including adolescence. Insomnia that occurs in adolescents can be caused by adolescent rest and sleep time being used to do other activities, such as: doing school work, watching television or playing online games and with gadgets [2]. The prevalence of insomnia in adolescence is high[3]. Yahoo research results and Mindshare in 2013 regarding smartphone usage in Indonesia showed that there are 41.3 million Indonesians who own smartphones and 39% of them are teenagers[4]. Research conducted by Adelina Haryono in 2009 on 140 students in Jakarta found a prevalence of sleep disorders of 62.9%, with wake-sleep transition disorders as the most common type of disorder (58%) [2]. Middle and high school students show a prevalence of sleep quality disorders varying from 15.3% up to 39.2% [5]. In addition, the National Sleep Foundation in 2020 stated that only 15% of adolescents reported sleeping 8 1/2 hours on

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school nights [6]. Moreover, the results of a preliminary study conducted by researchers with 80 students in class XI showed that more than 50% of 80 students were using smartphones all day up to night time before they sleep. Meanwhile, the KSPBJ insomnia rating scale questionnaire found that 66 of the 80 students using smartphones had insomnia.

Insomnia can be used as a sign that someone has psychological problems, a physical illness, or even because of lifestyle habits [7]. Insomnia that occurs in adolescents is influenced by several factors, both medical and non-medical [2]. The study of Moulin & Chung in 2017 concluded that 72% of adolescents who were still in high school and sleeping were sleeping with a smartphone or tablet placed on their beds, while 86% of student subjects also slept with their smartphone, tablets or laptops placed on their beds [8]. Moreover, the use of electronic media in adolescents is associated with sleep disorders and depression [9]. Another study found a relationship between smartphone addiction and sleep quality, depression and anxiety [10]. In addition, insomnia results in physical health problems including increased appetite which can lead to obesity, diabetes, heart disease, hypertension and immune system disorders [11]. Additionally, adolescents tend to have irregular sleep patterns across the week; they typically stay up late and sleep in late at the weekends, which can affect their biological clocks and hurt the quality of their sleep [6]. Adolescents with insomnia who experience psychological effects are not very good because the age of adolescence is an age that is still in the process of growing. The aim of this study was to identify smartphone addiction in adolescents, the level of insomnia in adolescents, and to analyze the relationship between smartphone addiction and insomnia in adolescents.

II. METHOD

- Study Design

The research involved a descriptive correlational cross-sectional approach to analyze the relationship between smartphone addiction and insomnia in adolescents.

- Sample and Setting

The sample in this study amounted to 103 adolescents who met the following criteria: 1) 16 to 18 years old, 2) using a smartphone, 3) willing to be a respondent, and 4) able to communicate well. The independent variable in this study was smartphone addiction and the dependent variable was insomnia.

- Instruments

The measuring tool used to measure the severity of smartphone addiction was modified from Nurdiani's 2015 research based on the addiction aspect from Griffiths [12]. Questionnaire questions consisted of 21 questions with 14 favorable items and 7 unfavorable items with the reliability test results having a Cronbach alpha value of 0.88. The interpretation of the results obtained was <42: Low, 42-63: Moderate,> 63: High. The higher the score obtained from the smartphone addiction scale, the higher the level of smartphone addiction in a subject and the lower the score obtained from the smartphone addiction scale, the lower the level of smartphone addiction in the subject.

The insomnia rating scale questionnaire used in this study was standardized by the Jakarta Biology Psychiatry Study Group (KSPBJ). This questionnaire has been tested and has a reliability coefficient of 0.83 and validity of 0.89. Interpretation of the results to be obtained was as follows: score 11-19 = no complaints of insomnia, score 20-27 = mild insomnia, score 28-36 = severe insomnia, score 37-44 = insomnia is very severe.

- Data Analysis

The research data were processed and tested with statistical tests using a Computerized Spearman rank correlation test and the Statistical Product and Service Solution (SPSS) program version 17.0 with a significance level of $\alpha = 0.05$.

- Ethical Considerations

The study procedures were reviewed and approved by the Ethics Committees on June 24th, 2016 with approval number 167-KEPK. Participants were given information and filled in informed consent before the study.

III. RESULT

Table 1. Distribution of the demographic characteristics of the respondents (n=103)

Demographic Characteristics	Category	n
Gender	Male	32
	Female	71
Age	16 years	30
	17 years	65
	18 years	8
Using time of smartphone in a day	< 1 hour	0
	1-6 hour	62
	7-12 hour	22
	>12 hour	19
Applications that are often used	Chatting	70
	Social Media	81
	Games	50
	Browsing	58
	Message	69
The state and position of the smartphone during sleep habits and lifestyle	The smartphone is not silent	40
	The position of the smartphone is next to the respondent	85
	Taking caffeine before bed	26
	Taking medicine (Last 1 week)	5
	Daily exercise regularly	21
Bedtime habits	Smoking	8
	Watching TV	73
	Using a smartphone	77
	Using a laptop / computer	5
The environment in the house	Noisy	9
	No ventilation	0
	Hot	28
	There is a TV in the bedroom / near the bedroom	62

Table 1 above shows that the sample of this study tended to be dominated by the female sex with 71 students (68.9%). Most respondents were 17 years of age (63.1%). Most students (60%) used smartphones for 1-6 hours and no students used smartphones <1 hour. Applications that were often used were social media (78.6%) and chat (67.9%). Most students (82.5%) had their smartphone next to them while sleeping. A total of 26 students (25.2%) consumed caffeine before going to sleep. The most common bedtime habit practiced by respondents (74.7%) was using a smartphone before they went to sleep. All respondents lived in rural areas and none of the respondents lived in urban areas. Most respondents (60%) had a TV in their bedroom / TV adjacent to the bedroom.

Table 2. Smartphone addiction level and level of insomnia

Variable	Level	n	%
Smartphone addiction	Low	3	2.9%
	Moderate	91	88.4%
	High	9	8.7%
	Total	103	100%
Insomnia	No complaint	10	9.7%
	Mild	80	77.7%
	Severe	13	12.6%
	Very Severe	0	0%
	Total	103	100%

Table 2 shows that the majority of respondents (88.4%) were at the level of moderate smartphone addiction and 77.7% of respondents had mild insomnia.

Table 3. Aspects of smartphone addiction

Addiction aspect	%
Salience	20.2%
Mood modification	15.3%
Tolerance	17.4%
Withdrawal	16.4%
Conflict	12%
Relapse	18.7%
Total	100%

Table 3 shows that salience was the highest aspect of addiction (20.2% of respondents).

Table 4. Relationship of smartphone addiction with insomnia

Insomnia	Smartphone addiction						Total	
	Low		Moderate		High			
	n	%	n	%	n	%	n	%
No symptoms	0	0%	10	9.7%	0	0%	10	0%
Mild	2	1.9%	73	70.9%	5	4.8%	80	0%
Severe	1	0.9%	8	7.7%	4	3.9%	13	0%
Total	0	0%	0	0%	0	0%	0	0%
	3	2.9%	91	88.3%	9	8.7%	103	0%
Spearman rank test		p=0,006		r= 0,267				

Table 4 shows that 73 students (70.9%) had low smartphone addiction and mild insomnia. In addition, a high smartphone addiction rate indicated a mild insomnia level (4.8%) and a severe insomnia level in 4 students (3.9%). Spearman rank statistical test results obtained a degree of significance of $p=0.006$. This shows that there is a relationship between smartphone addiction and insomnia in teens in high school.

IV. DISCUSSION

The results showed that there was a relationship between smartphone addiction and insomnia in adolescents. This is in accordance with the study that one of the factors causing insomnia in adolescents is access to social media on the internet through cellular phones which can affect the quality of teenage sleep [13][14]. There were some results showing that respondents who experienced moderate smartphone addiction did not experience insomnia and vice versa, respondents who experienced low smartphone addiction experienced severe insomnia. This is due to several factors, such

as consuming caffeine, watching TV before going to bed, having a hot, noisy sleeping room and there being a TV in the room / bedroom near the TV [15][16]

The use of smartphones for stress coping due to academic factors can lead to excessive and uncontrolled use of smartphones. The use of smartphones in teenagers continuously without control for a long time will result in smartphone addiction. The school schedule of respondents in this study from 7am to 2pm was added to the tasks to be done at home, which made them saturated and vent it using a smartphone [17].

One of the effects of smartphone use is disturbed sleep, because with 24-hour internet service the smartphone can vibrate or ring at any time. When there are short messages or notifications coming in at any time, users will play their smartphone, including when already in bed. As described in Table 1, most of the respondents 74.7% used smartphones before going to sleep and 82.5% of respondents said they kept their smartphones near them while sleeping.

The circadian rhythm is very sensitive to light; light that is present during sleep will inhibit and reduce the production of the hormone melatonin. Melatonin hormones play a role in the sleep process and the quality of one's sleep. So, for those with a smartphone addiction who keep their smartphones near them even when they are asleep, when the smartphone turns on whenever there is an incoming message, the body is forced to continue activities until late at night and light is emitted by the smartphone screen which will inhibit the cyclic mechanism, so that the production of the hormone melatonin in the body will be disrupted. If the production of the hormone melatonin in the body is disrupted, the process and quality of sleep will also be disrupted; this will cause sleep disturbances [18].

The results of this study indicate that there is a relationship between smartphone addiction and insomnia in adolescents. Based on these results, they consider smartphones to be the most important thing for them and they cannot control the use of smartphones. This situation causes smartphone addiction and makes them always keep their smartphones near them even while sleeping; light from the smartphone screen can disrupt sleep and result in insomnia.

V. CONCLUSION

Based on the results of the study, it can be concluded that there was a relationship between smartphone addiction and insomnia in adolescents. The smartphone addiction in this study was mostly at the level of moderate addiction with the highest values relating to salience and relapse, while the level of insomnia in this study was mostly at the level of mild insomnia.

CONFLICT OF INTEREST

The author(s) declared no conflict interest.

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