

Relationship Between Smartphone Addictions with Sleep Quality in Adolescents

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Abstract: The purpose of this study was to determine the relationship between Smartphone addiction and sleep quality in adolescents. This research is quantitative research with a correlation approach using data collection techniques in the form of a Smartphone addiction scale and sleeps quality scale. Research subjects amounted to 75 of the total population of 300 students at High School of Al Falah Ketintang in Surabaya. The sampling technique of this study uses a random sampling technique. For technical data analysis used the non-parametric analysis technique, namely spearman rho analysis. The results showed that the correlation value $p = 0.001 < 0.05$ means that H_a is accepted. The correlation coefficient between two variables is -0.372 . This result means that there is a relationship between Smartphone addiction and sleep quality in adolescents. Based on these results it can also be understood that the correlation is negative, thus indicating a reversed relationship, meaning that the higher the Smartphone addiction, the lower the quality of sleep in adolescents.

1 INTRODUCTION

Humans use a third of the time in life to sleep. Data from sleeping polls in America by the National Sleep Foundation found that women were more likely to experience sleep disorders than men, which was 63%: 54%. This is thought to be because women have a higher risk of experiencing puberty-related fatigue, a higher prevalence of mental disorders and are more sensitive to family problems, and high demands on family and social life (National Sleep Foundation, 2007). The American Academy of Pediatrics, an institution that handles the problem of students and adolescents in America, states that school-age adolescents need adequate sleep. Based on various studies, adolescents who lack sleep will experience a variety of negative things including being prone to accidents, physical health problems, memory disorders and learning, at high risk of obesity and mental health problems (Huda, 2016).

Hidayat (2014) states that many factors cause adolescents to experience sleep disorders, including lifestyle changes, one of which is the use of gadgets, especially Smartphone. The current existence of Smartphone seems to be a major need for everyone. According to the kominfo.go.id website, Indonesia's population of 250 million is a large market. Indonesian Smartphone users are also growing

rapidly. Digital marketing research institute, e-Marketer estimates that in 2018 the number of active Smartphone users will be in Indonesia is more than 100 million people. With this number, Indonesia will become the fourth largest Smartphone active country in the world after China, India and America.

In line with the information obtained from the communication site, the techniasia.com site also released the same news. A new report from e-Marketer states that there will be two billion active smartphone users worldwide in 2016. Indonesia is one of the countries that has the biggest growth, under China and India. These three countries will collectively add more than 400 million new smartphone users from 2014 to 2018. The following is a diagram of smartphone users in Indonesia and around the world according to techniasia.com site:



Figure 1 Active Smartphone Users in Indonesia (Source: <https://id.techniasia.com>)

When viewed from the diagram above, smartphone users active in Indonesia in 2018 are predicted to be more than 100 million users. Strong smartphone penetration in Indonesia is a good sign for e-commerce growth, which is mostly accessed through gadgets. Based on reports, Indonesia will surpass Brazil - another developing country that also has a large population demography at a young age - in terms of smartphones in the next few years. Both countries have similar numbers for now, but Indonesia is accelerating beyond Brazil starting next year and so on. While active smartphone users around the world are predicted to reach nearly 2.6 billion users in 2018 (the diagram description is below).

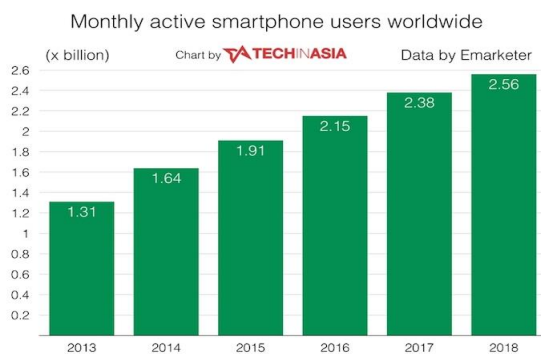


Figure 1.2 Active Smartphone Users in the World (Source: <https://id.technasia.com>)

With the acquisition of the data above and the function of the smartphone which is now not just used to exchange messages, it is possible to further "bind" users to continue playing with their smartphones so that they become addicted.

Reporting from the Daily Mail, the chairman of the study, Professor James Roberts, explained that Smartphone addiction will be more realistic in the future. The survey involved 164 teenagers in high school. They were asked about how long it took to use a Smartphone and its application. As many as 60 percent of teenagers answered that an average of 10 hours of them play with cell phones, which has entered the level of addiction. Overall, the teens spent most of their time chatting with an average of 94.6 minutes per day. In addition, they spent 48 minutes using e-mail, 38.6 minutes of social media, and listening to music 26.9 percent (<http://m.viva.co.id/gayahidup/kuliner/534014-studi-60-persen-remaja-kecanduan-ponsel>).

In addition, in a study of nearly 1,000 students in South Korea, around 25% of students entered the cell phone addiction category. This result is in line with the fact that 72% of children in South Korea, aged 11-12, have cell phones and spend 5.4 hours fiddling with their smart phone devices

(http://www.bbc.com/indonesia/majalah/2015/09/150907_majalah_kecanduan_ponsel).

As stated by researchers from Harvard T H Chan School of Public Health and quoted from the Times of India, in the study, found that teenagers who spent more than five hours a day to play mobile phone, has a 43 percent higher risk for obesity. This is obtained when compared to teenagers who use cell phones less than that time. They also found that teens whom spend more time playing cell phones are twice as likely to over-consume sweet drinks and experience sleep disorders. These teenagers also become more reluctant to engage in physical activity (<http://health.detik.com/read/2016/12/19/102635/3374732/1301/>). White et al (2010) conducted a study with the subject of psychology students with various tribes and concluded that some aspects of cell phone use, such as addiction to send messages and problems in cell phone use are related to sleep quality, but not related to length of sleep.

With the description above and based on preliminary data in the form of questionnaires distributed to 20 students of High School randomly at Al-Falah Ketintang Surabaya to students of class X-XII, it was found that every single student has at least more than two social media accounts in their smartphone. Not only that, on average they use their smartphones every day between 3-6 hours. There are even some of them who use their smartphones more than 6 hours. On average they also use smartphones not only to socialize the media, but also to play games, listen to music and read news.

Based on the results of the questionnaires obtained, on average they slept at night above nine o'clock at night, and some even slept before one o'clock in the morning. They just woke up around five o'clock in the morning and there were also those who just woke up at seven in the morning, even though the delay in entering senior high school at Al-Falah Ketintang Surabaya was 06.50 WIB. Not only that, some of them also immediately check their smartphones when they wake up in the morning and use them for 6-30 minutes.

Based on the phenomena and various related studies described above, the researcher considers it important to conduct deeper research on the relationship of smartphone addiction to sleep quality at Al-Falah Ketintang High School Surabaya.

Problem Formulation

Based on the background described above, the formulation of the problem proposed in this study is, "is there a relationship between Smartphone addiction and sleep quality in adolescents?"

Research Objectives

From the formulation of the problem proposed, the purpose of this study is to determine the relationship between Smartphone addictions and sleep quality in adolescents.

Research Objectives

The expected objectives of this research are as follows:

1. Theoretically

The results of this study can provide new information, insights and knowledge that can enrich scientific knowledge, especially in the field of clinical psychology about how Smartphone addiction can affect sleep quality in adolescents.

2. Practically

The results of this study are expected to provide benefits for:

- a. For adolescents, this research is expected to be useful as a material consideration to be wiser in using gadgets, especially Smartphone, so as not to interfere with daily activities, especially sleep patterns that can adversely affect sleep quality.
- b. For further researchers, it is hoped that this research can be useful as a consideration for researching the same things in subsequent studies. Both in terms of variables, research methods, to the subject used.

2 METHOD

The type of research used in this study is quantitative research, while the approach used is a correlational approach.

While the variables in this study are:

- a. Independent variable (X) = Smartphone addiction
- b. Dependent variable (Y) = Sleep Quality

The population in this study is active students at Al Falah Ketintang Surabaya High School 2015-2017 with a total of 300 students. Sampling in this study uses the formula from Slovin for an error rate of 10%. Restated by Prasetyo (2006) are as follows:

$$n = \frac{N}{1 + N(e)^2}$$

- n : Sample size
- N : Population size
- e : Critical value (accuracy limit) is desired (percent looseness of inaccuracy due to sampling error) that is equal to 10% with a confidence level of 90%

$$n = \frac{300}{1 + 300(0.1)^2} = 75$$

Based on the results of the calculations above, the sample used in this study amounted to 75 students who attended the Al Falah Ketintang High School Surabaya. Sampling in this study uses simple random sampling technique.

In this study, researchers used non-parametric data analysis techniques with spearman rho correlation test. This is done to determine the relationship between two variables, namely Smartphone addiction variable as an independent variable and sleep quality variable as dependent variable. While the non parametric data analysis technique was chosen because the scale used in this study were of two types. The Smartphone addiction scale uses interval scale and sleep quality scale (PSQI) using ordinal scale. Because the analysis test uses non-parametric statistics, it is not necessary to test the normality or linearity of data as well as using parametric statistical tests.

3 RESULT AND DISCUSSION

The relationship between Smartphone addiction and sleep quality can be known after testing the hypothesis through the Spearman rho correlation test with the help of SPSS (Statistical Package for the Social Sciences) program for windows version 16.00. The Spearman rho correlation test results are as follows:

Table 1 Spearman rho Correlation Test Results

Correlations				
			Smartphone addiction	Sleep Quality
Spearman's rho	Addicted Smartphone	Correlation Coefficient	1.000	-.372**
		Sig. (2-tailed)	.	.001
		N	75	75
	Sleep Quality	Correlation Coefficient	-.372**	1.000
		Sig. (2-tailed)	.001	.
		N	75	75

** Correlation is significant at the 0.01 level (2-tailed).

Based on the Spearman rho correlation test obtained a significance level of 0.001, which is much smaller than 0.05 (0.001 < 0.05), that means a hypothesis which states that there is a negative

relationship between Smartphone addiction and sleep quality in adolescents.

The minus sign on the correlation score shows a negative relationship (-0.372) which can be assumed that the higher the Smartphone addiction score, the lower the score of sleep quality, and vice versa, if the lower the Smartphone addiction score, the higher the sleep quality score.

This is in accordance with what was stated by Widuri (2010), that one of the things that affects the quality of sleep is anxiety, where anxiety and dependence can continue to increase every day due to the continuous use of Smartphone and increased nightly vigilance (waking up several times) of course it can cause sleep problems.

In line with the results of research conducted by Cleland & Holly (2016) that the higher use of social media via Smartphone will result in decreased sleep quality, low self esteem and increased anxiety and depression. This clearly affects the level of individual welfare.

Not only that, the study of Moulin & Chung (2017) concluded that 72% of teenagers who were still in high school and sleeping were sleeping with Smartphone or tablets placed on their beds. While 86% of student subjects also slept with their Smartphone, tablets and laptops placed on their beds. There are even some of them who claim that they occasionally wake up to access and respond to messages that enter their wireless devices. This of course can indicate unhealthy sleep habits that can give birth to generations of individuals with decreased sleep duration.

According to Hidayat (2009), individuals in their teens or students in high school need to sleep at least 8-9 hours a day. But from the results of the questionnaire that the researchers got, it was found that the average subject of sleep every day ranged no more than 8 hours. There are even some subjects who sleep only about 4-5 hours every day.

Students who receive a normal night's sleep show much better academic performance compared to their sleep-deprived colleagues (Caldwell, 2002, in White et al, 2010). In addition to experiencing a decrease in the amount of sleep, research also reveals that students experience poor sleep quality (Lund et al, 2009). Students who obtain low sleep quality not only suffer academically, but also physically and emotionally (Lund et al, 2009).

This is consistent with the results of research conducted by Tonetti et al (2015), where sleep quality is the strongest factor influencing students' academic achievement in school other than sleep time and sleep duration.

In addition, most Smartphone addicts are people with low self-esteem, who have problems with developing social relationships and feel the urge to continue to connect and connect with others. They can become very upset when they lose their Smartphone, and when turning off the Smartphone can cause anxiety, irritability, sleep disturbances or sleeplessness, and even shivering and digestive problems (Young & Cristian, 2011). This is as stated by Agusta (2016) that one of the factors causing someone to be addicted to a Smartphone is the level of self-esteem or low self-esteem.

From the results of the SPSS output table, the effective contribution of this study is 0.138 (r^2), where the value of r is (-0.372) 2 so that it produces a value of 0.138. This means that Smartphone addiction has an effect of 13% on sleep quality, the rest of sleep quality can be influenced by other factors, as stated by Hidayat (2009), namely there are factors such as illness, fatigue, psychological stress, environment, and motivation. Psychological stress referred to by Hidayat (2009) is a psychological condition that can occur to a person due to mental tension. This is seen when someone who has psychological problems experience anxiety so it is difficult to sleep. From the results of the questionnaires given, there were some students or subjects who claimed to have anxiety (disturbed) at night which caused them difficulty sleeping. One of the causes of their anxiety is anxiety because the next day will undergo an exam and other causes.

Data Description Based on Gender Respondents:

Table 2 Data Description Based on Gender Respondents

	Gender	Frequency	Mean	Std Dev
Smartphone addiction	Male	39	101.05	13.864
	Female	36	105.86	20.378
Sleep Quality	Male	39	11.18	1.958
	Female	36	11.39	2.101

From the demographic data based on sex, it can be seen that the highest average value of Smartphone addiction variable is the female gender with a mean value of 105.86. While the lowest average value is in respondents with male gender with a mean value is 101.05. This is consistent with the results of research obtained by Mok et al (2014) that gender (sex) also plays a role in influencing Smartphone addiction rates where women tend to score higher for Smartphone addiction compared to men. In contrast to the level of internet use, where men are more likely to be easily addicted compared to women.

This is consistent with the results of research conducted by Joiner et al (2005), where men have a higher score in internet use compared to women. They use the internet to open online game websites and download various things through the internet.

Not only that, according to the results of research conducted by Roberts et al (2014) shows that female subjects spend longer in using their Smartphone compared to men. Female subjects are reported to be able to use their Smartphone for about 600 minutes every day, while male subjects use their Smartphone around 458.5 minutes every day.

In line with the results of research conducted by Choi et al (2015), where research conducted in South Korea shows that most subjects at risk of Smartphone addiction are female subjects compared to male subjects. This can occur due to internet activities for women, such as chatting, blogging, or using a messenger system easier through a Smartphone because of its much easier usage. Conversely, for male subjects, they usually do not use Smartphone for internet activities such as online games because the gaming capabilities of Smartphone are lower than using computers.

Table 3 Description of Data by Age of Respondents

	Age s	Frequenc y	Mean	Std Dev
Smartphone addiction	15	25	103.96	12.892
	16	35	107.37	15.780
Sleep Quality	17	15	101.27	12.674
	15	25	18.20	23.404
	16	35	10.86	2.074
	17	15	11.80	2.145

Furthermore, from the data description data based on age, it can be seen that the highest average value of Smartphone addiction variable is among respondents with ages 15 and 16 years with mean values of 103.96 and 107.37 respectively compared to respondents aged 17 years. This is consistent with the results of research conducted by Haug et al (2015), where respondents aged 15 and 16 years had higher scores in Smartphone addiction compared to respondents with older age (17-21 years).

Based on the table 4, it can be concluded that the number of subjects studied were 75 respondents, both from the scale of Smartphone addiction and from the sleep quality scale. The Smartphone addiction scale has a range of 72, the lowest score is 71 and the highest score is 143 with an average value of 104.9867, a standard deviation of 14.28522 and a variant of 204.067.

Table 4 Statistical Description

	N	Range	Min	Max	Mean	Std. Dev	Var
Smartphone addiction	75	72.00	71.00	143.00	104.9867	14.28522	204.067
Sleep Quality	75	8.00	7.00	15.00	11.2267	2.07673	4.313
Valid N (listwise)	75						

As for the sleep quality scale has a range of scores (range) of 8, the lowest score of 7 and the highest score of 15 with an average value (mean) of 11.2267, the standard deviation value of 2.07673 and the variance value of 4.313.

Meanwhile, the empirical mean value of Smartphone addiction variable is 104.9867 while the theoretical mean value is 80, this indicates that the level of Smartphone addiction in the subject at Al Falah Ketintang Surabaya High School can be said to be very high ($104.9867 > 80$).

Whereas for the empirical mean value on the variable sleep quality of 11.2267 and the theoretical mean value of 10.5, this indicates that the level of quality of sleep in the subject can be said to be not too bad, although the empirical mean value is slightly higher than the theoretical mean value ($11.2267 > 10.5$).

According to research conducted by Chen et al (2016), the results show that when compared to non-addicted Smartphone subjects, Smartphone addicts can spend more money and time on their Smartphone. In addition there is a significant relationship between negative emotions and subjects who are addicted to Smartphone. Negative emotions are meant such as depression, social anxiety, and loneliness. The results of the questionnaire also indicate that the subjects at Al Falah Ketintang High School spend more time in using Smartphone than doing other activities such as interacting directly with individuals in their environment.

As with the results of research conducted by Lee & Lee (2017), it can be concluded that students are increasingly tied to parents, friends and teachers, the lower their level of addiction to Smartphone. However, in the subject at Al Falah Ketintang High School Surabaya, the majority of them were many who did not have time with parents because of their parents' busyness at work (this is what researchers get from the statements of the teachers at Al Falah Ketintang High School). In addition, from the results of Lee & Lee's research, it was also found that if the

motivations for using Smartphone were higher, it would be followed by an increase in the tendency of addiction to Smartphone. Associated with the demands of real interaction in the family which is increasingly difficult to obtain by the subject at Al Falah Ketintang High School, it is most likely to get a sense of attention they turn to social media on their Smartphone.

4 CONCLUSION

Based on the results of the study it can be concluded that there is a relationship between Smartphone addiction and sleep quality in adolescents of Al Falah Ketintang Surabaya High School students, where the correlation value is negative which means that the higher the Smartphone addiction, the lower the quality of sleep, and vice versa.

Suggestions

1. For teenagers

It is expected that for adolescents, both adolescents who are in junior high or high school can better control themselves in using a Smartphone as a facility provided by parents. It is better if the Smartphone that is owned can be used properly for the sake of school or entertainment as needed, not just used for things that are not important, especially to disrupt academic achievement and cause health problems.

2. For Parents

It is hoped that parents will be more in control of children's activities in using Smartphone. It's good if parents make their own rules for children in using a Smartphone. Provide an explanation of what benefits a Smartphone can also do so that children do not abuse what parents have entrusted to them.

3. For Further Researchers

The next researcher is expected to be able to look more closely at the phenomena regarding Smartphone addiction and better sleep quality so that the results of further research can be an additional reference for research with related topics. Also for further researchers to look at other factors that influence sleep quality, such as illness, environment, drugs and motivation.

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