

# Digital Technology Use and the Role of Parenting Mediation on their Children's Behaviors: Comparison between Governmental and Private Kindergartens

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## Abstract

**Objectives:** The aim was to assess Digital Technology (DT) use and the role of parenting mediation on children's behaviors in both governmental and private kindergartens

**Method:** A comparative study design was used to find-out the difference between governmental and private Kindergartens (KGs). The total participants were 174 parents and their (3-6 years old) children, selected as 20% from each KGs, by using convenience sampling.

**Result:** The majority of children were five years old. About 95% of participants have TV/DVD and 93% have the touchscreen as homes' digital devices in both KGs, while touchscreen used more than TV/DVD. Concerning time-consuming on DT; 40% of a preschooler in both KGs use DT above the recommended time and this was significantly associating with increase parents' DT use. About 73% of a preschooler in governmental KGs exhibit poor behavior in comparison with 44% of a preschooler in private KGs, and this was also associated with increase parents' digital media use and poor parenting mediation strategies.

**Conclusion:** The study concludes that there is a difference between preschoolers in governmental and private kindergartens regarding DT use and health-related behaviors., and this goes to the effect of parents on their children's behaviors and attitudes regarding DT use.

**Keywords:** Digital media use; Digital technology; Preschoolers' behaviors; Parental mediation

## Introduction

Digital media described as artifact services, which originate from the industry of information, entertainment, and mass of media. It involves many subsectors, firstly website and applications as a digital platform. Secondly, video, audio, text, and images as digitalized content. Finally, the service of entertainment, information, and communication that can be used through various technological devices [1].

Digital media as many things have advantages and disadvantages, particularly when used by preschool children. The younger children grow up in media-rich homes with internet service and digital technologies, and this could produce both positive and negative effect on the development of these children in many aspects depending on the content to which they are exposed [2,3].

Academically, as to improve learning, alphabetic and reading abilities in addition to the enhancement of early language and mathematical acquaintance. Furthermore, the positive cog-

nitive effect such as the development of fine motor skills in children and visual intellect talents. Conversely, digital media influence adversely on the child physical, psychological and social wellbeing, for instance, decrease physical activity, increase the risk of obesity and musculoskeletal problems. As well as, the danger of development the addiction disorder, hostile-aggressive, depression, and violence risk behavior. Moreover, the child prefers to involve in a fantasy world rather than the real world. Finally, performance unsocial behavior like spending less time with family, decrease communication and interaction between members [4].

The children are influenced extensively by the daily practices of their parents regarding digital media use and the parents play an impotent

role in guiding their digital media practices [5].

The Parents are considered as the first mediator since the child shares their first digital experience with them as well as they

find their parents as role models, and learn new skills by mimicking their practices and preference regarding digital media use [6]. Therefore, the term of parental mediation strategy represents the actions that are taken via parents as educators or mediators to manage the relationship between children and their Digital technology usage [7]. Moreover, American Academic of Pediatrics (AAP) set a series of policy statements concerning the amount of time that children and teenagers spend with digital media as well as the contents of these media. These statements come after the adverse effects of digital technologies, such as violence, unaccepted sexual behaviors, substance use, and obesity, besides media use in early childhood [8,9].

**Objectives of the study**

- 1.Assessment of preschoolers' digital technology use in both governmental and private kindergartens.
- 2.Assessment of parents' mediation strategies related to preschooler's digital media use.
- 3.Identify preschoolers' health-related behaviors regarding digital technology use.
- 4.Comparison between preschoolers in governmental and private KGs regarding digital media use and health-related behaviors.

**Methodology**

A comparative study design used to apply quantitative research through the period of 3 January 2021 to 4 April 2021. The study conducted in Al-Hillah city, at governmental (GOV) (N= 3) and private (N= 5) Kindergartens (KGs). The total participants were (N=174) parents and their (3-6 years old) children selected as 20% from each KG, by using convenience non-probability sampling approach. The questionnaire was constructed and developed as a tool for data collection, and it includes four parts; the first part was sociodemographic data of children and their parents. Second part comprised of several items concerning digital media uses among children and parents. The third about parental mediation strategies scale that was Adopted and modified from Shin & Li, (2017), which consists of (active mediation, restrictive mediation, and monitoring mediation) as five items for each one. The fourth part was adopted and modified from the Preschool Behavior Questionnaire [10] and Strengths and Difficulties Questionnaire [11], which focused on preschooler health-related behavioral. The scale consists of 25 items divided into five sub-scale (prosocial behaviors sub-scale 6 items, anxious-fearful behaviors sub-scale 6 items, hyperactive-distractable behaviors sub-scale 5 items and hostile aggressive behaviors sub-scale 8 items. The items of both pre-school health-related behaviors and parental mediation strategies were rated based on a 3-level Likert scale, which was determined according to the mean of items' scores as shown in (Table 1).

**Validity and Reliability of Study Instrument:**

The content validity was established via a panel of (14) experts and some modifications were made according to the experts' suggestions after they reviewed the study's instrument. Internal consistency reliability applied electronically through calculated Cronbach alpha via the SPSS program after collected the data of 25 parents who have a pre-school child by using the study instrument, and this data was excluded from the study.

Table 1: The Rating Scales and Scoring.

Scales	score	Grade
Parental mediation strategies scale	(1 - 1.66)	Poor mediator
	(1.67 – 2.33)	Accepted mediator
	(2.34 – 3)	Good mediator
Preschoolers' health related behaviors scale	(1 - 1.66)	Good behaviors
	(1.67 – 2.33)	Poor behaviors
	(2.34 – 3)	Very poor behaviors

Table 2: Cronbach's Alpha of Study Instrument's Items.

Questionnaires	Items	Cronbach's Alpha	Assessment
Parental Mediation Strategies	15	0.70	Accepted
Preschoolers' Health-Related Behaviors Scale	25	0.77	Accepted

**Methods of Data Analysis:**

The data of the present study analyzed electronically via the Statistical program (SPSS) version 20. The method that used in this program aimed to find out the descriptive and inferential statistic such as frequencies, percentage, correlation coefficient, chi-square and T-test of entering data in order to achieve the objectives of the study.

Table 3: Distributions of total study sample at governmental and private KG according to socio-demographical variables.

Variables	Government		NON-Government	
	N=133 76.4%		N=41 23.6%	
<b>Kindergartens</b>	Frequency	Percent	Frequency	Percent
<b>Child age</b>	3	0	4	9.8
	4	34	10	24.4
	5	81	19	46.3
	6	18	8	19.5
<b>child gender</b>	Frequency	Percent	Frequency	Percent
Male	63	47.4	17	41.5
Female	70	52.6	24	58.5
<b>Father's education attainment</b>	Frequency	Percent	Frequency	Percent
Does not read and write	8	6.0	0	0
Read and write	12	9.0	0	0
Primary School	44	33.1	3	7.3
Intermediate and secondary	39	29.3	8	19.5
Diploma and above	30	22.6	30	73.2
<b>Mother's education attainment</b>	Frequency	Percent	Frequency	Percent
Does not read and write	7	5.3	0	0
Read and write	14	10.5	0	0
Primary School	53	39.8	0	0
Intermediate and secondary	31	23.3	9	22.0
Diploma and above	28	21.1	32	78.0
<b>Family income</b>	Frequency	Percent	Frequency	Percent
Insufficient	26	19.5	0	0
Sufficient to some extent	99	74.4	32	78.0
Sufficient and more	8	6.0	9	22.0
<b>Father occupation</b>	Frequency	Percent	Frequency	Percent
Not working	16	12.0	0	0
working	117	88.0	41	100.0
<b>Mother occupation</b>	Frequency	Percent	Frequency	Percent
Not working	112	84.2	8	19.5
working	21	15.8	33	80.5

**Result**

Table 3 illustrates that most of the study sample (76.4%) were from governmental kindergarten, the majority of preschoolers in both governmental (60.9%) and private (46.3%) were five years old, however (53%) of the study sample were female in both KG and other were male. As regard to the parents' educational attainment, higher percent of preschoolers' parents at governmental KG (33%) have primary educational degree, while most parents of preschooler at non-governmental (70%) have diploma and above degree. (19.5%) of preschoolers' families that used governmental KG suffer from insufficient income, contrariwise of preschoolers' families who used private KG 22% of them have sufficient and more income. The majority of preschoolers' father about 80% in both KG have work. Regarding the occupation of mother, (84.2%) of preschoolers' mother used governmental KG not working; in contrast, 80.5% of preschoolers' mother at private KG have work.

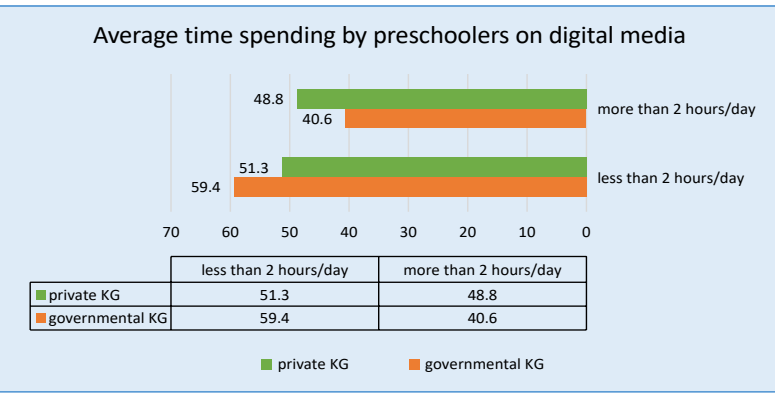


Figure 2: Show that 49% of pre-school children in private KG spend extra time on digital media above the recommended time by (AAP), as compared with 40% those in governmental kindergarten.

Table 5: Comparison between preschoolers at governmental and private KGs regarding overall health-related behaviors.

Overall preschool health-related behaviors	score	government	private
Good behaviors	1 - 1.66	24.1%	<b>56.1%</b>
Poor behaviors	1.67 - 2.33	<b>72.9%</b>	43.9%
Very poor behaviors	2.34 - 3	3.0%	0.0%

The table above shows that 73% of a preschooler in governmental KG exhibit poor behavior in comparison with 44% of a preschooler in private KG. In contrast, 56% of preschool children in private KG show, good behavior compared to 24% of children in governmental KG.

Table 6: The independent samples T-test between the type of kindergartens and preschoolers' health-related behaviors.

Variables.	Levene's Test for Equality of Variances.		T-test for Equality of Means.		
	F	Sig.	T	DF	Sig. (2-tailed).
Type of Kindergarten and Overall preschoolers' health-related behaviors	.669	.414	4.211	172	.000

The T-test used in this table in order to find a statistical difference between governmental and private KGs regarding preschoolers' health-related behaviors. The result shows that there is a statistically significant difference between preschoolers in GOV and Non-GOV-KGs at  $p < 0.05$ . Mean of GOV-KG (1.860) more than the mean of private-KGs (1.685), which indicate that the preschoolers in public KGs experience, poor health-related behaviors more than preschoolers in private KGs.

**Digital media device at home and used by preschoolers**

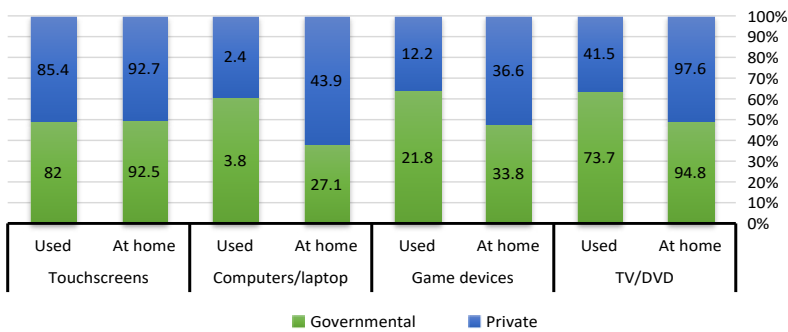


Figure 1: Demonstrate digital media devices at home and used by preschoolers at both governmental and private KG. The result shows that there is about (95%) of the families in study sample have TV/DVD in their homes while touchscreen (smart-phone/tab) consider the second higher percentage (93%) of homes' digital devices, at both governmental and private KG. Concerning the preschoolers' digital devices use, touchscreen used more than TV/DVD as the result shown, about 82% of Touchscreen in both KG. In contrast (74%) of preschoolers at governmental and 42% on those at private KG used TV/DVD.

Table 4: Comparison between preschoolers and their parent at governmental and private KGs, according to the DT usage.

Time-consuming on DT	Government			private		
	Child %	Father %	Mother %	Child %	Father %	Mother %
no usage	6.0	12.0	18.8	4.9	0	17.1
less than 1 hour a day	<b>37.6</b>	12.0	28.6	<b>29.3</b>	14.6	19.5
(1)hour a day	15.8	13.5	12.8	17.1	17.1	19.5
(2-3) hours a day	24.1	26.3	25.6	24.4	36.6	29.3
4 hours and above	16.5	36.1	14.3	24.4	31.7	14.6
Mean	<b>2.08</b>	<b>2.62</b>	<b>1.88</b>	<b>2.34</b>	<b>2.85</b>	<b>2.05</b>
Std. Deviation	1.235	1.390	1.365	1.277	1.038	1.341

The table above demonstrates the screen time by preschoolers and their parent in both governmental and private kindergartens. The findings show that Parents used DT more than 3 hours a day in both KG, particularly fathers (32%) of them used the DT 4 hours and more, while about (26 %) of mothers used DT (2-3) hours a day. In contrast preschooler in both KG use media more than 2 hours a day based on the mean (GOV = 2.08, non-GOV = 2.34).



Table 7: Correlation between average parents' screen time and preschoolers' health-related behavior at governmental and private kindergartens.

Governmental	Father screen time and child behaviors			Mother screen time and child behaviors		
	Value	DF	Sig.	Value	DF	Sig.
Pearson Chi-Square	32.130 <sup>b</sup>	8	.000	20.219 <sup>b</sup>	8	.010
private	Father screen time and child behaviors			Mother screen time and child behaviors		
	Value	DF	Sig.	Value	DF	Sig.
Pearson Chi-Square	4.080 <sup>b</sup>	3	.253	4.239 <sup>b</sup>	4	.375

The above table shows that there is a significant correlation between parents' digital media use and preschooler's health-related behaviors at governmental kindergarten and non-significant correlation for those in private KG at (P-value < 0.05).

Table 8: Correlation between average time consuming on digital media by a preschooler and their parent in both kindergartens.

Average time spent by the child on digital media	Spearman's rho	Average time spend by father	Average time spend by mother
	Correlation Co-efficient	.257**	.312**
	Sig.	.001	.000
	N	174	174

\*\* Correlation is significant at the 0.01 level

This table demonstrates the correlation between preschooler and their parent regarding digital media use in both KG. The result show positive Significant correlations between preschoolers and their father's digital media use (r = 0.257, p = 0.002) and their mothers digital media use (r = 0.312, p = 0.000).

Table 9: Comparison between preschoolers at governmental and private KGs according to parental mediation strategy.

Correlations	Average time spend by child on digital media
Pearson Correlation	-.143*
Sig.	.030
N	174

This table showed that adverse significant correlation between average times spend by child on digital media and parental mediation strategies at p ≤ 0.05.

Table 10: The Correlation between parental mediation strategies and preschoolers' health-related behaviors.

Correlations	Preschoolers' health-related behaviors
Pearson Correlation	-.189*
Sig.	.012
N	174

Table 10 illustrates Pearson correlation analysis that used to measure the association between parental mediation strategies and preschoolers' health-related behaviors. The finding shows that there is a statistically significant relationship between parental mediation strategies and preschoolers' health-related behaviors at p ≤ 0.05. The preschoolers demonstrate good health-related behaviors when the parents used good mediation.

## Discussion

### Comparison between preschoolers in GOV and private KGs regarding socio-demographic information.

The aim of study was to investigate the DT use of preschool children in governmental and private KGs and the effect of DT on their behaviors. Since this age group and younger neglected very much regarding studies, especially in DT and internet use researches according to Ofcom review about media literacy of children and young people in the UK [12]. As well as the review of the European evidence base, which show that only 7% of Europeans' research concerning preschooler digital media use and more research about the school age and adolescent, because older children were able to answer researches' questions contrariwise the younger children [13].

The result shows in Table 3 that uppermost percent of participants (76.4%) from GOV-KGs because the number of preschoolers in governmental KGs was high reach 200 children at one KG, in comparison to 20 children in private KG in Al-Hillah city.

However, the majority of participants age in both KG were 5 years old and this result similar to study that conducted by Frate and his colleagues [14]. In addition to non-experimental survey in that conducted in Turkey and find that the five years old represent the highest percent 40% in the recruited children (3-6 years old) [15].

The gender of preschoolers in the result indicates that more than half of the study sample in both KG were females and others were males. This result supported by the study under the title Exposure and Use of Mobile Media Devices by Young Children: A cross-sectional study of 350 children aged 6 months to 4 years which reported that the majority of participants was female (51.9%) and (48.1) was male [16]. While the survey of Frate and his colleagues have an opposite result, 49% of girls and 51% boys [14]. In addition to the non-experimental survey that conducted on 3-6 preschool children in Turkey, which showed the uppermost percent of children 60% male and 40% female [15].

### Digital media use and access by preschoolers and their parents.

The announcement form of American Academy of Pediatrics, in October (2016) about children's digital media use. When setting a new recommendation for families to use healthy media regime for their children. The AAP focused on the younger children, thus they recommended media free for those less than 2 years old and 1 hour/day with high-quality media programs for preschoolers as well as parent co-viewing to help their children understand what they see [17]. The result of the present study show at Figure 2 that 49% of pre-school children in private KG spend extra time on digital media above the recommended time, compared with 40% of those in governmental KG, and this result go back to the impact of the increases parents' DT usage on their children DT use as Table 4, 8 showed and this finding was similar to the study conducted in 2019 and showed significant correlations between both parent; mothers (r = 0.238, p = 0.002) and fathers (r = 0.283, p = 0.003) and their children, regarding daily TV viewing [14]. Moreover, the parents mediation strategies regarding DT use effect on the children DT use as Table 9 shown and this finding was comparable to the finding of Njoroge and his colleagues, which mentioned that there is an association between Parents' culture and attitudes regarding DT use and their preschooler digital media use and habits [18]

Figure 1 shows that there is (95%) of the families in study sample have TV/DVD in their homes while touchscreen (smart-phone/tab) consider the second higher percentage (93%) of homes' digital devices, at both governmental and private KGs. Concerning the preschoolers' digital devices use, touchscreen used more than TV/DVD, (82%) of Touchscreen in both KGs, in contrast (74%) of preschoolers at governmental and 42% of children in private KGs used TV/DVD. These result parallel with the report of the common sense organization about the digital media [19] and the non-experimental survey conducted on 85 Turkish parents and their children age 3-6 years old, with the title of parents' perceptions about the mobile technology use of preschool-aged children [15]. Furthermore, the Report of a Kaiser Family Foundation, zero to six electronic media in the lives of infants, toddlers and preschoolers; show similar result regarding use of digital device and time consuming except the touchscreen because this report conducted in 2003, when smartphones not popular at this period [20]. Moreover, the longitudinal cohort study between 2011 and 2017 in Leipzig, Germany, conducted on preschool children (2-6) and their parent (N=527) about electronic media use and preschoolers' behavioral difficulties, which resulted that there is a significant increase in using of mobile phones between 2011 and 2016 [21].

### Digital media and preschoolers' health-related behavior

Recently, the interaction between parent and child has a great effect on child behaviors especially with diminished in their interactions, because the parent spent more time on digital media instead of contact and communication with their children [22,23]. The study result in (Table 7) show that there was a significant correlation between the time consuming by the parent on digital media use and preschooler health-related behaviors, particularly those children at governmental KGs 73% of them exhibit poor health-related behaviors in comparison with 44% of a preschooler in private KGs as (Table 5, 6) shown. This result supported by the study conducted in 2017 on 170 American families and their child (3 years and above) and showed that parental technological interruptions 'technofence' have a significant correlation with the problematic behaviors of their children [23].

Another study conducted on 174 caregivers and their 2-5 year old children and after data analysis the study demonstrates that increase using of smartphones by both children and their parents (caregivers) have adversely effect on children's self-regulation and hostile behaviors, as well to displacement of social reactions and everyday activities between caregivers and children with these mobile technologies [24].

While the randomized controlled trial conducted on 565 parent and their 3-5 years old children, suggest that using media regimen intervention, increase prosocial programs and decrease violence mass media with assisting parents can affect on child behaviors. Moreover, after 6 – 12 months evaluation of the preschoolers' behavior and social aptitude the result show; that the child behaves positively when the exposure to less violence and more prosocial display [25].

Nevertheless, the difference between the behaviors of preschoolers in governmental and private KGs as Table 6 shown, goes to the effect of parenting mediation strategies on preschoolers' health-related behaviors as table (10) shown, which meant that the preschoolers demonstrate good health-related behaviors when the parents used good mediation regarding DT use. These findings go in line with Smahelova et al., (2017)

study, which recorded that the parents have great impact on their children's behavior and attitudes regarding digital technological use by managing their media behavior and helping them to become more competent in using these technologies [3]. Likewise, the meta-analysis of Collier et al., (2016) also shows that there is an association between the type of parental mediation and overall children outcome such as “media use, aggressive, sexual behavior, substance use and negative health outcome” [26].

### Recommendation:

- Development educational programs by governmental institutions such as the ministry of education and ministry of health for preschoolers' parents and teachers about the consequences of the digital media on child health and behaviors, besides put strategies to guide and monitor child healthy DT use.
- Need extended researches about the impact of digital technology on the family and children in our community.

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