

Impact of Family Type and Mother's Availability on Screen Time and Physical Activity of Preschoolers

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Abstract— The aim of the current study was to understand the relationship between gadget exposure and physical activity of preschool children, while also understanding the influence of family type and the availability of mothers in the association. It also aimed to assess the impact of parenting styles and the pandemic on these behaviours. The cross-sectional study included 154 parents of children aged 2-5 years, assessed their child's screen time and physical activity through validated questions and used a self-report parenting style scale to collect the data. The results showed a significant negative correlation between screen time and physical activity and significant differences due to parenting styles in this association. The children also showed an increased screen time during the lockdown years, which was back to previous levels after the pandemic. The family structure and availability of mothers significantly affected screen time but not physical activity. The findings suggest the need for early interventions to manage the negative impacts of early gadget exposure on child development. Further research also needs to focus on the differential impact of the kinds of exposure on the child.

Index Terms— Early Childhood Development, Family Dynamics, Parenting Interventions, Screen Time Management.

I. INTRODUCTION

The advent of technology and its infiltration into the work and academic environment has made an offline-only world almost impractical. Along with these developments, the COVID-19 pandemic aggravated the use of technology and online platforms by people of all ages [34]. Such a significant impact of technology has led even infants to be exposed to digital screens by their parents [27], [37]. With this increasing exposure, the research on the impacts of digital technologies on the overall development of children has also gained momentum.

Studies have shown that the human brain continues to develop until age 5 [7], [22]. It has also been shown that excessive screen time can generally slow down developmental milestones [3], [24], [30], [36]. Therefore, regulating the child's exposure and behaviours towards more growth-oriented activities becomes necessary. However, television and mobile phone exposure has significantly increased recently [6]. Given this development, the WHO has guidelines for children's screen exposure to be limited to less than an hour for children under five [8].

Despite such adverse effects, the 'Digital Goldilocks Hypothesis' supports that a certain amount of screen time is necessary for children to gain experiences beyond their normal range and continue their education beyond formal school settings [4]. Nevertheless, the negative impact of screen time on physical activity is mostly agreed upon. Greater sedentary activity due to screen time is associated with reduced motor skills and fitness, an increased risk of obesity, and poorer psychological well-being [17], [21]. Another facet of research on early childhood development is the role of parents. There have been three major approaches to defining parental behaviour towards children (Kuppens & Ceulemans, 2018). The first is the specific parental practices

that parents engage in, the second is the balance between parental support and control, and the third is the overarching theme of parenting styles. A pioneer in the study of childhood development and parental involvement has been Baumrind [5]. She gave three parenting styles with varying degrees of support and control – authoritarian, authoritative, and permissive. Since its conceptualization, parenting styles have been widely used in child development research.

Regardless of the abundant research on parenting styles and childhood development, the research has been limited in understanding the role of family type in influencing child behaviours. In a culture like India, where collectivistic beliefs are prevalent even in nuclear families [6], it is also important to understand the role of other family members in forming guidelines around digital behaviour for young children and engaging them in physical activities.

Moreover, certain qualitative studies have found that parental engagement during screen time and parents' screen time affect the child's behaviour [13], [14]. Thus, with the growing population of working parents [15], it becomes necessary to determine how these decisions impact the child's screen time, especially when mobile phones have become a way to keep the child occupied [3]. Along with that, the COVID-19 pandemic has significantly increased the time spent engaging in online activities. Thus, this worldwide phenomenon is expected to have an impact.

Therefore, the current study addresses several gaps in previous research. It aims to understand better the relationship between screen time and children's physical activity. The study first establishes the role of parenting styles on these variables. It then aims to understand the role of family types and parents' working patterns by studying their impact on screen time and physical activity. The study uses standardized scales to assess the parenting styles for authenticity. The study also accounts for the impact of the

worldwide COVID-19 pandemic and aims to understand its impacts on the lifestyle of children and their parents.

II. METHODS

A. Sample

The sample size for the study is 154 parents of children aged 2-5 years. The study focuses on pre-schoolers because studies have shown how early exposure to gadgets severely impacts their cognitive, linguistic, and physical development and leads to deteriorating sleep quality, among other impacts [25], [32].

Only those children with at least one parent living with them were considered for the study. This was to ensure that the results of the parenting style questionnaire were authentic and valid. Children with neurodevelopmental disabilities were not included in the study. This was done to exclude any potential biases on the parenting styles due to their special needs and caregiving requirements [28].

B. Measures

1) *Parenting Styles and Dimensions Questionnaire – Short Version (PSDQ – Short Version)*

The PSDQ was first developed by Robinson et al. [28], based on Baumrind's classification of parenting styles [5]. This questionnaire had 133 questions. However, it was revised to 31 questions for a shorter version [28]. It is a self-report measure with questions assessing the parenting styles and further sub-dimensions, including connection, regulation, and autonomy granting. The responses are collected using a 5-point Likert scale from 1 (Never) to 5 (Always). It has been used previously as a reliable and valid measure [2], [20].

2) *Screen Time and Physical Activity Measures*

The questions related to the child's screen time and physical activity were adapted from the questionnaire used by Langer et al [19]. Three questions were asked – "How many hours does the child spend exposed to digital screens?", and "Does the time differ on weekdays and weekends?" "If yes, specify the time for both." The same questions were used to elicit the child's time to engage in physical activity. The responses were scored on a 3-point Likert scale from 0 (less than 1 hour) to 2 (greater than 2 hours).

Information about the change in screen time and physical activity habits during and after the COVID-19 pandemic was also gathered. This was also done through close-ended questions adapted from a study conducted by Eyimaya and Irmak [11] – "Did the screen time of the child increase during the COVID-19 pandemic (2021-2022)?" and "Did the screen time of the child decrease after the pandemic (2022-2023)?" The questions for the physical activity were similar – "Did the amount of physical activity of the child decrease during the COVID-19 pandemic (2021-2022)?" and "Did the amount of physical activity of the child increase after the COVID-19 pandemic (2022-2023)?" The responses were

collected through the options of 'Yes', 'No' and 'Maybe'. These questions were only answered by parents of children aged 4 and 5 years.

C. Data Collection

The participants were asked to fill out their demographic information and the duration of their child's screen time and daily physical activity. They were then asked to fill out the PSDQ – Short Version. The data was collected by contacting the parents personally through play schools and pediatric hospitals. The parents signed a consent form, including information about the study and the use of the data. They were also informed of their right to withdraw from the study at any point in time.

III. RESULTS

A total of 154 parents agreed to participate in the study, with 69% of the families where only the child's father worked and the remaining 31% of the families where both of the parents worked full time. It was also noted that 53% of the children lived in joint families, and the remaining 47% lived in nuclear families.

Of the total participants, 48% had children aged 4 and 5 years. Of these parents, 15% reported an increased screen time without a change in physical activity during the pandemic. Whereas 23% of the participants mentioned decreased physical activity without any change in screen time. About half the participants mentioned decreased physical activity and increased screen time, while the remaining 22% reported no change in their child's habits.

While reporting the data for the time spent in these behaviours after the pandemic, only 1% mentioned a decrease in their child's average screen time without increased physical activity. Further, 17% of the participants mentioned increased physical activity without a decrease in screen time. Moreover, 70% of the participants reported a decrease in screen time and an increase in their child's physical activity. The remaining 12% of the participants reported neither decreased screen time nor increased physical activity after the pandemic.

A bivariate correlation analysis was conducted to estimate the relationship between screen time and the physical activity time of the child, between screen time and parenting styles, and between physical activity and parenting styles (see Tables I and II). As the sample distribution was non-normal, a Spearman correlation was conducted.

There was a significant negative correlation between the variables ($\rho = -.74, p < .005$). This implies that children with higher screen time have less physical activity and thus have greater chances of having developmental difficulties later in life [31]. There was a significant negative correlation between screen time and authoritative parenting style ($\rho = -.78, p < .005$), and a significant positive correlation between screen time and authoritarian ($\rho = .73, p < .005$) and permissive parenting ($\rho = .70, p < .005$).

A One-Way ANOVA analysis was performed to understand the differences in the screen time and physical activity of children across the various parenting styles (see Tables III and IV)

The effect of parenting styles was significant on screen time ($F(3, 151) = 7.31, p <.005$) and on physical activity ($F(3,151) = 7.40, p <.005$) of children. Post Hoc analysis showed that the screen time of children with authoritative parenting was significantly lower than that of authoritarian parents ($M = -.524, SD = .141$). Moreover, the time spent engaged in physical activity was significantly higher in children with authoritative parents than in authoritarian

parents ($M = .561, SD = .169$).

Independent Samples t-tests were performed to understand the differences between the family types and the mother's

Table I. Screen Time and Physical Activity Correlation

		Screen Time
Physical Activity	Spearman's rho	- 0.747
	p-value	< 0.005

Table II. Screen Time, Physical Activity, and Parenting Styles

		Authoritative Parenting	Authoritarian Parenting	Permissive Parenting
Physical Activity	Spearman's rho	0.750	- 0.721	- .700
	p-value	<0.005	<0.005	<0.005
Screen Time	Spearman's rho	- 0.784	0.735	.701
	p-value	<0.005	<0.005	<0.005

Table III. Parenting Styles and Screen Time ANOVA

	Sum of Squares	df	Mean Square	F	p
Parenting Styles	6.42	3	3.209	7.31	<.005
Residuals	54.89	151	0.439		

Table IV. Parenting Styles and Physical Activity ANOVA

	Sum of Squares	df	Mean Square	F	p
Parenting Styles	9.34	3	4.670	7.40	<.005
Residuals	78.88	151	0.631		

Availability for screen time and children's physical activity (see Tables V and VI).

There was a significant difference in the screen time of children in joint families as compared to those in nuclear families ($t(152) = 3.21, p <.005$). However, no significant difference was found in the time spent in physical activity. The results also reported a significant difference in the screen time of children whose mothers were available during the day as compared to those whose mothers were working ($t(152) = 3.11, p <.005$). Nevertheless, no significant difference was found in the children's physical activity time.

IV. IV. DISCUSSION

This study aimed to assess the impact of family type and mother's availability on preschoolers' screen time and physical activity. It was also conducted to deepen the understanding of people's lifestyle changes after the

pandemic and plan specific interventions accordingly. The analysis of the current study reveals that increasing screen time has led to a decrease in young children's physical activity and that the time spent by children on each of these activities differs across parenting styles. Furthermore, the children's screen time also differed based on their family type and the availability of their mothers. However, no such difference was found in the physical activity of children. The results of this study align with previous research on child behaviours and the factors that influence them despite the non-significant differences in physical activity [18], [29].

Several previous studies have found a negative correlation between screen time and physical activity [10], [33]. The impact of COVID-19 on these behaviours has been in line with recent research highlighting a sudden increase in screen time during the pandemic years [35]. The slight return to pre-Covid times noticed in the study adds to our

understanding and brings hope to the better development of children raised during COVID-19.

Table V. Family Type T-test

		Statistic	df	p
Screen Time	Student's t	3.21	152	<.005
Physical Activity	Student's t	-0.444	152	.658

Table VI. Mother's Availability T-test

		Statistic	df	p
Screen Time	Student's t	3.11	152	<.005
Physical Activity	Student's t	-2.15	152	.033

Apart from other environmental factors, the role of parents and parenting styles is also significant in understanding children's screen time and physical activity [5]. Furthermore, the mother's role in parenting has been considered more important than that of the father [12], [26]. However, validating these beliefs became necessary with the growing culture of working mothers. The results of this study did so by showing the differences in the child's behaviour based on the time children spent with their mothers.

The current study also showed that the effects of family type and the mother's availability were found to be significant only on the child's screen time and not the physical activity. This lack of impact can be explained by other factors. It has been found that joint family interactions add more parental practices through other family members and other engagements for the child [1]. However, the child's participation in rigorous physical activity also depends on factors such as the availability of a park, parental physical activity, parental concerns about their child's safety, and the time spent outdoors [9], [23]. This might explain the lack of significant impact on the child's physical activity.

Overall, the current study adds to the existing literature by studying the influences of parenting styles, family structure and changing working patterns in a culture of collectivistic beliefs. The study also establishes that the influences of digital technology are being observed from an early age and that interventions need to be planned for a younger age group to see better impacts. The study also brings out a hopeful future for the COVID-19 generation by showing the reversing effects of exposure to gadgets and the awareness of parents to engage their children in physical activities more often.

The study, however, was not without its limitations. It used self-report and non-standardized measures to assess the children's screen time and physical activity. Such measures could have led to several participant biases and may have

influenced the data. The study also included the urban population, which could have made the sample biased due to greater awareness on the part of parents. It also did not account for the parenting practices of both parents, which might have impacted the results. Using a more quantitative approach to collect data about the changes due to the pandemic would also have resulted in a better and more generalized understanding of the lifestyles of the participants.

Future research can focus on understanding the impact of a collective parenting style of both parents on the child's screen time, along with including the type of content being watched on the gadgets. This is important to make decisive conclusions about the impact of screen time on the cognitive and linguistic development of children. Future research can also focus on the specific strategies parents and other family members adopt to engage their children in activities other than screen exposure. A more in-depth study around the influence of other family members can also deepen the understanding obtained through this research. Studying all these influences and strategies in depth would help develop better guidelines and interventions in play schools and households to reduce gadget exposure.

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