

Association Between Electronic Media Use and Development of Children Aged 2–5 Years in Child Development Centers, Thailand: A Cross–Sectional Study

Krittianee Panatthanang, Thanakamon Leesri*

Abstract: Excessive electronic media use among young children is an emerging global health concern that may adversely affect developmental outcomes. As access to technology increases in Thailand, understanding the relationship between media use and early childhood development is critical for health professionals and families. This descriptive correlational study examined the relationship between electronic media use and developmental outcomes in children aged 2–5 years attending child development centers in one province in the lower northeast of Thailand. The participants included 128 parent-child pairs. Instruments consisted of general information and media use questionnaires, a media use log, and the Developmental Surveillance and Promotion Manual. Descriptive statistics and the chi-square test were employed for data analysis.

Overall, 55.5% of children aged 2–5 years demonstrated age-appropriate development across all domains. When analyzed by specific developmental domains, the highest prevalence of developmental delays was found in fine motor and cognitive skills, followed by expressive language, social and self-help skills, receptive language, and gross motor skills, respectively. A significant association was found between children’s overall development and both the duration of electronic media use and parental involvement during media use. Children who used electronic media for more than one hour per day showed statistically significant delays in fine motor skills, cognitive skills, and expressive language. Moreover, parental involvement during children’s media use was significantly associated with fine motor, cognitive, and social and self-help skills. In contrast, the number of electronic media used and the type of media content show no significant association with the specific developmental domains. These findings suggest that routine screening of media use should be included in developmental assessments, that parents should be educated on recommended screen time limits, and that active parental co-viewing should be promoted to support optimal child development.

Keywords: Child development, Developmental delay, Electronic media, Preschool, Screen time, Thailand

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Introduction

The rapid integration of electronic media into daily life has resulted in increasing exposure among

Krittianee Panatthanang, RN, MNS, FHEA-UKPSF, Lecturer, School of Pediatric and Adolescent Nursing, Institute of Nursing, Suranaree University of Technology, Thailand. E-mail: Krittianee@sut.ac.th

Correspondence to: *Thanakamon Leesri*,* RN, PhD, Assistant Professor, School of Community Health Nursing, Institute of Nursing, Suranaree University of Technology, Thailand. E-mail: thanakamon@sut.ac.th

infants and young children, raising concerns regarding its impact on early childhood development.¹ Evidence from high-income countries indicates that electronic media use begins at increasingly younger ages. In the United Kingdom, more than 50% of children can use tablets or smartphones proficiently by one year of age, while in the United States, 40.3% of infants are exposed to television between 3 and 9 months of age.² These patterns reflect a global trend toward early and frequent screen-based media exposure during critical periods of brain development.

Exposure to rapidly changing visual and auditory stimuli from electronic media may reduce opportunities for reciprocal caregiver-child interaction, which is fundamental to language acquisition, social development, and cognitive growth. Consequently, early inappropriate use of electronic media has been associated with delayed language development, reduced social skills, attention deficits, and impaired cognitive function.³ In response to these concerns, the American Academy of Pediatrics and the Royal College of Pediatricians of Thailand recommend that electronic media use should not exceed one hour per day for children older than two years.^{4,5}

Despite these guidelines, studies in Thailand indicate that children aged 2–5 years spend more than one hour per day using electronic media across multiple platforms, including mobile phones, televisions, computers, and tablets.⁶ Parental involvement during children's media use varies considerably, with some parents actively engaging in guidance and co-viewing, while others provide minimal supervision.^{6,7} Previous research has demonstrated associations between digital media use and preschooler development; 49.48% of children showed developmental delays, though specific domains affected were not identified.¹

In Thailand, early childhood development outcomes have been monitored using the Developmental Surveillance and Promotion Manual (DSPM). National data show that age-appropriate development

among children aged 0–5 years declined from 85.1% in 2022 to 79.7% in 2023, slightly below UNICEF estimates, indicating that approximately 80% of children aged 24–59 months (2–5 years) are age-appropriately developed.^{8,9} Notably, developmental delays were most prevalent in expressive language, followed by receptive language, fine motor and cognitive skills, social and self-help skills, and gross motor development.⁹

Taken together, the increasing prevalence of early exposure to electronic media, inconsistent parental mediation, and persistent developmental delays—particularly in language-related domains—highlight the need for further investigation into the relationship between screen-based media use and early childhood development. This evidence is essential for informing public health policy, parental guidance, and early intervention strategies.

Conceptual Framework and Literature Review

Electronic media use among preschool children is a behavior influenced by multiple levels of factors according to McLeroy's Ecological Model,¹⁰ encompassing individual, family, and environmental levels. These factors determine patterns of use, duration of electronic media exposure, number of devices used, content characteristics, and parental involvement, which subsequently affect various developmental domains. The impact of media can be explained in accordance with Piaget's theory of cognitive development,¹¹ which emphasizes that development occurs through hands-on activities, exploration of the real environment, and interactions with people.

Based on the literature review supporting this conceptual framework, factors affecting child development at the individual level include age and medical history, which are significant in media use.^{1,12,13} Young children have cognitive limitations and require direct experiences to construct understanding

according to Piaget's principles. Therefore, excessive media use beyond recommended duration or lack of interaction affects fine motor and cognitive skills, expressive language, receptive language, and reduces physical activity.

At the family level, parental factors such as age, occupation, income, educational level, and parental roles have a substantial influence.^{1,12,13} Parental involvement through co-viewing or co-engagement, combined with time restrictions, helps children connect media content to authentic experiences, promoting assimilation and accommodation according to Piaget's theory, which positively affects cognitive skills, expressive language, receptive language and social and self-help skills. Conversely, families lacking supervision may allow children to use media alone and excessively, increasing risks of developmental delays in multiple domains.

At the environmental level, technology availability, societal media culture, and device diversity (television, mobile phone, tablet, computer, DVD player) influence media access. Certain content types with emotionally stimulating or rapidly changing images (cartoons, games, dramas, entertainment content on Facebook, YouTube, TikTok)^{1,12,13} may affect attention and self-regulation. This reduces direct experiences essential for Piagetian development and limits opportunities for physical and social skill development. Therefore, integrating the ecological perspective with Piaget's theory reveals that children's electronic media use is not merely individual behavior but rather an outcome of multi-level factors that play roles in learning quality and child development. The application of McLeroy's Ecological Model and Piaget's cognitive developmental theory provides an appropriate foundation for studying the relationship between electronic media use and development among children aged 2–5 years, which involves behaviors and changes influenced by multiple levels of factors.

Study Aims

1) To examine electronic media use patterns (including duration of use, number of devices, type of media content, and parental involvement during children's media use) and developmental outcomes among children aged 2–5 years in child development centers in one province in the lower northeast of Thailand; 2) To examine the relationship between electronic media use and development in children aged 2–5 years.

Method

Study Design: This study used a descriptive cross-sectional design. This report adhered to the STROBE checklist for observational studies.

Sample and Setting: This study was conducted between July and October 2024 in one province located in the lower northeastern region of Thailand. Within this province, there were 724 child development centers under local administrative organizations. Of these, 43 centers are located in one of the largest districts, and three centers situated near a university were purposively selected. There were 62 children aged 2–5 years attending Center A, 34 attending Center B, and 67 attending Center C, for a total of 163 children.

The inclusion criteria for the children were: 1) ability to communicate in Thai, and 2) no medical conditions affecting development, such as preterm birth, perinatal hypoxia, congenital heart disease, Down syndrome, autism, attention-deficit/hyperactivity disorder, or any diagnosed or suspected developmental delay.

The parental inclusion criteria were: 1) primary caregivers of the target children in the current study, and 2) proficient in the Thai language communication, including reading and writing.

The discontinuation criteria were children who failed to cooperate during the assessment, such

as showing disinterest, crying, or throwing objects, and who continued to be uncooperative after three attempts to calm them. In such cases, the developmental evaluation would be discontinued.

Sample size was calculated a priori using a power analysis with a significance level (α) of 0.05, a statistical power of 0.80, and an assumed moderate effect size (Cohen's $d = 0.50$) for the primary outcome. The analysis was conducted using G*Power, and the calculated sample size was increased by 10% to account for potential attrition.¹⁴ The minimum required sample size was 116 parent-child pairs; adding 10% to account for possible errors or incomplete data resulted in a total sample size of 128 parent-child pairs.

Proportional allocation was applied to ensure representative sampling from each child development center, with 70% of the eligible population at each site selected using simple random sampling. This resulted in 49 parent-child pairs from Center A, 26 pairs from Center B, and 53 pairs from Center C.

Ethical Considerations: This study was approved by the Human Research Ethics Committee of Suranaree University of Technology (COA No. 66/2567, Project code: EC-67-39, the period of granting from 13 February 2024 to 7 May 2026). Parents or legal guardians (e.g., fathers, mothers, grandparents, or primary caregivers) participated in the informed consent process. Individuals who were not parents or legal guardians (e.g., neighbors) were not eligible to provide consent. Parents or legal guardians received information about the study and their rights, then provided written informed consent.

Instruments: Two instruments were used for data collection.

The Electronic Media Use Questionnaire for children aged 2–5 years in child development centers collects general information on both parents and children, as well as electronic media use. The questionnaire developed by the research team, based on a literature review, comprises four sections:

Section 1: General Information of Parents, with nine items: the child's relationship with the parent, gender, age, education level, occupation, total income, marital status, family structure, and primary caregiver

Section 2: General Information about Children. This section comprises seven items: gender, age, chronic illnesses, most recent developmental assessment, vaccination history, birth history, and postnatal complications. The items are presented in a checklist format.

Sections 3: Electronic Media Use. This section comprises three items assessing children's general electronic media use: 1) Number of electronic media use: one type (i.e., television, mobile phone, tablet, computer, or music/DVD player); two or more types (i.e., television and computer, mobile phone, tablet, or music/DVD player); 2) Type of media content. For children only (i.e., cartoons, documentaries, toy advertisements, educational programs, and games); for adults only (i.e., dramas, entertainment content—Facebook, YouTube, TikTok); and for children and adults (i.e., children combined with adult content); and 3) Parental involvement during children's media use (i.e., consistently present, occasionally present, or no guidance).

Section 4: Daily Log Used to Record Children's Specific Media Consumption within One Week, including screen time duration, media types, media content, and parental involvement. Three experts, including two pediatric nursing instructors and one well-child clinic nurse, reviewed the content. Revisions were made based on their recommendations.

The Developmental Surveillance and Promotion Manual (DSPM) was originally developed in Thai by the Ministry of Public Health, Thailand. It is used for developmental screening, monitoring, promotion, and referral in children aged 0–5 years, and has demonstrated 96.04% sensitivity.¹⁵ The DSPM has a checklist covering five developmental domains:

gross motor skills, fine motor and cognitive skills, expressive language, receptive language, and social and self-help skills. The researcher observes the child's behavior or skills using the checklist, with each item scored as "pass" or "fail" to determine whether the child met the expected milestone for their age. For instance, fine motor and cognitive skills are assessed through hand-eye coordination and problem-solving tasks (e.g., grasping objects, stacking blocks, drawing). Children pass if they complete tasks correctly at the expected developmental level and fail if they are unable to complete the tasks or complete them incorrectly. Scores from all five domains are combined to provide an overall developmental assessment. Children who meet age-appropriate criteria across all domains are classified as having "normal development." In contrast, those who fail to meet criteria in one or more domains are classified as having "suspected developmental delay."

Data Collection: Following ethical approval, the principal investigator visited the child development centers to explain the study objectives and secure cooperation. Eligible children were identified through simple random sampling. During drop-off or pick-up times, caregivers were approached to obtain written informed consent. They were also given the study questionnaires along with a one-week daily electronic media log to complete at home from Monday to Sunday and return the following Monday. Developmental assessments were conducted using the Developmental Surveillance and Promotion Manual by the principal investigator, a lecturer from an institute of pediatric and adolescent nursing. After establishing rapport with children, their chronological age was calculated from their birth dates to determine the appropriate assessment domains according to DSPM guidelines. Assessments were conducted in well-ventilated, distraction-free areas within the centers. Parents remained present if children showed distress. Each

20–30-minute session evaluated five developmental domains: gross motor, fine motor and cognitive skills, receptive language, expressive language, and social and self-help skills. For age-appropriate results, parents were advised to follow the manual for the next age range. For suspected delays, parents received targeted guidance on failed skills and reassessment after one month.

Data Analysis: Data were analyzed using SPSS as follows: parental and child demographic data were summarized using frequencies, percentages, means, and standard deviations. Developmental outcomes were tabulated as frequencies and percentages. The association between electronic media use and developmental status among children aged 2–5 years was tested using the Chi-square test.

Results

Parental and child characteristics, and electronic media use are shown in **Table 1**. Most participants were mothers (57.7%) and females (75.8%), aged 18–65 years. Occupationally, 41.4% worked as laborers and earned 5,000–10,000 THB monthly (US\$158–316). The majority had completed high school (33.6%), lived with partners (68.8%) in nuclear families (62.5%), and identified mothers as primary caregivers (53.1%). All children were over 2 years old (mean age 3 years 3 months), 53.9% were female, 82.8% had no chronic illnesses, and there was no missing data. Among children over two, 58.6% used electronic media for more than one hour per day; the duration ranged from 1 to 3 hours daily, 72.1% engaged with two or more types of media, 67.2% were exposed to content appropriate for both children and adults, and 54.7% had occasional parental involvement in media selection and guidance.

Table 1. Distribution of participants by child electronic media use (n = 128)

Children's electronic media use	Frequency	%
Duration of electronic media use		
≤ 1 hour per day	53	41.4
> 1 hour per day	75	58.6
Number of electronic media used		
No media use	1	0.8
Single type	36	28.1
Two or more types	91	72.1
Type of electronic media content		
No media use	1	0.8
Child-appropriate content	37	28.9
Adult-appropriate content	4	3.1
Both child- and adult-appropriate content	86	67.2
Parental involvement during children's electronic media use		
No media use	1	0.8
Consistently present, providing guidance and participating in media selection	22	17.2
Occasionally present, offering guidance and participating in media selection	70	54.7
Not present or not providing guidance	35	27.3

Note. Regarding the types of electronic media used by children at home (multiple responses allowed), 102 children used televisions, 108 used mobile phones, and 20 used tablets.

Among children aged 2–5 years, 55.5% demonstrated age-appropriate overall development, while 44.5% were considered to have developmental delay. Domain-specific delays were most prevalent in fine motor and cognitive skills (32.8%), followed by expressive language (25%), social and self-help skills (7.8%), receptive language (5.5%), and gross motor skills (2.3%), as shown in **Table 2**.

Table 2. Frequency and percentage of participants by child developmental status (n = 128)

Development category	Age-appropriate	Frequency(N)	Percentage(%)
Overall child development	Yes	71	55.5
	No	57	44.5
Domain-specific development			
Gross motor skills	Yes	125	97.7
	No	3	2.3
Fine motor and cognitive skills	Yes	86	67.2
	No	42	32.8
Expressive language	Yes	96	75
	No	32	25
Receptive language	Yes	121	94.5
	No	7	5.5
Social and self-help skills	Yes	118	92.2
	No	10	7.8

Table 3 shows that the duration of electronic media use and parental involvement during media exposure were significantly associated with overall

child development. In contrast, neither the number nor the type of media content showed a significant relationship with child development

Table 3. Association between electronic media use and overall child development (n = 127)

Electronic media use	Child developmental status				χ^2	p-value
	Age-appropriate (n = 70)		Not age-appropriate (n = 57)			
	Frequency	%	Frequency	%		
Duration of electronic media use					9.153	0.002
≤ 1 hour per day	37	52.9	15	26.3		
> 1 hour per day	33	47.1	42	73.7		
Number of electronic media use					0.729	0.393
Single	22	31.4	14	24.6		
Two or more	48	68.6	43	75.4		
Type of media content					0.664	0.718
For children only	20	28.6	17	29.8		
For adult only	3	4.3	1	1.8		
For children and adult	47	67.1	39	68.4		
Parental involvement during children's media use					7.399	0.025
Consistently present, providing guidance and media selection	18	25.7	17	29.8		
Occasionally present, providing guidance and media selection	45	64.3	25	43.9		
Absent or No guidance	7	10.0	15	26.3		

Note. Excluded: 1 case (no electronic media use)

Association between electronic media use and specific developmental domains. The duration of electronic media use was significantly associated with fine motor and cognitive skills ($\chi^2 = 3.973$, p = 0.046) and expressive language ($\chi^2 = 4.498$, p = 0.030). Moreover, parental involvement during children's media

use was significantly associated with fine motor and cognitive skills ($\chi^2 = 5.544$, p = 0.019) and social and self-help skills ($\chi^2 = 3.898$, p = 0.048). In contrast, the number of electronic media use and the type of media content showed no significant association with the specific developmental domains (see **Table 4-7**).

Table 4. Association between duration of electronic media use and specific developmental domains (n = 127)

Developmental domain	Age-appropriate development	Duration of electronic media use		χ^2	p-value
		≤ 1 hour/day (n = 52)	> 1 hour/day (n = 75)		
Gross motor skills	Yes	51	73	0.074	0.786
	No	1	2		
Fine motor and cognitive skills	Yes	40	45	3.973	0.046
	No	12	30		
Expressive language	Yes	44	51	4.498	0.030
	No	8	24		

Table 4. Association between duration of electronic media use and specific developmental domains (n = 127) (Cont.)

Developmental domain	Age-appropriate development	Duration of electronic media use		χ^2	p-value
		≤ 1 hour/day (n = 52)	> 1 hour/day (n = 75)		
Receptive language	Yes	51	69	2.177	0.140
	No	1	6		
Social and self-help skills	Yes	49	68	0.538	0.463
	No	3	7		

Note. Excluded: 1 case (no electronic media use)

Table 5. Association between the number of electronic media used and specific developmental domains (n = 127)

Developmental domain	Age-appropriate development	Number of electronic media use*		χ^2	p-value
		Single (n = 36)	Two or more (n = 91)		
Gross motor skills	Yes	35	89	0.038	0.846
	No	1	2		
Fine motor and cognitive skills	Yes	24	61	0.002	0.968
	No	12	30		
Expressive language	Yes	26	69	0.178	0.673
	No	10	22		
Receptive language	Yes	35	85	0.721	0.396
	No	1	6		
Social and self-help skills	Yes	35	82	1.799	0.180
	No	1	9		

Note. Excluded: 1 case (no electronic media use); *One type refers to a single device (television, mobile phone, tablet, computer, or music/DVD player); Two or more types refers to multiple devices used simultaneously.

Table 6. Association between type of media content and specific developmental domains (n = 127)

Developmental domain	Age-appropriate development	Type of media content*		χ^2	p-value
		For children only (n = 37)	For children and adult (n = 90)		
Gross motor skills	Yes	36	88	0.026	0.871
	No	1	2		
Fine motor and cognitive skills	Yes	24	61	0.101	0.751
	No	13	29		
Expressive language	Yes	28	67	0.021	0.885
	No	9	23		
Receptive language	Yes	34	86	0.676	0.411
	No	3	4		
Social and self-help skills	Yes	34	83	0.004	0.950
	No	3	7		

Note. Excluded 1 case (no electronic media use); *Content categories are defined as follows: For children only, cartoons, documentaries, toy advertisements, educational programs, and games; For adults only, dramas and entertainment content (Facebook, YouTube, TikTok); For children and adults, combined content (e.g., cartoons and dramas, educational programs and entertainment content).

Table 7. Association between parental involvement during children’s media use and specific developmental domains (n = 127)

Developmental domain	Age-appropriate development	Parental involvement* during children’s media use		χ^2	p-value
		Not providing guidance (n = 22)	Providing guidance (n = 105)		
Gross motor skills	Yes	21	102	0.170	0.680
	No	1	3		
Fine motor and cognitive skills	Yes	10	75	5.544	0.019
	No	12	30		
Expressive language	Yes	13	82	3.485	0.062
	No	9	23		
Receptive language	Yes	20	100	0.655	0.419
	No	2	5		
Social and self-help skills	Yes	18	99	3.898	0.048
	No	4	6		

Note. Excluded: 1 case (no electronic media use); *Parental involvement was categorized as: Not providing guidance (absent or no guidance); Providing guidance (consistently or occasionally present with engagement in media selection).

Discussion

This cross-sectional study examined electronic media use and its associated factors among children aged 2–5 years. The findings indicated that, overall, the children demonstrated age-appropriate development across all domains. However, developmental delays were most prevalent in fine motor and cognitive skills, followed by expressive language, social and self-help skills, receptive language, and gross motor skills. A significant association was observed between overall developmental outcomes and both the duration of electronic media use and the degree of parental involvement during media exposure. Children who used electronic media for more than one hour per day exhibited statistically significant delays in fine motor, cognitive, and expressive language skills.

The study found that most children over 2 years old used electronic media for more than 1 hour per day (58.6%), with an average duration of 1 to 3 hours per day. Children whose parents had a bachelor’s

degree averaged 1.7 hours of electronic media use per day, compared to 2 hours per day for children whose parents had less than a bachelor’s degree. This may be attributed to differences in work schedules and availability, as parents with varying educational backgrounds often have different occupational demands that can affect the time available for direct child supervision. These findings align with previous studies indicating that families with higher educational levels tend to establish clear screen-time rules, which correlates with their children having lower screen exposure.¹⁶ Moreover, children whose mothers work long hours or are overworked tend to have increased screen time.¹⁷ The findings indicate that a substantial proportion of children exceed the recommended screen time, reflecting changes in family behaviors and the widespread presence of technology in daily life. Moreover, a systematic review reported that parents often hold conflicting attitudes toward children’s screen use; although they recognize the associated risks, they lack clarity in setting time limits.¹⁸ However, children’s screen

time remains inconsistent with the recommendations of the American Academy of Pediatrics (AAP), which recommends that children aged 2–5 years should use screens for no more than 1 hour per day.⁴ Scientific studies have shown that excessive screen exposure is associated with reduced white matter, impaired language development, and diminished memory.¹⁹ Therefore, further research is warranted on factors influencing excessive screen use, such as family attitudes toward media.

In this study, most children used two or more types of electronic media at home (72.1%), including televisions, mobile phones, and tablets. Among these devices, mobile phones were the most frequently used, with 108 children reporting use. Children had access to all types of electronic media and often engaged with at least two types simultaneously, indicating a tendency toward media multitasking. These results are consistent with a study conducted in Rayong, a province in eastern Thailand, which reported that children under 5 years old used multiple media types concurrently (32.8%), often before bedtime or during meals.²⁰ Moreover, the simultaneous use of multiple media devices tends to have more negative than positive effects, with extended exposure to simultaneous media multitasking between ages 1 and 3 being associated with executive function deficits and lower cognitive development in preschool-aged children.²¹

The study found that 67.2% of participants viewed electronic media content intended for children and adults. Most parents watched adult-oriented media in the presence of children. This may be attributed to the fact that most parents had completed secondary education, which may have limited their knowledge and awareness in selecting age-appropriate media. Consequently, children were exposed to diverse content without consideration of suitability. These results are consistent with a previous study showing that parents play a crucial role in selecting appropriate media, as their knowledge and attitudes influence decisions regarding the quality and age-appropriateness of

content for children.²² The use of electronic media can produce both positive and negative effects on children's development. Educational and high-quality media may enhance learning skills, such as attention and memory. However, inappropriate or excessive media use may negatively impact development, including reduced attention span and impaired analytical thinking.²³

Only 54.7% of parents were present and engaged while children used electronic media, possibly because most parents held labor-based occupations, limiting their time for supervision. Parental occupation is a significant factor influencing early childhood development.^{1,12,13} Parents with occupational stability and greater time availability tend to engage in more supportive behaviors that promote child development. In contrast, parents with unstable income spend more time working to earn money, leading to child neglect and leaving children with media devices such as phones and television. This reduces the time for play and developmental stimulation, increasing the risk of suspected developmental delays.²⁴ Furthermore, in-depth studies are needed on the quality of parental involvement, specifically comparing passive co-viewing without interaction versus active engagement through discussion or explanation of media content with children, as well as analyzing the relationship between these behaviors and children's development.

Developmental status of children aged 2–5 years in child development centers in one province in the lower northeast, Thailand. According to the early childhood developmental assessment based on the Developmental Surveillance and Promotion Manual, 55.5% of participants exhibited age-appropriate development across all domains. However, nearly half of the children were considered to have developmental delay in specific domains. Fine motor and cognitive skills were the most affected (32.8%), followed by expressive language (25%), social and self-help skills (7.8%), receptive language (5.5%), and gross motor skills (2.3%). These results are consistent with a study

conducted in Phatthalung, a province located in southern Thailand, which reported that toddlers aged 30 months exhibited the highest delays in fine motor and cognitive skills (44.2%), followed by receptive language (39.5%) and social and self-help skills (32.6%).²⁵

Fine motor and language development are particularly at risk for delays, as they require repeated practice, caregiver interaction, and a supportive learning environment. In contrast, gross motor development tends to progress more rapidly because it involves basic physical skills children use in daily activities. These delays often found in early childhood are a concern because fine motor skills are fundamental to later cognitive abilities, and difficulties with either can impact a child's overall development. Neglect is one of the environmental factors that contributes to these delays. It was highly likely that the study children were neglected due to the characteristics of their parents' occupation and their low level of education.

In this study, regarding occupational stability, most parents were employed in labor work, had completed high school, and earned a total income of 5,000–10,000 THB (US\$ 158–316). Parental characteristics may have increased the risk of child neglect. Parents with limited educational attainment often have limited access to higher-paying employment, resulting in insufficient financial resources to provide age-appropriate toys or educational materials that promote developmental stimulation. Additionally, the nature of labor-intensive occupations with extended working hours may limit the time parents have to engage in direct interactions with their children. Parents with limited education may lack the skills and knowledge to access or use information on child development promotion. These interconnected factors may create an environment that is not conducive to optimal child development. These findings are aligned with research showing that children from socioeconomically disadvantaged families face higher risks of developmental delays across all domains.²⁶

Moreover, they also correspond to findings on factors influencing delays in fine motor development, which reported that children living with both parents were 1.079 times more likely to exhibit age-appropriate fine motor development than other groups. Children whose parents encouraged coloring activities were 3.045 times more likely to achieve age-appropriate fine motor skills compared to those who did not receive such encouragement.²⁷ According to the 2024 child and family situation report by the Thai Health Promotion Foundation (ThaiHealth) and the National Institute for Child and Family, 7.8 million children and adolescents live in agricultural families with unstable incomes, often below 3,000 THB (US\$94.82) per month, which adversely affects their education and development.²⁸ Furthermore, the early childhood development monitoring data for fiscal year 2025 from the Department of Health indicated that 78.7% of children aged 0–5 years exhibited age-appropriate development, while developmental delays were observed in expressive language (72.7%), receptive language (58.6%), fine motor and cognitive skills (44.4%), social and self-help skills (38.3%), and gross motor skills (28.2%).²⁹

The duration of electronic media use was significantly associated with overall child development. Domain-specific analysis indicated significant associations between media use duration and fine motor, cognitive skills, as well as expressive language. Children aged 2–3 years, a critical period for brain and communication skill development, who engage in prolonged media use, often perform repetitive manual actions such as swiping or pressing buttons. This repetitive action may impair hand skills and eye-hand coordination, thereby limiting practice in complex motor tasks such as holding a pencil, drawing, cutting paper, or building blocks. Interactive media, such as drawing, writing, or screen-based puzzle games, may partially support fine motor development but cannot replace real-world activities like coloring or block play.³⁰ This aligns with studies indicating that the use of

electronic media, particularly new media formats (e.g., tablets, smartphones, games) during the preschool years, may impede fine motor development. Early and prolonged media exposure is associated with reduced fine motor development later, even after controlling for other factors such as environment, parental knowledge, age of media initiation, and socioeconomic status.³¹ Therefore, electronic media use is significantly associated with fine motor and cognitive development. Consistent with previous studies, children who spend more than 4 hours per day on screen time are at higher risk of developmental delays in communication, problem-solving, fine motor skills, and personal-social abilities. Excessive electronic media use, particularly with inappropriate content or passive viewing (e.g., continuous video watching), is associated with delays in language development, including both receptive and expressive language, as children have fewer opportunities to practice speaking or interact with adults. These findings align with research showing that children aged 2–3 years who exceed 1 hour of daily screen time exhibit reduced language development and communication skills.³² Additionally, the study found that 40.9% of children who engage in more than 2 hours of daily screen time exhibited significant delays in expressive language and receptive language.³³

The American Academy of Pediatrics recommends that electronic media use should not exceed one hour per day for young children, as learning through real-world play, parent-child communication, and environmental exploration more effectively stimulates brain development.⁴ However, co-viewing or co-playing with parents and selecting age-appropriate content can support learning in areas such as language, numeracy, music, and logical reasoning.³⁴

There was no significant association between the number of electronic media used and overall domain-specific child development, including gross motor skills, fine motor and cognitive skills, language, and social and self-help skills. One possible explanation is that children's muscles remain engaged and stimulated

during media use. Furthermore, most electronic media provide auditory input, allowing children to continue receiving language exposure and sound perception. These findings align with research showing that the number of electronic media alone does not directly affect all aspects of child development.³⁵ However, some studies have reported that the number of electronic media used is associated with certain aspects of child development, such as receptive language¹ and emotional and behavioral difficulties.³⁶ These findings suggest that other factors may play a more critical role than media quantity, including media characteristics, co-use with parents, and learning-supportive environments.

Interestingly, no significant association between the type of electronic media content and the overall development domains. Furthermore, research findings revealed that when parents are involved in children's electronic media use, children demonstrate age-appropriate development at a rate of 90%. This suggests that regardless of whether the media content is age-appropriate for children or intended for adults, children continue to receive auditory input and verbal exposure from the media. Moreover, children still receive developmental stimulation through daily activities and interactions with parents or their surrounding environment. This reflects the crucial role of parental mediation and co-use in mitigating the negative impact of media content exposure on children's emotional and socio-emotional abilities.^{37,38}

Notably, the study found a significant association between parental involvement during children's electronic media use and specific developmental domains. When analyzing specific developmental domains, parental involvement showed a strong association with fine motor and cognitive skills, social and self-help skills. According to the study, children whose parents were involved and engaged in conversation during electronic media use showed more age-appropriate development than those whose parents were not present and did not converse during media use. These findings align with

research showing that parental involvement during children's use of electronic media is associated with their language, social, and emotional development.³⁹ In particular, co-viewing or co-playing enables children to ask questions, express opinions, and better understand content, while reducing exposure to inappropriate material. Such involvement also fosters parent-child interaction and shared learning. Parents are encouraged to implement media parenting practices, such as setting time limits and selecting educational content, to support optimal child development.^{40,41}

Limitations

First, the sample was limited to children attending development centers in one province in the lower northeast of Thailand, which may limit the generalizability of the findings to other geographic regions or socioeconomic contexts in Thailand. Second, data on electronic media use obtained from parental questionnaires may be subject to recall bias, particularly regarding the duration and frequency of media exposure and the degree of parental involvement during screen time. To mitigate this limitation, standardized interviews were conducted with all parents, and domain-specific terms were clearly defined within each questionnaire item to ensure consistent interpretation. Additionally, a one-week media log was employed to enhance accuracy. Future research should employ prospective longitudinal designs, include more diverse populations, and utilize objective measures of screen time.

Conclusions and Implications for

Nursing Practice

Excessive electronic media use (> 1 hour daily) and limited parental involvement were associated with developmental delays in fine motor, cognitive skills, and expressive language among children aged 2–5

years. Implications include: 1) Integrating electronic media screening into routine child health assessments, asking about screen time duration, device types, content, and parental involvement; 2) Promoting adherence to AAP guidelines of less than 1-hour daily screen time; 3) Emphasizing active parental co-viewing and engagement; 4) Collaborating with early childhood educators to implement institutional media policies, including screen-free times and parent education; and 5) Developing and delivering parent or caregiver education workshops in communities, child development centers, and healthcare settings focusing on: age-appropriate media content selection, balancing screen time with physical activity and hands-on play, and understanding developmental milestones.

Author Contributions

Conceptualization, Method and design, Editing the manuscript, Final approval of the submitted version: K.P., T.L.

Data collection, Data analysis and interpretation, Drafting the manuscript, Revising the manuscript: K.P.

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ความสัมพันธ์ระหว่างการใช้สื่ออิเล็กทรอนิกส์และพัฒนาการของเด็กอายุ 2-5 ปี ในศูนย์พัฒนาเด็กเล็กของประเทศไทย

กฤติยาณี ปะนัดถานัง ธนภมณ ลีศรี*

บทคัดย่อ : การใช้สื่ออิเล็กทรอนิกส์มากขึ้นในเด็กเล็กเป็นปัญหาสุขภาพระดับโลกที่กำลังเกิดขึ้นซึ่งอาจส่งผลเสียต่อพัฒนาการของเด็ก เนื่องจากการเข้าถึงเทคโนโลยีในประเทศไทยเพิ่มมากขึ้น การทำความเข้าใจความสัมพันธ์ระหว่างการใช้สื่อและพัฒนาการเด็กปฐมวัยจึงมีความสำคัญต่อบุคลากรทางสุขภาพและครอบครัว การศึกษาเชิงพรรณนาหาความสัมพันธ์นี้ ศึกษาความสัมพันธ์ระหว่างการใช้สื่ออิเล็กทรอนิกส์และพัฒนาการในเด็กอายุ 2-5 ปี ที่เข้าสู่ศูนย์พัฒนาเด็กเล็กในจังหวัดหนึ่งทางภาคตะวันออกเฉียงเหนือตอนล่างของประเทศไทย กลุ่มตัวอย่างประกอบด้วยคุณแม่-เด็ก จำนวน 128 คู่ เครื่องมือที่ใช้ประกอบด้วย แบบสอบถามข้อมูลทั่วไป แบบสอบถามการใช้สื่ออิเล็กทรอนิกส์ของเด็ก แบบบันทึกการใช้สื่ออิเล็กทรอนิกส์ของเด็ก และคู่มือเฝ้าระวังและส่งเสริมพัฒนาการเด็กปฐมวัย วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนาและการทดสอบไคสแควร์

ผลการศึกษาพบว่า โดยรวมแล้ว เด็กอายุ 2-5 ปี ร้อยละ 55.5 มีพัฒนาการที่เหมาะสมกับวัยในทุกด้าน เมื่อแยกพัฒนาการรายด้าน พบว่าเด็กมีพัฒนาการสงสัยไม่สมวัยในด้านกล้ามเนื้อเล็กและสติปัญญา รองลงมา คือ การใช้ภาษา การช่วยเหลือตนเองและสังคม การเข้าใจภาษา และการเคลื่อนไหวตามลำดับ ในส่วนของระยะเวลาที่เด็กใช้สื่ออิเล็กทรอนิกส์ และการมีส่วนร่วมของผู้ปกครองในขณะที่เด็กใช้สื่ออิเล็กทรอนิกส์ มีความสัมพันธ์กับพัฒนาการโดยรวมของเด็กอย่างมีนัยสำคัญทางสถิติ ส่วนจำนวนของสื่ออิเล็กทรอนิกส์และประเภทเนื้อหาของสื่อไม่มีความสัมพันธ์กับพัฒนาการเด็กโดยรวม และ เมื่อพิจารณาความสัมพันธ์ระหว่างการใช้สื่ออิเล็กทรอนิกส์กับพัฒนาการเด็กแยกเป็นรายด้าน พบว่า ระยะเวลาที่เด็กใช้สื่ออิเล็กทรอนิกส์มากกว่า 1 ชั่วโมงต่อวัน มีความสัมพันธ์กับพัฒนาการด้านกล้ามเนื้อเล็กและสติปัญญาและการใช้ภาษาอย่างมีนัยสำคัญ นอกจากนี้ การมีส่วนร่วมของผู้ปกครองในขณะที่เด็กใช้สื่ออิเล็กทรอนิกส์มีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติกับพัฒนาการด้านกล้ามเนื้อเล็กและทักษะด้านสติปัญญา และทักษะทางสังคมและการช่วยเหลือตนเอง และในทางตรงกันข้าม จำนวนการใช้สื่ออิเล็กทรอนิกส์และประเภทเนื้อหาของสื่อไม่มีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติกับพัฒนาการทุกด้าน ผลการศึกษานี้แนะนำว่าพยาบาลเด็กควรคัดกรองการใช้สื่อเป็นประจำระหว่างการประเมินพัฒนาการ ให้ความรู้แก่ผู้ปกครองเกี่ยวกับขอบเขตเวลาการใช้หน้าจอที่ควรจะเป็น และส่งเสริมการดูสื่อร่วมกันอย่างมีส่วนร่วมของผู้ปกครองเพื่อสนับสนุนพัฒนาการที่ดีที่สุดของเด็ก

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คำสำคัญ : พัฒนาการเด็ก พัฒนาการล่าช้า การใช้สื่ออิเล็กทรอนิกส์ เด็กปฐมวัย เวลาการใช้หน้าจอ ประเทศไทย

กฤติยาณี ปะนัดถานัง อาจารย์ สาขาวิชาการพยาบาลเด็กและวัยรุ่น
สำนักวิชาพยาบาลศาสตร์ มหาวิทยาลัยเทคโนโลยีสุรนารี
E-mail: Krittiyane@sut.ac.th
ติดต่อที่ : ธนภมณ ลีศรี* ผู้ช่วยศาสตราจารย์ สาขาวิชาการพยาบาล
อนามัยชุมชน สำนักวิชาพยาบาลศาสตร์ มหาวิทยาลัยเทคโนโลยีสุรนารี
E-mail: thanakamon@sut.ac.th