



The Relationship Between Gadget Usage and Adolescent Sleep Quality

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Abstract

Introduction: Adolescent are very interested in gadgets that make it easier for them to carry out various social activities. One of the problems that can arise from gadget overuse is decreased quality of sleep. The purpose of this study was to determine the relationship between gadget usage behavior and adolescent sleep quality.

Methods: Cross-sectional design was used in this study. Ninety-nine respondents had chosen with a proportionate stratified random sampling. Analysis was done by Chi square test.

Results: Data analysis showed that 84.8% of the respondents were categorized as gadget addiction and 80.8% of the respondents experienced poor sleep quality. The relationship between gadget usage and sleep quality was significant with a p-value of 0.0001.

Conclusion: There was a relationship between gadget usage and sleep quality in adolescents, in which gadget dependency had poorer quality of sleep.

Keywords : gadget usage, sleep quality, adolescents

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Introduction

The current era of 4.0 shows an increasing number of technological developments. The development of this technology is of interest to some people, especially teenagers. One of the most popular developments is gadget. A gadget is an electronic device connected to the internet and has a special function in each device.¹ The prevalence of gadget users has increased from every year, where in 2019 it reached 3.2 billion, which has increased 5.6% from the previous year. The prevalence is predicted to continue to increase to reach 3.9 billion in 2022.²

The prevalence of gadget users in Indonesia has reached 4th place, with a prevalence of 69%, after Nigeria with a prevalence of 81%, India 79%, and South Africa 78%.³ Gadget users in Indonesia have increased rapidly with the number of users about 64.8% in 2018 become 73.7% in 2019.⁴ According to the Indonesian Internet Service Providers Association (APJII) in 2019, Java Island is the first ranked gadget user to access to the internet with a percentage of 56.4%, followed by the island of Sumatra with a prevalence of 22.1%.⁴ Adolescents are one of the highest groups of gadget users with a prevalence of 24.82%.⁴

Adolescence is a stage of growth and development from childhood to adulthood which is very important to note.⁵ The adolescent phase requires good time, quality and quantity of sleep to support successful growth and development and academic achievement.⁶ Lack of quality and quantity in adolescent sleep will have several impacts, including decreased concentration, decreased activity, decreased learning process caused by drowsiness and fatigue due to lack of sleep.⁷ Other studies showed the same thing that the physiological effects such as fatigue, weakness, eye disorders, decreased endurance to frequent dizziness.⁸ Adolescents need normal sleep time ranging from 8 to 10 hours to produce better rest.⁹

Adolescents who frequently use gadgets will tend to experience addictions so that the quality of sleep is poor due to staying up late, and has less sleep time.¹⁰ Teenagers often use gadgets for more than 60 minutes and even more than 11 hours per day and this causes

teenagers to have longer time to fall asleep. This is due to the sophistication and convenience of the gadgets used. Teenagers often use gadgets for a long time to have conversations with other people on social media such as Twitter, Facebook, Instagram or Tik-tok.¹² Based on the results of interviews that have been conducted, it is known that children use gadgets more than 3 hours per day until late at night and admit that there is a decrease in the quality of their sleep process. The purpose of this study was to determine the relationship between gadget usage behavior and adolescents' sleep quality.

Methods

This study used a cross-sectional design. The population of this study were all adolescents who were in class X and XI of SMA Negeri 1 Purwokerto. The total number of 99 respondents were chosen from class X and XI SMA Negeri 1 Purwokerto using proportional random sampling. Data were collected through interviews using the Smartphone Addiction Scale-Short Version (SAS-SV) questionnaire with 10 question items to determine the level of gadget addiction and the *Pittsburgh Sleep Quality Index* (PSQI) questionnaire, which has 9 questions to determine the sleep quality of adolescents.^{13,14} Data were analysed by Chi-Square test with a significant level of 0.05. This study had passed the ethical merits of the Research Ethics Commission of the University of Harapan Bangsa.

Results

The result showed that 84.8 % of adolescents were in gadget dependency, 80.8% experienced poor sleep quality and 58% have sleep time > 6 hours. Table 2 shows that 94.1% of adolescents who were in gadget dependency had poor sleep quality, and only 6.7% of the adolescents who were in gadget independency had poor sleep quality (p=0.0001). It can be concluded that there was a relationship between gadget usage behaviour and sleep quality, in which the gadget dependency had poorer quality of sleep.

Table 1. Frequency Distribution of Gadget Usage Behaviour and Sleep Quality (n=99)

Variables	Frequency (f)	Percentage (%)
Gadget Usage Behaviour		
a. Gadget independency	15	15.2
b. Gadget dependency	84	84.8
Sleep length at night		
a. > 6 hours	42	42
b. ≤ 6 hours	58	58
Sleep Quality		
a. Good	19	19.2
b. Poor	80	80.8

Table 2. The Relationship between Gadget Usage and Adolescent Sleep Quality (n=99)

Gadget Usage Behaviour	Sleep Quality		Total
	Good (n %)	Poor (n %)	
Gadget independency	n (%) 14 (93.3%)	n (%) 1 (6.7%)	n (%) 15 (100%)
Gadget dependency	5 (5.9%)	79 (94.1%)	84(100%)
Total	19 (19%)	80 (81%)	99 (100%)

p-Value : 0.000*

Discussions

The results showed that majority of the respondents has gadget dependency (84.8%). They revealed that the use of gadgets is used to interact with other friends through chatting, playing social media and using it for online selling or buying. This condition is an advantageous as communication becomes more practical, train intelligence and information access is available worldwide or globally.¹⁵ Various kinds of features in various gadgets make adolescents more interested than others. Gadget usage has become more attractive as information can be received visually or in audio, easy to use, practical to carry and used anywhere, furthermore curiosity about technological developments such as the internet, online games, and others were increased.¹⁶ About 85% of adolescents more often used gadgets than doing other activities, which lead to decreased socialization with the environment. This has an impact on the aspect of socializing with other people.¹⁶

Sleep quality was assessed using the Pittsburg Sleep Quality Index (PSQI) questionnaire. The results showed that in this study, 53 out of 80 respondents who experienced poor sleep quality, went through

their daily lives with heavy feelings. The results also showed that there were 58 respondents who had ≤ 6 hours of sleep per day. This shows that adolescents had short sleep hours, where the normal sleep time is 8.5 hours per day.¹⁶

The researcher suggested that there were several possibilities that cause short hours of sleep at night, such as doing school work, chatting, playing games, accessing social media such as Instagram, WhatsApp, Twitter, Facebook, line. This condition led to the sleep irregularity. Some of these causes were obtained from the conclusions of respondents' answers regarding the reasons for sleeping late at night. Some teenagers, mostly had trouble sleeping until late and wake up early in the morning. Adolescents had irregular sleeping hours, and often experience sleep dissatisfaction.¹⁷ Some of the factors that cause sleep disorders in adolescents were changes in lifestyle, such as the habit of using gadgets on a daily basis.¹⁸

The results showed that 94.1% of students experienced gadget addiction and experienced poor sleep quality, with a p-value <0.001. This indicated that there was a significant relationship between gadget usage and sleep quality among the adolescents.

Teens who were involved in this study mostly prefer to interact using gadgets. Children who play with gadgets spend more time playing, thus reducing socialization and interaction with others. The impact is that children prefer to be alone, reduced socialization and interaction.¹¹

Excessive use of gadgets had also been seen to interfere daily activities, children will focus on gadgets, tend to be silent when playing, and had an impact on feeling lazy. Most teenagers found difficulties to stay away from gadgets. Many interesting features made teenagers even more happy to use gadgets. This was supported by the theory that teenagers today were very cool and enjoy solitude when using gadgets, they didn't care about friends, they had lacked of socialization.¹⁹ Teens tended to use gadgets longer at night in bed. This condition might be caused by the fact that not all parents could supervise their children when they were in their bedrooms. This condition would have an impact on decreasing the quality of sleep.

Similar studies have shown a link between gadget addiction and sleep quality. Gadget users taking the gadgets to bed and use them before bedtime.²⁰ This condition can interfere sleep duration and quality, which then lead to drowsiness. Other study have shown that there was a significant relationship between the length of time using gadgets and the incidence of insomnia. The use of gadgets among adolescents often made them stayed up late so that they experienced lack of sleep, triggering insomnia and headaches. The gadget also emits electromagnetic waves which are released when used, which then affects the circadian clock. The bright light emitted by the gadget will delay the body's endogenous clock and cause sleep disturbances.²¹

Conclusion

There was a relationship between gadget usage and sleep quality in adolescents, in which gadget dependency had poorer quality of sleep.

References

1. Sharma, M. (2012). "Addiction of youth towards gadgets," 6568–6572
2. Newzoo. (2019). "Most Popular PC Games". Dipetik Februari 12, 2019, dari Internet: [https://newzoo.com/insights/rankings/top-](https://newzoo.com/insights/rankings/top-20-core-pc-games/)

3. [20-core-pc-games/](https://databoks.katadata.co.id/datapublikasi/2017/05/22/) Data Boks. (2017). Akses Internet Via Mobile Indonesia Posisi 4 Dunia. <https://databoks.katadata.co.id/datapublikasi/2017/05/22/>. Diakses pada tanggal 21 Oktober 2017.
4. Asosiasi Penyelenggara Jasa Internet Indonesia. (2019). Penetrasi dan perilaku pengguna internet indonesia 2019-2020.
5. Sarwono. (2011). *Psikologi Remaja*. Rajawali Press. Jakarta.
6. Gaultney, J. F. (2010). The prevalence of sleep disorders in college students: Impact on academic performance. *Journal of American College Health*, 59(2), 91–97. <https://doi.org/10.1080/07448481.2010.483708>.
7. Nilifda, H., Nadjmir, & Hardisman. (2016). Hubungan Kualitas Tidur dengan Prestasi Akademik Mahasiswa Program Studi Pendidikan Dokter Angkatan 2010 FK Universitas Andalas. *Jurnal Kesehatan Andalas*, 4(1), 243–249
8. Sari, I. M., & Prajayanti, E.D. (2017). Peningkatan pengetahuan siswa SMP tentang dampak negatif game online bagi kesehatan. *Gemassika*, 1(2), 31–39
9. P2PTM Kemenkes RI 2019
10. Permadi, Adi And Khusnal, Ery. (2017) *Hubungan Perilaku Penggunaan Gadget Dengan Kualitas Tidur Pada Anak Usia Remaja Di Sma Negeri 1 Srandakan Bantul*. Skripsi Thesis, Universitas 'Aisyiyah Yogyakarta.
11. Mawitjere, O. T., Onibala, F., & Program, Y. A. I. (2017). Hubungan Lama Penggunaan Gadget dengan Kejadian Insomnia pada Siswa Siswi di SMA Negeri 1 Kawangkoan. *Ejournal Keperawatan (E-Kp)*, 5(1), 5. Retrieved from <https://media.neliti.com/media/publications/104905-ID-hubungan-lama-penggunaan-gadget-dengan-k.pdf>
12. Keswara, Umi & Syuhada, Novrita & Wahyudi, Wahid. (2019). Perilaku penggunaan gadget dengan kualitas tidur pada remaja. *Holistik Jurnal Kesehatan*. 13. 233-239. 10.33024/hjk.v13i3.1599.
13. Nowreen, Nida., Ahad, Farhana. (2018). Effect of Smartphone Usage on Quality of Sleep in Medical Students. *National Journal of Physiology, Pharmacy and Pharmacology Vol 8, Issue 10*, 1366-1370. <https://doi.org/10.5455/njppp.2018.8.062>

0009062018

14. Kwon, M., Kim, D., Cho, H., & Yang, S. (2013). The Smartphone Addiction Scale : Development and Validation of a Short Version for Adolescents, *8*(12), 1–7. <https://doi.org/10.1371/journal.pone.0083558>.
15. Mariam, F., Kamal, M.Y., Lukman, Z.M., Azlini, C., Normala, R. (2018). The Effect in Cognitive, Affective, and Behaviour of Using Electronic Gadget Among University Students. *IJRIS Journal Vol II, Issue XII*
16. Sarfriyanda, J. ', Karim, D. ', & Dewi, A. P. (2015). Hubungan Antara Kualitas Tidur Dan Kuantitas Tidur Dengan Prestasi Belajar Mahasiswa. *Jurnal Online Mahasiswa (JOM) Bidang Ilmu Keperawatan, 2*(2), 1178–1185. Retrieved from <https://jom.unri.ac.id/index.php/JOMPSIK/article/view/8282>.
17. Gaultney, J. F. (2010). The prevalence of sleep disorders in college students: Impact on academic performance. *Journal of American College Health, 59*(2), 91–97. <https://doi.org/10.1080/07448481.2010.483708>.
18. Wijanarko, J. Dan Setiawati, E. (2016). *Ayah Baik-Ibu Baik Parenting Era Digital Pengaruh Gadget dan Perilaku Terhadap Kemampuan Anak*. Keluarga Indonesia Bahagia. Jakarta Selatan.
19. Hidayat, S., & Mustikasari. (2014). Kecanduan Penggunaan Smartphone Dan Kualitas Tidur Pada Mahasiswa Rik Ui, 1–10. Retrieved from <http://www.lib.ui.ac.id/naskahringkas/2016-08//S56399-Sarip Hidayat>.
20. Niro, Agustin & Pawitra, Annisa & Faizah, Novia & Putra, Rendra & Arfiputri, Veikha & Sihombing, Renata & Rachmi, Shabrina & Nuswantoro, Djohar & Martha, Ledy. (2020). CORRELATION OF GADGETS ADDICTION WITH SLEEP QUALITY IN 4th – 6th GRADE STUDENTS AT SDN 01 SRIGADING LAWANG IN 2019. *Journal of Community Medicine and Public Health Research, 1*. 80. 10.20473/jcmphr.v1i2.21699.
21. Fuller, C., Lehman, E., Hicks, S., & Novick, M. B. (2017). Bedtime Use of Technology and Associated Sleep Problems in Children. *Global pediatric health, 4*, 2333794X17736972. <https://doi.org/10.1177/2333794X17736972>