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Determining Factors for Long Term Use of Gadget by Preschool Children

Wardatus Sholihah[1*], Allenidekania[2], Nur Agustini[2], Rukmini[3], Dwi Yuniar Ramadhani[3]

1. Faculty of Nursing, Universitas Jember, Jember 68121, Indonesia
2. Faculty of Nursing, Universitas Indonesia, Depok 16424, Indonesia
3. Nursing Department, STIKes Adi Husada, Surabaya 60141, Indonesia

*E-mail: wardatussholihah4@gmail.com

Abstract

In the digital era, preschoolers spent more time playing on their gadgets than with their peers. The excessive use of gadgets (including laptops, cellphones, tablets, and similar electronic devices) can have negative impacts on preschool-age children. This study analyzes the determining factors that influence the duration of gadget use in preschool children. The study used a correlational design with a cross-sectional approach involving 318 parents who were selected using cluster sampling. The results showed that there was a significant relationship between the duration of gadget use and the gender of the parents (p = 0.001), parental education (p = 0.035), family economic status (p = 0.018), educational media (p = 0.039), distraction media (p = 0.029), and psychosocial development (p = 0.001). The factors that most influence the duration of gadget use in children are family economic status with lower income adjusted odds ratio (AOR) (0.327) 95% CI (0.106–0.947), educational media is to add information AOR (0.367) 95% CI (0.183–-0.736), distraction media so that the child doesn't fuss AOR (0.392) 95% CI (0.203–0.758) and children do not have psychosocial disorders AOR (0.348), 95% CI (0.189–0.638). The results of the study can offer a basis for developing the latest nursing interventions in providing education and support to parents and children when using gadgets.

Keywords: factors of gadget use, parents, preschool age

Abstrak

Faktor Penentu Lama Penggunaan Gawai pada Anak Usia Prasekolah. *Pada era digital, anak prasekolah lebih banyak menggunakan waktunya untuk bermain gawai daripada dengan teman sebayanya. Penggunaan gawai yang berlebihan (termasuk laptop, telepon genggam, tablet, dan alat elektronik sejenis) dapat memberikan dampak negatif terhadap anak-anak usia prasekolah. Penelitian ini bertujuan untuk menganalisis faktor penentu yang memengaruhi lamanya penggunaan gawai pada anak usia prasekolah. Desain penelitian korelasional dengan pendekatan* cross-sectional *dengan melibatkan 318 orang tua yang dipilih menggunakan* cluster sampling. *Hasil penelitian menunjukkan adanya hubungan yang signifikan antara lamanya penggunaan gawai dengan jenis kelamin orang tua (p* value= *0,001), pendidikan orangtua (p = 0,035), status ekonomi keluarga (p = 0,018), media edukasi (p = 0,039), media distraksi (p = 0,029) dan perkembangan psikososial (p = 0,001). Faktor yang paling memengaruhi lama penggunaan gawai pada anak yaitu status ekonomi keluarga dengan penghasilan ≤upah minimum kabubaten/kota* AOR *(0,327)* CI *95% (0,106–0,947), sebagai media edukasi yaitu menambah informasi* AOR *(0,367)* CI *95% (0,183–-0,736), sebagai media distraksi supaya anak tidak rewel* AOR *(0,392)* CI *95% (0,203–0,758), dan anak yang tidak mengalami gangguan psikososial* AOR *(0,348),* CI *95% (0,189–0,638). Hasil penelitian dapat digunakan sebagai dasar dalam menyusun intervensi keperawatan yang terbaru dalam memberikan edukasi dan pendampingan bagi orantua dan anak saat menggunakan gawai*.

Kata Kunci: *anak usia prasekolah, faktor penggunaan gawai, orang tua*

Introduction

Preschool children are at an early stage of very rapid growth and development, especially in cognitive and psychosocial development (Hockenberry & Wilson, 2018). The psychosocial development of preschool children is at a stage of high curiosity, very energetic in learning, playing, and feeling satisfaction and pride in the achievements they have made (Mansur, 2019). However, in the digital era, children spend more time playing with devices than playing outside

with their peers (Sundus, 2018).

Data from the Statistics Indonesia *(Badan Pusat Statistik; BPS)* (as cited in Indonesia Internet Provider Association *[Asosiasi Penyelenggara Jasa Internet Indonesia; APJII]*, 2020) show that the number of internet users in Indonesia in the second quarter rose to 196.7 million,73% of Indonesia's total population of 266.9 million. A survey by the Indonesian Child Protection Commission *(Komisi Perlindungan Anak Indonesia; KPAI)* (2021) on the COVID-19 pandemic in 34 provinces with a total sample of 25,164 found that most parents (73%) allow their children to use devices; 71.3% of children have personal devices, and 79% of parents do not have rules for their children's device use. According to the survey, the average amount of time spent on the internet by children each day was 1–2 hours (36.5%), 2–5 hours (34.8%), and > 5 hours (25.4%).

The American Academy of Pediatrics and the Italian Pediatrics Association recommend that parents avoid using devices for 2-year-olds because children's brains develop quickly; learning through interaction with others is preferred (United Nations Children's Fund [UNICEF], 2020). The recommended daily screen uses by children aged 2–5 years is < 1 hour per day, and for children aged 5–8 years < 2 hours per day (UNICEF, 2020). In fact, most preschool-aged children use devices > 1 hour per day (Putri et al., 2020). Consistent with research by Tezol et al. (2022), most children aged 2–5 years use gadgets for > 4 hours per day.

Zhu et al. (2020) also found that using devices for > 1 hour per day can increase children's risk of sleep disorders by 12.35%. Neshteruk et al. (2021) observed that excessive use of screen time was also associated with an increase in children's body mass index (BMI) Z-score, while limiting/monitoring screen use was associated with a reduced BMI Z-score and smaller waist circumference. Research by Tezol et al. (2022) showed that the group of children aged 2–5 years who used electronic screens excessively had significantly higher scores on emotional and behavioral problems, peer relationship problems, and ability to deal with difficulties (total $p < 0.01$). Sundus (2018) added that the negative impact of gadget use on children includes speech or language delays, problems in learning, anxiety, depression, and adverse impacts on the child's character. This study aims to analyze the determining factors that influence the duration of gadget use in preschool children.

Methods

The research design used a correlational study with a cross-sectional approach. This design was applied to measure the independent variable (parent and child factors), and the dependent variable (length of gadget use in preschool children). The researcher has obtained ethical approval from the Research Ethics Committee of the Faculty of Nursing Universitas Indonesia under number Ket-50/UN2.F12.D1.2.1/PPM.00.02/2022.

Participants. The participants in this study were 318 parents. The selection of participants used cluster sampling conducted in Jember district with 31 sub-districts. The researcher selected 10% of the 31 sub-districts in the Jember Regency, obtaining the results for three sub-districts, which were randomized again by 10% in the selection of sub-districts/villages. The results of the randomization of the sub-districts/villages were the place of research in early childhood education and licensed kindergartens. Furthermore, in selecting parents, the researcher collaborated with teachers whose ages satisfied the study's inclusion and exclusion criteria.

Questionnaire. The data collection tool used was a questionnaire on parents' demographic data—gender, age, education, and parent's job. The parent knowledge questionnaire developed by researchers contained 10 closed statements and was evaluated for validity and reliability with a Cronbach's alpha of 0.711. This questionnaire consisted of four domains: the definetion of gadgets, the use of gadgets, the benefits of gadget use on children, and the impacts of

gadget use on children. Each correct answer was given a value of 1, while the wrong answer was given a value of 0. The score for knowledge was not sufficient if the total result was ≤ 5; the respondent's knowledge was acceptable if the total score was > 6. Family economic status was based on the Jember district minimum wage in 2020. The questionnaire design was based on the Parenting Styles and Dimensions Questionnaire (PSDQ); the questionnaire contained 32 closed statements that had been tested for validity and reliability by Wulandari (2019), with Cronbach's alpha 0.712. The PSDQ measures three parenting styles: authoritative parenting (15 items), authoritarian parenting (12 items), and permissive parenting (5 items).

The assessment used a Likert scale as follows: always = 5, often = 4, sometimes = 3, rarely = 2, and never = 1. The calculation for each parenting pattern was based on the average value of each item; the highest value was categorized as parenting style. The questionnaire regarding child factors (age, education media, distraction media, number of siblings, order of children) provided several short statements that respondents could choose from according to their characteristics. Psychosocial development used the pediatric symptom checklist 17 (PSC-17) patented by Irwanto et al. (2020). It is a short screening questionnaire containing 17 questions that help identify and assess changes in emotional and behavioral problems in children.

The PSC-17 questionnaire contained 17 questions in three subscales: internalization, externalization, and attention. The questionnaire responses were graded based on the total number of results from each subscale: never = 0, sometimes = 1, and always = 2. Unanswered questions were given a value of 0; if ≥ 4 were unanswered, the questionnaire was considered invalid. The results indicated behavioral, emotional, and psychosocial disorders if the total value of the internalization subscale was ≥ 5, the total value of the externalization subscale was ≥ 7, the total value of the attention subscale was ≥ 7, or the total value was ≥ 15 based on the time devoted gadgets (UNICEF, 2020).

Results

The characteristics of the respondents are summarized in Table 1. The majority of parents were females aged 20–35 with a basic education (elementary/middle school). Most parents did not work; the majority of families' economic status was below the provincial minimum wage. Most parenting styles were authoritative on the PSDQ scale, and most were well-informed. Most children were entering Kindergarten B, most had two siblings, and most were first-born. Regarding educational and distraction media, the reason most parents allowed their children to have devices was to increase their knowledge and play. In terms of psychosocial development, most children in the survey were suspected of having behavioral, emotional, and psychosocial disorders. The majority of children used devices to an extent considered "excessive."

Table 2 analysis of independent variables and length of use of devices in preschool children. The table shows that there is a significant relationship between gender ($p = 0.001$), pa-rents' last education ($p = 0.035$), family economic status ($p = 0.018$), educational media ($p = 0.039$), distraction media ($p = 0.029$) and psychosocial development ($p = 0.001$), with the length of use of devices in preschool children increasing ($p < 0.05$).

The results of the multivariate analysis in Table 3 show that the economic status of families with income ≤ provincial minimum wage by a factor of 0.327 increased the length of time children used gadgets compared to income > provincial minimum wage after being controlled by other variables. Allowing the use of gadgets for educational media, especially to obtain various information for children, has an influence of 0.367 times influenced the length of time they used gadgets after control for other variables.

Table 1. Characteristics of the Respondents

Variable	n	%
Parental Factors		
Parent's Gender		
Male	29	9.1
Female	289	90.9
Parent Age		
Early adulthood 20–35 years	211	66.4
Middle adults 36–49 years	81	25.5
Late adulthood 49–50 years	26	8.2
Last Education of Parents		
Basic education (elementary/middle school)	148	46.5
Secondary education (high school/vocational school)	130	40.9
Higher education (bachelor to doctoral degree)	40	12.6
Parent's Job		
Does not work	212	66.7
Work	106	33.3
Family Economic Status		
Income ≤ provincial minimum wage	264	83.0
Income > provincial minimum wage	54	17.0
Parenting Style		
Permissive	20	6.3
Authoritarian	5	1.6
Authoritative	293	92.1
Parent Knowledge		
Not enough	28	8.8
Good	290	91.2
Educational Media		
Information facilities	116	36.5
Conduct a task	60	18.9
Increase knowledge	142	44.7
Distraction Media		
Children are not fussy	86	27.0
Play	232	73.3
Child Factors		
Child's Age		
Kindergarten A	109	34.3
Kindergarten B	209	65.7
Number of Siblings		
1 child	103	32.4
Two children	145	45.6
≥ 3 children	70	22.0
Order of Children		
1 child	158	49.7
Two children	111	34.9
≥ 3 children	49	15.4
Psychosocial Development		
There are no behavioral, emotional, or psychosocial disorders	121	38.1
Suspicion of behavioral, emotional, or psychosocial disorders	197	61.9
Length of Time Using the Device		
Normal < 1 hour per day	60	18.9
Excessive ≥ 1 hour per day	258	81.1

Table 2. Relationship of Parent and Child Factors to the Duration of Gadget Use

Variable	Duration of Gadget Use				Total		OR (95% CI)	p
	Normal		Excessive					
	n	%	n	%	n	%		
Gender								
Male	12	41.4	17	58.6	29	100	3,544 (1,590–7,898)	0.001*
Female	48	16.6	241	83.4	289	100		
Parent Age								
Early adulthood 20–35 years	39	18.5	172	81.5	211	100		
Middle adults 36–49 years	16	19.8	65	80.288	81	100	-	0.968
Late adults 50–65 years	5	19.2	21	0.8	26	100		
Last Education								
Basic education (elementary/middle school)	23	15.5	125	84.5	148	100		0.035*
Secondary education (high school/vocational school)	33	25.4	97	74.6	130	100	-	
Higher education (bachelor to doctoral degree)	4	10	36	90	40	100		
Parent Job								
Does not work	39	18.4	173	81.5	212	100	0.912	0.761
Work	21	19.8	85	80.2	106	100	(0.505–1.647)	
Family Economic Status								
Income ≤ provincial minimum wage	56	21.2	208	78.8	264	100		0.018*
Income > provincial minimum wage	4	7.4	50	92.6	54	100	3,365 (1,166–9,717)	
Parenting Style								
Permissive	4	20	16	80	20	100		
Authoritarian	1	20	4	80	5	100	-	0.989
Authoritative	55	18.8	238	81.2	293	100		
Parent Knowledge								
Not enough	4	14.3	24	85.7	28	100	0.696	0.692
Good	56	19.3	234	80.7	290	100	(0.232–2.088)	
Educational Media								
Information facilities	30	25.9	86	74.1	116	100		
Doing homework	11	18.3	49	81.7	60	100	-	0.039*
Increase knowledge	19	13.4	123	86.6	142	100		
Distraction Media								
Children do not fuss and cry	23	26.7	63	73.3	86	100	1,924	0.029*
Play	37	15.9	195	84.1	232	100	(1,063–3,481)	
Child's Age								
Kindergarten A	25	22.9	84	77.1	109	100	1,480	0.181
Kindergarten B	35	16.7	174	83.3	209	100	(0.832–2.631)	
Number of Siblings								
1 child	19	18.4	84	81.6	103	100		
Two children	27	18.6	118	81.4	145	100	-	0.963
≥ 3 children	14	20	56	80	70	100		
Order of Children								
1 child	32	20.3	126	79.7	158	100		
Two children	18	16.2	93	83.8	111	100	-	0.676
≥ 3 children	10	20.4	39	79.6	49	100		

Variable	Duration of Gadget Use				Total		OR (95% CI)	p
	Normal		Excessive					
	n	%	n	%	n	%		
Psychosocial Development								
No behavioral, emotional, or psychosocial disorders	34	28.1	87	71.9	121	100	2,570 (1,450–4,555)	0.001*
Suspected behavioral, emotional, or psychosocial disorders	26	13.2	171	86.8	197	100		

Table 3. Final Modeling of the Logistic Regression Model with Variables Related to the Length of Use of Gadget in Preschool Children

Variable	AOR	p value	95% CI
Family Economic Status			
Income ≤ provincial minimum wage	0.327	0.040	0.106–0.947
Income > provincial minimum wage	Ref		
Educational Media			
Add information	0.367	0.05	0.183–0.736
Doing homework	0.882	0.774	0.373–2.085
Increased knowledge	Ref		
Distraction Media			
Children are not fussy	0.392	0.06	0.203–0.758
Play	Ref		
Psychosocial Development			
No distractions	0.348	0.001	0.189–0.638
Suspect interference	Ref		

Children without psychosocial development disorders 0.348 times influenced the length of time they used devices versus being suspected of having psychosocial development disorders after controlling for other variables.

Discussion

Parental Factors and the Length of Time Their Children Use Devices. The parents involved in this study were mostly mothers aged 20–35, had a secondary level of education, spent most of their time as housewives, had an economic status below the minimum provincial wage, and used authoritative parenting styles. Among these characteristics, gender, educational background, and family economic status had a significant relationship with the length of the children's use of gadgets. According to Tezol et al. (2022), the average use of gadgets by children with mothers at home is excessive because mothers are too focused on housework, thereby neglecting the responsibility of supervising and accompanying children in using gadgets (Novianti & Garzia, 2020). According to Çaylan et al. (2021), mothers with low levels of education and children > 1 cannot spend quality time with their children because they must juggle housework and caring for their children; they choose to keep their children busy by watching devices. Economic factors influence on how long children use gadgets because parents must work. They cannot supervise and monitor how long children use gadgets, increasing the risk of addiction to playing games and behavioral problems (Sholihah et al., 2022).

Authoritative parenting style has no relationship with the length of time children use gad-

gets, which is consistent with Suherman et al. (2021). Parents with authoritative parenting patterns have children with mild and moderate dependence on gadget use, whereas those with permissive parenting patterns exhibit heavy gadget dependency. Parents who provide autonomy (permissive parenting) to their children in using gadgets have a higher level of addiction than children who are not given full autonomy in using gadgets (Sholihah et al., 2022).

The most prevalent reasons why parents give gadgets to children as educational media are increasing knowledge and providing distractions. In such devices, there are several applications to increase children's knowledge, such as colors, learning to read, and watching child-friendly videos (Zaini & Soenarto, 2019). Sundus (2018) found that gadgets are more fun because they contain applications such as puzzles, races, and simple games characterized by cause-and-effect and action-reaction. Harsela and Qalbi (2020) stated in qualitative research that kindergarten children who use devices < 30 minutes per day have good cognitive abilities. In contrast, children who use devices > 3 hours per day exhibited declining cognitive abilities, such as reduced concentration in learning, loss of focus, decreased motivation to study and write, and reduced achievement.

The Relationship between Child Factors and the Duration of Gadget Use. Most of the children were in Kindergarten B. The age of the children was not related to the length of time they used a device. Kulakci-Altintas (2020) observed that most children start using devices at the age of four months with low intensity use, and 36 months with higher intensity. Waller et al. (2021) stated that children aged > 4 years use devices excessively. Mulyantari et al. (2019) found that the highest use of gadgets was at the age of 6. Most children use gadgets because their parents or guardians allow them to or they have their own device.

Most of the children in this study had two siblings, although the number of siblings was not related to the length of time the child used the devices. Good parental knowledge and time management regarding caring for and supervising children in using devices prevent excessive use (Irmayani et al., 2021). Parents also apply rules and limit gadget use to certain times, such as mealtimes, before bed, and during family time. Although the rules and limits regarding the use of technology vary from parent to parent, the aim is to help children stay connected to the present and strengthen relationships with the people around them (Johnson & Hertlein, 2019).

Most of the children in this study were first born in their families, although order of birth was not related to the length of time they used a device. Children's use of electronic screens cannot be separated from parents' knowledge about children's use of devices, such as supervision and assistance to prevent excessive use of devices (Sholihah et al., 2022). Tezol et al. (2022) observed that the use of gadgets in the eldest children was within normal limits; therefore, older siblings could be role models for younger siblings regarding the use of electronic devices.

The characteristics of adverse child development observed in this study were mostly behavioral, emotional, and psychosocial disorders. Psychosocial development has a significant relationship with the duration of device use. Research by Tezol et al. (2022) showed that a group of children aged 2–5 years who used electronic screen devices excessively had significantly higher scores on emotional, behavioral, or peer relationship problems, and in dealing with difficulties. A systematic review conducted by Oktafia et al. (2022) found that excessive use of devices can affect a child's personal and social development.

Factors Influencing the Length of Time Children Spend Using Gadgets. Based on this research, the economic status of families with income ≤ the provincial minimum wage influenced the length of device use by children. De Lepeleere et al. (2018) showed that parents from families with a lower socioeconomic status are inconsistent in applying rules regarding

gaming, which is associated with higher screen time use. The Ministry of Education and Culture, Republic Indonesia (2019) stated that the costs of using devices by students in one month were approximately IDR 50,000–100,000 per month, requiring additional costs for internet packages. In their research, Neshteruk et al. (2021) observed that work schedules did not always make it possible for parents to monitor their children's screen use.

Apart from that, most parents, especially housewives, focus more on taking care of the household, putting aside their responsibilities for supervising and accompanying their children by using gadgets; technological media becomes their children's companion and entertainer (Novianti & Garzia, 2020). Oliveira et al. (2021) added that poor parents' socioeconomic status, authoritarian parenting style, and low education level resulted in the highest scores for behavioral problems, gaming addiction, and sleep disorders in children.

In educational media, the use of gadgets as a means of information influence the length of time children use gadgets. A 2020 survey by the Indonesian Child Protection Commission showed that the reason parents give gadgets to their children is as a means of information so that children can write and edit videos, or engage in other productive activities (Novianti & Garzia, 2020). Devices often have several features for recognizing colors, learning to read, and watching videos for children (Zaini & Soenarto, 2019). Children can access educational websites and obtain detailed information on the required topics. Technology makes everything better, making it easier to access certain materials.

Educational videos, interactive programs, study tutorials, and various books available around the clock on the internet have revolutionized education for the better. Children learn with advanced tools and methods at their own pace. Educational games, such as online quizzes, online tutorials, and puzzle games, help children excel in their studies (Sundus, 2018). The use of gadgets as educational media is not consistent with the level of digital competence of parents. Most parents are still at the basic level or can only use simple internet content, while children's digital competence is more rapid in using digital media (Rahayu & Haningsih, 2021).

In terms of emotional development, children who do not experience psychosocial development disorders reflect the length of time they use their devices. According to Erik Erikson (as cited in Hockenberry and Wilson, 2018), the psychosocial task of preschool age is to develop a sense of initiative versus guilt. At this age, children's curiosity is very high, and children are very enthusiastic about learning new things. A preschool child feels proud when he or she succeeds in conducting an activity, thereby helping the child use initiative. However, when a child expands his or her abilities further but is unable to complete a task, the child may feel guilty. In their research on psychosocial development, Agustia et al. (2021) found that children aged 3–4 who have a close relationship with their parents are able to control their feelings, have active imaginations, and engage in activities with their peers.

The results of this study have implications for the length of time children use gadgets, which are influenced by several factors related to both children and parents. Children who excessively use gadgets can experience several negative impacts, one of which is gadget addiction. This can affect children's concentration in learning and emotional control and decrease children's academic achievement. As a result, nurses are expected to function as educators to provide guidance and supervision of gadget use directly or to provide counseling to parents and children.

The limitations of this study include the unbalanced participation of fathers and mothers when the study. Measurement of gadget use duration did not differentiate between workdays and holidays. Furthermore, because most parents were not accustomed to filling out ques-

tionnaires online, their questionnaires were completed using paper forms.

Conclusion

Factors that influence the duration of gadget use < 1 hour per day include parent's gender and education, family economic status with Income ≤ provincial minimum wage, children's educational media, distraction media, and psychosocial factors. While the factors influencing the duration of gadget use by children include family economic status with provincial minimum wage, educational media, distraction media, and psychosocial factors.

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