RESEARCH PAPER

Association Between Early Social Media Exposure And Autism Like Behaviour In Young Children - A Cross Sectional Study

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ABSTRACT

Introduction: Virtual autism, marked by autism-like symptoms from excessive screen time, is an emerging concern with the rise of fast-paced social media reels. These reels can overstimulate young children, affecting their cognitive, social, and emotional development.

Aim: To investigate the prevalence of virtual autism symptoms in children frequently exposed to social media reels and explore the relationship between exposure duration and symptom severity.

Materials & Methods: This cross-sectional study was conducted at the Department of Pediatric and Preventive Dentistry at Saveetha Dental College and Hospital, Chennai from May 2024 to June 2024 with a sample size of 100 children aged 2–6 years who were exposed to social media reels and without significant sensory impairments. The data was collected using convenience sampling to evaluate the impact of social media reel exposure on virtual autism symptoms. Data were collected through a structured parental questionnaire, and statistical analyses, including descriptive statistics, Pearson's correlation, and regression analysis, were performed with $p < 0.05$ set as the significance threshold.

Results: The study revealed considerable differences in behavioral and autism-related traits among participants, identifying screen time, bedtime routines, and imitation behavior as significant influencing factors ($p < 0.05$). Positive correlations were noted between screen time preference and autism scores ($r = 0.692$). Multivariate analysis emphasized bedtime and imitation as critical factors (Pillai's Trace = 0.849). Reliability testing showed good internal consistency (Cronbach's Alpha = 0.849), with factor analysis retaining 18 key items explaining 82% variance.

Conclusion: The study highlights the significant impact of social media reels on children's behavior, stressing the need for screen time guidelines. Promoting balanced screen time and parental involvement is crucial to mitigate developmental risks linked to virtual autism.

Keywords:- Autism Spectrum Disorder, Social Media, Screen Time, Child Development, Cross-Sectional Studies

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INTRODUCTION

The widespread use of digital technology and social media has significantly altered how individuals, particularly children, engage with their environment. Platforms such as YouTube, Instagram, TikTok, and Facebook have popularized short-form video reels—visually captivating and highly stimulating content designed to capture attention within seconds. While these reels are primarily consumed for entertainment, growing concerns highlight their potential impact on child development, particularly to "virtual autism." Virtual autism describes autism-like behaviors believed to result from excessive screen exposure rather than genetic or traditional environmental causes. Children affected by

virtual autism may exhibit delayed speech development, reduced eye contact, social withdrawal, irritability, and repetitive actions. However, unlike Autism Spectrum Disorder (ASD), these symptoms tend to improve significantly when screen time is reduced or eliminated. While traditional ASD is rooted in genetic and environmental factors, virtual autism is increasingly linked to prolonged screen exposure during critical developmental stages.[1],[2]

Short video reels, in particular, deliver intense sensory stimulation through rapid visuals, vibrant colors, and engaging sounds. Such overstimulation can overwhelm the developing brains of young children, hindering milestones such as language acquisition, cognitive growth, and social interaction. Unlike interactive play or problem-solving activities, reels promote passive content consumption, limiting opportunities for meaningful developmental engagement.[3] Early childhood represents a crucial period for brain development, and excessive screen use during this time may disrupt these processes, leading to developmental delays and behavioral challenges. Existing research has established associations between prolonged screen use and issues such as attention deficits, hyperactivity, and delayed language skills. However, studies specifically examining the unique effects of short-form content, like social media reels, remain limited. Given their distinctive features—brief duration, rapid pacing, and repetitive sequences—further investigation is necessary to understand their impact on early childhood development.

The increasing prevalence of early and prolonged exposure to social media content, particularly short-form videos or "reels," has raised concerns about its potential impact on child development. Emerging anecdotal and clinical observations suggest a pattern of autism-like symptoms in young children who have excessive screen exposure, a phenomenon sometimes referred to as "virtual autism." However, empirical research in this area remains limited. This study aims to explore the possible associations between exposure to social media reels and the emergence of social, communicative, and behavioral traits commonly linked to autism spectrum disorder (ASD).[4],[5] By examining these correlations in a cross-sectional sample, the study seeks to contribute valuable insights into how digital media consumption may influence neurodevelopment and inform early intervention strategies and parental guidance.

This cross-sectional study aims to address several key objectives, including assessing the prevalence of virtual autism symptoms in children frequently exposed to social media reels, analyzing behavioral patterns such as delayed speech development and social withdrawal, and evaluating developmental concerns reported by parents. Additionally, it explores the correlation between the duration of reel exposure and the severity of virtual autism symptoms. By achieving these objectives, the study provides empirical evidence to deepen understanding of how short-form digital content influences child development. The findings will offer actionable recommendations for parents, educators, and healthcare professionals to manage screen exposure effectively and promote healthier developmental outcomes. Recognizing the developmental risks posed by social media reels is essential as they continue to dominate digital spaces. This research highlights the importance of strategic interventions to safeguard children's cognitive, social, and emotional well-being during their formative years.[6],[7],[8]

The aim of this cross-sectional study is to evaluate the impact of social media reel exposure on virtual autism symptoms. The primary objectives include assessment of behavioural disturbances in children with social media reel exposure, and the secondary objectives include assessment of the involvement of parental concerns in limiting the same.

MATERIALS AND METHODS

Study Design

This cross-sectional study was conducted to explore the impact of social media reel exposure on virtual autism symptoms (prevalence: 0.72). The study adhered to the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines. Ethical approval was obtained from the Saveetha Dental College Institutional Human Ethical Committee (IHEC/SDC/UG-2104/24/PEDO/204). Informed consent was collected from all participating parents/guardians, and participation was voluntary.

The study was conducted at Saveetha Dental College and Hospital, Chennai, India, within the Department of Oral Medicine & Special care dentistry and Pediatric and Preventive Dentistry. Data collection occurred from January 2024 to June 2024, during which parents and guardians were invited to participate. The study recruited 100 children who reported to the department for regular check-ups or other dental needs.

Participants

Inclusion Criteria:

1) Children aged 2 to 6 years, accompanied by a parent or guardian.
2) Children who had been exposed to social media reels (e.g., YouTube, Instagram, TikTok, Facebook) for at least one hour daily over the past 6 months, as reported by their parents.
3) Children exhibit at least two noticeable developmental delays, such as language delay, short attention span, hyperactivity, decreased cognitive/language development, or difficulty with emotional regulation, as observed by their parents.
4) Parents/guardians willing to provide informed consent and complete the questionnaires.
5) Children without significant sensory impairments, accompanied by a parent or guardian.

Exclusion Criteria:

1) Children diagnosed with ASD, ADHD, or other neurodevelopmental disorders before social media exposure.
2) Children with pre-existing cognitive or language delays unrelated to screen time.
3) Children with neurological or psychiatric conditions affecting development.
4) Parents/guardians unwilling or unable to participate in the study.

Variables:

The primary exposure variable was the duration of social media reel consumption, specifically daily exposure of at least one hour over the past six months. Parental reports on screen time habits, developmental milestones, and behavioral concerns were used as predictors to understand the potential impact of screen time on child development. To account for potential confounding effects, factors such as age, socioeconomic status, and pre-existing developmental conditions were considered. Additionally, the study acknowledged that the relationship between screen time exposure and symptom severity could have been influenced by effect modifiers, including parental involvement, the child's behavior prior to exposure, and the quality of social interactions outside of screen time. These elements collectively helped to better understand the complex dynamics of screen time and its potential influence on autism-related symptoms.

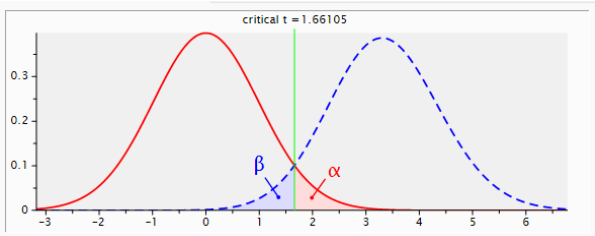
Data Sources/Measurement:

A prevalidated structured questionnaire (Appendix I), prepared by a multidisciplinary team of experienced professionals including a pediatrician, pediatric dentist, anesthetist, and dental surgeon—each registered with the MCI or DCI and having over 10 years of clinical experience—was designed in English and administered as a self-reported tool by parents to gather comprehensive data on children's social media usage, demographic details, and behavioral, emotional, and social change. The tool assessed virtual autism symptoms using a Likert scale (1 = never to 5 = always), covering aspects such as language delay, attention span, hyperactivity, social withdrawal, and emotional regulation. To strengthen the assessment, a blinded investigator used a standardized autism scale (Appendix II) to objectively evaluate developmental and behavioral traits. The questionnaire showed high content validity (CVI = 0.72), while construct validity was confirmed by factor analysis retaining 18 strong items (82% variance explained; communalities: 0.642–0.914) despite a low KMO (0.374). Bartlett's Test of Sphericity ($p = 0.027$) supported its appropriateness. Additionally, reliability testing involving 15 pediatric dentists and 10 psychologists yielded a Cronbach's Alpha of 0.849, indicating high internal consistency. This two-tiered, reliable, and valid approach provided a comprehensive and objective evaluation of the children's behavioral changes linked to social media exposure.[9],[10],[11],[12],[13]

Bias:

To minimize bias, the study employed random sampling of participants from the Department of Oral Medicine & Special Care Dentistry and the Department of Pediatric and Preventive Dentistry. A structured questionnaire was utilized to ensure consistency in data collection, and data were anonymized to prevent information bias. Although parental self-reporting posed a potential for recall bias, this was mitigated by framing clear and specific questions that focused on screen time usage and developmental milestones to enhance accuracy.

Study Size:



Table/Fig-1: Priori G*Power Analysis for Linear Multiple Regression in Assessing Virtual Autism Symptoms Related to Social Media Reel Exposure in Children

This G*Power analysis shown in Table/Fig-1 was conducted using version 3.1.9.7 to calculate the required sample size. Using a point biserial model for correlation, the analysis determined that a sample size of 97 participants is needed to detect a moderate effect size (|p| = 0.32) with 95% power and a significance level (α = 0.05) in a one-tailed test. The software ensures that the study is well-powered, providing a 95% probability of detecting a true relationship between social media reel exposure (binary variable) and virtual autism symptom severity (continuous variable) while minimizing errors. Specifically, it reduces the risk of a Type I error (false positive) to 5% and the risk of a Type II error (false negative) to 5%, ensuring reliable and valid results.

Statistical analysis:

Statistical analysis was performed using SPSS version 25.0. Descriptive statistics were used to summarize demographic and clinical data, with means and standard deviations for continuous variables and frequencies with percentages for categorical variables. Pearson's correlation coefficient and linear regression were used to assess the relationship between social media reel exposure and virtual autism symptoms. An independent samples t-test was conducted to compare symptom scores between high and low exposure groups. Multivariate analysis was also carried out to evaluate the combined effect of factors such as screen time, bedtime viewing, and imitation behavior. A p-value of < 0.05 was considered statistically significant.

RESULTS

The study sample included 100 children aged 2–6 years, with the majority aged 3 years (30%) and 5 years (30%). Parental education levels were evenly distributed among primary (20%), secondary (20%), college (30%), and professional education (30%). Gender distribution was balanced, with 50% male and 50% female participants.

Sl. No.	Variable	N	Mean ± SD
1	Time Spent Daily on Social Media	100	2.80 ± 0.985
2	Reels	100	1.10 ± 0.302
3	Social Media Platforms	100	1.50 ± 0.810
4	Time Spent Daily on Reels	100	2.11 ± 0.952
5	Bedtime Reels	100	1.41 ± 0.494
6	Imitation of Reels	100	1.39 ± 0.490
7	Reduced Eye Contact	100	2.61 ± 0.803
8	Social Interaction Struggles	100	3.29 ± 1.018
9	Preference for Screen Time	100	3.81 ± 1.253
10	Social Withdrawal	100	2.81 ± 0.748
11	Irritability or Frustration	100	2.80 ± 0.876
12	Repetitive Behaviors	100	2.61 ± 1.024
13	Difficulty Shifting Focus	100	3.18 ± 1.086
14	Disrupted Sleep Pattern	100	1.91 ± 1.590
15	Delay in Speech Development	100	2.50 ± 0.927
16	Change in Social Skills	100	1.20 ± 0.402
17	Concern about Child's Behavior	100	2.30 ± 0.644
18	Limiting Child's Screen Time	100	1.41 ± 0.494

19	ISAA Autism Scale	100	2.50 ± 0.927

Table/Fig-2: Descriptive statistics of behavioral and social parameters related to social media reel exposure

Table/Fig-2 provides descriptive statistics for the demographic, behavioral, and autism-related variables among 100 participants. Behavioral factors vary, with preference for screen time (3.81 ± 1.253) having the highest standard deviation and reel exposure (1.10 ± 0.302) having the lowest. The average time spent daily on social media is 2.80 ± 0.985, while bedtime reel usage shows a mean of 1.41 ± 0.494. Social and behavioral aspects indicate moderate engagement, with social interaction struggles averaging 3.29 ± 1.018, difficulty shifting focus at 3.18 ± 1.086, and social withdrawal at 2.81 ± 0.748. Irritability or frustration (2.80 ± 0.876) and repetitive behaviors (2.61 ± 1.024) show similar trends. Autism-related metrics such as the ISAA autism scale (2.50 ± 0.927) and delay in speech development 2.50 ± 0.927) also reflect moderate levels. In contrast, changes in social skills have a lower mean of 1.20 ± 0.402. Disrupted sleep patterns (1.91 ± 1.590) and imitation of reels (1.39 ± 0.490) show relatively lower averages. Overall, the dataset highlights significant variability in demographic and behavioral traits, providing insights into the developmental and autism-related characteristics of the population.

Sl. No.	Effect	Pillai's Trace	F	Hypothesis df	Error df	Sig.
1	Intercept	0.898	398.008	2	90	<0.05
2	Time	0.447	36.334	2	90	<0.05
3	Time on Reels	0.556	56.458	2	90	<0.05
4	Concern	0.381	27.654	2	90	<0.05
5	Limit	0.502	45.433	2	90	<0.05
6	Bedtime	0.817	201.255	2	90	<0.05
7	Reels	0.503	45.503	2	90	<0.05
8	Imitation	0.096	4.794	2	90	0.011
10	Interaction (Bedtime * Imitation)	0.849	253.944	2	90	<0.05

Table/Fig-3: Multivariate test results for factors influencing social media reel exposure and related behaviors multivariate analysis

Table/Fig-3 summarizes the multivariate test results from a study examining the effects of social media reel exposure on children, focusing on factors like time spent on reels, concern about screen time, bedtime, imitation behavior, and their interactions. Several factors, including Time, Time on Reels, Concern, Limit, Bedtime, Reels, and Imitation, show significant effects (p-value < 0.05), indicating they significantly influence the study outcomes related to children's social behaviors and screen time. The interaction between Bedtime and Imitation was found to be significant, suggesting that both bedtime routines and imitation behaviors jointly affect the study variables. The study model demonstrates strong explanatory power, with high R-squared values (e.g., bedtime showing $R^2 = 0.866$), reflecting the model's good fit. This analysis highlights how screen time, bedtime, and behavior all play important roles in shaping children's outcomes. It emphasizes that managing screen time and establishing consistent routines, such as bedtime, are crucial for supporting healthier development in children.

Sl. No	Variables	Correlation with Age (r value)	Correlation with Autism Scale	Significant at 0.01?	Significant at 0.05?
1	Educati	0.37	0.044	<0.01	>0.05

	on Status of Parent				
2	Gender	-0.49	-0.108	<0.01	>0.05
3	Time Spent Daily on Social Media	0.255	0.111	>0.01	<0.05
4	Reels	-0.276	-0.542	<0.01	>0.05
5	Social Media Platforms	0.199	0.336	>0.05	<0.05
6	Time Spent Daily on Reels	0.35	0.166	<0.01	>0.05
7	Bedtime Reels	0.169	-0.011	>0.01	>0.05
8	Imitation of Reels	-0.004	-0.656	>0.01	<0.05
9	Reduced Eye Contact	0.002	0.672	<0.01	>0.05
10	Social Interaction Struggles	0.013	0.594	<0.01	>0.05
11	Preference for Screen Time	-0.064	0.692	<0.01	>0.05
12	Social Withdrawal	0.121	0.721	<0.01	>0.05
13	Irritability or Frustration	0.287	0.373	<0.01	>0.05
14	Repetitive Behaviors	0.085	0.633	<0.01	>0.05
15	Difficulty Shifting Focus	0.159	0.512	<0.01	>0.05
16	Disrupted Sleep Pattern	-0.006	-0.106	No	>0.05
17	Delay in Speech Development	0.101	1	<0.01	>0.05
18	Change in Social Skills	-0.034	-0.542	>0.01	<0.05
19	Concern about Child's Behavior	0.14	0.254	>0.01	<0.05
20	Limiting Child's Screen Time	-0.691	0.21	<0.01	<0.05

Table/Fig-4: Correlation of variables with age and autism scale, and their significance levels at 0.01 and 0.05

Table/Fig-4 presents the correlation between various variables, such as parental education, gender, screen time, and behavioral traits, with two key metrics: Age and the Autism Scale. The correlations are evaluated for their strength and significance at the 0.01 and 0.05 levels, with positive values indicating a direct relationship and negative values indicating an inverse one. A significant negative correlation is noted between gender and age (-

0.490), suggesting that younger individuals in the dataset tend to be male. A strong positive correlation is observed between the preference for screen time and the autism scale (0.692), indicating that higher screen exposure is associated with increased autism scores. Additionally, reduced eye contact shows a positive correlation with both age and the autism scale (0.672), highlighting its relevance in autism-related behaviors. Moderately significant correlations are seen between the change in social skills and the autism scale (-0.542), where lower social skills correlate with higher autism scores, and between time spent daily on social media and the autism scale (0.111), reflecting a weak positive association. These findings emphasize the complex relationships between demographic, behavioral, and environmental factors, pointing to areas for further research and potential intervention.

Sl. No.	Variable	Equality of Variances (F)	Sig. (Levene's Test)	t (Equal Var.)	df	Sig. (2-tailed)	95% CI Lower	95% CI Upper	Cohen's d	Hedges' Correction
1	Time Spent Daily on Social Media	19.6	<0.01	7.668	98	<0.05	1.482	2.518	0.782	0.789
2	Reduced Eye Contact	19.439	<0.01	8.982	98	<0.05	1.394	2.184	0.598	0.602
3	Social Interaction Struggles	29.27	<0.01	11.351	98	<0.05	2.1	2.989	0.673	0.678
4	Preference for Screen Time	41.738	<0.01	11.273	98	<0.05	2.573	3.672	0.831	0.837
5	Disrupted Sleep Pattern	20.45	<0.01	1.934	98	0.056	-0.026	2.048	1.568	1.58
6	Delay in Speech Development	45.581	<0.01	6.39	98	<0.05	1.149	2.184	0.782	0.789
7	Change in Social Skills	6.4	0.013	-8.854	98	<0.05	-1.088	-0.69	0.301	0.303
8	Limiting Child's Screen Time	1230.512	<0.01	2.864	98	0.005	0.14	0.771	0.477	0.481
9	Repetitive Behaviors	17.472	<0.01	6.135	98	<0.05	1.21	2.368	0.875	0.882

Table/Fig-5: shows independent t-test and effect size analysis for variables related to screen time and behavioral traits in children

The independent samples t-test results from table/Fig-5: reveal significant differences between groups for several variables, including time, reduced eye contact, social interaction struggles, preference for screen time, delay in

speech development, repetitive behaviors, and limiting child's screen time ($p < 0.05$). Change in social skills showed a negative mean difference, while limiting screen time and repetitive behaviors showed positive mean differences. For disrupted sleep patterns, a significant result emerged only when assuming unequal variances ($p = 0.056$ for equal variances). The effect size analysis, using Cohen's d and Hedges' correction, showed varying magnitudes of differences, with Cohen's d values ranging from small to large. Disrupted sleep pattern (Cohen's $d = 1.568$) and preference for screen time (Cohen's $d = 0.831$) exhibited the largest effect sizes, while change in social skills (Cohen's $d = 0.301$) had the smallest. Overall, the analysis as shown in table 4, highlights moderate to large effect sizes, particularly in behavior-related areas like social interaction struggles and repetitive behaviors.

Validity & Reliability of Questionnaire

Sl. No.	Test/Statistic	Result
1	Kaiser-Meyer-Olkin (KMO) Measure	0.374 (Sampling adequacy: low)
2	Bartlett's Test of Sphericity	Approx. Chi-Square: 188.465, df: 153, Sig.: 0.027 (Significant)
3	Communalities	Range: 0.642–0.914
4	Principal Components Extracted	8 Components, explaining 82% variance
5	Key Components (After Rotation)	- Component 1: Items Qn5, Qn15
		- Component 2: Items Qn1, Qn3
		- Component 3: Items Qn7, Qn14
		- Component 4: Items Qn9, Qn11
		- Others: Various loadings on remaining components
6	Rotation Method	Varimax with Kaiser Normalization
7	Component Transformation Matrix	Values ranged from -0.571 to 0.760

Table/Fig-6: shows summary of construct validity test

The average content validity index (CVI) calculated from the expert ratings is 0.72, indicating high content validity. The factor analysis was conducted to explore underlying dimensions in questionnaire responses as shown in table 5. After factor analysis, 18 questions were retained because they demonstrated strong factor loadings and contributed significantly to explaining the underlying behavioral and psychological dimensions influenced by social media exposure. The 7 eliminated questions either had low factor loadings, did not meaningfully contribute to the variance, or were redundant, improving the questionnaire's focus and validity. The Kaiser-Meyer-Olkin (KMO) measure was 0.374, indicating low sampling adequacy, while Bartlett's Test of Sphericity was significant ($p = 0.027$), supporting the suitability of factor analysis. Eight components were extracted, collectively explaining 82% of the variance, with communalities ranging from 0.642 to 0.914. Varimax rotation revealed distinct groupings, such as Qn5 and Qn15 loading strongly on Component 1 and Qn1 and Qn3 on Component 2, indicating different behavioral or psychological domains influenced by social media exposure. These findings suggest that exposure to reels may affect multiple facets of behavior linked to virtual autism.(Table/Fig-6)

Sl No.	Statistic	Value
1	Cases	25
2	Valid Cases (%)	100%
3	Reliability (Cronbach's Alpha)	0.849
4	Cronbach's Alpha (Standardized)	0.778
6	Friedman's Chi-Square	9.594
7	Significance (p-value)	0
8	Sum of Squares (Between Items)	240.198
9	Degrees of Freedom (df)	23
10	Mean Square (Between Items)	10.443

11	Residual Nonadditivity	158.044
12	Nonadditivity (p-value)	0
13	Grand Mean	3.4383
14	Tukey's Estimate of Power	6.199

Table/Fig-7: Summary of reliability analysis results

The reliability testing as shown in table 6 of 25 questions, assessed by 15 pediatric dentists and 10 psychologists, showed high internal consistency, with a Cronbach's Alpha of 0.849, indicating good reliability. The analysis revealed significant variability between the 24 items, as indicated by a Friedman's Chi-Square value of 9.594 and a p-value of 0.000, highlighting that raters provided differing assessments for each question. The grand mean score of 3.44 suggests moderate agreement across the questions. The results confirm that the questions are reliable and valid for use in research or clinical settings.(Table/Fig-7)

DISCUSSION

This study highlights the significant impact of social media reel exposure on children's behavior and autism-related traits, emphasizing the need for regulated screen time, consistent routines, parental guidance, and targeted interventions to promote healthier developmental outcomes. According to previous research, children at risk for autism exhibit heightened sensitivity to digital media, which can lead to the manifestation of symptoms of the disorder, particularly language delay.[3] A retrospective study by Alghurabawi et al. (2022) found that children with ASD had longer screen time, started screen viewing earlier, and spent less time playing with their mothers compared to their siblings.[14]

Hermawati et al. documented significant behavioral changes, such as hyperactivity and delayed language, in Indonesian children with ASD symptoms who were exposed to more than three hours of screen time daily. Children showed increased hyperactivity, reduced attention spans, and delayed language development.[[15]] While a relationship between early screen exposure and autism-related symptoms, describing it as "early media overexposure" syndrome, this research specifically focuses on the impact of social media reels—a newer and distinct form of screen exposure.[8] Unlike broader screen time, this study highlights how screen time and stimulating content influence specific behaviors like social withdrawal, language delays, and disrupted sleep patterns.

Neurochemical studies show deficiencies in the levels of major neurotransmitters such as dopamine, acetylcholine, gamma-aminobutyric acid (GABA), and 5-hydroxytryptamine (5-HT) in young children with behavioral abnormalities caused by excessive screen time during early childhood. In contrast, children with autism spectrum disorder (ASD) show receptor polymorphisms in these primary neurotransmitters, altering their biological action and metabolism, leading to elevated levels, particularly for 5-HT and GABA.[16],[17]

Exposure to screens at earlier ages poses a higher risk of developing ASD symptoms, as at a younger age the brain is more prone to genetic variables that affect development later in life.[11] Previous research by Dieu-Osika et al. (2020) and Sarfraz et al. (2023) described the association between early screen exposure and autism-related symptoms as "early media overexposure" syndrome, suggesting that symptoms such as speech delay and ASD-like behaviors in toddlers may be reversible upon reducing or eliminating screen exposure.[18],[10]

These findings align with the present study, reinforcing the role of excessive screen time in the emergence or exacerbation of ASD-like behaviors in children. Research by Aishworiya et al. and Chen et al. emphasizes that screen exposure not only influences social and behavioral traits but that its reduction, alongside improved caregiver interaction, adequate sleep, and outdoor activities, may help mitigate these symptoms—supporting the need for regulated screen use as part of early behavioral interventions in at-risk children.[19],[20] A notable study by Tanimura et al. (2007) demonstrated that frequent television viewing in infants was associated with reduced parental verbal engagement and delayed speech development , highlighting how excessive screen exposure can impair caregiver interaction—a key mediator in ASD-like outcomes.[21]

The use of audiovisual media as a distraction technique in pediatric care is effective but must be used cautiously due to its potential link with neurological issues and

ASD-like symptoms when overused. Limiting screen exposure time helps prevent the onset or worsening of these symptoms by reducing overstimulation and allowing the child's brain to engage in more natural, interactive developmental processes. Establishing a dental home and providing pre-appointment parental counseling are proactive strategies that not only support optimal behavior during treatment but also guide families in managing screen time and promoting healthy routines. Sensory-adapted environments serve as a safer alternative by encouraging emotional regulation and attention without relying on fast-paced visual stimuli. Moving forward, incorporating screen-time education and sensory-friendly approaches should become a standard part of pediatric healthcare, ensuring both immediate cooperation and long-term developmental well-being.[22],[23]

Setting up screen-free periods and establishing explicit guidelines about the quantity and kind of screen time are two parental strategies for limiting children's screen exposure.[24] Kamenetz (2018), emphasizes mindful screen use, shared media experiences, and healthy boundaries; strategies clinically relevant for reducing excessive screen exposure and mitigating ASD-like symptoms in children; alongside practical techniques such as creating screen-free areas, using parental locks, and restricting access to chargers and electronic devices.[25] Lewis et al. (2021) highlighted effective strategies like screen-free zones, parental controls, and behavior modeling to reduce screen time in young children—key factors in managing ASD-related behaviors. Fathima et al. (2024) demonstrated how sensory-adapted environments and structured behavioral techniques reduce overstimulation, reinforcing the relevance of these approaches in minimizing screen-related ASD symptoms.[26],[27]

Chen et al. highlighted that early screen use is associated with autistic-like behaviors, especially when coupled with reduced parent-child interaction, sleep disturbances, and lack of outdoor activity.[20] Similarly, Slobodin and Heffler emphasized in their systematic review that prolonged screen time has a consistent association with ASD symptoms, including language delays and social withdrawal.[28] The American Academy of Pediatrics also underscores the risks of excessive media use in early childhood and its link to delays in cognitive and socio-emotional development.[29] Harlé introduced the term "virtual autism" to describe ASD-like symptoms resulting specifically from intensive early screen exposure, which mirrors the behavioral traits observed in our study such as reduced eye contact and imitation.[7] Dahiya et al. reported overlapping symptoms between children diagnosed with ASD and those exhibiting screen-induced developmental traits, further supporting our focus on behavioral differentiation.[30],[31] Research by Hutton et al. linked high screen use to altered brain structure in young children, reinforcing the neurodevelopmental implications of digital overexposure.[32] In a large cohort study, Kushima et al. demonstrated that screen time at age one was significantly associated with an ASD diagnosis by age three, particularly in boys.[11] Dieu-Osika et al. described this as "early media overexposure syndrome" and reported improvements in behavior following screen time reduction [18], which was echoed in retrospective findings by Alghurabawi et al., showing ASD children had earlier and longer screen exposure than their typically developing siblings [14],[33]. These comparative findings emphasize the importance of this study's focus on social media reels, a novel and highly stimulating form of digital exposure, and reinforce the urgency for early parental guidance, screen regulation, and therapeutic interventions. Also, these findings have important clinical implications, as they call for pediatricians, dentists, and child health professionals to actively screen for excessive screen exposure during routine visits[34], provide early parental guidance to families, and incorporate screen-time regulation as part of behavioral and developmental assessments to prevent or mitigate ASD-like symptoms.[35]

Limitations: This study has several limitations. It primarily relied on parental self-reports, which may introduce reporting bias and subjectivity in assessing screen time and behavioral symptoms. Key confounding factors such as family history of autism, genetic predisposition, and existing neurological conditions were not considered. The study also did not control for the type and content of screen exposure, which can vary significantly in impact. Additionally, the small sample size limits the statistical power and generalizability of the findings. Future studies should aim to include larger, more diverse populations, account for a wider range of confounding variables, and use objective tools such as

standardized behavioral assessments, neurophysiological evaluations, and screen tracking technologies to strengthen the reliability and applicability of results.

CONCLUSION

The present study draws attention to the considerable influence of social media reels on the developmental patterns of young children, particularly in relation to behaviors resembling virtual autism. Extended screen exposure was notably associated with challenges such as reduced social interaction, delayed speech development, and disturbances in sleep. These observations point to the importance of implementing focused strategies, including active parental supervision, limiting screen usage, and fostering direct social engagement. It is equally important for healthcare providers to be informed about the developmental implications of excessive screen exposure. Establishing structured guidelines and offering support systems can help prevent potential autistic patterns and foster balanced digital habits in children.

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