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Screen time addiction and its impact on Social responsiveness and communication

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ABSTRACT

Introduction: Covid -19 pandemic has forced a rapid shift from classrooms to screens, increasing the screen time for academics and entertainment.

Objective: To investigate the impact of screen time on Social relationship and reciprocity, Emotional responsiveness, and Speech, language, and communication among pre-school children.

Methods: The scope of the study is restricted to 50 Anganwadi-going children between the ages 3-5 years. The assessment was done using the first three domains of ISAA (Indian Scale for Autism Assessment), with parental feedback, the average screen time in minutes per day was taken. Statistical analysis was done to correlate the ISAA score with average screen time.

Results: Indicated negative correlation between screen time and these developmental domains- Social relationship and reciprocity, Emotional responsiveness, and Speech language and communication.

Conclusion: This study highlights the need for early parental supervision in screen time and training for anganwadi/preschool teachers to monitor developmental milestones.

Future directive: Strategies need to be formed for novel social interactive platforms for real-world social interaction for children from an early age.

Keywords: *Screen time, Social relationship and reciprocity, Emotional responsiveness and Speech language and communication, pre-school aged children*

1. INTRODUCTION

In recent years, the prevalence of digital technology has rapidly increased, and children started to depend heavily upon technology for knowledge gaining, social interaction and entertainment. The Covid-19 pandemic has caused a rapid shift from schools to remote learning[1]. This caused an unpredicted surge in screen time. The WHO recommends the exposure to screen for 2-4 years aged should be restricted to not more than one hour per day. But many preschool age children exceed this time limit (WHO, 2019).

This paper defines screen addiction and its prevalence and discusses its impact upon important developmental milestones such as social skills, emotional responsiveness, and speech and language communication skills. It also highlights the critical role of parents and caregivers in supervising the digital use and effectively controlling the time spent in front of the screen.

Screen time

The appropriate use of digital technology has many positive aspects. The potential benefits include high quality educational content designed especially for preschool age children. Certain screen activities can also stimulate soft cognitive skills, fine motor skills and digital literacy[2]. Screens can facilitate social interaction. In this modern era of nuclear families digital media has played a large role in keeping people connected, especially during the pandemic it gave a sense of community. Digital media give a treasure of resources and knowledge which both parents and the children can make use of. The problem begins when the screen use becomes excessive and compulsive causing addiction. The key lies in limited and supervised use of screens[3].

Physiology of screen time addiction

The mechanism behind screen addiction is similar to any other addiction- dopamine release and neuroplasticity[4]. The constant dopamine needs lead to excessive and compulsive demand for screen exposure.

Dopamine release

Dopamine is a neurotransmitter associated with rewards and pleasure[5].When the child is exposed to vibrant fast moving contents, music, games and other interactive contents the brains reward system gets trigger and releases dopamine. This causes reinforcement in the individual's behavior causing them to seek more of this pleasure or reward.

Neuroplasticity

The capacity of the brain to change and adapt by forming new neural pathways is called neuroplasticity[4]. Excessive screen time can lead to changes in existing neural pathways and forming new ones associated with pleasure reward and impulses[5]. When the repeated exposure to digital platforms becomes excessive the brain slowly gets desensitized to dopamine and thus the threshold gets increases this causes a higher demand of dopamine causing more screen time and more intense exposure to achieve the same level of satisfaction.

Screen is a space where child is only getting a one way communication. Very limited platforms offer interactive contents. The children participated in the study mostly reported to be viewing some kind of cartoons, vibrant reels and fast-paced music. What the child lacks here is face to face interaction. According to the social learning theory, Albert Bandura, the individual learns by observing other's behavior and the consequences of those behavior[6]. If the toddler does not get an opportunity to interact with this environment and this learning may not happen there .This will negatively impact their personality development. By spending more time in front of the screens the children are lacking the opportunity for social play. Through social play only the children learn important life skills such as cooperation, sharing and resolving conflicts. This prevents development of healthy social relationships. When face to face interactions are absent the child will slowly lack the ability to understand verbal and non verbal cues and engage in reciprocal conversations. This might reduce their social competence later on leading to social anxiety which impact largely upon their ability to form meaningful social relationships with peer groups making them lone and aloof .

The purpose of this paper is to examine the impact of screen time addiction on three important milestones of development social relationship and reciprocity, emotional responsiveness and speech language and communication. By understanding this relationship the parents, the caretakers and the policy makers can have an insight and develop strategies to meet the adverse effects of excessive screen time.

Social relationship and reciprocity

The ability of a child to involve and interact with their peers and adults where they begin to learn social norms empathy and cooperation is called social responsiveness[7]. It helps them to initiate social exchange. It is one of the most important milestone in a preschool aged child is the foundation the child's future development.

Emotional responsiveness

The ability of a child to react sensitively and appropriately do emotional stimuli which could be internal or external. This is a crucial aspect of emotional development and is influenced by various factors such as temperament, social experiences and environment, attachment to parents and caregivers[8].

Speech and language communication

The ability of the child to understand the use of language and express themselves using language skills, both verbal and nonverbal. This includes both receptive and expressive language use[9].

2. METHODOLOGY

Aim

To evaluate the average screen time, social relationship and reciprocity, emotional responsiveness and speech and language communication among preschool children

Objective

To examine the impact of screen time on social relationship and reciprocity, emotional responsiveness and speech and language communication among preschool aged children

Participants

The study sample was obtained from 50 preschool-aged children (3-5) from local preschools and anganwadis were included in the study. Informed consent was obtained from parents or guardian prior to sample collection.

Data collection

The data was collected through 2 methods

Each participant was assessed using the first three domains of ISAA manual to evaluate their respective social relationship and reciprocity, emotional responsiveness and speech and language communication skills. A lower score indicate better ability in each domain.

The average screen time of each participant per day in minutes were obtained from parental feedback

Psychological tool

Indian Scale for Autism Assessment (ISAA) was used to assess the participants. The scale is proven to be valid, reliable, consistent and sensitive.

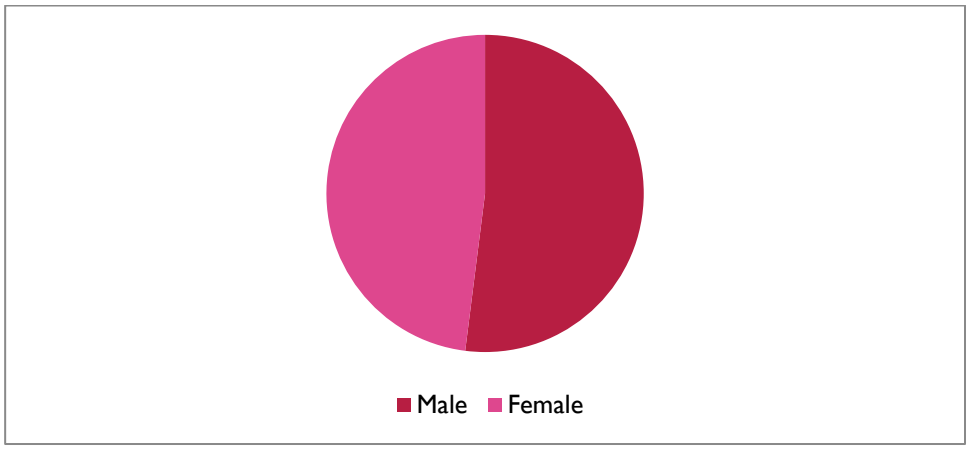
Statistical analysis

Karl Pearson correlation coefficient was calculated to determine the correlation between average screen time and domains of social interaction emotional regulation and communication scores.

3. RESULTS

Descriptive Statistics

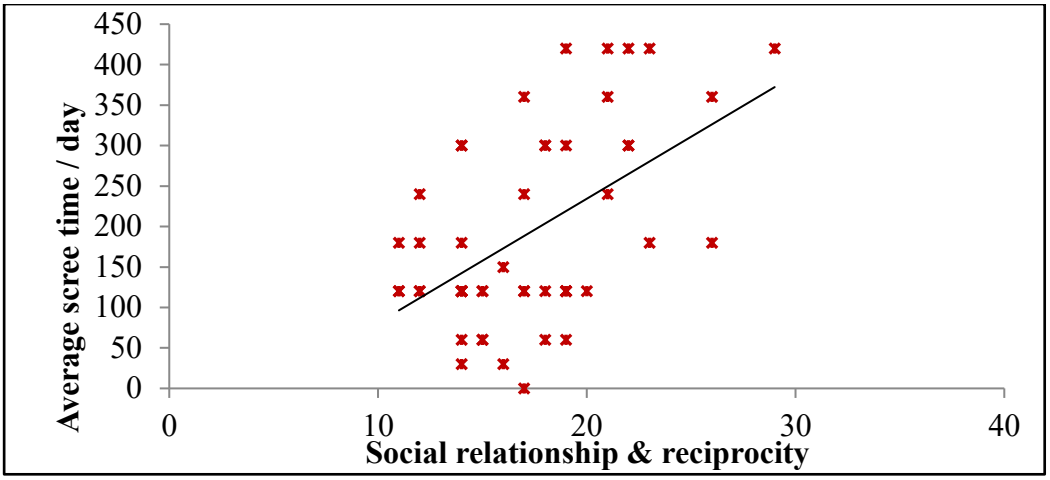
Sex distribution



3.1 Correlation between Social relationship, reciprocity and Average screen time/day

Variables	n	Pearson Correlation	Significance *(p-value)*
Social relationship, reciprocity & Average screen time/day	50	0.5326	*< 0.01*

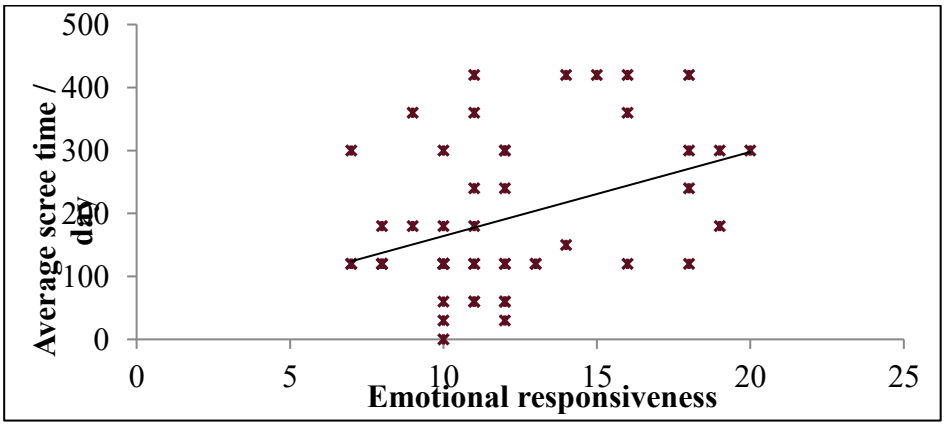
The correlation coefficient shows a positive correlation between social relationship, reciprocity and average screen time/day. Since the *p-value < 0.01*, the correlation is statistically significant. Increased score of social relationship and reciprocity indicates decreased ability. Hence the correlation indicates that, as the average screen time/day increases, social relationship, reciprocity is seen decreasing. The following scatter diagram also interprets this.



3.2 Correlation between Emotional responsiveness and Average screen time/day

Variables	n	Pearson Correlation	Significance *(p-value)*
Emotional responsiveness & Average screen time/day	50	0.382	*< 0.05*

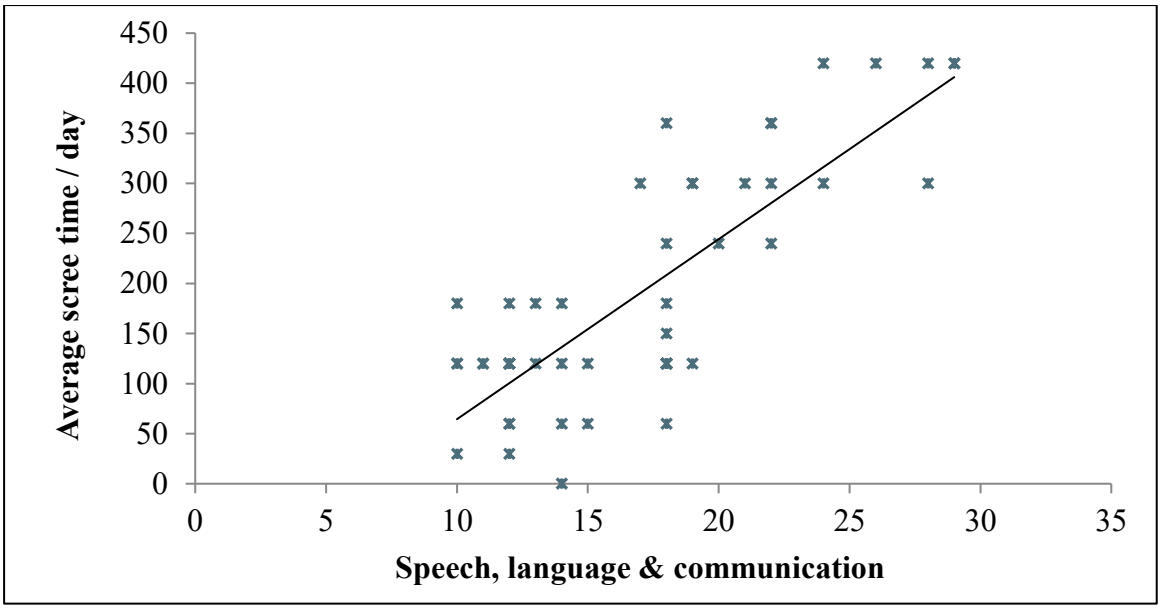
The correlation coefficient shows a positive correlation between emotional responsiveness and average screen time/day. Since the *p-value < 0.05*, the correlation is statistically significant. Increased score of emotional responsiveness indicates decreased ability. Hence the correlation indicates that, as the average screen time/day increases, emotional responsiveness is seen decreasing. The following scatter diagram also interprets this.



3.3 Correlation between Speech, language, communication and Average screen time/day

Variables	n	Pearson Correlation	Significance *(p-value)*
Speech, language, communication & Average screen time/day	50	0.808	*< 0.001*

The correlation coefficient shows a positive correlation between speech, language, communication and average screen time/day. Since the *p-value* < *0.001*, the correlation is statistically significant. Increased score of speech, language, communication indicates decreased ability. Hence the correlation indicates that, as the average screen time/day increases, speech, language, communication is seen decreasing. The following scatter diagram also interprets this.



4. DISCUSSION

The result of the study indicates that excessive screen time addiction negatively impacts socialization, emotional regulation, and communication skills among preschool-age children. The significant correlation between increased screen time and higher ISAA scores indicates a potential risk in typical and age associated development in each of the domains. These results align with the previous studies, indicating that there is a shift from traditional outdoor and group play activities to indoor and virtual-based games causing more social isolation[10]. High screen time can hinder child's ability to engaging meaningful social interactions and develop strong emotional connections and language skills[11.] Another study reveals that children who engage in excessive time in front of the screen will have higher increased levels of anxiety and depression. Emotional distress will be of a higher grade[12]

4.1 *Implications for parents and caregivers*

The results of the study give a strong direction that monitoring and setting limits in screen time is an essential component for healthy growth, both physical and mental, for young children. Parents and educators should enhance real-world interaction, and more platforms need to be developed for enhancing face-to-face communication. Strategies need to be formed from the administrative system to enhance the same. It is impossible to avoid screens, but shared screen experiences, promoting active play, and replacing screens with quality time spent with the kids can help to mitigate the negative effects of excessive screen exposure.

5. LIMITATIONS AND FUTURE RESEARCH

This study has several limitations. The reliability of the self-reporting for screen time by the parents, limited sample size, and cross-sectional nature of the data, which limit causal inferences, are some of the limitations. Future research should explore the longitudinal effects of screen addiction on development and some of the possible extraneous factors, such as family environment and social exposure of the child.

Author contributions

Conceptualization: Radhakrishnan D; Investigation: Radhakrishnan D

Methodology: Radhakrishnan D, Preet K; Statistical analysis: Radhakrishnan D, Preet K ;

Project administration: Radhakrishnan D, Visualization: Radhakrishnan D,

Writing original draft: Radhakrishanan D, Writing-review and editing: Radhakrishanan D, Preet K

Transparency

Declaration of Funding

This research did not receive any specific grant from funding agencies in ht e pubic, commercial or not-for-profit sectors

Data Availability

Data can be made available on request.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationship that could have appeared to influence the work reported in this paper.

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