POOR SLEEP QUALITY DIFFERENCES AMONG ADOLESCENTS WITH SMARTPHONE ADDICTION COMPARED TO THOSE WITHOUT

By Irwina Angelia Silvanasari

Jurnal Kesehatan dr. Soebandi

POOR SLEEP QUALITY DIFFERENCES AMONG ADOLESCENTS WITH SMARTPHONE ADDICTION COMPARED TO THOSE WITHOUT

Introduction

In recent years, there is a massive increase in the use of smartphones not only in developed countries but also in developing countries (Lian et al., 2016). Indonesia, as one of the developing countries, ranked fourth in the world where the population is actively using a smartphone, after China, India, and America (Rahmayani, 2015). An adolescent aggregate is an age group that uses a smartphone on a daily basis. A high number of smartphone addiction was also reported among this age group (Yen et al., 2009).

One of the negative effects of smartphone addiction is poor sleep quality (Demirci et al., 2015). A previous study found that the frequent use of a smartphone is a risk factor for sleeping disorder (Thomée et al., 2011). Moreover, the excessive use of the smartphone has a negative effect on adolescents' sleep patterns, which will also affect their sleep quality (Akçay & Akçay, 2018).

Sleeping is one of the basic human necessity on a daily basis. Fulfilling the need for adequate sleep is directly related to the achievement of better physical, psychological, and cognitive well-being in individuals (Crivello et al., 2019). The necessity of sleep in adolescents is an essential requirement to support learning, memory processes, and achievement in school (Dewald et al., 2010). Consequently, the impact of poor sleep quality in adolescents is potentially associated with poor academic performance at school (Short et al., 2013).

Previous researchers have conducted a preliminary study on ten randomised secondary school adolescents in Jember. The preliminary study found that some adolescents had difficulties falling asleep at night. Also, some adolescents said that they were often sleepy and found it hard to focus on the teachers when participating in learning activities at school. Moreover, most of them also admit that they own a smartphone and frequently use their smartphone before going to sleep.

There is growing evidence related to smartphone addiction and adolescent's sleep quality, but most of the studies only discussed the relations between smartphone addiction and adolescents' sleep quality. A previous study has yet discussed whether adolescents with addiction scored higher poor sleep quality compared to their peers without addiction. This study aims to analyse the poor sleep quality score differences between adolescents with smartphone addiction compare to those without.

Method

This is a quantitative study using analytical observational design with a cross-sectional approach. The researchers measured smartphone addiction and poor sleep quality in adolescents at the same time. This study was conducted on July 2020. This study was conducted at Jenggawah Junior High School, Jember, Jawa Timur Province. The target population of this study was 280 adolescents in the 7th grade of secondary school. A total of 165 participants were recruited in the study, calculated using the Slovin formula (d=5%). A purposive sampling technique was performed as the sampling method. The inclusion criteria are adolescents who own a smartphone, adolescents with poor sleep quality indicated by PSQI score > 5, and willing to participate in this study. The exclusion criteria are adolescents who were sick at the time of the study.

The instruments in this study include an instrument to measure sleep quality– Pittsburgh Sleep Quality Index (PSQI) (Buysse et al., 1989), and an instrument to measure smartphone addiction– Smartphone Addiction Scale: Short Version (SAS-SV) (Kwon et al.,

2013). The SAS-SV instrument consist of 10 statements covering 5 indicators, including daily life disturbances, withdrawals, cyberspace-oriented relationship, overuse, and tolerance. The PSQI instrument consist 7 sleep quality indicators including subjective sleep quality, sleep latency, sleep duration, sleep habits efficiency, sleep disturbances, use of sleeping pills, and disturbances or complaints when awakening.

The data collection process using both instruments was carried out online. The statistical analysis performed was the Mann Whitney test. The research ethics committee form KEPK Stikes dr. Soebandi has approved the current study with approval number 51/SDS/KEPK/TL/VI/2020 on June 2nd, 2020.

Result

The results of this study consist of both general and specific data, recap on the following tables.

Table 1
Participants' characteristics distribution: gender

Gender	Frequency	Percentage (%)
Male	80	48,5
female	85	51,5
Total	165	100.0

Table 1 shows that the female accounted for most of the participants, with a total of 85 respondents (51,5%).

Table 2
Participants' characteristics distribution: age and period of smartphone ownership

Characteristics	Mean	SD	Minimum-Maximum
Age (year)	13,52	0,631	12-15
Time of smartphone ownership (years)	2,48	1,603	1-8

Table 2 shows that the participants' age was, on average, 13.52 years with a standard deviation of 0,631. The oldest was 15-year-old, and the youngest was 12-year-old. On average, participants own their smartphone for 2,48 years with a standard deviation of 1,603. The maximum period of owning a smartphone was eight years, and the shortest period of the smartphone ownership was one year.

Table 3
Data identification: smartphone addiction

Smartphone addiction	Frequency	Percentage (%)
Not addicted	53	32,1
Addicted	112	67,9
Total	165	100.0

Table 3 shows that the highest percentage was on the participants who were addicted to smartphones; 112 participants (67,9%).

3

Jurnal Kesehatan dr. Soebandi Vol. X, No. X   X

Jurnal Kesehatan dr. Soebandi

Table 4

Data identification: poor sleep quality

Dependent Variable	Mean	SD	Minimum-Maximum
Poor sleep quality	6,93	1,156	6-11

Table 4 shows that the mean poor sleep quality score was 6.93, with a standard deviation of 1,156. The highest score was 11, while the lowest was 6.

Table 5.

Bivariate analysis results

	Median (minimum-maximum)	Mean Rank	P-value
Poor sleep quality in adolescents not addicted to smartphone (n=53)	6,00 (6-9)	63,06	0,000
Poor sleep quality n adolescents addicted to smartphone (n=112)	7,00 (6-11)	92,44	

Table 5 shows the results of statistical analysis with a p-value < alpha (0,000 < 0,05), which means at a 95% confidence level, there is a difference in the poor sleep quality score between adolescents who were addicted to smartphones to those who were not.

Discussion

This study shows that the female participants accounted for 51.5% (n=85) of the participants, a higher percentage than the male. This result is in line with a previous study that stated gender (female) is a risk factor of smartphone addiction (Lee et al., 2017). A significant aspect of smartphone addiction in females was multimedia application, social networking usage, depression, anxiety, and poor sleep quality (Chen et al., 2017). Females have a higher tendency to use a smartphone than males, hence the higher risk of sleeping disorder (Wang et al., 2019).

The mean age of the participants was 13.52 years. Thirteen years old is categorised as an early adolescent (Hurlock, 2011). A previous study reported that Korean adolescents' mean age with smartphone addiction was 13.28 years (Lee et al., 2017). This may occur due to the finding self-identity phase in early adolescence. Nowadays, smartphone usage tends to be more related to adolescents' social media habits or instant messenger to interact with their peers.

The average period of owning a smartphone was 2.48 years. This result indicates that adolescents own a smartphone since their early adolescence; some even own a smartphone since they were in school-age. Another previous report found 15% of school-age children and 48% of secondary school students own and use smartphones on average an hour a day (Hosokawa & Katsura, 2018). Owning a smartphone before entering adolescence is certainly quite risky because school-age children do not have a mature mindset and cannot judge the good from the bad of their smartphone.

There are 112 adolescents (67.9%) were categorised as adolescents with smartphone addiction. One of smartphone addiction signs is a longer-than-planned screen time (Kwon et al., 2013). A preceding study found that smartphone addiction among adolescents in India may impair their interpersonal skills. Smartphone addiction was also significantly related to adverse health risks and harmful effects on adolescents' psychological aspects (Davey & Davey, 2014).

The mean score of poor sleep quality among participants was 6.93. Poor sleep quality in adolescents may be correlated to poor grades at school (Short et al., 2013). Efforts to improve sleep quality to a good score is therefore necessary. The mean poor sleep quality in adolescents within this study is close to the upper limit of good sleep quality (5). A score of 5 in sleep quality is the score reference in decreasing adolescents' sleep quality score.

The statistical analysis found a difference in sleep quality scores between adolescents with and without smartphone addiction. Adolescents with smartphone addiction scored worse in sleep quality compared to their peers without smartphone addiction. Adolescents without smartphone addiction also had poor sleep quality, but the score was relatively better than adolescents with smartphone addiction. Smartphone usage in adolescents is generally acceptable; however, other factors may cause them to score poorly in sleep quality. Factors that may affect sleep quality include lifestyle, fatigue, psychological stress, smoking, or illness (Kozier, 2004).

The result of this study adds to findings by preceding studies. An earlier study found that smartphone addiction is positively correlated to sleep quality (high score indicates poor sleep quality) (Liu et al., 2017). Most adolescents who use their smartphone for an hour before sleep or use it on bed suffer from impaired ability to fall asleep (Adams et al., 2013)

The excessive use of smartphones may cause anxiety, which then leads to sleep disorders among adolescents. Adolescents with sleep disorders caused by excessive use of technology are prone to sleepy during the daytime and have difficulties concentrating (Demirci et al., 2015). The use of smartphone exposes the users with bright light. Exposure of electromagnetic fields from a smartphone can also affect the pineal gland, which in turn has an impact on sleep quality. Exposure of electromagnetic fields may also induce changes in cerebral blood flow and electrical activity in the brain. The prolonged smartphone usage can also trigger physical discomfort, like headaches, leading to sleep disorders (Nowreen & Ahad, 2018). Efforts that may help improve sleep quality in adolescents include limiting smartphone usage according to needs. Smartphone usage during sleep time or after getting on the bed should also be minimised to achieve quality sleep.

Conclusion

This study concludes a significant difference in poor sleep quality between adolescents with and without smartphone addiction. Adolescents with smartphone addiction scored higher in poor sleep quality than their peers without smartphone addiction. Adolescents should be able to minimise their smartphone usage according to their needs. They should also reduce using a smartphone before sleeping to achieve better sleep quality.

3

Jurnal Kesehatan dr. Soebandi Vol. X, No. X   X

POOR SLEEP QUALITY DIFFERENCES AMONG ADOLESCENTS WITH SMARTPHONE ADDICTION COMPARED TO THOSE WITHOUT

ORIGINALITY REPORT

8%

SIMILARITY INDEX

PRIMARY SOURCES

1   media.neliti.com
    Internet   65 words — 3%

2   link.springer.com
    Internet   27 words — 1%

3   Eky Madyaning Nastiti. "Hubungan Tingkat   24 words — 1%
    Pengetahuan Pertolongan Pertama Pada Layperson
    Usia Anak Sekolah Terhadap Efikasi Diri Dalam Penanganan
    Kasus Cedera : a Systematic Review", Jurnal Kesehatan dr.
    Soebandi, 2020
    Crossref

4   www.tandfonline.com
    Internet   17 words — 1%

5   Kun Wang, Yue Xue, Xiang Fan, Tao Huang,   9 words — < 1%
    Zuosong Chen. "Sedentary behaviors,
    psychological status, and sleep quality in Chinese university
    students", Social Behavior and Personality: an international
    journal, 2019
    Crossref

6   open.library.ubc.ca
    Internet   8 words — < 1%

7 Severin Haug, Raquel Paz Castro, Min Kwon, Andreas Filler, Tobias Kowatsch, Michael P. Schaub. "Smartphone use and smartphone addiction among young people in Switzerland", Journal of Behavioral Addictions, 2015
Crossref

6 words — < 1%

EXCLUDE QUOTES   OFF   EXCLUDE SOURCES   OFF
EXCLUDE BIBLIOGRAPHY   OFF   EXCLUDE MATCHES   OFF