

Exploring the Influence of Screen Time on Developmental Milestones in Early Childhood

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Abstract:-

➤ *Background*

Examining the potential effects of screen time on pre-school children's developmental milestones is the main goal of this study. This study aims to identify significant relationships between exposure to screen time and several developmental features. To better understand the possible effects of screen time on children's development, the study focuses on aspects like age, parental education levels, types of electronic devices used, duration of outside activities, and behavioral issues.

➤ *Methods*

This cross sectional study was conducted after ethical approval from Jan 2022 to Dec 2022 at Lady Reading Hospital Peshawar. Informed consent was taken from the parents who were willing for giving the information. Data from a sample of pre-school children was gathered and categorized based on age, parental education levels, types of electronic devices (mobile, tablets, TV), length of outdoor activities, and behavioral indicators (social problems, attention problems, obey problems, aggressive behavior, and sleep disturbances). For each category of the variables, frequencies and percentages were determined. P-values were calculated using the relevant statistical methods in order to assess the significance of the relationships between screen time consumption and

developmental milestones. Those who were not willing and children with congenital development were excluded from the study. All data was analyzed through spss-24 ver.

➤ *Results*

Age groups, parental education levels, electronic device kinds, length of outdoor activity, and behavioral characteristics all showed unique distributions in the analysis. Age ($p = 0.05$), use of electronic devices ($p = 0.03$), social issues ($p = 0.04$), attention issues ($p = 0.02$), aggressive behavior ($p = 0.03$), and sleep disturbances ($p = 0.01$) all had notable p-values, which may indicate a link between screen time and developmental milestones in preschoolers. Maximum ratio 54 (56.25%) of those aged 6 and older and less than 6 (6.25%) of those aged 2-4. While the father education high ratio was in the educated group and 23 (23.95%) less in the uneducated group, the mother education high ratio was in the uneducated 42 (43.75%) and less in the educated group 17 (17.70%). Low 8(8.3%) ratio & high 56(58.33%) ratio in electronic equipment. The majority of children's behaviors included: disrupt sleep 72 (75%); social difficulties 51 (53.12%); aggression 67 (69.79%); and obey problem orders 57 (59.37%).

➤ *Conclusion*

This study emphasizes the importance of assessing screen time exposure and its potential effects on pre-school children's developmental milestones. The research

highlights possible connections between screen time and developmental characteristics, especially in relation to social issues, attention issues, aggressive behavior, and sleep disruptions. These findings are essential for educators, careers, and health professionals to devise methods that support pre-school children's balanced and healthy developmental trajectories and make educated decisions about media usage. To understand the underlying processes of these correlations and to design successful interventions that promote the best developmental outcomes in this young age group, more study is necessary. The secret to a better future is having decent social skills, paying attention, and obeying your parents. Digital media Overuse affects children's development in addition to disrupting their sleep.

Keywords:- *Developments, Skills, Social Behavior, Electronic Devices, Aggressiveness.*

I. INTRODUCTION

The speech and language development milestones are a delicate and crucial time when language is quickly picked up and careers' language input and environmental stimulation are helpful. Due to the quick advancements in device manufacture and the wide variety of devices and applications, as well as the fact that we now live in a digital age when exposure to visual and spoken media stimulation spans language development, there has been a significant rise in the ownership and use of portable devices. The amount of time spent utilizing a screen—is it a computer, television, iPod, or mobile device—is referred to as screen time. Given the development of technologies during the past ten years, there has been an increase in exposure to digital media. Children are now born as digital naves because the age at which they first see and interact with media screens has been dropped from 4 years to 4 months since the 1970s¹. Concerns concerning the effects on child development have arisen as a result of growing exposure to digital media. The relationship between media consumption and language development has attracted growing study. It is crucial to comprehend the connection between child screen time and their language development. According to American Academy of Pediatrics (AAP) recommendations, children under 2 years of age shouldn't be exposed to any screen time, while children ages 2 to 5 are deemed to have too much screen time if they use a screen for more than 3 hours a day². In a review, Gupta et al. noted that children under the age of five in high- and middle-income countries have a significant prevalence of excessive screen use. Excessive screen time has a number of negative health effects, including behavioral, sleep, and emotional problems that affect young children's growth and cognitive development³. The results of a systematic review by Chao Li et al. demonstrate the link between excessive screen time and a variety of physical, behavioral, and psychosocial health markers. Over the past ten years, there has been a lot of discussion about the dangers of excessive screen time in research, health, and the general

population^{4,5}. Young children grow up in a social setting, and screens are increasingly a part of these relationships. The first screen interactions a youngster has are important since habitual patterns of exposure and use have been shown to persist throughout adulthood⁶⁻⁷. Limits are necessary because infants and young children interact with screens in ways that may harm their cognitive and socio-emotional development and language acquisition⁸. An investigation examining the potential impacts of additional screen time on toddlers and preschoolers' white matter development was conducted in 2019. Language, literacy, and cognitive abilities are all governed by white matter. The disturbance of neurochemical processes as well as the previously described alterations in the white matter may be to blame. A lack of other neurotransmitters, such as dopamine, acetylcholine, gamma-aminobutyric acid (GABA), and 5-hydroxytryptamine (5-HT), was also observed in children who had internet addiction in urban left-behind children, which also causes physical and psychological symptoms. Excessive screen time can reduce the production of melanin levels, which can affect sleep⁹⁻¹⁰.

II. METHODOLOGY

After taking ethical committee this cross-sectional study was conducted Between January 2022 and January 2023. To investigate the link between pre-school children's screen time consumption and developmental milestones, this study uses a cross-sectional observational design. This design enables the examination of relationships between variables without changing them by gathering data at a precise point in time. A sample of pre-school children between the ages of 2 and 6 are included in the study. To ensure that different demographic parameters were well represented, participants were chosen from a variety of socioeconomic backgrounds. Before any data was collected, parents or legal guardians provided their informed consent. Children's ages were taken into account when dividing participants into the appropriate age groups (2-4 years, 4-6 years, and 6 & above years) based on demographic information. Mother and father's educational backgrounds were gathered and classified as being uneducated, intermediate, or master's degree holders. It was noted how participants used their mobile phones, tablets, and TVs. The total number of participants was used to compute percentages. The amount of time spent engaging in activities outside the home was noted and divided into three categories: 1-2 hours, 3-4 hours, and 6 hours. To assess behavioral aspects, certain indicators were employed. Social concerns are categorized as either present or absent. There are two types of attention problems: present and absent. Issues with obedience are either present or absent. It is determined whether aggressive behavior is present or absent. Disruptions to sleep are indicated as either present or absent. For each category of variables, frequencies and percentages were calculated using descriptive statistics. The significance of relationships between categorical variables (such as screen time usage, behavioral issues, etc.) and developmental milestones was assessed using chi-squared tests. The statistical significance

was determined at a level of p 0.05. The study complied with ethical standards for kid subject research. Parents or legal guardians provided their informed consent, and participant

identity and confidentiality were maintained at all times during the study.

III. RESULTS

The following data was obtained after running the result through spss-24 version

Variables	Frequency	Percentages	P-Value	
age	2-4 year	6	6.25%	0.05
	4-6 year	36	37.5%	
	6 & above years	54	56.25%	
Mother education	Uneducated	42	43.75%	0.79
	Intermediate	17	17.70%	
	Master	37	38.54%	
Father education	Uneducated	23	23.95%	0.68
	Intermediate	39	40.62%	
	Master	34	35.41%	
Electronic devices	Mobile	56	58.33%	0.03
	Tablets	32	33.33%	
	t.v	8	8.33%	
Activities outside home	1-2 hr	28	29.16%	0.49
	3-4 hr	49	51.04%	
	6 hr	19	19.79%	
Social problem	Present	51	53.12%	0.04
	absent	46	47.91%	
Attention problem	Present	64	66.66%	0.02
	absent	32	33.33%	
Obey problem	Present	57	59.37%	0.51
	absent	39	40.62%	
Aggressive behavior	Present	67	69.79%	0.03
	Absent	29	30.20%	
Sleep disturbance	Present	72	75%	0.01
	absent	24	25%	

IV. DISCUSSION

A roughly equal representation of the various categories may be seen in the distribution of mother's educational attainment. The p-value of 0.79 indicates that the outcome may not be significantly influenced by the mother's schooling. Father's education exhibits a very uniform distribution across categories, just like mother's education does. The p-value of 0.68 suggests that father's education may not be a very reliable indicator of the result. The distribution of cases among the various age groups reveals that the "6 & above years" category has the vast majority of participants. Age may affect the outcome of the study, as suggested by the p-value of 0.05, which indicates potential statistical significance. Research on how (and how much) young children actually learn from screens has increased in recent years, although evidence for neuroanatomical and physiological alterations to the developing brain associated to early, extensive exposure to screen media remains equivocal. Digital media may grab and hold newborns' attention even though they can't understand

what's on the screen¹¹⁻¹³. In our study 54(56.25%) high ratio was seen in age group 6& above while 6 (6.25%) less ratio was in age group 2-4. Parental education is important for their children future, master level education as seen in 37(38.54%) in mothers while uneducated women's ratio was high 42(43.75%). Father education ratio was seen high at intermediate level 39(40.62%), master 34(35.42%) and less in uneducated level 23(23.95%) with p-value 0.68. Early literacy can be developed with interactive 'learn-to-read' applications and e-books that practice letters, phonics, word identification, and story comprehension¹⁴. In our study ratio of mobile use 56(58.33%) was seen high while television use was seen less 8(8.3). One recent Canadian study discovered a substantial negative correlation between the use of mobile media devices and the use of expressive language in 18-month-old children¹⁵. Attention problem 64(66.66%) & aggressiveness 67(69.79%) were significant with p-value 0.02 & 0.03 in children's. According to the data, more participants utilize mobile devices than tablets or televisions. The usage of electronic gadgets may potentially have a substantial impact on the results,

according to the p-value of 0.03 which suggests this. According to the distribution, a sizeable percentage of participants spend 3–4 hours per day on activities away from home. The duration of activities outside the home, however, might not be highly related to the result, according to the p-value of 0.49. Toddlerhood may be a crucial time for creating these skills because focused attention is thought to be the foundation for the development of executive function abilities in later childhood. High background exposure Children under the age of five have been shown to have poorer language usage and acquisition, cognitive growth, and core executive function skills (such as attention, working memory, and impulse control). Few parents complained about the obey order which they give as not fulfilled ratio 57(59.37%) were happy in this category while 39(40.62%) were not obeying. Additionally, it has been demonstrated that background TV lessens the quantity and quality of parent-child interaction and keeps kids from playing¹⁶⁻¹⁷. Seven studies found that more hours spent using various screen types are linked to a higher risk of developmental disorders, such as autistic spectrum disorder. The distribution of social issues between those who experience them and those who don't is generally balanced. With a p-value of 0.04, it may be assumed that social problems may have an impact on the result. The majority of participants struggle with paying attention. The p-value of 0.02 implies that attention issues may have had an impact on the result. Social behavior and presentation of children has good impact on parental education, greeting with guest or at social gathering present the child attention and skills to outside world. The majority of participants engage in hostile behavior. The p-value of 0.03 suggests that aggressive behavior may have some bearing on the result. According to the distribution, obey problems are distributed in a fairly even manner. The p-value of 0.51 implies that this variable may not have a significant effect on the result. In our study the social problem was seen in 51(53.12%) & absent in 46(47.9%) with p-value 0.04. Alrahili et al. found that high social communication questionnaire scores were significantly correlated with screen time (p 0.05), indicating that longer exposure to screens is linked to the prevalence of developmental disorders¹⁸. The majority of participants engage in hostile behavior. The p-value of 0.03 suggests that aggressive behavior may have some bearing on the result. The statistics show that sleep disruptions are rather common. As indicated by the low p-value of 0.01, sleep disturbance may have a major impact on the result. More use of electronic devices will increase more time spend which effects the sleep of majority children's. In our study 72(75%) ratio was seen high with sleep disturbance while 24(25%) were not affected. The data displays the distributions of different variables and their potential influence on the outcome under study. According to the stated p-values, variables including age, electronic device use, social problems, attention issues, aggressive behavior, and sleep disruptions may be significant. To pinpoint the precise links and effects of these variables on the relevant outcome, additional statistical analysis would be required.

V. CONCLUSION

Families can utilize digital media in beneficial (educational, imaginative, and playful) and safer ways by promoting career participation and interaction. We aim to intervene and inform parents and guardians about the true effects of digital media since we believe that exposure to screens may have a major detrimental correlation with children's cognitive development.

LIMITATIONS

Additional crucial factors including temperament, social interaction, and parenting style were not adequately assessed. For further studies we recommend including a larger sample size and adjusting all the possible confounders.

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