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Original Research

Screen Time and Physical Activity in Under-Five Children

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ABSTRACT

Introduction: High screen time is defined as activities in front of a screen for more than 60 minutes in 24 hours. These activities can lead to a decreased rate of physical activities in under-five children and pose a risk of turning into gaming addiction or gaming disorder. This study aimed to identify the relationship between screen time and physical activities in under-five children at Kindergarten in East Java.

Methods: This study was designed as a correlational study with a cross-sectional approach with a purposive sampling technique. The population in this study was all mothers and children aged 24-60 months at Kindergarten totaling 35 people. The number of samples was 31 respondents. The study was conducted at one of Kindergarten in East Java. Instruments to measure variables in this study were modified screen time questionnaires to measure screen time and PAQ-C questionnaires to measure physical activities.

Results: The results show that nearly all (83.9%) respondents had high screen time and the majority of them (51.6%) displayed decreased physical activities. An analysis with Spearman's Rank statistical test obtained a p-value of $0.00 < \alpha < 0.05$, meaning that there is a relationship between screen time and physical activities in under-five children at Kindergarten in East Java. A correlation coefficient of -0.701 shows that there is a negative (inverse) and strong relationship.

Conclusion: Parents are expected to be able to direct their children to manage their screen time so that their children's physical activity is still fulfilled

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1. INTRODUCTION

In the era of globalization, Indonesia sees rapid and radical advancements in technology. While positive impacts are expected from these advancements in technology, negative impacts lurk around every corner, like increasing consumption of smartphones and online games both among adults and preschoolers (Palar, Onibala and Wenda Oroh, 2018; Rahmandani, Tinus and Ibrahim, 2018; Rahmalah et al., 2019). These days, children spend more time using gadgets or smartphones than engaging in physical activities with peers. Excessive and uncontrolled use of gadgets or smartphones and TV watching are on an upward trend not only among adults but also under-five children (Roza, Kamayani and Gunawan, 2018; Rahmalah et al., 2019; Ludyanti and Ishariani, 2020). Screen time is defined as time or hours per day spent in front of screens such as a television, computer, smartphone, tablet, and video games/digital video discs (Sanders et al., 2019; Webster, Martin and Staiano, 2019). Under-five children are at a period where they grow rapidly and undergo changes in their daily habit patterns (Harahap, Sandjaja and Nur Cahyo, 2013).

The proportion of passive physical activities in Indonesia was 26.1% with the top five provinces being DKI Jakarta (44.2%), Papua (38.9%), West Papua (37.8%), Southeast Sulawesi and Aceh (37.2%) (Kemenkes RI, 2013). At the same time, the lifestyle of children and adolescents has changed a lot where the use of television, video games, computers and other electronic media has increased dramatically with the average amount of time spent using these media reaching 3 to 4 hours per day (Bingham et al., 2016; Cliff et al., 2017). The researcher conducted a preliminary study at PAUD Al Azhaar in Kedungwaru Sub-District, Tulungagung. Interviews were conducted with parents and guardians of students at the research location regarding screen time and children's physical activity. The results of the preliminary study on 7 mothers show that their children frequently used a smartphone to play games and they used a smartphone to keep children from being fussy. The mothers reported positive and

negative impacts of smartphone on their children. The positive impacts include children's aptitude in language, numbers and color recognition. The negative impacts tend to be observed on the children physically, such as eye rubbing before sleeping due to eye fatigue as a result of staring at screens, decreased physical activity of children like playing, and decreased interaction between peers.

Principally, this behavior itself, known as screen time, especially featuring gadgets and smartphones, entails a multitude of impacts, both positive or negative ones. According to (Cliff et al., 2017; Sanders et al., 2019; Webster, Martin and Staiano, 2019), since screen time involves technology such as a television, tablet and smartphone, it has positive impacts for children such as providing learning opportunities, entertainment for children, and allowing parents to enjoy free time. On the other hand, some of the negative impacts include difficulty to limit children's time in using the technology and children's disappointment and anger when their time limit is up. In under-five children, technology is thought to lead to decreased the rate of physical activities since children prefer to sit idly in front of electronic media. Gradually children will forget the pleasure of playing with peers and with their family which will hinder the child's ability to socialize.

One way to mitigate the negative impacts from screen time is by modifying parental behavior to give greater attention to their children to encourage healthier lifestyle. A healthy lifestyle, one that promote physical activities, must be fostered as early as possible in children through daily habits (Hanifah and Nindya, 2013; Harahap, Sandjaja and Nur Cahyo, 2013; Ludyanti, 2019; Ramadhani, 2020). Physical activity in children brings many benefits and can reduce the risk of obesity, vascular disease, and malignancy in later life. Movement skills, social interaction, and brain development are also perceived during play. Active children will learn more effectively, both inside and outside the school environment. Habitual physical activity since childhood will shape a child into an adult with active lifestyle. Parents are also required to catch up on current trends since electronic media already exists and will continue to do so.

Parents should educate their children on how to use electronic media properly and responsibly to improve their social welfare and to foster positive behavior (Roza, Kamayani and Gunawan, 2018; Viandari and Susilawati, 2019).

Based on the screen time issue described above, the researcher wished to conduct a study titled "Relationship Between Screen Time and Physical Activity in Under-Five Children at Kindergarten in East Java."

2. METHOD

2.1 Design

This study was designed as a correlational study with a cross-sectional approach. It analyzed the relationship between screen time and physical activity in under-five children at Kindergarten in East Java.

2.2 Population

2.2 Population, Samples, and Sampling

The target population in this study was all mothers with children aged 24-60 months at Kindergarten in East Java totaling 35 subjects. The samples in this study were mothers and preschoolers aged 4-6 years, totaling 35 people, taken with a purposive sampling technique. The inclusion criteria were willingness to participate as research subjects proven by filling in an informed consent, preschoolers that actively used television or smartphone in the last one year. The exclusion criteria included sick respondents, respondents not being present at the time of the study, respondent that changed schools or changed domicile.

2.3 Variables

The independent variable in this study was screen time, while the dependent variable was physical activities (Nursalam, 2017; Notoatmodjo Soekidjo, 2018).

2.4 Instruments

Instrument used by the researcher was a screen time questionnaire describing children's activities during a screen time in 24 hours. Based on the calculation of children's screen time, two categories were formed, namely Low Screen Time (LST) = ≤ 60 minutes/day and High Screen Time

(HST) = > 60 minutes/day. The assessment of physical activity was performed using a PAQ-C questionnaire (Physical Activity Questionnaire Children) with a modification by the researcher. The researcher calculated physical activity in the last 24 hours. The questionnaire contained 18 questions where 9 questions explored sedentary activities and 9 questions explored mobile activities. Based on the PAQ-C, the physical activity categories were mild physical activities (sedentary lifestyle) = 1.40 - 1.69 kcal/hour; moderate physical activity (active or moderate lifestyle) = 1.70 - 1.99 kcal/hour; vigorous physical activity (vigorous or vigorously active lifestyle) = 2.00 kcal/hour.

2.5 Procedure

The process of data collection began with seeking permission from the management of Kindergarten in East Java and continued with identification of respondents who met the research criteria. Then, informed consents were distributed to prospective respondents and the purpose, objectives, research procedures were explained. Questionnaires containing children's physical activity data were given directly and they were filled under the researcher's supervision while complying with the health protocol. After the completion of the data collection process, the data was processed and analyzed by the researcher.

2.6 Analysis

The statistical test used in this study is the Spearman's Rank test. The calculation process was carried out using a computer program with a significance level (α) of 0.05, thus, the conclusion in this study was if the p-value was ≤ 0.05 , then H1 was accepted, meaning a relationship was found and if the p-value was > 0.05 , then H1 was rejected, meaning that no relationship was found.

2.7 Ethical Clearance

This research has previously gone through the ethical test stage and was declared ethically compliant, organized by the Ethics Committee of STIKES Karya Husada Kediri as evidenced by an ethical certificate numbered 313/EC/LPPM/STIKES/KH/XII/2020.

3. RESULT

The respondent characteristics are presented in the following table.

Table 1. Distribution of respondent characteristic frequency at Kindergarten in East Java, December 2020 (n=31)

Respondent Characteristics	N	%
Parent General Data		
Father's Age		
21-30 Years	2	6.5
31-35 Years	29	93.5
Mother's Age		
21-30 Years	35.5	20
31-45 Years	64.5	33.3
Father's Education		
< Middle School	4	12.9
> High School	24	77.4
Mother's Education		
< Middle School	6	19.4
> High School	20	64.5
Father's Occupation		
Private Sector Employee	5	16.1
Civil Servant	7	22.6
Entrepreneur	19	61.3
Mother's Occupation		
Private Sector Employee	10	32.3
Entrepreneur	8	25.8
Housewife	13	41.9
Mounthly Family Income		
< Rp 1,000,000	3	9.7
Rp 1,000,000 – Rp 3,000,000	9	29.0
< 3,000,000	19	61.3
Under-Five Children General Data		
Children's Age		
37-48 months	9	29
49-69 months	22	71
Children's Gender		
Female	22	71
Male	9	29
Owned Gadgets or Electronics		
TV	1	3.2
TV and Handphone	30	96.8
Mother's Role in Supervising the Children's Playtime		
Implementing Time Limit	31	100
Not Implementing Time Limit	0	0

Table 2. Distribution of the children's screen time and physical activity frequency at Kindergarten in East Java, December 2020 (n=31)

Category	N	%
Screen Time Category		
Low Screen Time (LST)	5	16.1
High Screen Time (HST)	26	83.9
Physical Activity Category		
Light	16	51.6
Moderate	10	32.3
Vigorous	5	16.1
Total	31	100

Table 3. Distribution of the children's screen time and physical activity frequency at Kindergarten in East Java, December 2020 (n=31)

	Physical Activity Category			Total
	Light	Moderate	Vigorous	
Screen Time Category				
Low Screen Time	0	0	5	5
High Screen Time	16	10	0	26
Total	16	10	5	31

As seen in Table 1, the majority of the fathers (93.5%) aged 31-45 years, while the majority of the mothers (64.5%) aged 31-45 years. The majority of the fathers (77.4%) had at least high school education, and similarly, the majority of the mothers (61.3%) had at least high school education. The majority of the fathers (61.3%) were entrepreneurs, while almost half of the mothers (41.9%) were housewives. The majority of the families (61.3%) had income > 3,000,000, the majority of the children (71%) aged 49-60 months, most children (71%) were female, and almost all of the children (96.8%) had a TV and mobile gadget or electronic device. All of the mothers (100%) reported to limit the children's playtime with gadgets.

As seen in Table 2, 26 (83.9%) children had a High Screen Time and only 5 (16.1%) children had a Low Screen Time. The identification of the children's physical activity, 16 (51.6%) under-five children were in the light physical activity category, 10 (32.3%) were in the moderate category, and 5 (16.1%) were in the vigorous category.

Table 3 shows the analysis of the relationship between screen time and physical activity in under-five children at Kindergarten in East Java. From the data processing with a Spearman's Rank statistical test with computerize on the screen time variable with physical activity, a significant result (p) of 0.000 was obtained and since the p-value < 0.05, there is a relationship between screen time and physical activity in under-five children at Kindergarten in East Java.

A correlation coefficient of 0.701 indicates a strong relationship between the screen time variable and physical activity in under-five children at Kindergarten in East Java. The negative result (-0,701) above indicates that the relationship between the two variables is inverse, meaning that the higher the screen time, the lower the children's activity is.

4. DISCUSSION

4.1 Identification of Screen Time in Under-Five Children at Kindergarten in East Java

In the results of this study, among the 31 children, on average they spent 80.54 minutes to watch videos on a smartphone, 53.54 minutes to play games, and 4.41

minutes to watch TV. In other words, high screen time in children greatly reduces the rate of physical activities. Screen time is defined as time or hours spent every day in front of screen media such as a television, computer, smartphone, tablet, and videogames/digital video discs (Sanders et al., 2019; Janssen et al., 2020). The American Academy Pediatrics recommends a screen time no more than an hour a day for children aged 3-6 years (Bingham et al., 2016; Cliff et al., 2017). When children play gadgets over a long period of time, laziness starts to develop, causing children to only want to do and feel comfortable with stationary or sedentary activities which ultimately lead to gadget addiction (Downing, Hnatiuk and Hesketh, 2015; Vaughn et al., 2017; Janssen et al., 2020). Based on these facts and theory, the researcher argues that high screen time occurs due to smartphones presenting a variety of interesting pictures, videos and games, so children prefer to sit and feel lazy and disinclined to move.

4.2 Identification of Physical Activity in Under-Five Children at PAUD Al Azhaar Tulungagung

As shown in Table 3, 16 (51.6%) under-five children had light physical activity, 10 (32.3%) had moderate physical activity, and 5 (16.1%) had vigorous physical activity. Based on the data above, it can be inferred that the level of physical activity tends to be low, both outside and inside the house. Children do too many sedentary activities such as sleeping, playing computer (which does not involve movement, just sitting), sitting listening to music, reading or being read, drawing, coloring, making crafts, sitting while playing toys, eating while sitting watching TV. The lack of stimulations that motivate children to move is the cause of this high screen time, evoking habitual laziness or reluctance to move. If this goes on, children will eventually only be willing to do activities that do not require moving or mobility, such as playing gadgets. This is what is known as gadget addiction (Janssen et al., 2020). At this age, children are undergoing psychosocial development where more active under-five children are more likely to spend time doing activities and fostering relationships with peers, thereby necessitating parental support and involvement so that the developmental needs of children's growth are met and their physical activity can be monitored in order to

detect lethargy and ensure undisturbed growth (Potter and Perry, 2015). The frequency of children who have a light activity level is quite high in this study. The habit of playing games, watching TV and others are activities that are generally sedentary (immobile). In this study, under-five children with light physical activity tend to prefer to spend time playing gadgets and watching TV, while most under-five children in the moderate and vigorous activity categories spend their time playing with friends with their toys without any tendency to play gadgets.

4.3 Analysis of The Relationship Between Screen Time and Physical Activity in Under-Five Children at PAUD Al Azhaar Tulungagung

From the results of the study, it is known that 83.9% of the children had high screen time and 51.6% of them fell into the light physical activity category. From the results of data processing with the Spearman's Rank statistical test on the screen time variable with physical activity, a significant result (p) of 0.000 was obtained. A value (p) < 0.05 indicates a relationship between screen time and physical activity in under-five children at PAUD Al Azhaar Tulungagung with a correlation coefficient of 0.701 indicating that there is a strong correlation between the screen time variable and physical activity in under-five children. Whereas the negative correlation coefficient of -0.701 indicates that the relationship between the two variables is not unidirectional (inverse), thus it can be interpreted that the higher the screen time, the lower the children's activity. In other words, screen time has a negative impact on children activity. Based on this correlation test, H1 is accepted, meaning that there is a significant and inverse relationship between screen time and physical activity in under-five children at PAUD Al Azhaar Tulungagung.

This shows that high screen time will affect the level of children's physical activity. According to (Syahidah and Wijayanti, 2017; Ludyanti and Ishariani, 2020) , while watching videos on a smartphone and using electronic media or gadgets can indeed make children sit still over a long period of time, it tends to make children reluctant to carry out activities that require energy, leading to low levels of physical activity.

The results are in line with a study by (Elfiadi, 2018; Puspa, 2019; Rahmalah et al., 2019; Munisa, 2020), stating continuous use of gadgets or high screen time can hinder the progress of early childhood development. If parents let this continue unperturbed, it is going to be harder and harder for the children to concentrate in learning, they become lazy to write, to read books and it will impair the children's social life due to unbalanced use of gadgets. Every parent wants what is best for their children. However, knowledge, background and experience drive every action and behavior. The higher education of most respondents also supports the formation of age-appropriate parenting patterns that support the development of children, one of which is by enforcing rules in using gadgets. Parents are more focused and directed to monitor their children when playing gadgets and playing with parents actively at home so that optimal children's development can be achieved according to age.

According to (Sujianti, 2018) screen time and gadget are not all about negative repercussions. Gadgets can also be utilized as a means fo learning, to improve language proficiency since gadgets come with various languages, reduce stress levels and so on. Amidst the COVID-19 pandemic, children continue their education online. This condition requires parents to understand certain functions of a gadget and direct them to use the gadget as a means of learning, not merely a means of entertainment, and more importantly, to keep encouraging children to stay active inside the house or with their peers. Based on these findings and theories, the researcher expresses the importance of special monitoring by parents of children who use gadgets so as to avoid the effects of gadget addiction. Parents should limit their children in playing gadgets and direct the use of gadgets as a means of learning for children, encourage children to participate in physical activities, guide children during a screen time and regularly remind them of their duties, such as bathing, eating, studying and playing with their peers so that their social skills with the surrounding environment are well developed.

5. CONCLUSION

Based on the analysis above, the following conclusions is screen time related to the physical activity of under-five children

at Kindergarten in East Java where almost all under-five children have a High Screen Time and the majority of the under-five children are in the light physical activity category.

6. ACKNOWLEDGEMENT

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7. CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

8. REFERENCES

- Bingham, D. D. et al. (2016) 'Physical Activity During the Early Years: A Systematic Review of Correlates and Determinants', *American Journal of Preventive Medicine*. Elsevier, 51(3), pp. 384-402. doi: 10.1016/j.amepre.2016.04.022.
- Cliff, D. P. et al. (2017) 'Adherence to 24-Hour Movement Guidelines for the Early Years and associations with social-cognitive development among Australian preschool children', *BMC Public Health*, 17. doi: 10.1186/s12889-017-4858-7.
- Downing, K. L., Hnatiuk, J. and Hesketh, K. D. (2015) 'Prevalence of sedentary behavior in children under 2years: A systematic review', *Preventive Medicine*. Elsevier B.V., 78, pp. 105-114. doi: 10.1016/j.ypmed.2015.07.019.
- Elfiadi (2018) 'DAMPAK GADGET TERHADAP PERKEMBANGAN ANAK USIA DINI', *ITQAN: Jurnal Ilmu-ilmu Kependidikan*.
- Hanifah, N. and Nindya, T. S. (2013) 'Hubungan Kontribusi Beban Glikemik Makanan dan Aktivitas Fisik terhadap Kejadian Gizi Lebih pada Remaja di SMP Full Day Surabaya', *Media Gizi Indonesia*, 9(No. 1 Januari-Juni 2013), pp. 66-71.
- Harahap, H., Sandjaja, N. and Nur Cahyo, K. (2013) 'POLA AKTIVITAS FISIK ANAK USIA 6,0-12,9 TAHUN DI INDONESIA', *GIZI INDONESIA*. doi: 10.36457/gizindo.v36i2.138.
- Janssen, X. et al. (2020) 'Associations of screen time, sedentary time and physical activity with sleep in under 5s: A systematic review and meta-analysis', *Sleep Medicine Reviews*. doi: 10.1016/j.smrv.2019.101226.
- Ludyanti, L. N. (2019) 'PERILAKU KURANG GERAK (SEDENTARY BEHAVIOUR) DENGAN PERKEMBANGAN PSIKOSOSIAL ANAK PRA SEKOLAH', *Care : Jurnal Ilmiah Ilmu Kesehatan*. doi: 10.33366/jc.v7i2.1290.
- Ludyanti, L. N. and Ishariani, L. (2020) 'Parent Coaching dan Aktivitas Berbasis Layar sebagai Bentuk Sedentary Behaviour pada Anak Pra Sekolah', *Jurnal Sehat Mandiri*. doi: 10.33761/jsm.v15i1.191.
- Munisa (2020) 'Pengaruh Penggunaan Gadget Terhadap Interaksi Sosial Anak Usia Dini Di TK Panca Budi Medan', *Jurnal Abdi Ilmu*.
- Notoatmodjo Soekidjo (2018) 'Metodologi Penelitian Kesehatan', Rineka Cipta.
- Nursalam (2017) *Metodologi penelitian ilmu keperawatan, Metodologi Penelitian Ilmu Keperawatan*.
- Palar, J. E., Onibala, F. and Wenda Oroh (2018) 'Negatif Penggunaan Gadget Pada Anak Dengan Perilaku Anak Dalam Penggunaan Gadget', *e-Journal Keperawatan*.
- Potter, P. A. and Perry, A. G. (2015) 'Fundamental Keperawatan Buku 1 Ed. 7', Jakarta: Salemba Medika.
- Puspa, F. (2019) 'INTENSITAS PENGGUNAAN GADGET DAN AKTIVITAS MOTORIK ANAK USIA 4-6 TAHUN DI KOTA PONTIANAK', *Altius: Jurnal Ilmu Olahraga dan Kesehatan*. doi: 10.36706/altius.v8i2.9980.
- Rahmalah, P. Z. et al. (2019) 'Pengaruh Penggunaan Gadget Terhadap Pembentukan Karakter Anak Usia Dini', *Prosiding Seminar Nasional Lppm Ump*.
- Rahmandani, F., Tinus, A. and Ibrahim, M. M. (2018) 'Analisis Dampak Penggunaan Gadget (Smartphone) Terhadap Kepribadian dan Karakter (kekar)', *FKIP Universitas Muhammadiyah Malang*.

- Ramadhani, N. W. (2020) 'Identifikasi Pola Aktivitas Fisik Anak Sekolah Dasar di Kota Surabaya dan Kabupaten Nganjuk', *Jurnal Kesehatan Olahraga*.
- Roza, E., Kamayani, M. and Gunawan, P. (2018) 'Pelatihan Memantau Penggunaan Gadget pada Anak', *Jurnal SOLMA*. doi: 10.29405/solma.v7i2.1062.
- Sanders, T. et al. (2019) 'Type of screen time moderates effects on outcomes in 4013 children: Evidence from the Longitudinal Study of Australian Children', *International Journal of Behavioral Nutrition and Physical Activity*. doi: 10.1186/s12966-019-0881-7.
- Sujianti, S. (2018) 'HUBUNGAN LAMA DAN FREKUENSI PENGGUNAAN GADGET DENGAN PERKEMBANGAN SOSIAL ANAK PRA SEKOLAH DI TK ISLAM AL IRSYAD 01 CILACAP', *JURNAL KEBIDANAN*. doi: 10.31983/jkb.v8i1.3735.
- Syahidah, Z. A. and Wijayanti, H. S. (2017) 'Perbedaan aktivitas fisik, screen time, dan persepsi ibu terhadap kegemukan antara balita gemuk dan non-gemuk di Kota Semarang', *Journal of Nutrition College*. doi: 10.14710/jnc.v6i1.16886.
- Vaughn, A. E. et al. (2017) 'Assessment of nutrition and physical activity environments in family child care homes: Modification and psychometric testing of the Environment and Policy Assessment and Observation', *BMC Public Health*, 17(1). doi: 10.1186/s12889-017-4686-9.
- Viandari, K. D. and Susilawati, K. P. A. (2019) 'Peran pola asuh orangtua dan penggunaan gadget terhadap interaksi sosial anak prasekolah', *Jurnal Psikologi Udayana*. doi: 10.24843/jpu.2019.v06.i01.p08.
- Webster, E. K., Martin, C. K. and Staiano, A. E. (2019) 'Fundamental motor skills, screen-time, and physical activity in preschoolers', *Journal of Sport and Health Science*. doi: 10.1016/j.jshs.2018.11.006.