

Original Research Article

Exposure to electronic gadgets and its impact on developmental milestones among preschool children

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ABSTRACT

Background: The wellbeing of the children including their physical, mental, psychological growth and development and their opportunity to achieve full potential as adults is very important. But there are several factors which affect the normal development of the children. TV, mobiles, video gaming, DVD's and other forms of electronic gadgets have become pastimes among preschool children. Thus, this study is planned to know the exposure of electronic gadgets and its impact on the developmental milestones among preschool children.

Methods: A cross sectional study was conducted at Gadag among 240 preschool children of age 2-5 years attending School. The data was collected from April 2018 to October 2018. Information was gathered from parents and teachers by using pretested semi-structured questionnaire. Frequencies, percentages and chi-square test were used in analysis.

Results: In this study children using most common electronic gadgets were mobile and television for less than one hour followed by 1-2 hours usage. On an average each family had 5 members possessing 6 electronic gadgets and 3 mobiles. Majority of the children started using electronic gadget for the first time at 13-24 months. Authors found that there was significant association between electronic gadget usage and personal and social development.

Conclusions: The most commonly used electronic gadgets were mobiles and television and, in this study, there is an association between total duration of electronic gadget usage and personal and social development.

Keywords: Developmental mile stones, Electronic gadgets, Pre-school children

INTRODUCTION

Children are the world's most important resources. The well-being of the children including their physical, mental, psychological growth and development and their opportunity to achieve full potential as adults is very important.¹ As growth and development of children are continuous process, they attain certain milestones during their development. Children attain gross motor, fine motor, personal and social development, general understanding, vision and hearing. But there are several factors which affect the normal development of the children.² TV, mobiles, video gaming, DVD's and other forms of electronic gadgets have become pastimes among preschool children. Children especially toddlers are

exposed to TV, videos in day-care and home based child care settings and even at home.³ The greatest exposure to media and are at increased risk in general for disparities in early development, school readiness, and educational achievement. Although younger children often experience difficulties in using apps on smart mobile devices still are motivated to continue to use the device.⁴ Thus this study is planned to know the exposure of electronic gadgets and its impact on the developmental milestones among preschool children.

Objectives

The objective of the study was to know the pattern of electronic gadgets usage among the pre-school children

and to assess the impact of electronic gadgets on developmental milestones among the pre-school children.

METHODS

A cross sectional study was conducted from April 2018 to October 2018 at Gadag city after taking institutional ethical clearance. Bachpan play school, Gadag was selected randomly, study group included 240 preschool Children of aged 2-5 years of Bachpan play school, Gadag, Karnataka, India.

Data was collected after taking consent of the parent. A pretested semi-structured questionnaire was used. This questionnaire includes socio-demographic profile of the parents, usage of electronic gadgets by children was collected information from parents and assessment of developmental milestones and some information was gathered by teachers once they were trained to assess the milestones. Questionnaire was given to the child to home for completing it and next day collected from the children. Total 240 preschool children data were collected who were present on the date of data collection from April 2018 to October 2018. All the children were included in the study. The only exclusion criteria we had used was child absent at the time of visit to school for 3 visits.

Statistical analysis

The data was analysed by using Epi-info software and frequencies, percentages and chi-square/Fischer exact test were used.

RESULTS

In this study majority of the children were female children (59.2%). Most of the children belonged to the age group between 37-48 months (30%), followed by 49-60 months (27.9%), 61-72 months (20.4%), 24-36 months (11.7%). Most of the mothers belonged Hindu (87.5%) religion followed by Muslims (10.8%) and Christians (0.8%). Majority of mothers age was more than 30 years (51.3%) followed by 26-30 years (42.5%). Most of the mothers are married (98.2%). Majority of them are studied up to graduate (37.1%) followed by postgraduates (29.6%), post high school (22.5%), high school (9.2%) and primary school (1.7%) and majority of the mothers were homemakers (78.3%). Most of the fathers belonged to the age group between 31-35 years (47.5%) followed by 36-40 years (32.1%).

Majority of fathers belonged to 31-35 years (47.1%), followed by 36-40 years (32.1%). Majority of the fathers were graduates (43.3%) followed by postgraduates (27.5%) and post high school/diploma (23.3%). Majority of the fathers belonged to clerical, shop owner, farmer (48.3%) followed by semi-profession (21.3%) and later by profession (22.5%). Most of the children belonged to the nuclear family (50%) followed by joint family

(39.2%). Majority of the children's family belonged to class 1 of modified BG Prasad classification (75%), followed by class 2 (22.5%).

Table 1: Socio-demographic profile of the study subject.

Variable	Categories	Frequency (198)	%
Age of infant/child (in months)	24-36	28	11.7
	37-48	72	30
	49-60	67	27.9
	61-72	49	20.4
	>72	24	10
Gender of the child	Female	142	59.2
	Male	98	40.8
Place	Urban	224	93.3
	Rural	16	6.7
Religion	Hindu	210	87.5
	Muslim	26	10.8
	Christian	03	1.3
	Others	01	0.4
Mother age (years)	20-25	15	6.3
	26-30	102	42.5
	>30	123	51.3
Mother education	Post-graduate	71	29.6
	Graduate	89	37.1
	Post high school/diploma	54	22.5
	High school	22	9.2
	Primary school	04	1.7
Father age (years)	26-30	10	4.2
	31-35	113	47.1
	36-40	77	32.1
Father education	Post-graduate	66	27.5
	Graduate	104	43.3
	Post high school/diploma	56	23.3
	High school	12	5
	Primary school	02	0.8
Mother occupation	Working	52	21.7
	Homemaker	188	78.3
Father occupation	Semi-skilled workers	05	2.1
	Skilled workers	14	5.8
	Clerical, shop owner, farmer	116	48.3
	Semi-profession	51	21.3
	Profession	54	22.5
Type of family	Nuclear	120	50
	Joint	94	39.2
	Extended	26	10.8
Modified BG Prasad classification	Class 1	180	75
	Class 2	54	22.5
	Class 3	05	2.1
	Class 4	01	0.4

Table 2: Distribution of age of first usage of electronic usage.

Age of 1 st usage of EG (in months)	Frequency	%
8-12	28	11.7
13-24	81	33.8
25-36	79	32.9
37-48	32	13.3
49-60	7	2.9
61-72	5	2.1
Do not know	8	3.3

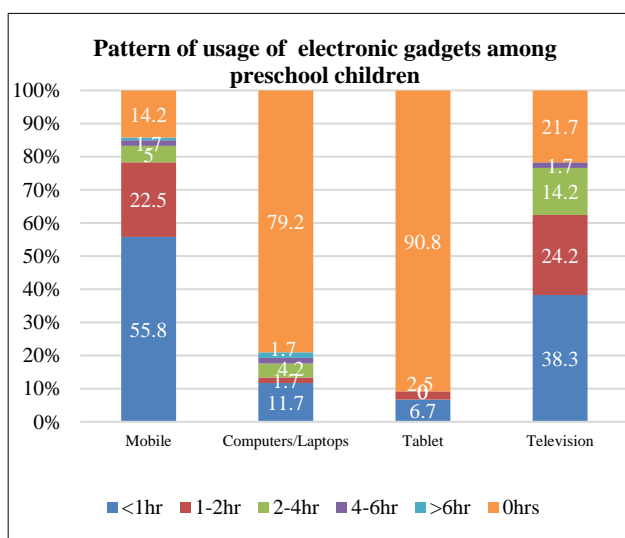


Figure 1: Duration of usage of electronic gadgets among preschool children.

The first age started using electronic gadgets for the first time was as early as 8-12 months, followed by 13-24 months and 25-36 months, and later by 37-48 months. Only few children started the usage at more than 49 months. As the age progressed the number of the users for 1st time electronic gadgets increased.

Children used different electronic gadgets like mobiles, computers, tablets, television etc. So, majority of them used mobiles <1 hour (55.8%) followed by 1-2 hours (22.5%). Computer and tablet were used by few children i.e., 20.8% and 9.8% respectively. 11.7% and 6.7% children used computer and tablet less than one hour. 38.3% of the children watched television for less than one hour followed by 1-2 hours usage among 24.2%.

On an average each family had 6 electronic gadgets in which each family had had average 3 mobiles. On an average child used mobile for the 1st time at 30.8 months

Most of children were not using electronic gadgets after getting up from sleep (84.6%) and before going to sleep (63.3%). It was found in this study that majority of the children do not have delay in initiation of sleep (71.7%), do not feel sleepy in the day-time (72.5%), do not wake in

the night (55.8%). Majority of the children take day time naps >60 min (50%). Most of the children do not use gadgets before going to sleep (40.8%).

Table 3: Distribution of pattern of usage among preschool children.

Variables	Yes (%)	No (%)
Use of EG immediately after getting up in the morning	37 (15.4)	203 (84.6)
Use EG before going to sleep	88 (36.7)	152 (63.3)
Delay in initiation of sleep	68 (28.3)	172 (71.7)
Child feel sleepy during daytimes	66 (27.5)	174 (72.5)
Child wakes up in night	106 (44.2)	134 (55.8)
Use of EG while charging	25 (10.4)	215 (89.6)
Use EG while eating	94 (39.2)	146 (60.8)

EG: electronic gadget.

Most of them do not use electronic gadgets during charging (89.6%) as well as while eating (60.8%).

Table 4: Distribution of social participation of the children.

Variables		Frequency	%
Participation in class	Good	212	88.3
	Bad	28	11.7
Mingles with Friends	Yes	231	96.3
	No	09	3.8
Play outdoor games	Always	96	40
	Sometimes	75	31.3
	Occasionally	51	21.3
	Never	18	7.5
Play indoor games	Always	125	52.1
	Sometimes	85	35.4
	Occasionally	21	8.8
	Never	09	3.8

Table 5: Distribution of health problems related to electronic gadget usage.

Variables		Frequency	%
Eye problems	Yes	13	5.4
	No	227	94.6
Use of specs	Yes	08	3.3
	No	232	96.7
Headaches	Yes	18	7.5
	No	222	92.5
Overall sleep	Good	235	97.9
	Bad	05	2.1
Binge eating while using EG	Yes	26	10.8
	No	214	89.2

Most of the children play outdoor games at least 5 days in a week (40%) as well as outdoor games (52.1%) and few

never play (7.5%). Majority of them have good participation in the class (88.3%) as well as mingle with their friends (96.3%).

Only 5.4% of mothers complained of eyestrain and watering from eyes of their children and 3.3% children had usage of specs in day to day life. 7.5% had complain of headache. 97.9% children had good sleep. Few of them have habit of eating more (10.8%) while using gadgets and others were not (89.2%).

Table 6: Distribution of development among preschool children.

Developmental milestones	Normal (%)	Delayed (%)
Gross motor	234 (97.5)	6 (2.5)
Fine motor	240 (100)	0 (0)
Personal and social development	212 (88.3)	28 (11.7)
Language	230 (95.8)	10 (4.2)

Table 7: Association of total duration of electronic gadget usage and developmental milestones.

EG usage in hours	Delayed	Normal	Fischer exact test/Chi square test
Gross motor			
0.5-2	6	140	
2.5- >6	0	94	0.084
Fine motor			
0.5- >6	0	240	-
Personal and social development			
0	2	14	
0.5-2	20	126	
2.5-6	2	34	
>6	4	4	0.022
Language			
0	2	14	
0.5-2	6	140	
2.5->6	2	76	0.13

In this study authors found gross motor development was normal among majority (97.5%) children and only 2.5% had delayed development. Fine motor development was normal among all the children (100%). Personal and social developmental delay was noticed among 11.7% children and language delay was among 4.2%. In this study authors found that there is no association between electronic gadget usage and gross motor ($p=0.084$) and language development ($p=0.13$). Authors found that there is significant association between electronic gadget usage and personal and social development.

DISCUSSION

In this study children using most common electronic gadgets were mobile and television for less than one hour followed by 1-2 hours usage. On an average each family

had 5 members processing 6 electronic gadgets and 3 mobiles. Majority of the children started using electronic gadget for the first time at 13-24 months.

Most of children were not using electronic gadgets after getting up from sleep (84.2%) and before going to sleep (63.3%). It was found in this study that majority of the children do not have delay in initiation of sleep (71.6%), do not feel sleepy in the daytimes (72.5%), do not wake in the night (55.8%). Majority of the children take day time naps >60 min (50%). Most of the children do not use gadgets before going to sleep (40.8%). Almost all children had good sleep (98.3%). Most of the children play outdoor and indoor games regularly. Majority of the children had good participation and mingling with friends. Very few children had complaints about headache, binge eating, sleep problems, eye problems and use of specs.

In a study conducted by Mendelsohn AL et al, found daily media exposure, with a median exposure of 120 minutes.⁵ which was more compared to this study. In another study conducted by Byeon H, found the average daily television watching time was <1 hour (23.3%), 1-2 hour (44.1%), 2-3 hours (24%) and >3 hours (8.6%).⁶ which was similar to thi study. In another study conducted by Dr. Suzy Tomopoulos 15.8% had less than 60 minutes of exposure, including 3.9% who had no exposure to media but in this study, it was found that exposure duration and no exposure was more compared to this study.⁷

In one of the studies conducted by Schmidt ME et al mean daily television viewing in infancy (birth to 2 years) was 1.2 (SD: 0.9) hours. On average, children watched 0.9 (SD: 1.2) hours of TV per day at 6 months of age, 1.2 (SD: 1.5) hours/day at 1 year of age, and 1.4 (SD: 1.1) hours/day at 2 years of age.⁸ This study done among preschool children showed mobile and television usage was for less than 1 hour.

In one of the studies conducted by Peter Nikken Marjon Schools according to the reports of their parents, TV sets are most often used by children. They watch on average about 52 min per day, whereas the other three media types each are used for about 11-12 min on average per day. The use of game devices and computers significantly increases gradually with age, which was similar to this study. These devices are used the least per day by 0-1-year old, somewhat longer by 2-3 years old, then even significantly longer per day by 4-5 years old children, and finally the longest by 6-7 years old children.⁹

In a study conducted by Garrison MM et al, 18% of them had sleep problems.¹⁰ But in this study, authors found there 30% had delay in initiation and feel sleepy in the daytimes.

Most of them do not use electronic gadgets while eating (60.8%). Few of them have habit of eating more (10.8%)

while using gadgets. A study reported that each additional hour of TV viewing per week increased the risk of obesity by 2%. The experimental study by Robinson found strong evidence of a causal link between TV viewing and children being overweight.¹¹ In India, this association has also been emphasized.¹² In this study few have reported binge eating while using electronic gadget. Stettler et al, showed a significant association between electronic game use and obesity, with nearly a 2-fold increased risk of obesity for every hour spent playing electronic games daily.¹³ An inverse relationship between time spent using video games and daily physical activity has also been observed.¹⁷ In this study majority of the children were using electronic gadgets for less than one hour and they were playing outdoor and indoor games regularly.

In a study conducted by Mendelsohn AL et al, study analyses were first performed to determine whether media verbal interactions had a direct positive impact on language development. Media verbal interactions considered separately were associated with enhanced total language in both unadjusted analysis (model 1; $\beta=0.15$, $p<0.05$) and after adjustment for all potential confounders except for cognitive stimulation (model 2; $\beta=0.16$, $p<0.05$).¹⁴ In this study majority of the children had personal and social development delay (11.7%). Authors have found that there is an association between electronic gadget usage and personal and social development ($p=0.022$).

CONCLUSION

In this study authors have found most commonly used electronic gadgets were mobiles and television. The 1st time electronic gadget usage was as early as 8-12 months and majority started at 13-24 months. Majority of the children were not having health problems related to electronic gadgets and their social participation was good. Authors found in this study there is an association between total duration of electronic gadget usage and personal and social development.

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