

The Correlation of Parental Digital Media Habits with Time-Spent on Digital Media among Preschool Children

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ABSTRACT

Recently, the use of digital media has increased significantly. The role of parents is very important in children's use of digital media. This study aims to determine the correlation between parental digital media and physical play habits with time spent on digital media by preschool children aged 2-6 years in Semarang City, Indonesia.. Data were collected using the Surveillance of Digital-Media hAbits in earLy chiLdhood Questionnaire (SMALLQ®). We analyzed the data collected with the Spearman test. The result showed that the time spent on digital media by parents positively correlated with time spent on digital media by children on weekdays (p value<0.01) and on weekends (p value<0.01). Digital media engagement with children negatively correlated with time spent on digital media by children on weekdays (p-value: 0.03) and on weekends (p-value: 0.02). However, physical play engagement with children does not correlate with time spent on digital media by children on weekdays (p value: 0,71) and on weekends (p value: 0,35). In conclusion, time spent on digital media by parents and digital media engagement was correlated with time spent on digital media by preschool children aged 2-6. The benefit of this research is that it can serve as a reference for parents using digital media in child care. The novelty of this research is an analysis of the use of digital media on children's physical activity. It was a cross-sectional study of 360 parents with preschool children who voluntarily completed the validated online questionnaire

Keywords: digital media, engagement parents, time spent, preschool children

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INTRODUCTION

UNESCO advocates maximizing children's digital opportunities to ameliorate the digital divide without caution and concern for the inimical consequences of entrenchment of sedentary behaviors, screen addiction, increased obesity and metabolic conditions, poor sleep, and eyesight- of excessive daily indulgence in digital media. Digital devices such as smartphones and tablets initially targeted at adults are increasingly in the tiny hands of preschool children, with or without parental supervision (Shofwan et al., 2023). The use of digital technology is often associated with a lack of physical activity, sleep problems, lack of attention, aggressive behavior, and obesity in preschool and school-age children (Mustafaoğlu et al., 2018).

The benefits of digital media use should outweigh the demerits for the holistic development of preschool children. Children should not be passive in viewing the screen while using digital media, encouraging increased physical activity (Kaloeti et al., 2021). Children respond to programming that supports physical activity, which

is fun, designed for them, and encourages participation after three years (McGowan et al., 2023). The study found that actively playing video games can cause an increase in physical activity from mild to moderate in a short period (Ufholz et al., 2022). In addition, digital media through health education videos has also been proven to change the care of eating patterns of high-risk pregnant women (Yusriani & Septiyanti, 2021).

Mobile device applications can naturally explore the world and enhance children's physical activity outside their rooms (Ek et al., 2019). Content children enjoy in a quality manner can connect directly with off-screen experiences, encourage active involvement with caregivers and peers, and support creative, active, and imaginative play according to their age. A previous study showed that time spent watching commercial TV was significantly related to BMI and was not associated with time spent watching non-commercial education TV (Domoff et al., 2021; Hu et al., 2019).

A 2009 study that measured physical activity and body fat in middle school preschoolers linked TV viewing behavior to higher body fat and showed this association did not change when the variable of physical activity levels in children was also involved (Wyszyńska et al., 2020). Among the side effects that have been reported, the most common are disorders of neurocognitive development, well-being, learning, listening, vision, and metabolic and cardiological functions (Bozzola et al., 2018). This sedentary behavior is supported by the selection of commercial TV that also exposes advertisements for unhealthy food to children and encourages them to snack, increasing their overall food intake (Binder et al., 2019).

Limited descriptive studies in the last five years in some Asian countries show that the screen time experienced by children was significant from television, laptops, and other forms of digital cellular devices, even before primary school. As research needs to catch up to the ubiquity of digital media use among preschool children, more research is required before the issue is in a sharper focus.

The COVID-19 pandemic has forced most students to study at home and reduce outside activities. Apart from that, learning during the pandemic was conducted online via video conferences and discussions, and school assignments were sent online (Nopembri et al., 2023; Susilowati et al., 2021). This phenomenon even applies to preschool children. Children's outside-home activities are limited, so preschool-age children use digital media as their play material. It is feared that this could affect children's development (Fauziah et al., 2022; Susilowati et al., 2021). The adoption of remote learning through the Internet would result in a more extended amount of screen time than the recommended amount set by international guidelines, which state that preschoolers should only watch screens for up to an hour a day while being closely supervised by their parents. Children who spend 2-3 hours a day in front of a screen are more likely to struggle with behavior, have delayed development, and have limited language. Especially if their parents are not with them (Anggorowati et al., 2019).

The role of parents is vital in the use of digital media for children. Parents' use of digital media has proven to predict children's digital media use significantly (Durham et al., 2021; Nikken & Schols, 2015). In particular, mothers' parental television time was associated with children's television time. Still, there was limited evidence that parental television time was associated with child viewing time combined with other media. Previous studies have demonstrated that the electronic media environment at home, such as the number of TVs in the house and access to electronic gaming devices, is also associated with children's TV consumption and is combined with other media viewing times (Mesce et al., 2022). The research purpose is to examine the correlation between physical play engagement and time spent on digital media by parents with time spent on digital media by children aged 2-6 years in Semarang City, Indonesia.

METHOD

This research was cross-sectional. The study collected data about physical play engagement and time spent on digital media by parents, as well as time spent on digital media by children aged 2-6 years in Semarang City, Indonesia. The defined population of this study was all preschool children aged 2-6 years old who attended kindergarten in Semarang City. The sample was 360 preschool children registered in kindergarten in Semarang City. Three hundred sixty parents or guardians aged 20-58 had preschool children and voluntarily completed the validated online questionnaire. We used consecutive sampling during data collection from

February to June 2020. Data were collected online using a validated questionnaire called the Surveillance of Digital-Media hAbits in Early Childhood Questionnaire (SMALLQ®) (Chia et al., 2019). We analyzed the data collected with the Spearman test to determine the correlation between interest variables.

RESULTS AND DISCUSSION

This study examined the correlation between physical play engagement and time spent on digital media by parents with time spent on digital media by children aged 2-6 years in Semarang City, Indonesia. Respondents of parents of a 2-6-year-old preschooler living in Semarang, Indonesia, can be characterized by age, highest education attained, ethnicity, and household income. The average age of parents was 33 years and six months. The characteristics of parents' education level can be seen in Table 1.

Table 1. Characteristics of Respondents by Education, Ethnicity, and Income (N: 360)

Variable	N	Percent
Highest education attained.		
Primary schools	6	1.0
Secondary schools	126	21.4
Diploma	46	7.8
Bachelor	157	26.6
Postgraduate	25	4.2
Ethnicity		
Javanese	342	58.0
Sundanese	5	0.8
Batak tribe	2	0.3
Betawi	2	0.2
Other	9	1.5
Monthly household income		
0-1,900,000 IDR	94	26.1
1,900,001-2,500,000 IDR	81	22.5
2,500,001-5,000,000 IDR	116	32.2
5,000,001-10,000,000 IDR	47	13.1
10,000,001-15,000,000 IDR	16	4.4
>15,000,000 IDR	6	1.7

Characteristics of respondents by highest education attained in Table 1 showed that most of the respondents' education was bachelor's (26.6%) followed by secondary schools (21.4%). Only 1% of respondents were graduates of primary schools. According to ethnicity, 58% of respondents came from Java. Meanwhile, according to household income, 12.8% of respondents earn 2,500,001-5,000,000 IDR monthly.

Table 2. Time Spent on Digital Media by Children

Time Spent on Digital Media	Mean (hours)	Median (hours)
On Weekday		
For Education	0.50	0
For Entertainment	1.10	1
For Creating Media	0.12	0
For Communicating	0.35	0
For Others	0.19	0
On Weekday		
For Education	0.49	0
For Entertainment	1.32	1
For Creating Media	0.15	0
For Communicating	0.43	0
For Others	0.19	0

Table 2 shows the time spent on digital media by children. On weekdays, the highest average use of digital media was for education (mean: 0.5 hours/ day), while on weekends, the highest average use of digital media was for entertainment (mean: 1.32 hours/ day), and the average time for education on weekends was only 0.49 hour/ day. Some parents cannot fill the average time spent using digital media for their children because the use of digital media cannot be determined. Sometimes, the children do not hold digital media for a week, but sometimes, they do not hold digital media for a week. Sometimes, they play using digital press daily. This is influenced by the environment (friends), busy parents, and the child's mood.

Furthermore, table 3 shows the use of digital media by parents of preschool children. The use of digital media for work was more on weekdays (mean: 2.39 hours) than on weekends (mean: 0.88 hours). However, the use of digital media for entertainment was more on weekends (mean: 1.39 hours) than on weekdays (mean: 1.14 hours). The average use of digital media for social networking and personal development on weekdays and weekends was similar.

Table 3. Time Spent on Digital Media by Parents

Time Spent on Digital Media	Mean (hours)	Median (hours)
On Weekday		
For Work	2.39	1
For Entertainment	1.14	1
For Social Networking	1.41	1
For Personal Development	1.08	1
For Others	1.04	1.04
On Weekday		
For Work	0.88	0.25
For Entertainment	1.39	1
For Social Networking	1.41	1
For Personal Development	1.04	0.75
For Others	1.2	0.13

Table 4 showed that the average engagement time when children use digital media on weekends (57.5%) was more than on weekdays (49.8%), but the difference was insignificant. However, there was a significant difference between engagement time in indoor and outdoor physical play on the weekends (63,5%) and weekdays (27.9%).

Table 4. Digital Media and Physical Play Engagement With Children

	Mean (%)	Median (%)
Digital media engagement		
On weekday	49.8	50.0
On weekend	57.5	60.0
Physical play engagement		
On weekday	27.9	20.0
On weekend	63.5	70.0

Table 5 showed a positive correlation between time spent on digital media by parents and time spent on digital media by children on weekdays (p value<0.01; r value: 0.31). This means the higher the time spent on digital media by parents, the higher the time children spend on weekdays. Likewise, on weekends, in Table 6, parents' time spent on digital media positively correlated with children's time spent on digital media (p value<0.01; r value: 0.35). At the same time, there was a negative correlation between digital media engagement with children and time spent on digital media by children on weekdays (p-value: 0.03; r value: - 0.42). This means that the higher the digital media engagement with children is, the lower the time spent on digital media by children on weekdays.

Table 5. Correlation Between Parental Digital Media and Physical Play Habits With Time Spent on Digital Media By Children on Weekday

Parental Digital Media and Physical Play Habits	Time Spent on Digital Media by Children	
	p value	r value
Time spent on digital media by parents (hours)	<0.01	0.31
Digital media engagement with children (%)	0.03	- 0.42
Physical play engagement with children (%)	0.71	- 0.02

As well as on the weekend in Table 6, there was a negative correlation between digital media engagement with children and time spent on digital media by children on weekends (p-value: 0.02; r value: - 0.59). However, there was no correlation between physical play engagement with children and time spent on digital media on weekdays (p value: 0,71; r value: - 0.02) and weekends (p value: 0,35; r value: - 0.05).

Table 6. Correlation Between Parental Digital Media and Physical Play Habits With Time Spent on Digital Media By Children on Weekend

Parental Digital Media and Physical Play Habits	Time Spent on Digital Media by Children	
	p value	r value
Time spent on digital media by parents (hours)	<0.01	0.35
Digital media engagement with children (%)	0.02	- 0.59
Physical play engagement with children (%)	0.35	- 0.05

The COVID-19 pandemic has swept the globe, affecting nearly every nation and area. Its influence has stopped in-person instruction in certain areas, such as equivalency education. The application of innovative learning strategies and alternative assessments is critically needed. COVID-19 has made it possible and paved the way for introducing remote or digital learning (Arbarini et al., 2022). However, social media has become a bigger draw for students than online education. Recent data demonstrating higher global social media usage during COVID-19 supports this. Students increasingly use social media for various reasons, including socializing and finding links to entertainment events (Siregar et al., 2023).

A previous study of TV viewing and the detrimental effects of food on children aged 2 to 6 years shows that most studies report adverse effects by only watching 1 hour/day (Kaloeti et al., 2021). Children of preschool age (2–5 years) are sedentary for between 7 and 7.5 hours daily on average (Barnett & Kelly, 2018). The time spent watching the screen before going to sleep was associated with increased sleep problems for this age group (Cheung et al., 2017). Time spent watching television was the most common among children, with boys needing to watch more television and play video games, while girls report more use of computers (Barnett & Kelly, 2018).

A mobile device is an application that can increase outdoor physical activity and be used to explore the world. Quality content can encourage engagement with peers and caregivers, support more active and imaginative play, and connect experiences of the screen (Wyszyńska et al., 2020). The usage of gadgets is high in 20% of preschool children during the working day, but it is almost doubled (39%) during the holiday (Asl & Manjvuni, 2019). Electronic devices in children's bedrooms were associated with fewer minutes of sleep per night, partly because of the suppression of the hormone melatonin (AlShareef, 2022).

The higher sedentary behaviour of parents is linked to higher sedentary behaviour in children, with a stronger significant association observed during weekends than on weekdays. Parents were found to have considerably higher screen time on weekdays than on weekends. Studies show that higher parents' screen time was associated with children's screen time, and parents' BMI was also associated with children's BMI (Goncalves et al., 2019). Intuitively, all members of families with preschool children spend more free time together and share more activities on weekend days than on weekdays (Nopembri et al., 2023). Intervention to decrease parents' screen time was needed to reduce sedentary habits and promote healthy weight in the family.

Based on the correlation of parents/guardians with digital media and interactions with children, on weekdays (Monday-Friday), as many as 49.91% are used by parents/guardians to interact with children. As for the weekend (Saturday and Sunday), the average time for parents/ guardians of children who are used to interacting with children is as much as 57.37%. This shows that parents/guardians of children interact a lot with children when playing digital media on weekends rather than on weekdays.

Gadgets are one example of technological developments currently very popular with the community. The benefits of this gadget are huge, but if it is used too much, it will also hurt its users; for example, it can lead to gadget addiction. Addiction to this gadget can occur in children and adults, including parents of preschool children. Excessive use of gadgets by parents can result in a lack of parental attention to children, which can ultimately impact the physical and psychological development of preschool children. Parents who are addicted to gadgets will be engrossed in themselves, so they will ignore the surrounding environment, including ignoring sleep hours, time that should be spent monitoring children's development, and time to play with children. The duration of time spent staring at the monitor screen is called screen time. Some guidelines state children recommended maximum screen time is < 2 hours/day. Based on research, 60% of people in Indonesia use electronic media > 2 hours per day (Asl & Manjuvani, 2019).

Another negative impact of excessive use of gadgets on children is nutritional status. Excessive screen time and low physical activity levels will affect children's eating patterns. Lack of physical activity and the wrong diet will ultimately affect nutritional status. Playing gadgets is a form of inactive physical activity or a sedentary life. A sedentary life can increase calorie intake, so the more gadgets you use, the higher your calorie intake. This is based on research conducted in Brazil on adolescents aged 11-14 with high screen time. High screen time is associated with weight gain and unhealthy eating patterns. Another study conducted in Canada also showed that about 64% of children have at least 1 Electronic Entertainment and Communication Devices (EECDa). The use of EECDs at night is associated with body weight, decreased quality of nutritional intake, and a significant decrease in physical activity (Barnett & Kelly, 2018).

The existence of a parent-child relationship during screen time was stronger on weekends than on weekdays. Parental self-efficacy in limiting screen time showed a significant inverse relationship between child weekday and weekend screen time (Sigmundová et al., 2018). In line with the results of previous studies, we found a stronger parent-child relationship during screen time on weekends than on weekdays (Attai et al., 2020). The energy-balance-related behavior (including physical activity and sedentary behavior) of children might be influenced by many variables besides parental behavior on weekdays, while at weekends, parents might be more closely linked to their children and stimulate health-enhancing behaviors (such as joint PA, applying parental rules for watching TV and screen time) (Sigmundová et al., 2018).

In children's daily lives, cognitive, emotional, and social development are affected by the integration of digital technology, which continues to increase daily (Mustafaoğlu et al., 2018). Digital devices (fixed screens (television, desktop computers) and mobile screens (smartphones, tablets)) targeted initially at adults are now increasingly available to preschool children, with or without parental supervision. Nowadays, children grow together with more personal technological advancements, so parents must ensure they can take advantage of sleep quality, balanced nutrition, adequate physical activity, and positive social interactions for healthy growth (Mustafaoğlu et al., 2018).

At present, studies of the influence of technology and physical activity are still being conducted in deepening studies, especially on the effect on the quality of night sleep. In a study of children aged 4-11 years, it was found that 37% of children have a low level of active play, 65% have time-high playback (television, computers, tablets, etc.), and 26% have a combination of both conditions (Mustafaoğlu et al., 2018).

Children used to sleep with mobile devices in the bedroom, use excessive social media, and have a higher risk of experiencing sleep disorders. Sleep quality in adolescents is associated with excessive cellphone use. In contrast, the number of cellular devices in bed and poor sleep quality are associated with excessive internet use and duration of use before bedtime before adolescence (Mustafaoğlu et al., 2018). Sleep quality is also influenced by using electronic devices during the day. Some of the things above, such as using digital technology and maintaining television, computers, or cell phones in a bedroom during childhood, are associated with sleep quality (Mustafaoğlu et al., 2018). Poor sleep quality in adolescents is associated with

extreme mobile phone use. In contrast, the number of devices in a bedroom and poor sleep quality are associated with excessive internet use and duration of digital technology usage before sleep in pre-adolescents. Electronic devices during the daytime can also affect sleep quality (Mustafaoğlu et al., 2018).

A study mentioned that watching commercial TV during leisure time correlated significantly with BMI, while the leisure time owned to watch non-commercial educational TV did not correlate with BMI (Domoff et al., 2021; Hu et al., 2019). A study conducted in Canada 2012 found that children who spend only 1 hour/day watching TV are 50% more likely to be overweight than those who watch TV less than 1 hour/day (Greier et al., 2019).

A study conducted in 2009 measured the relationship between physical activity and fat in middle-class preschoolers by linking TV watching with high body fat. This study found no change in the relationship between the compilation of physical activity level variables in middle-class preschoolers that counted. Based on the side effects essentially influence vision and listening, neurocognitive development, metabolic and cardiological functions, and the development of well-being (Bozzola et al., 2018). In sedentary behavior, children who watch commercial TV can be exposed to advertisements that display many unhealthy foods and encourage snacking, thus increasing food intake in children (Russell et al., 2019). Another study found that 52% of children from lower-income households had TVs in their bedrooms, compared to only 14% of children from higher-income households; however, parents in the middle-income category had fewer rules regarding media use than lower- and higher-income families (Roberts et al., 2017).

Parents are the primary supervisors of their children's device usage. Given that children use the device most often at home and at least at school, it is appropriate if 77% of parents have appointed themselves to monitor their children and look at their devices. To assist them in this task, parents have expressed their desire for parental control mechanisms that will enable them to accomplish two courses of action: 1. Limit children's consumption of content by setting time limits, censoring the type of content or app made available to them and having a subscription to a library of children's apps; and 2. Monitor children's usage behavior by allowing parents to create different profiles for each child using the device, receive notifications on their child's activities, receive a history of app usage, block in-app purchases, and turn the child's device on/off remotely.

CONCLUSION

Parental digital media habits have essential roles in children's digital media habits. There are positive correlations between time spent on digital media by parents and time spent on digital media by children on weekdays and weekends. At the same time, there is a negative correlation between digital media engagement with children and time spent on digital media by children on weekdays and weekends. However, there is no correlation between physical play engagement with children and time spent on digital media by children on weekdays and weekends.

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