International Journal of Contemporary Pediatrics
Reddy DP et al. Int J Contemp Pediatr. 2023 Jun;10(6):873-877
http://www.ijpediatrics.com
pISSN 2349-3283 | eISSN 2349-3291

DOI: https://dx.doi.org/10.18203/2349-3291.ijcp20231492

Original Research Article

Mobile phones and children: exposure and pattern of usage of mobile phones among children - a descriptive cross-sectional study

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Received: 05 May 2023
Accepted: 19 May 2023

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ABSTRACT

Background: Mobile phone as an invention of the modern world has managed to penetrate not only the most distant parts of the world but also various age groups in a person's life. There is a need to evaluate the children' interactions with these modern devices as they might have a significant effect on their behavior, sleep patterns, and psychological addiction. Objectives of the research were: to study the socio demographic characteristics of children using mobile phones, to determine the average time duration of exposure to mobile phones, and to determine the age of initial exposure to mobile phones.
Methods: It was a descriptive cross sectional observational study. The study was conducted at Sri Manakula Vinayagar Medical College and Hospital. All the children between the age group of 0-12 years visiting the pediatric outpatient department fulfilling the inclusion criteria were enrolled in the study.
Results: Of the 248 children enrolled in the study mobile phone exposure was found in 143 (57.66%) boys and 105 (42.34%) girls. 67.74% of the parents agreed that the mobile phones were being used by their children just for fun without any intended or specific use. 26% of the times it was used to engage the children when the parents were busy. 30.24% of the kids had a screen time of less than 30 minutes on a daily basis. 23.39% of the children were used to the screen for more than 2 hours in a day, on a cumulative basis. It was noted that more than 50% of children were exposed to mobile phones within 1 year of age. The earliest age of exposure to mobile phone was 2 months of age.
Conclusions: Regardless of the socioeconomic status the accessibility and the owning of the mobile phones is same across the socioeconomic strata. The need of the hour is to raise awareness among the parents regarding the excessive use of mobile phones among children and their possible adverse impacts on physical and psychosocial health.

Keywords: Children, Mobile phone, Screen time, Device

INTRODUCTION

Mobile phone as an invention of the modern world has managed to penetrate not only the most distant and remote parts of the world but also the various age groups in a person's life. With the development of technology, the mobile phone is no longer just a communication tool but has evolved into much more than that. They are not only used for calling, they are also used for text or picture messaging, surfing the internet, watching videos, playing games, social networking to name a few.[1] There has been a gradual but persistent increase in the use of mobile phone among adolescents and young children. The widespread use of internet and their easy accessibility has indeed changed the way the mobile phones are being utilized. There is an exponential increase in the accessibility and exposure to mobile phones and other touch screen devices. Older children view mobile phone as an essential mode of supporting and maintaining a relationship, they feel that it offers them a sense of security and reassurance.[2] At the same time it is not devoid of potential adverse impact on

health. Hence, its extensive use may act as a double edged sword for the young population of the modern world.[2]

Children of the present generation because of their early initial exposure to mobile phones and longer lifetime duration of exposure when they grow older, hence they will have a higher cumulative exposure.[3] American Academy of Pediatrics specifically discouraged the use of media for children less than two years of age.[4] However, it currently appears that most of the children are exposed to media devices by 1 year of age. The mobile phones are devised in such a way that they are held close to the head during their usage, one of the main concerns that has been emerging is the effect of the emitted radiofrequency waves on the brain. The effect of extensive use of mobile phone on the developing brain of a child is yet to be investigated. The International Agency for Research on Cancer (IRAC), based on a large retrospective case control study on adults, has classified mobile phone's radiofrequency electromagnetic fields as one of group 2B.[5]

There is an increase in the popularity and ownership of these devices among teenagers.[6] The populations belonging to the previous generations are seldom exposed to this amount of radiation during their childhood. There is a need to evaluate the children' interactions with these modern devices as they might have a significant effect on their changed behavior, sleep patterns, cognition and psychological addiction. There is a dearth of research about the pattern of use of these devices by the children. There are very few studies with data describing the age of first exposure, purpose of mobile phone usage in a child's daily activities and its pattern especially among children and their care givers.

Objectives

Objectives of the research were: to study the socio demographic characteristics of children using mobile phones, to determine the average time duration of exposure to mobile phones, and to determine the age of initial exposure to mobile phones.

METHODS

Study design

This descriptive cross-sectional study was conducted at Sri Manakula Vinayagar Medical College and Hospital, a medical teaching hospital and a tertiary care center in Puducherry; from September 2019 to March 2020 for a period of 18 months, after obtaining clearance from the institutional ethics committee. After written informed parental consent all the children between the age group of 0-12 years visiting the pediatric outpatient department fulfilling the inclusion criteria were enrolled in the study. A preformed structured questionnaire was administered to the parents'/care givers. The questionnaire included the socio-demographic status, age of initial exposure of the child to mobile phones, the purpose of use of mobile phones by the children and the duration of exposure to mobile phones.

Inclusion criteria

All children in the age group of 0-8 years in whom their parents or the caregivers gave a history of mobile phone exposure were included in the study.

Exclusion criteria

Children with neuro-psychiatric illness, and parents or caregivers who are not willing to participate in the study were excluded.

Statistical analysis

The data was entered in Microsoft excel. As the study is a descriptive study, descriptive statistics has been used in the representation of the data. Descriptive analysis was done for the socio-demographic variables. Statistical analysis was done by using statistical package for the social sciences (SPSS) 16.0 software. The categorical variables were represented in numbers and percentage.

RESULTS

Of the 248 children enrolled in the study mobile phone exposure was found in 143 (57.66%) boys and 105 (42.34%) girls. In our study it was noted that more than 50% of children were exposed to mobile phones within 1 year of age (Table 1). The earliest age of exposure to mobile phone was 2 months of age. Almost 57% of the kids under the study were exposed to mobile phones by 1 year of age. Among the distribution of first exposure to mobile phones, majority of the children were exposed to mobile phones by 4-6 months of age 22.58% (56), 52 kids (20.97%) were exposed before 4 months of age.

Table 1: Age of first exposure to mobile phones.

Age	Number	Percentage
<4 months	52	20.97
4-6 months	65	22.58
6-12 months	35	14.11
1-1½ years	36	14.52
1½-2 years	22	8.87
>2 years	47	18.95

Mobile phone usage as per the children' school grade, majority of the children belonged to preschool or kindergarten 68 (27.4%) followed by primary school 63 (25.4 %) (Table 2). Another 6 children who were used to mobile phones belonged to the toddler or infant age group who were staying at home; formal schooling was not yet initiated.

Enquiring about the mobile phone usage it was noted that the mobile phones were being used for a varied number of

purposes (Table 3). Most of the parents agreed that the mobile phones were being used by their children just for fun without any intended or specific use i.e. 67.74%. 26% of the times it was used to engage the children when the parents were busy. 24% of the times it was used by the parents as a method of distraction to aid them in feeding the child. 17% of the parents were using the mobile phones with the intention of educating their children with some educational videos or text content in addition to the other purposes. 16.9% of the parents were using the mobile phone in order to pacify them when they were irritable or excessively crying or during travelling.

Table 2: Class/grade distribution of children using mobile phones.

Grade	Number	Percentage
Home	61	24.60
Pre-school/kindergarten	68	27.42
Primary school	63	25.40
Middle school	51	20.56
High school	5	2.02

Table 3: Major purpose of using mobile phone.

Purpose of using mobile phone	Number	Percentage
For fun/no specific purpose	168	67.74
To engage the children when the parents are occupied	66	26.61
For pacifying	42	16.93
Habituated	30	12.09
To distract while eating	61	24.59
During passing stools	10	4.03
To educate them	44	17.74
Social networking	6	2.41
Communication	21	8.46
Others	8	3.22

30.24% of the kids had a screen time of less than 30 minutes, on a daily basis (Table 4). 16.94% of the children were exposed to the screen from 30 minutes to 1 hour. 23.39% of the children were used to the screen for more than 2 hours in a day, on a cumulative basis.

Table 4: Average duration of screen exposure.

Duration of screen exposure	Number	Percentage
<30 minutes	75	30.24
30-60 minutes	42	16.94
1-1½ hour	46	18.55
1½-2 hour	27	10.89
>2 hours	58	23.39

Among the phones that were being used by children 159 (64.11%) had the additional feature of internet facility. In our study it was noted that 45 (18.15%) children owned a mobile phone, the rest of the children used the mobile phone that belonged to their parents and/or care takers.

As many as 128 children (51%) were noted to use some form of touch screen technology regularly on a daily basis which included their usage even multiple times in a single day (Table 5). 7.26% i.e. 18 children in the study were not exposed to any kind of screen as the caregivers never owned a smart phone or a tablet or they consciously decided not to expose the infants to the mobile phones.

Table 5: Usage and exposure of touch screen technology.

Usage of touch screen	Number	Percentage
Never seen or touched; there are no tablets or smartphones at home	18	7.26
Never used such technology, although he/she may have seen me and other family members interact with one	10	4.03
Has occasionally used such technology, but not more than once a month	14	5.65
Occasionally uses such technology, but not more than once a week	28	11.29
Regularly uses such technology, but not more than once a day	50	20.16
Uses such technology every day	128	51.61

On the analysis of children's activities on mobile phones, majority of them i.e. 47.98% (119) used the mobile phones to play some games on the device (Table 6). In 41.94 % of the children the mobile phones were being used by their parents to show some videos/songs/rhymes on YouTube. Elder children in the study used the mobile phones for some mobile apps. The other common activities for which the mobile phone was used included showing some pictures or downloaded videos.

Table 6: Activities of children on mobile phones.

Activity	Number	Percentage
Downloaded videos	59	23.79
YouTube	104	41.94
Games	119	47.98
Pictures	51	20.56
Mobile apps	25	10.08
Others	30	12.10

DISCUSSION

In a study done among Taiwanese children between 11 and 15 years of age mobile phone usage was noted in 63.2% of children.[7] In a study done by Fowler it was noted that among children of 8-11 (168) years 95% of the children had access to mobile phone and 66% of them owned one, while in the age group 11-14 (136) years all the participants except one owned a mobile phone i.e. 99%.[8] Of the 149 children and adolescents who were included in the study, 137 of them owned a mobile phone[9]. In a study conducted in Oman by Siddiqi et al, 1985 students participated. Among them 414 were from primary section and 1438 were from secondary section. 86% of the children from primary section whose average age was 9.54±0.91 were using mobile phone actively. 91% of students from secondary section whose average age was 14±2.16 years actively used mobile phones.[10]

In our study out of 248 children 45 of them owned a mobile phone. No significant difference was noted in mobile phone usage across socio economic status, unlike the study by Byun who reported that more children belonging to lower socio economic position communities owned a mobile phone compared to those of higher socioeconomic position.[11]

Average time spent on mobile phone use was ≤20 minutes in 718 (55.6%) children and ≥60 minutes in 57 (4.4%) children.[7] In our study the average time spent on touch screen devices was ≤30 minutes in 75 (30.24%) and 60-90 minutes in 46 (18.55%) and >2 hours in 58 (23.39%). It was noted among the children of 8-11 years and 11-14 years that 2/3 of them wished to have their phone all the time while three quarter of them wished they should be able to call or text all the time, reported a study done by Fowler.[8] A systematic review by Paudel et al points that the children' age, their media skills, their accessibility to media devices and the parental use of these devices had an impact on the use of mobile devices by the children.[12] Children, through their interaction with these hand held devices derive pleasure which in turn leads not only to their habitual use but also their sedentary behavior.[13]

Mobile phones have become an inseparable part of our everyday lives; a significant change in parenting behavior has been noted regarding the use of mobile phone. The use of technology by the parents impacts the use of the same by the children.[14] There has been an increased use of mobile phones by parents as a tool of distraction for children and to pacify them, hence subjecting the child for an early exposure and dependency to these devices.[14] Siddiqi et al concluded in their study that children started using mobile phones at an earlier age than it was earlier expected. Not only in Oman but also all over the world the mobile phone ownership among children and also the duration of time utilized on internet has increased exponentially during the recent few years.[10]

The excessive mobile phone usage by the parents in home environment influences the behavior of the children. More often than not the caregivers are engrossed by the mobile phone to such an extent that it hinders their responsiveness to the child.[9] It is necessary to increase the awareness of the parents regarding the potential long term effects of excessive mobile phone usage in children.

CONCLUSION

The epidemiological and demographic data regarding the characteristics of mobile phone usage in young children and adolescents would prove to be essential not only to analyze its long term effects but also to frame public health policies regarding its usage. Regardless of the socioeconomic status the accessibility and the owning of the mobile phones is same across the socioeconomic strata. The need of the hour is to raise awareness among the parents regarding the excessive use of mobile phones among children and their possible adverse impacts on physical and psychosocial health. A prospective longitudinal study would shed some light on the long term effects of mobile phone usage by children. Socio-cognitive, socio emotional, Psychological and behavioral aspects which have not been included in our study could be done so to discern the possibility of a strong association.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Reddy DP, Earan SK, Kalaimani T, Arunagirinathan A. Mobile phones and children: exposure and pattern of usage of mobile phones among children - a descriptive cross-sectional study. Int J Contemp Pediatr 2023;10:873-7.