

Original article

Parents' knowledge and attitudes toward usage of digital screen devices in 6-month-old to 5-year-old children in Thailand

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Background: Because 6-month-old to 5-year-old children cannot control their behavior of using digital screen devices on their own and control and supervision from parents are required, parents' knowledge toward proper usage of digital screen devices in children is necessary.

Objective: This study aimed to investigate parents' knowledge and attitudes toward usage of digital screen devices in 6-month-old to 5-year-old children in Thailand.

Methods: This was a cross-sectional descriptive study. The data were collected from 954 samples of parents of 6-month-old to 5-year-old children in Thailand. They volunteered to answer the online questionnaire between April – June 2019.

Results: Most parents used digital screen devices 6 hours/day or over, mostly used in front of children \leq 1 hour/day. Most parents had very good knowledge and attitudes toward usage of digital screen devices in 6-month-old to 5-year-old children. But only 58.8 - 61.6% of them could follow the instructions of how to use digital screen devices in children properly. Most children used digital screen devices less than 1 hour/day and started using digital screen devices before 2 years old. Parents' knowledge and attitudes were related to usage in children in terms of their age of initial usage and usage duration. The findings indicated personal factors and usage in parents were related to children's age of initial usage and duration of children each day.

Conclusion: The study found that parents' knowledge and attitudes toward proper usage of digital screen devices in 6-month-old to 5-year-old children. The findings can be applied for planning how to educate parents about using digital screen devices more properly under different ages of children based on valid recommendations.

Keywords: Parents' attitudes, parents' knowledge, usage of digital screen devices in children.

Digital screen devices currently show their roles more in our daily life. Digital screen devices basically refer to any devices for communication through screen, e.g., Televisions (TVs), computers, video games, mobile phones, tablets, and laptops.^(1,2) Usage of digital screen devices has remarkably increased in the past 10 years.⁽³⁾ A study of USA in 2013 found that over a half of 4-year-old children had their own TVs; 75.0% of children had their own mobile phones;

and 96.6% of children used digital screen devices since the age of 1.^(4,5)

Children of early childhood include newborns to 6 years old, are the most crucial period of brain development. Their first 2 years particularly affect their cognitive development and intelligence.⁽⁶⁾ Some studies found that the development of thinking, language, muscle, emotional, and social skills require social interaction between children and their parents and children could not learn through digital media like they learned from parents and their daily life.^(7,8) Executive function also generally requires learning through social playing between parents and children.⁽⁹⁾ Usage of digital screen devices in parents decreases interaction with children.⁽¹⁰⁻¹⁴⁾ Previous studies found that more duration of watching screens slowed down

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intellectual, language, and muscle development. It also increased risks of obesity and improper behavior compared to children who did not watch screens.⁽¹⁵⁻¹⁹⁾ As 6-month-old to 5-year-old children cannot control their usage of digital screen devices. Therefore, they need control of such usage from parent. That is why parents' knowledge of proper usage of digital screen devices in children of each age range is necessary.

It was also found that the likelihood of using digital screen devices in children in Thai society has increased. Ruangdaraganon N, *et al.* (2009) conducted a study on 260 children and found that they were exposed to TVs since the age of 6 months, 1.2 hours/day; and increased up to 1.7 hours/day in 2-year-old children. 66.0 - 75.0% of parents believed that being exposed to TVs was useful for child development.⁽²⁰⁾ Chonchaiya W, *et al.* (2015) studied 194 samples of 6 to 8-month-old children in Thailand who exposed to TVs. It was found that 91.8% of them were exposed to TVs before 1 year old. 6 and 12-month-old children were exposed to TVs 4 hours/day on average. 18 and 24-month-old children were exposed to TVs 5 hours on average. Most contents they were exposed to were TV programs for adults (85.0%) as the background Media.⁽²¹⁾

In 2016, American Academy of Paediatrics (AAP)⁽²²⁾ launched the recommendations for usage of digital screen devices in children, i.e., children below 2 years old should not use digital screen media, except for video chat; and should not be left alone. 2 to 5-year-old children should use digital screen media not over 1 hour/day for quality educational programs, and parents should watch with children. However, no studies have been conducted in Thailand yet on how much parents have learnt of the recommendations and what are their attitudes toward those recommendations. Hence, this research was conducted to study parents' knowledge and attitudes toward usage of digital screen devices in 6-month-old to 5-year-old children to build data for further applications.

Materials and methods

This is a cross-sectional descriptive study, conducted on parents of 6-month-old to 5-year-old children in Thailand. The sample size was calculated by the formula of Yamane (1967), with the presumed proportion of 0.5 and 95.0% reliability. With the difference of each region such as Bangkok region,

central region, northern region, southern region, eastern region, western region based on the design effect estimated at 2. The final calculated sample size is 880.

For the inclusion criteria, the samples must be parents at the age of 18+ with 6-month-old to 5-year-old children. They must also live in the same places of their children and have take care of them for at least 3 consecutive months. They must consent to participate in the research. As for the exclusion criteria, parents who could neither understand nor communicate in Thai were excluded. The data was collected by the online questionnaire between April – June 2019 from all of 954 sample, obtained by purposive sampling. Parents were recruited into the study by online questionnaire on Facebook website. The study was consented from the Research Ethics Review Committee for Research Involving Human Subjects, Faculty of Medicine, Chulalongkorn University (IRB no.783/61). The samples acknowledged the research objectives and signed their names as the consent to participate with willingness.

The questionnaire consisted of 5 parts as follows:

Part 1: Demographic data of parents (9 items), i.e., age, gender, address, educational level, marital status, income, number of children, relationship between parents and children, and time spent with children.

Part 2: Usage of digital screen devices in parents (6 items), i.e., usage duration each day, usage frequency each week, place, type of usage, usage duration in front of children.

Part 3: Demographic data of children (3 items), i.e., age, gender, and birth order.

Part 4: Usage of digital screen devices in children (9 items), i.e., usage duration each day, age of initial usage, usage frequency each week, place, type of device, type of application, use with or without parents?, are they allowed to have their own device(s)?, age of their initial ownership. Usage duration each day: No usage, ≤ 1 hour/day, and > 1 hour/day. Age range of initial usage: ≤ 2 years and > 2 years.

Part 5: Parents' knowledge and attitudes toward usage of digital screen devices in children, based on the recommendations from article in Pediatrics (Official Journal of the American Academy of Pediatrics), 21 October 2016⁽²²⁾ in different aspects as follows (9 items).

Recommendations for proper usage of digital screen devices in children from American academy of pediatrics⁽²²⁾

1. Children below 2 years old should not be allowed to use digital screen devices, except for video chat.
2. Children below 2 years should be limited for their usage duration on high quality educational program under a very short time; and must not be left alone.
3. 2 to 5-year-old children should use digital screen devices not over 1 hour/day for quality educational programs, and parents should watch with children.
4. Children should not be allowed to watch media while eating and 1 hour before bed.
5. Digital screen devices should not be used to attract children.
6. Parents should check usage to remain within limited durations. Contents of media should be proper for children's age (Avoid contents with quick motions and violence).
7. TVs and digital screen devices should be turned off when not in use and while staying with children (background media).
8. Screen-free time and screen-free zones should be set at home.
9. There should be the rules of using digital screen devices at a certain level that do not affect sleeping time, exercise, playing and social interaction.

“Recommendations for proper usage of digital screen devices in children” were applied into the 4 subparts in the questionnaire as follows:

5.1 Parents' knowledge: assessed whether parent have learnt of each item from the recommendations for proper screen time use (1 point for each known item). The interpretation of the findings was divided into 3 groups, i.e., poor 0 - 3 point (s), moderate 4 - 6 points, and very good 7 - 9 points.

5.2 Attitudes toward recommendations: assessed whether parents agree with the recommendations: Strongly disagree (1), disagree (2), unsure (3), agree (4), strongly agree (5). A 5-rating Likert scale was applied. Only one answer in each item could be selected following the true feelings of the samples. The total score of attitudes toward a recommendation = 9 - 45 points. Higher points represented higher agreement with the recommendations.

5.3 Attitudes toward usage: assessed how much parents think the recommendations can be applied in real-life situation?: Can be applied (2 points), unsure (1 point), cannot be applied (0 point). The total score

of attitudes = 0 - 18 point(s). The interpretation of the findings was divided into 3 groups, i.e., poor 0 - 6 point(s), neutral 7 - 12 points, and very good 13 - 18 points.

5.4 Obstacles of usage: assessed obstacles against following the recommendations:

- Parents were not able to firmly impose screen-time control.
- Parents and people around also used digital screen devices, which could be imitated by children.
- Parents thought usage of digital screen devices could make children calm and stay still.
- Younger children still could not control themselves well while using digital screen devices.
- Younger children used digital screen devices to solve their boredom.
- The media is designed to captivate young children, making it hard for them to stop watching the media.

Statistical analysis

Statistical package for the social science for Windows (SPSS) version 22.0 was applied for data analysis. The descriptive statistics included number, percentage, mean, standard deviation (SD), median, maximum, and minimum. For the inferential statistics, the statistical significance was set as $P < 0.05$. The relationships in the categorical data were examined by Chi-square test, e.g., gender, educational level, age range, relationship with children, marital status, knowledge level toward usage, and attitudes toward usage versus children's age of initial usage (2 groups) and usage duration in children (3 groups). In case of over 20.0% of the expected cell below 5, Fisher's exact test was applied.

For the comparison of the level of age (year), level of knowledge score and level of attitude score, it was discriminated based on age of initial usage (2 groups) and the demographic factors of parents. Unpaired student *t*-test was applied to normal distribution while Mann-Whitney U-test was applied to non-normal distribution.

Results

According to the findings of the demographic data of 954 parents, most were female (90.7%); had a relationship with children as their mothers (86.4%); average age of (SD) 35.7 (\pm 5.2) years; married (88.9%); graduated with bachelor's degree and higher (90.0%); lived in Bangkok (41.3%), followed by the central region (20.5%); had monthly income between

20,000 - 40,000 baht (39.1%), followed by income below 20,000 baht (23.8%); mostly had 1 child (78.8%); spent time with children over 6 hours/day (83.6%). For the samples of children, most of them were male (50.6%), followed by female (49.4%); average age 37.5 (\pm 16.6) months; mostly the eldest child (73.1%) (Table 1).

According to the findings of usage of digital screen devices in parents, usage duration each day was over 6 hours/day (42.0%); daily usage (83.2%); mostly used at home (80.5%), followed by workplace (51.6%); mostly smartphones (91.1%); used for social media (90.9%); used for information searching (63.7%); mostly used in front of children \leq 1 hour/day (44.9%); no usage (10.7%) (Table 1).

Table 1. Demographic data and usage of digital screen devices in parents and children (n = 954).

Data		Number (%)
Demographic data of parents and children		
Parents' gender	Female	865 (90.7)
	Male	89 (9.3)
Parents' age (year)	\leq 30	138 (14.5)
	31 - 40	703 (73.7)
	> 40	113 (11.8)
Parents' educational level	High school or below	95 (10.0)
	Bachelor's degree	505 (52.9)
	Master's degree or higher	354 (37.1)
Children's gender	Male	483 (50.6)
	Female	471 (49.4)
Children's age (year)	6 months - 1 year	93 (9.7)
	> 1 - 2 years	158 (16.6)
	> 2 - 3 years	168 (17.6)
	> 3 - 4 years	193 (20.2)
	> 4 - 5 years	342 (35.8)
Usage of digital screen devices in parents		
Usage duration	No usage	18 (1.8)
	\leq 1 hour/day	83 (8.7)
	2 - 3 hours/day	197 (20.6)
	4 - 5 hours/day	255 (26.7)
	\geq 6 hours/day	401 (42.0)
Usage in front of children	No usage	102 (10.7)
	\leq 1 hour/day	428 (44.9)
	2 - 3 hours/day	273 (28.6)
	4 - 5 hours/day	80 (8.4)
	\geq 6 hours/day	17 (7.4)
Usage of digital screen devices in children		
Usage duration	No usage	240 (25.2)
	\leq 1 hour/day	419 (43.9)
	2 - 3 hours/day	219 (23.0)
	4 - 5 hours/day	50 (5.2)
	\geq 6 hours/day	26 (2.7)
Age of initial usage (month)	6 months - 1 year	140 (19.6)
	> 1 - 2 years	254 (35.6)
	> 2 - 3 years	203 (28.4)
	> 3 - 4 years	94 (13.2)
	> 4 - 5 years	23 (3.2)
Type of digital screen device	Smartphones	492 (51.6)
	TVs	297 (31.1)
	Others	165 (17.3)
Type of application	TV programs/online music	652 (68.3)
	Video call	150 (15.7)
	Others	152 (16.0)
With or without parents	Alone	96 (10.0)
	With parents	618 (64.8)
	Not allowed	240 (25.2)
Total parent knowledge of screen usage recommendation	Very good	891 (93.4)
	Moderate	52 (5.5)
	Poor	11 (1.1)

According to the findings of usage of digital screen devices in children, usage duration each day was in the group of ≤ 1 hour/day (43.9%) and no usage (25.2%); daily usage (38.5%); age of initial usage between 1.1 – 2 years (35.6%), followed by 2.1 – 3 years (28.4%); used with parents (64.8%); used without allowance from parents (68.9%); age allowed for usage = 3 years; mostly used at home (72.0%); mostly smartphones (51.6%), followed by TVs (31.1%) and z (16.0%) (Table 1).

According to the findings of “Recommendations for Proper Usage of Digital Screen Devices in Children,” in term of knowledge showed that over 90.0% of parents have learnt of the recommendations for proper usage of digital screen devices in children, except for no. 4: Children should not be allowed to watch media while eating and 1 hour before bed. 15.2% of parents did not learn of the recommendations. For attitudes, 90.0% of parents thought that only 2 recommendations could be applied in real life, i.e. no. 3: 2 to 5-year-old children should use digital screen devices not over 1 hour/day for quality educational programs, and parents should watch with children; and no. 7: TVs and digital screen devices should be turned off when not in use and while staying with children (background media). The one thought to be the least applicable was no. 5: Digital screen devices should not be used to attract children (Table 2).

Knowledge and attitude scores were divided into 3 groups; very good, moderate and poor (as outlined

in Table 1). It was found that the score of knowledge on the recommendations of usage of digital screen device in parents was mostly in the group of very good knowledge (93.4%), with means = 8.4 ± 1.2 points out of 9 (median = 8.7). The score of attitudes toward the recommendations of usage of digital screen device in parents was mostly in the group of very good attitudes (83.1%), with means = 15.5 ± 3.5 points out of 18 (median = 16.8).

The study also found that only 58.8% of sampled parents who took care of children below 2 years old followed the recommendation (Children below 2 years old should not use at all). And only 61.6% of Parents of children at 2 - 5 years old followed the recommendation (Children at 2 years old or over should use not over 1 house/day).

Approximate proportion of no screen use versus < 1 hour use versus > 1 hour use in the very good knowledge group was 1 : 1.7 : 1.1, while that of the moderate knowledge group was 1 : 2 : 3, and that of the poor knowledge group was 1 : 3 : 7. Fisher's exact test showed significant association between parents' knowledge of screen usage recommendations and to usage duration/day in children ($P = 0.006$). ANOVA found mean number of known recommendations to be statistically different between the groups ($P < 0.001$) (8.7 ± 0.8 , 8.5 ± 1.0 , and 8.1 ± 1.5) points, respectively). However, no statistical difference was found between the means of knowledge in parents of children who did not use at all and who used for 1 hour or less (Table 3).

Table 2. Parent's knowledge and attitude toward the items of recommendations for proper usage of digital screen devices in children (n = 954).

No. of Recommendation	Number of parents (%)		Mean of Agreement (Score) (5 points)	Number of parents' attitudes toward applicability of recommendations (%)		
	Have learnt	Never learnt		Can be applied	Unsure	Cannot be applied
1	95.6	4.4	4.621	74.4	10.9	14.7
2	97.1	2.9	4.747	87.0	6.2	6.8
3	90.3	9.7	4.729	91.3	5.8	2.9
4	84.8	15.2	4.742	72.9	13.7	13.4
5	94.7	5.3	4.742	70.0	16.1	13.8
6	98.0	2.0	4.894	73.8	12.5	13.7
7	95.3	4.7	4.849	90.8	4.3	4.9
8	92.1	7.9	4.819	81.0	10.2	8.8
9	96.0	4.0	4.891	89.2	6.9	3.9

Approximate proportion of no screen use versus < 1 hour use versus > 1 hour use in the Good attitude group was 1 : 1.6 : 0.8, while that of the neutral group was 1 : 4.2 : 7.5, and that of the poor attitude group was 1 : 5 : 24. Chi-square test found significant association between parents' attitudes toward usage of digital screen devices was significantly related to usage duration/day in children ($P < 0.001$). Means of attitude scores were different amongst three usage groups [17.0 ± 2.0), 15.9 ± 2.8), and 13.6 ± 4.4), respectively] (Table 3).

Proportions of parents with very good knowledge on screen recommendation whose child started using screen before versus after the age of two year was 1 : 1.8. For those with moderate knowledge the proportion was 1 : 0.8, and those with poor knowledge the proportion was 1 : 0.6. Chi-square test found significant association between parent knowledge on screen recommendation and age of initial usage group ($P = 0.022$). When comparing the means of knowledge, they were found significantly different ($P = 0.018$). In the group of children who started using since 2 years old and over, parents had higher means of knowledge than those in the group of children who started using when below 2 years old (8.5 ± 1.1 and 8.2 ± 1.4 points, respectively) (Table 3).

Proportions of parents with good attitude toward usage of digital screen devices whose child started using screen before versus after the age of two year was 1 : 2. Neutral attitude group's proportion was 1 : 0.9, and poor attitude group's proportion was 1 : 0.6. Chi-square test found significant association

between parents' attitudes toward usage of digital screen devices and children's age of initial usage ($P < 0.001$). Difference in means of attitude score between children who started using at below 2 years old and children at 2 – 5 years old were statistically significant ($P < 0.001$). In the group of children who started using at 2 years old and over, parents had higher means of attitudes than those in the group of children who started using at below 2 years old (15.5 ± 3.4 and 14.0 ± 4.0 points, respectively) (Table 3).

Demographic data and usage of digital screen devices in parents are related to duration usage/day in children, i.e., Parent age ($P = 0.02$) educational level ($P < 0.001$), caring time/day ($P = 0.006$), usage time/day in parents ($P < 0.001$), and usage duration in front of children ($P < 0.001$) (Table 4).

Demographic data and usage of digital screen devices in parents are also related to children's age of initial usage, i.e., age ($P = 0.014$) and using with children ($P = 0.027$) (Table 4).

Samples reported that thought the recommendations were inapplicable due to the following reasons (multiple response). The findings revealed that parents thought the recommendations still could not be applied due to the following reasons. Parents were not able to firmly impose screen-time control ($n = 128$). Parents and people around also used digital screen devices, which could be imitated by children ($n = 92$). Parents thought usage of digital screen devices could make children calm and stay still ($n = 68$).

Table 3. The relationship between parents' knowledge and attitudes toward usage of digital screen devices; and usage duration/day in children ($n = 954$) and Children's age of initial usage ($n = 714$). Percentages given are of total number of subjects.

	Usage duration			P-value	Age of initial usage		P-value
	No usage (n = 240)	≤ 1 hour (n = 419)	> 1 hour (n = 295)		< 2 years (n = 266)	≥ 2 years (n = 448)	
Knowledge of screen usage recommendations				0.006* ^F			0.022* ^C
Very good (7 - 9)	230 (24.2)	399 (41.8)	262 (27.5)		237 (33.2)	424 (59.4)	
Moderate (4 - 6)	9 (0.9)	17 (1.8)	26 (2.7)		23 (3.3)	20 (2.8)	
Poor (0 - 3)	1 (0.1)	3 (0.3)	7 (0.7)		6 (0.8)	4 (0.5)	
Mean ± SD	8.7 ± 0.8	8.5 ± 1.0	8.1 ± 1.5	< 0.001* ^O	8.2 ± 1.4	8.5 ± 1.1	0.018* ^T
Attitudes toward usage of digital screen devices				< 0.001* ^C			< 0.001* ^C
Good (13 - 18)	229 (24.0)	370 (38.8)	194 (20.3)		186 (26.1)	378 (52.9)	
Neutral (7 - 12)	10 (1.1)	44 (4.6)	78 (8.2)		63 (8.8)	59 (8.3)	
Poor (0 - 6)	1 (0.1)	5 (0.5)	23 (2.4)		17 (2.4)	11 (1.5)	
Mean ± SD	17.0 ± 2.0	15.9 ± 2.8	13.6 ± 4.4	< 0.001* ^O	14.0 ± 4.0	15.5 ± 3.4	< 0.001* ^T

C = P - value from Chi-square test, F = P - value from Fisher's exact test, O = P - value from One-way ANOVA, T = P - value from Independent t - test, * Significant at the 0.05 level

Table 4. The relationship between the demographic data of parents and usage duration/day in children (n = 954); and children's age of initial usage (n = 714).

Demographic data of parents	Number of children with usage duration (%)				Children's age of initial usage (%)		
	No usage (n = 240)	≤ 1 hour (n = 419)	> 1 hour (n = 295)	P-value	≥ 2 years (n = 448)	< 2 years (n = 266)	P-value
Parent age				0.02			0.014
≤ 35 years	131 (13.7)	170 (17.8)	142 (14.9)		180 (25.2)	132 (18.5)	
> 35 years	109 (11.4)	249 (26.1)	153 (16.1)		268 (37.5)	134 (18.8)	
Educational level				<0.001			0.274
High school or below	13 (1.4)	33 (3.5)	49 (5.1)		57 (8.0)	25 (3.5)	
Bachelor's degree	128 (13.4)	205 (21.5)	172 (18.0)		228 (31.9)	149 (20.9)	
Master's degree or higher	99 (10.4)	181 (19.0)	74 (7.7)		163 (22.8)	92 (12.9)	
Caring time/day				0.006			0.246
< 6 hours/day	24 (2.5)	73 (7.7)	59 (6.2)		77 (10.8)	55 (7.7)	
≥ 6 hours/day	216 (22.6)	346 (36.3)	236 (24.7)		371 (51.9)	211 (29.6)	
Usage duration/day				<0.001			0.052
No usage	17 (1.8)	1 (0.1)	0 (0)		1 (0.1)	0 (0)	
≤ 1 hour/day	13 (1.4)	62 (6.5)	8 (0.8)		50 (7.0)	20 (2.8)	
2 - 3 hours/day	52 (5.4)	90 (9.4)	55 (5.8)		91 (12.8)	54 (7.6)	
4 - 5 hours/day	71 (7.4)	104 (10.9)	80 (8.4)		126 (17.6)	58 (8.1)	
≥ 6 hours/day	87 (9.1)	162 (17.0)	152 (15.9)		180 (25.2)	134 (18.8)	
Usage duration in front of children				<0.001			0.626
No usage	63 (6.6)	26 (2.7)	13 (1.4)		25 (3.5)	14 (2.0)	
≤ 1 hour/day	102 (10.7)	250 (26.2)	76 (8.0)		203 (28.4)	123 (17.2)	
2 - 3 hours/day	51 (5.3)	102 (10.7)	120 (12.6)		144 (20.2)	78 (10.9)	
4 - 5 hours/day	14 (1.5)	23 (2.4)	43 (4.5)		43 (6.0)	23 (3.3)	
≥ 6 hours/day	10 (1.0)	18 (1.9)	43 (4.5)		33 (4.6)	28 (3.9)	
Use with children or not							0.027
Yes					378 (52.9)	240 (33.6)	
Children use alone					70 (9.8)	26 (3.7)	
Allow children to use or not							0.135
Yes					41 (5.7)	16 (2.3)	
No					407 (57.0)	250 (35.0)	

P - value from Chi-square test

Discussion

The study collected the data from the samples of parents with 6-month-old to 5-year-old children. The data were collected by the online questionnaire in Thailand. The strengths of this study demonstrated consequent behaviors related to those knowledge and attitudes eg. children's usage duration and children's age of initial usage, which would reflect the applicability of those knowledge and attitudes.

According to the study, most parents in Thailand used digital screen devices 6 hours/day or over. Most of the devices used were smartphones, which was the same prevalence as the previous survey on internet usage behavior.⁽⁵⁾ For usage of the devices in children, it was found that most children below 5 years old used

them for 1 hour or less, which was less than what was found in the study of Chonchaiya W, *et al.*⁽²¹⁾ However, it was found that most children started using digital screen devices at the age below 2 years old, consistent with the previous study. The devices used most by children were mobile phones, followed by TVs for watching TV programs/listening to online music, and video call.

Most parents had very good knowledge and attitudes toward usage of digital screen devices in 6-month-old to 5-year-old children. Only 58.8% of most parents of the group of children below 2 years old followed the recommendations of proper usage of digital screen devices in children. Only 61.6% of most parents of the group of children at 2 years old and

over followed the recommendations of proper usage of digital screen devices in children. These conformed to the findings of previous studies on the effects of TV media,⁽²⁰⁾ which found that 66.0 - 75.0% of parents believed that exposure to TVs was useful for children development. This study was found that parents were not able to firmly impose screen-time control, parents and people around also used digital screen devices, which could be imitated by children and parents thought usage of digital screen devices could make children calm and stay still. Therefore, some parents were still unable to control and apply the proper recommendations appropriately.

The study also pointed out association between parents' knowledge and attitudes and usage of digital screen devices in children, in terms of children's age of initial usage and actual usage duration. As 6-month-old to 5-year-old children cannot control their usage of digital screen devices, they need control of such usage from parent. According to the study, usage of digital screen devices in parents are also related to children's age of initial usage. Because usage in front of children might also bring less interaction between parents and children. Therefore, parents, directly interacting with children, have considerable influence in controlling this behavior. Parents' knowledge and attitudes of proper usage of digital screen devices in young children are necessary. These factors can change if parents have knowledge and attitudes toward proper usage of digital screen devices in children.

Parent's age, itself being nonmodifiable, were nevertheless found to be associated with children's screen time use. This may influence further research in particular parent age group where their screen usage, attitude, and control of their children may be of clinical interest. Parents' educational level, caring time, usage duration/day, and usage duration in front of children are related to usage duration in children. Parents' age and using with children are related to children's age of initial usage. Some recommendations were not heard of by parents, e.g., children should not be allowed to watch media while eating and 1 hour before bed; and digital screen devices should not be used to attract children. The study also found that the parent's learnt of difficulties in applying the recommendations lie in their lack of firmness to impose the rules. This point can be brought up in future parental educations.

Most parents in the study were mothers and had high education. Thus, they could not be the representatives of the entire population. Only limited groups of people could access the online questionnaire and recruitment. Age of initial usage might be affected by recall bias.

Conclusion

Most parents of 6-month-old to 5-year-old children had very good knowledge and attitudes toward usage of digital screen devices of children; however, some of the recommendations of usage of digital screen devices were less acknowledged than other. There are association between parents' knowledge and attitudes related to usage of digital screen devices in 6-month-old to 5-year-old children in terms of usage duration and age of initial usage. Parental factors are partly related to usage in children. The findings can be used promote proper usage of digital screen devices in children.

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Conflict of interest

The authors, hereby, declare no conflict of interest.

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