THE RELATIONSHIP BETWEEN THE DURATION OF GADGET USE AND SLEEP QUALITY IN SCHOOL-AGE CHILDREN

Syifa Fauziah Fajrin, Titi Sulastri*, Yupi Supartini, Ratna Ningsih, Eviana S, Dina Carolina
Poltekkes Kemenkes Jakarta III, Indonesia
*email: titi.s.soelman03@gmail.com

ABSTRACT
Background: The use of gadgets continues to increase, along with the many special functions and interesting features in gadgets. This is certainly not only interesting for adults but also for children. The inability of children to control the time limit of gadget use can cause the quality of children's sleep to deteriorate. **Research Objective:** This study was conducted to analyze the relationship between the duration of gadget use and sleep quality in grade IV to VI children at SDN Mekarsari 04. **Research Method:** This type of researcher is quantitative research with cross-sectional approach. The population of thi study was grade IV to VI children at SDN Mekarsari 04. The sample in this study amounted to 205 respondents. Data analysis using non-parametric test, namely the chi-square test. Results: It was foud that there was a significant relationship between duration of gadget use and quality of sleep of school children (p value=0,00<0,05). **Conclusion:** There is relationship between the duration of gadget use and sleep quality in school children. Because they are too preoccupied with it and frequently put off going to bed, in addition to that blue light from gadgets can also interfere with the production of the hormone melatonine.

Keywords: Gadgets; Duration; Sleep Quality

ABSTRAK
Latar Belakang: Penggunaan gadget terus meningkat, seiring dengan banyaknya fungsi khusus serta fitur-fitur yang menarik dalam gadget. Hal tersebut tentunya tidak hanya menarik untuk orang dewasa saja namun juga pada anak-anak. Ketidak mampuan anak dalam mengontrol batas waktu penggunaan gadget dapat menyebabkan kualitas tidur anak memburuk. ***Tujuan:*** *Penelitian ini dilakukan untuk menganalisis hubungan antara durasi penggunaan gadget dengan kualitas tidur pada anak Usia Sekolah di Wilayah Mekarsari.* ***Metode Penelitian:*** *Jenis penelitian ini merupakan penelitian kuantitatif dengan pendekatan cross-sectional. Populasi penelitian ini adalah anak Usia Sekolah di Wilayah Mekarsari. Sampel dalam penelitian ini berjumlah 205 responden. Analisis data menggunakan uni non-parametrik yaitu uji chi-square.* ***Hasil:*** *Didapatkan bahwa adanya hubungan yang signifikan antara durasi penggunaan gadget dengan kualitas tidur anak sekolah (p value=0,00<0,05).* ***Simpulan:*** *Adanya hubungan antara durasi penggunaan gadget dengan kualitas tidur pada anak sekolah, karena anak terlalu asyik bermain gadget sehingga menunda waktu tidurnya, selain itu sinar biru yang berasal dari gadget juga dapat menganggu produksi hormon melatonine*

Kata Kunci: *Gadget; Durasi; Kualitas Tidur*

INTRODUCTION

According to the WHO World Organization (WHO), school-age children are individuals between the ages of 7 and 15 years. The Ministry of Health of the Republic of Indonesia stated that school-age children have an age range of 6-18 years, who have entered elementary, junior high school, and senior high school (Kemenkes RI, 2019).

Everyone certainly has basic health needs that are important for his or her life. One of the human needs that must be rest and sleep. Sleep is a physiological behavior carried out for all living things. Sleep is a condition in which a person's level of consciousness will decrease. Sleep has a function to maintain the balance of the body and store energy reserves. If the child has a good quality of sleep, the body can produce hormones, by facilitating the production of growth hormone, which of course, increases the body's immunity so that it does not get sick easily, and replaces damaged cells. If the quality of a child's sleep is , the body's organs cannot function optimally, as a result of which the child will easily feel tired and sleepy, and it will be difficult to concentrate while studying (Mustayah, 2022). One of the factors that causes sleep quality for a person is the use of gadgets.

The development of technology and science makes it impossible for people to be able to escape the use of technology, namely the internet, including school-age children. In general, people access the internet using technology called gadgets. The presence of the internet that can be accessed through gadgets can help human activities easily. The Central Statistics Agency stated that in 2019 it was recorded that 48.2% of children in Indonesia aged 7-17 years had accessed the internet (Rizaty, 2021). From the results of research that has been conducted by Kominfo and Kata Data Insight Center (KIC), a report related to the examination of the Status of Digital Literacy in Indonesia recorded the behavior of the Indonesian people digitally, one of which is related to the duration of internet use, most of the respondents, namely Gen Z (35%) access the internet for more than 6 hours/day (Ahdiat, 2023). In 2016 APJII (Indonesian Internet Service Providers Association) stated that as many as 16.8% of people who use the internet are students.

In this era, there are a lot of school-age children who have been facilitated by gadgets by their parents. Giving gadgets to children is certainly a good thing. In using gadgets, the role of parents is very important in controlling children when using gadgets. Gadgets can cause addiction for their users, including children. The impact of the addiction can reduce the concentration of children at school. In addition, gadgets can also reduce the quality of children's sleep.

Sleep quality in children is quite a serious thing. As described above, sleep has a very important role for children's growth and development and also replaces damaged body cells. sleep quality can also have an impact on the child's learning process. Children become less concentrated when studying, often feel sleepy while studying. The presence of gadgets can affect the quality of sleep in children, this is because gadgets can cause addiction in children. If the child is addicted to gadgets, the child becomes too intense in using gadgets so that the child often skips the supposed sleep hours. The purpose of this study is to determine the relationship between the duration of gadget use and sleep quality in school-age children.

METHOD

This study uses a type of quantitative research, a cross-sectional design. The population in this study is children in grades IV to VI at SDN Mekarsari 04. This study uses a simple random sampling technique with a total of 205 sample. The type of data used in this study is primary data, where data is taken directly from the research sample using a questionnaire sheet. The data collection technique in this study uses the Pittsburgh Sleep Quality Index (PSQI) sleep quality instrument. This questionnaire has been tested for validity and declared reliable. The analysis test used in this study is a non-parametric test, namely chi-square with a software application. This research has been declared feasible by the Health Research Ethics Commission (KEPK) of the Jakarta Ministry of Health Polytechnic III as evidenced by letter No.LB.02.02/F.XIX.21/3815/2024.

RESULT AND DISCUSSION

Distribution of frequency characteristics of each variable, namely respondent characteristics (age and gender), duration of gadget use, sleep quality. The following is a distribution table of frequency characteristics of 205 respondents.

Table 1 Frequency Distribution Based on Age, Gender, Duration of Use of Gadeget and Sleep Quality in School-Age Children in Mekarsari Village Area

No.	Variabel	Number of Responden (n)	Percent (%)
1.	**Age**		
	10	21	10,2%
	11	73	35,6%
	12	111	54.1%
2.	**Gender**		
	Boys	98	47,8%
	Girls	107	52,2%
3.	**Sleep Quality**		
	Good	91	44,4%
	Bad	114	55,6%
4.	**Duration of Gadget Use**		
	≤ 1 jam	51	24,9%
	> 1 jam	154	75,1%

Table 1 shows that the majority of respondents are 12 year old children's 111 (54,1%), then 11 years old 73 (35,6%), and 10 years old 21 (10,2%). The majority of respondents in this study were girls 107 repondents (52,2%). While 98 (47,8%) respondets were boys. The majority of respondents had bad sleep quality 114 people (55.6%), while those who had good sleep quality were 91 people (44.4%). A total of 154 people (75.1%) used gadgets > 1 hour, while 51 people (24.9%) used gadgets.

Table 2 The Relationship between Respondent Characteristics and Sleep Quality

Variabel	Sleep Quality				Total	*P-value*	OR (CI=95%)
	Good		Bad				
	N	%	N	%			
Age							
10	14	66,7%	7	33,3%	21	0,094	-
11	31	42,5%	42	57,5%	73		
12	46	41,4%	65	58,6%	111		
Gender							
Boys	52	53,1%	46	46,9%	98	0,024	1,971
Girls	39	36,4%	68	63,6%	107		(1,127-3,447)

The results from table 2 show that 14 10-year-old children have good sleep quality as many as 14 people (66.7%), and 7 people (33.3%) have sleep quality. 11-year-old children who had good sleep quality were 31 people (42.5%), and sleep quality was 42 people (57.5%). 46 (41.4%) 12-year-olds had good sleep quality, and 65 (58.6%) had sleep quality. In the age variable with sleep quality, a P-value of 0.094 ($p < 0.05$) was obtained, indicating that there was no significant relationship between age and sleep quality. This is in line with research conducted by Zurutuza *et al* (2024). (p value = 0.21>0.05) which states that there is no relationship between age and sleep quality.

According to the researcher, the results are based on the fact that the age range of respondents is still classified in one category, namely school-age children (10-12 years old). Another study also mentioned that age is not included in the factors that cause sleep quality, but a person who is women, bad mood and physical illness are the most common risk factors that can cause sleep quality (Smagula et al., 2016). This theory is in accordance with (Sinthania et al., 2022) concluding that age does not affect sleep quality.

According to the Kemenkes RI (2018), a good sleep duration for school-age children is 10 hours/day. If the child sleeps less than the time limit, it will have an impact on his health. Sleep is one way to charge the brain. During night sleep, there is a brain regeneration process that makes the brain not easily damaged. Therefore, sleep quality greatly affects a person's cognitive function. In children, sleep quality can lower IQ, as well as children's achievement in school.

Based on the results above, it shows that boys who have good sleep quality are 52 (53.1%), and boys with sleep quality are 46 (46.9%). Girls with good sleep quality were 39 (36.4%), and girls with sleep quality 68 (63.6%). In the variable between gender and sleep quality, a P-value of 0.024 ($p<0.05$) was obtained, indicating that the data was significant, which means that there was a significant relationship between gender and sleep quality. From the results of the gender analysis with sleep quality, an odds ratio value of 1.971 was obtained, which means that boys have a higher chance of having good sleep quality when compared to girls.

This is similar to what has been done by Supartini, Martiana and Sulastri (2021) that there is a significant relationship between gender and sleep quality. Girls had worse sleep quality than boys (p=0.020 and OR = 2,747). Another study said that there was a relationship between the sex of children and sleep quality, because boys tended to have more physical activity than girls,

which also affected the quality of sleep in children (Galan-Lopez *et al.*, 2021) Physical activity can improve a person's sleep quality. This is because people who have done physical activity will fall asleep faster.

Table 3 The Relationship between Gadget Use and Sleep Quality

Variabel	**Sleep Quality**				**Total**	***P-value***	**OR (CI=95%)**
	Good		**Bad**				
	N	**%**	**N**	**%**			
< 1 hour	39	76,5%	12	23,5%	51	0,000	6,375 (3,078-13,204)
> 1 hour	52	33,8%	102	66,2%	154		

The bivariate results in table 3 were obtained that there were 12 (23.5%) students who played gadgets <1 hour got sleep quality. Meanwhile, 102 (66.2%) students who played gadgets >1 hour got sleep quality. A value of p= 0.00 (p<0.05) can be concluded that there is a significant relationship between the duration of gadget use and the quality of children's sleep. The results of the analysis obtained the value of Odds Ratio = 6.375, This means that children who use gadget for <1 hour gets a 6.375 times higher chance of having good sleep quality compared to children who use gadget for >1 hour.

The same thing is also seen in the research of Balbina (2021), which found that with a p value of 0.000 which means that there is a significant relationship between the intensity of using gadgets and the quality of sleep of school-age children. This is in line with previous research which stated that there was a significant relationship between gadget use and sleep quality in students at SDN Pejuang VII Bekasi (Dewi and Agustina, 2024) obtained a p <0.005, meaning that there was a significant relationship between gadget use and student sleep quality at SDN Pejuang VII Bekasi city. Based on the results of research from Chandra, Tat, Florentianus and Wawo (2022) showed that the results of p<0.05 there was a significant influence between the duration of gadget use and the quality of students of SD Kristen Citra Bangsa Kupang.

If children use gadgets excessively, it can result in the quality of children's sleep deteriorating, because they are too preoccupied with it and frequently put off going to bed Irwanto, Widjaja and Prihaningtyas (2018). A child who uses gadget excessively may have worse quality sleep because they are too preoccupied with it and frequently put off going to bed.

The screen of gadgets such as smartphones, tablets, and laptops can emit a blue light that interferes with the hormone melatonin in the body, which is important for preparing the body for sleep, which results in a person finding it difficult to start falling asleep (Saras, 2023).

CONCLUSION

Based on the results of the analysis that has been carried out, it is concluded that there is a strong correlation relationship between the duration of gadget use, Because they are too preoccupied with it and frequently put off going to bed, in addition to that blue light from gadgets can also interfere with the production of the hormone melatonine. The gender and sleep quality in school-age children because boys tended to have more physical activity than girls, which also affected the quality of sleep in children, because people who have done physical activity will fall asleep faster.. However, there was no significant relationship between age and sleep quality in school-age children.

ACKNOWLEDGMENTS

The process of preparing this thesis is certainly inseparable from the help and support from various parties. The researcher would like to express his deepest gratitude to the supervisors who have provided guidance and direction so that the researcher can complete this research. The researcher also expressed his gratitude to his family and friends who always motivated the researcher to complete this study. To all stakeholders who have contributed to this study, especially respondents who have been willing to participate in this study.

REFERENCES

Ahdiat, A. (2023) 'Durasi Responden Menggunakan Internet Berdasarkan Kelompok Usia', Katadata Media Network, February. Available at: https://databoks.katadata.co.id/datapublish/2023/02/01/berapa-lama-warga-ri-gunakan-internet-per-hari-ini-surveinya.

Annur, C.M. (2021) 'Jumlah Siswa di Indonesia Berdasarkan Jenjang Pendidikan pada Tahun Ajaran 2020/2021', *Katadata Media Network*, November. Available at: https://databoks.katadata.co.id/datapublish/2021/11/26/siswa-sd-dominasi-jumlah-pelajar-di-indonesia-pada-tahun-ajaran-20202021.

Arthy, C.C. *et al.* (2019) 'Indonesian Version of Addiction Rating Scale of *Smartphone* Usage Adapted from *Smartphone* Addiction Scale-Short Version (SAS-SV) In Junior High School', *Open Access Macedonian Journal of Medical Sciences*, 7(19), pp. 3235–3239. Available at: https://doi.org/10.3889/oamjms.2019.691.

Ariyanti, S.W. and Syahrani, D. (2023) 'Sosialisasi Internet Positif untuk Anak Usia Sekolah Dasar di SD Negeri 2 Ngemplak', Jurnal Bina Desa, 5(1), pp. 66–70. Available at: https://doi.org/10.15294/jbd.v5i1.41135.

Balbina, W.M.A. (2021) 'Intensitas Menggunakan Gadget Mempengaruhi Kualitas Tidur Anak Sekolah', *Jurnal Ilmiah Ilmu Keperawatan*, 12(04), pp. 190–200.

Chandra, I., Tat, Florentianus, B.A. and Wawo, M. (2022) 'Pengaruh Durasi Bermain Gadget terhadap Kualitas Tidur pada Anak Usia Sekolah Kelas V dan VI (Sekolah Dasar Kristen Citra Bangsa)', CHMK Health Journal, 6(1), pp. 393–399. Available at: https://media.neliti.com/media/publications/367877-none-75bb690e.pdf.

Galan-Lopez, P. et al. (2021) 'Sleep Quality and Duration in European Adolescents (The AdolesHealth Study): A Cross-Sectional, Quantitative Study', Children, 8(3), p. 188. Available at: https://doi.org/10.3390/children8030188.

Irwanto, Widjaja, N.A. and Prihaningtyas, R.A. (2018) Anak Obesitas. jakarta: Alex Media Komputindo.

Kemenkes RI (2018) 'Kebutuhan Tidur Sesuai Usia', P2PTM KEMENKES RI, September. Available at: https://p2ptm.kemkes.go.id/infograpic-p2ptm/obesitas/kebutuhan-tidur-sesuai-usia.

Kemenkes RI (2019) ‘Anak-anak’. Available at: https://www.bing.com/ck/a?!&&p=9dbca907901a67cbJmltdHM9MTcxODE1MDQwMCZpZ3VpZD0zMmY0ZGVkOC1jYjQ3LTYwMzYtM2QyNy1jY2I2Y2ExNTYxMGMmaW5zaWQ9NTM0OA&ptn=3&ver=2&hsh=3&fclid=32f4ded8-cb47-6036-3d27-ccb6ca15610c&psq=kategori+umur+menurut+kemenkes+terbaru&u=a1aHR0c.

Mustayah (2022) Bahan Ajar Psikologi Untuk Keperawatan. NEM.

Ni’matuzahroh, Fitriati, S. and Sari, A.P. (2023) Psikologi Sekolah Konsep, Isu, Intervensi Sekolah Peka Mental Health. Malang: UMMPress.

Nur Riska, Rusilanti, Melly Latifah, A.I. (2023) Gizi Tumbuh Kembang. Jakarta: Bumi Medika.

Nurcahyaningtyas, W. (2024) Buku Ajar Keperawatan Dasar. Jambi: PT. Senopedia Publishing Indonesia.

Pane, J.P., Saragih, I.S. and Laoli, T.L. (2022) ‘Hubungan Lama Penggunaan Gadget dengan Kejadian Astenopia Pada Mahasiswa Program Studi Ners’, Jurnal Penelitian Perawat Profesional, 4(3), pp. 947–954. Available at: http://jurnal.globalhealthsciencegroup.com/index.php/JPPP.

Parulian, D. and Soputri, N. (2023) ‘Hubungan Penggunaan Gadget Terhadap Kualitas Tidur Mahasiswa Di Asrama Universitas Advent Indonesia’, Action Research Literate, 7(2), pp. 145–149. Available at: https://doi.org/10.46799/arl.v7i2.128.

Rahayu, V.P. (2022) ‘Kenali Dampak Kurang Tidur Pada Kesehatan Tubuh’, Kemenkes, July. Available at: https://yankes.kemkes.go.id/view_artikel/770/kenali-dampak-kurang-tidur-pada-kesehatan-tubuh.

Rakhman, A. et al. (2023) ‘Hubungan Lama Pemakaian Smartphone Dengan Tingkat Kualitas Tidur Pada Remaja Di Kabupaten Brebes’, Care : Jurnal Ilmiah Ilmu Kesehatan, 11(3), pp. 450–457. Available at: https://doi.org/10.33366/jc.v11i3.4068.

Richter, R., Rares, L.M. and Najoan, I.H.M. (2018) ‘Gambaran Ketajaman Penglihatan terhadap Lama Penggunaan dan Jarak Pandang Gadget pada Siswa Kelas XII SMA Negeri 9 Binsus Manado’, e-CliniC, 6(2), pp. 70–76. Available at: https://doi.org/10.35790/ecl.6.2.2018.21993.

Rita Rena Pudyastuti, K. (2023) Penggunaan Gadget Bagi Anak. Edited by R.P.M. M. Hidayat,

Miskadi, Muhamad Suhardi. Lombok Tengah: Penerbit P4I.

Rizaty, M.A. (2021) ‘Mayoritas Anak Indonesia Mengakses Internet untuk Bermedia Sosial’, Katadata Media Network. Available at: https://databoks.katadata.co.id/datapublish/2021/07/14/mayoritas-anak-indonesia-mengakses-internet-untuk-bermedia-sosial.

Rohayati, E. (2019) Keperawatan Dasar I. Edited by A. Rahmawati. Cirebon.

Saras, T. (2023) Mengatasi Insomnia: Panduan Praktis untuk Tidur Berkualitas. Edited by W. Anita. Semarang: Tiram Media.

Sinthania, D. et al. (2022) Keperawatan Dasar I. Sukoharjo.

Smagula, S.F. et al. (2016) ‘Risk factors for sleep disturbances in older adults: Evidence from prospective studies’, Sleep Medicine Reviews, 25, pp. 21–30. Available at: https://doi.org/10.1016/j.smrv.2015.01.003.

Supartini, Y., Martiana, P.D. and Sulastri, T. (2021) ‘Dampak Kecanduan Smartphone Terhadap Kualitas Tidur Siswa SMP’, JKEP, 6(1), pp. 69–85. Available at: https://doi.org/10.32668/jkep.v6i1.463.

Zurutuza, J.I. et al. (2024) ‘Factors Associated With Sleep Quality Among Primary Healthcare Workers During the SARS-CoV-2 Pandemic’, Cureus [Preprint]. Available at: https://doi.org/10.7759/cureus.56502.