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The Use of Mobile Devices Among Children Aged Under 5 Years in the Kurdistan Region-Iraq: A Cross-Sectional Study

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A R T I C L E I N F O

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Abstract

BACKGROUND: Young children's use of mobile devices has become increasingly common in today's homes. The study aimed to explore the usage of mobile devices among children aged 1-60 months in contemporary households in the Kurdistan Region, Iraq.

METHODS: A cross-sectional study design was adapted from May 10, 2023, to November 14, 2023. A purposive, non-random sampling technique was utilized to collect data from 504 parents of children aged 1-60 months attending outpatient clinics in the Hevee pediatric hospital. A modified question was used, composed of 4 sections, including socio-demographic characteristics, number of features of mobile device usage, factors associated with intensive mobile usage, and circumstances in which parents let their children use mobile devices. SPSS version 23 has been used to analyze collected data.

Results: The findings revealed that 57.5% of participants reported intermittent use of mobile media, with 56.3% of children beginning mobile device usage between 13 and 24 months. Approximately 31.7% of participants reported that their child owned a mobile device, with smartphones being the most commonly used devices, as reported by 97.5%. The primary activities on these devices included watching videos (87.8%) and watching TV (75.1%). Furthermore, 24.1% of participants reported 1.5–2 hours of daily usage. These statistics underscore the prevalent integration of smartphones and similar devices into the daily lives of young children.

CONCLUSIONS: This study indicates a high prevalence of mobile device exposure among young children. These findings indicate the importance of monitoring the utilization of digital tools, particularly during early childhood.

What is already known about the topic? It is known that mobile device use among children under 5 years is increasing globally, including in the Kurdistan Region of Iraq. Early exposure to mobile devices can impact children's development, behavior, and health, with potential effects on attention, sleep, and social skills. Parental supervision and usage patterns vary, influencing the extent of these effects.

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Introduction

The utilization of mobile devices, encompassing smartphones, tablets, iPods, and computers, has become increasingly integral in the dynamic realm of information technology. These devices have garnered favor among children due to their portability, extensive content options, and interactive capabilities, thus seamlessly integrating into their daily activities (Goel, Dixit, Bajpai, and Singh, 2021).

In recent years, growing apprehensions have been raised regarding the potential adverse effects of excessive technology use among young children. Nevertheless, interactive touch screen devices have become ubiquitous in their lives, with toddlers being exposed to touch screen technology before the age of two. While certain technological aspects have been linked to detrimental effects on cognitive development and academic performance, current research is establishing a connection between children's cognitive development and touch screen devices and well-designed mobile applications (apps) (Papadakis et al., 2022). The early childhood phase, spanning from 0 to 5 years, is critical for social, emotional, and cognitive development, with parents and caregivers playing a pivotal role in ensuring the safety, security, and learning opportunities for their children (Mangan, Leavy & Jancey, 2018). It is incumbent upon parents to cultivate a nurturing home environment that supports development, with children's use of technology occurring within the framework of family norms (Griffith & Arnold, 2019).

Despite parental concerns regarding the appropriateness of using apps to deliver educational content, mobile devices have become an integral part of children's lives. Excessive screen time and media usage have been linked to various negative health consequences, including loneliness, depression, social isolation, obesity, aggression (Martin, 2011), as well as poor sleeping, sedentary lifestyle such as physical inactivity (Abdullah, Galary & Majid,2020). Moreover, prolonged smartphone use correlates with altered sleep patterns among adolescents, resulting in reduced sleep duration, poorer sleep quality, and increased disturbances during sleep (LeBourgeois *et al.*, 2017).

Understanding the circumstances under which parents permit their children to use mobile devices can offer valuable insights. Studies indicate that children are most commonly allowed to use mobile devices during household chores, in crowded situations, when their relatives are using mobile devices, or when their parents are absent from home (Radesky, Peacock-Chambers, Zuckerman & Silverstein, 2016). This intermittent usage pattern suggests that mobile device usage occurs in specific contexts rather than consistently.

Research on parental beliefs, knowledge, and practices regarding mobile device use among young children reveals that parents who allow their children to use mobile devices during daily activities, such as household chores, tend to have higher overall usage among their children (Kabali, Irigoyen, Nunez-Davis, Budacki, Mohanty, Leister, & Bonner, 2015). Furthermore, higher levels of mobile device use during daily routines have been associated with lower-quality interactions between parents and children and an increase in behavioral problems among children (Jensen, George, Russell, & Odgers, 2019).

The Iraqi Ministry of Planning reported that a recent survey on children older than 5 years old revealed that 86% of children in Iraq use mobile phones, with 90% of boys and 81% of girls being users. Additionally, the survey found that 79% of children use the internet, with 85% of boys and 72% of girls accessing it (Ministry Of Planning, 2022). There is unavailability of data regarding mobile use among children less than 5 years in Iraq. Thus, this study aimed to determine the prevalence of mobile devices use among children less than 5 years of age.

Materials and methods

Study design and setting

The research utilized a cross-sectional study design to meet its objectives at Hivee Pediatric Hospital in the Duhok City of the Kurdistan Region of Iraq, from May 10, 2023, to November 14, 2023.

Sample size and sampling

The study employed a purposive non-random sampling method, targeting children between 1 and 60 months who visited the outpatient clinic at Hivee Pediatric Hospital A sample of 504 eligible parents (either the mother or the father) of children aged 1-60 months who consented to participate was included in the study.

Measurement

The research employed various instruments for data collection. The mobile device questionnaire developed after extensive review of relevant literature. This questionnaire encompassed yes/no and multiple-choice queries addressing diverse facets, including demographic variables, characteristics of children's media exposure, and the circumstances under which parents permitted their children to utilize mobile media devices.

The demographic variables section encompassed details such as children's age and gender, parental age, parental educational attainment, and household monthly income, categorized as either below or above the national poverty threshold. Mobile devices were categorized into two classifications: smartphones and tablets. Aspects of children's mobile device exposure and usage were evaluated through inquiries regarding the frequency of use, age of initial usage, the need for navigational assistance, device ownership, activities engaged in, and simultaneous use of multiple media devices. Notably, the use of mobile phones was confined to screen time, excluding voice calls. The age of initial mobile device usage was determined based on parental responses; while the frequency of use was assessed through the query "Do you allow your child to use a mobile device?" Activities in which children engaged on mobile devices were ascertained through a question addressing their interests, encompassing watching videos, playing games, watching TV, reading books, and accessing applications.

Data collection and data analysis

Data collection for the study spanned approximately two months. Sample collection occurred during two working days per week, with duration of five hours per day, focusing solely on the outpatient population of Hivee Pediatric Hospital. The data for the present study was collected using a direct interview technique to gather information from the parents of the children involved in the study. This technique allowed personal and interactive approach to obtain accurate and comprehensive data. All collected data, including demographic information and laboratory test results, were entered into IBM SPSS Statistics

software version 23 for analysis. The data were subjected to various analytical approaches to derive meaningful insights. Descriptive statistics were employed to summarize and present the demographic variables, features of children's media exposure, and the circumstances under which parents allowed their children to use mobile media devices. This involved calculating measures such as frequency, percentage, and odds ratios (OR). Descriptive statistics serve to provide a clear and concise summary of the collected data, facilitating a better understanding of the variables and their relationships.

Ethical Considerations

This study was accepted by the Scientific Committee of the Nursing College and approved by the Research Ethical Committee at the Director of Health in Duhok governorate as reference number (28092022-7-3). Informed consent was taken from the (Hevee pediatric hospital in Duhok governorate). Personally informed consent was obtained from parents in order to participate in the present study.

Results

Study based on the responses of 504 participants who completed interview questionnaire. **Table 1** provides insights into the socio-demographic characteristics of the participants, including the distribution of sex, age of children, and child with mental disorder, mother's education level, husband's education level, and monthly income. In the study, there were 504 participants, with 49.6% being female and 50.4% being male. The children of the participants were in various age ranges, with the highest percentage (29.7%) falling in the 37-48 months' category and (9.1%) children diagnosed as have mental disorders. When it comes to education, the majority of mothers had completed secondary school (29.9%) or primary school (27.8%). For husbands' education, the largest percentage had completed secondary school (27.8%) or high school (20.8%). In terms of monthly income, the highest percentage of participants (40.0%) had a monthly income between 500,000 and 750,000 IQD

Table (2) showed features that provide insights into the participants'. The majority of participants reported using mobile media sometimes (57.5%), indicating a moderate frequency of exposure. Most children started using mobile devices between 13-24 months (56.3%), suggesting early exposure to these devices. Approximately one-third of participants reported that their child had their own mobile device (31.7%), highlighting the prevalence of personal ownership among children. Smartphones were the most commonly used devices (97.5%), reflecting their widespread popularity. The primary activities on mobile devices included watching videos (87.8%) and watching TV (75.1%), indicating the dominance of multimedia consumption. In terms of duration, the highest percentage of participants reported 1.5-2 hours of usage per day (24.1%). Finally, the majority of participants sometimes needed help to navigate mobile devices (52%), indicating a moderate level of assistance required.

Table (3): The data shows that parents have varying rules for allowing their children to use mobile devices. Most parents prohibit usage during home visits (70.4%) and in public places (85.3%). However, they are more lenient during housework (38.2%) and when their own mobile devices are being used (75.7%). Mobile device usage is more common in crowds (41.6%), when

relatives are using devices (29.3%), and when parents are not at home (20.4%). These findings highlight the different circumstances in which parents permit their children to use mobile devices. The current data highlights that the most common frequency of mobile media exposure is "Sometimes," representing a significant portion of the responses. Additionally, a large number of children first used a mobile device between 13-24 months of age.

Table (4) : Table provides information on the main factors associated with intensive mobile device usage findings highlight the importance of various factors, such as child's age, ownership of a mobile device, presence of mental health disorders, and maternal knowledge, in influencing the intensity of mobile device usage among children. The table showed older children are more likely to use mobile devices odd (0.325). Children who have their own mobile devices are more likely to use them (OR = 0.56). Children with mental health disorders are less likely to use mobile devices (OR = 0.46). Mothers, who have knowledge about the effects of mobile device use, as provided by a pediatrician, are less likely to allow their children to use mobile devices (OR = 2.00). Longer durations of smartphone use are associated with an increasing likelihood of mobile device usage, The OR for different durations compared to less than 1hour are as follows: 1-2 hours: OR = 0.67and 2-3 hours: OR = 0.39. For more than 3 hours OR= 0.13 (Table 4).

Table 1: Socio-demographic characteristics (n=504)

Socio-demographic characteristics (n=504)	(n)	(%)
Gender		
Female	250	49.6
Male	254	50.4
Age of children (months)		
1-12 M	19	3.7
13-24 M	92	17.9
25-36 M	142	27.6
37-48 M	153	29.7
49-60 M	98	19.0
Does a child have mental health disorders?		9.1
Yes	46	90.9
No	458	
Mother's education level		
Illiterate	73	14.2
Primary school	143	27.8
Secondary school	154	29.9
High school	76	14.8
Bachelor, master ,or PhD	58	11.3
Father's education level		
Illiterate	33	6.4
Primary school	100	19.4
Secondary school	143	27.8
High school	107	20.8
Bachelor, master ,or PhD	121	23.5
Monthly income		
Less than 500,000 IQD	137	26.6
500.000 - 750.000 IQD	206	40.0
750.000-1000.000 IQD	131	25.4
1000.000- or more IQD	30	5.8

Table 2: Features of mobile device usage

Features (n = 504)	(n)	(%)
Frequency of mobile media exposure		
Almost	123	23.9
Sometimes	296	57.5
rare	63	12.2
never	22	4.3
How old was your child when she /he first used mobile device?		
1-12 M	59	11.5
13-24 M	290	56.3
25-36 M	139	27.0
37-48 M	14	2.7
49-60 M	2	.4
Does your child have own mobile devices?		
Yes	163	31.7
No	341	66.2
Which mobile device they use		
Smartphones	503	97.5
Laptops	129	25
In which activities children participated on mobile devices (degree of use)		
watching TV	387	75.1
play game	246	47.8
watching videos	452	87.8
reading book	77	15
web surfing	49	9.5
Education	178	34.8
How many hours do they use mobile device in the day (hours)?		
0.5-1	105	20.4
1-1.5	100	19.4
1.5-2	124	24.1
2-2.5	100	19.4
>2.5	75	14.6
Need help to navigate the mobile devices		
Almost	85	16.5
Sometimes	268	52.0
Rare	99	19.2
Never	51	9.9

Table 3: Circumstances influencing parents to let their children use mobile devices

Circumstances	N	%
	Home visit	
Almost	44	8.7
Sometimes	86	17
Rare	19	3.7
Never	355	70.4
	Public places	
Almost	19	3.7
Sometimes	45	8.9
Rare	10	1.9
Never	430	85.3
	House work	
Almost	88	17.4
Sometimes	193	38.2
Rare	38	7.5
Never	185	36.7
	Public places	
Almost	19	3.7
Sometimes	45	8.9
Rare	10	1.9

Never	430	85.3
Parents own mobile use		
Almost	41	8.1
Sometimes	68	13.4
Rare	13	2.5
Never	382	75.7
Crowds of Child		
Almost	97	19.2
Sometimes	210	41.6
Rare	40	7.9
Never	157	68.8
Child's of relatives mobile use		
Almost	47	9.3
Sometimes	148	29.3
Rare	19	3.7
Never	290	57.5
When their parents were out of the home		
Almost	34	6.7
Sometimes	103	20.4
Rare	15	2.9
Never	352	69.8

Table 4: Factors associated with mobile usage

Factors		B*	P*	OR*	95% CI*
Child's sex (ref. = male)	**Female**	0.087	0.676	1.09	0.72-0.63
Child's age		-0.325	0.001	0.72	0.59-0.87
Household income (ref. = more than 1000.000)	Less than-500,000	-0.081	0.864	0.92	0.36-2.33
	500.000 - 750.000	0.114	0.806	1.12	0.45-2.78
	750.000-1000.000	-0.295	0.533	0.74	0.29-1.88
Child's have their own mobile (ref. No)	Yes	-0.577	0.007	0.56	0.36-85
Does a child have mental health disorders (ref. No)	Yes	-0.771	0.017	0.46	0.24-0.87
Do Mothers have knowledge regarding the effects of mobile devices use on children which give by a pediatrician (Ref. No)	Yes	0.695	0.001	2.00	1.31-3.05
Duration of smart phone use (ref. less than 1 hours)	1–2 hours 2-3 hours More than 3 hours	-0.392 -0.927 -2.005	0.287 0.011 0.001	0.67 0.39 0.13	0.32-1.391 0.19-0.80 0.06-0.27

* B: The coefficient value, P: The p-value, Odds Ratio (OR): The odds. 95% Confidence Interval (CI): The range of values within which we can be 95% confident that the true value lies.

Discussion

The impact of mobile device use on children, in the current research, it was showed that there is a significant proportion of children have early exposure to mobile devices, with one out of every three children having their own device. This indicates a high prevalence

of personal ownership of mobile devices among children. The prevalence of technology among children in the 21st century surpasses that of previous generations, with youngsters being enthusiastic users of digital devices. This surge in technological engagement has sparked widespread concern regarding its repercussions on children's cognitive, socio-emotional, and physical development (Panjeti-Madan and Ranganathan, 2023). The use of digital technology has grown rapidly during the last couple of decades. During use, mobile phones and cordless phones emit radiofrequency radiation (Hardell, 2018).

Smartphones were the most commonly used devices with long duration. Research suggests that children at different ages exhibit varying levels of interaction with digital devices. At three years old, they show similarities to two-year-olds but demonstrate improved interaction skills. By the age of four, children have developed a better understanding and ability to perform various actions on devices, such as tapping, sliding, flicking, and pinch-to-zoom. By the age of five, children have acquired a wide range of skills and ideas on how to use mobile devices, demonstrating proficiency in performing diverse gestures without difficulty (Aziz, 2013). According to study conducted by (Kabali, Irigoyen, Nunez-Davis, Budacki, Mohanty, Leister, & Bonner, 2015) researchers investigated mobile device usage patterns among children aged 6 months to 4 years. The findings revealed that as children grew older, both the frequency and duration of mobile device use increased. Older children spent more time using mobile devices compared to younger children. Another study by (Radesky, Peacock-Chambers, Zuckerman & Silverstein, 2016) focused on children aged 6 months to 4 years and found that the child's age influenced the types of activities engaged in on mobile devices. Younger children were more likely to engage in passive activities such as watching videos, while older children tended to engage in more interactive activities like playing games or using educational apps.

The current data highlights that the most common frequency of mobile media exposure is "Sometimes," representing a significant portion of the responses. Additionally, a large number of children first used a mobile device between 13-24 months of age. Moreover, the majority of children do not own their own mobile devices. Smartphones are the predominant type of mobile device used. When it comes to activities, watching videos is the most prevalent. Regarding the hours of mobile device use per day, a substantial portion fell into the 1.5-2 hours' category. Lastly, a considerable number of respondents indicated that they sometimes need helps to navigate mobile devices.

Findings from s study on parental beliefs, knowledge, and practices regarding mobile device use among young children revealed that parents who reported allowing their children to use mobile devices during daily tasks, such as housework, were more likely to have higher overall mobile device usage among their children (Radesky, Peacock-Chambers, Zuckerman & Silverstein, 2016). Similarly, (Kabali, Irigoyen, Nunez-Davis, Budacki, Mohanty, Leister, & Bonner, 2015) examined the impact of mobile device use during daily routines on parent-child interactions and children's behavior. Their findings indicated that higher levels of mobile

device use during activities like housework were associated with lower quality parent-child interactions and increased behavioral problems in children.

According to factors associated with mobile usage, on the provided data, several factors show a statistically significant association with the outcome variable. These include child's age, child's ownership of a mobile device, mothers having knowledge about the effects of mobile device use on children, and using a smartphone for 2-3 hours and more than 3 hours. In a meta-, analysis of screen viewing highlights that prolonged screen time can negatively impact the language and social skills development of young children. This is attributed to the challenge children face in learning from screen interactions compared to real-life engagements. Despite the widespread use of mobile technology sparking speculation about similar consequences from increased device usage, uncertainties persist regarding the influence of mobile devices on children's development and behavior, given the limited availability of longitudinal data due to the technology's relatively short existence (Haddon & Vincent, 2015).

As the proliferation of mobile phone use especially in children is a relatively recent phenomenon, the long-term health risks in this group are not clear as there has been no previous generation exposed during childhood or adolescence to this kind of radiation (Hardell, 2018).The research conducted by (Madigan, Browne, Racine, Mori, & Tough, 2019) investigated the correlation between individuals owning mobile devices and the amount of time spent on screens. The results indicated that children who had their own mobile devices had higher levels of screen time compared to those who did not have personal ownership. Additionally, (Radesky, Kistin, Zuckerman, Nitzberg, Gross, et al., 2014) investigated the influence of personal ownership of mobile devices on parent-child interactions and child behavior. The study found that children who had their own mobile devices had more solo screen time and had less interaction with their parents compared to children who did not have personal ownership.

Furthermore, Odgers, & Jensen (2020), investigated the associations between adolescent mental health and digital technology use, including mobile device usage. The study revealed that higher levels of digital technology use were associated with poorer mental health outcomes, such as symptoms of depression, anxiety, and attention-deficit/hyperactivity disorder (ADHD). Mental health, screen time (including mobile device usage) has been found to be correlated with negative outcomes. Twenge & Campbell, (2018), identified a correlation between higher levels of screen time and increased depressive symptoms and suicidal ideation among adolescents. Similarly, Jensen and colleagues found that the smartphone use among young adults were associated with higher levels of psychological distress, including symptoms of depression and anxiety (Jensen, George, Russell, & Odgers, 2019)

Strategies for managing and reducing children’s screen time involve raising awareness and implementing simple actions. Other approaches may consist of using electronic monitoring tools to

restrict screen time, participating in campaigns like the mobile Turn-off Campaign, linking screen time with physical activities, and spreading information through various media channels such as newsletters and posters. Educational institutions have a crucial role in overseeing students' screen time both inside and outside the classroom, and they should clearly communicate their policies to students and families. The recommended guidelines for discretionary screen time suggest 0.5-1 hour per day for children aged three to seven, one hour for 7-12-year-olds, 1.5 hours for 12-15-year-olds, and two hours for individuals aged 16 and older (Muppalla, Vuppalapati, Reddy Pulliahgaru & Sreenivasulu ,2023).

Conclusions

The current study concludes that there is a high prevalence of exposure to mobile devices among children below 60 months of age. The majority of children had their own mobile device, and started using mobile devices between the ages of 13-24 months. Smartphones are the most frequently utilized devices by children, with their main activities on these devices being watching videos. Further studies recommended deeply exploring this issue and adopting programs to reducing it.

DECLARATION SECTION

Availability of data and material

Data is available at the request of the corresponding author.

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