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"EFFECT OF SCREEN TIME ON ORAL HEALTH IN CHILDREN": AN OBSERVATIONAL STUDY

Pedodontics

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ABSTRACT

Screen time encompasses the time spent on electronic gadgets such as smart phones, tablets, computers and televisions & they have become an integral part of modern childhood. However, there have been growing concerns about the impact of screens on children and young people's overall health. With increasing digital device usage among children, concerns are rising about its potential impact on general and oral health. Recent research suggests a strong association between increased screen time and adverse oral health outcomes, including poor oral hygiene and a higher prevalence of dental caries. **Aim:** The aim of this study was to evaluate the relationship between scree n time and oral health among children between 5- 12 years of age and to assess the association between screen time duration, oral hygiene status and prevalence of dental caries. **Material And Method:** A cross-sectional, observational study was conducted on 200 healthy and cooperative children from the department of Paediatric and Preventive Dentistry in Rishikesh . Oral health was assessed using DMFT/deft and OHI-S scores. Screen time was measured using a pre-validated, open ended Digital Screen Exposure Questionnaire (DSEQ)[1] provided to parents. Data were statistically analyzed. **Results:** As screen time increased, both DMFT/deft and OHI-S scores also increased, indicating that higher screen time was associated with a greater prevalence of dental caries and poorer oral hygiene.

KEYWORDS

Screen time, Digital device, Oral health, Prevalence

INTRODUCTION

Dental caries, considered by the World Health Organization as a major public health problem globally, and the most widespread non-communicable disease, share common risk factors, such as diet, with other conditions, such as obesity. Excessive consumption of high- fat, high- sugar foods and sugar-sweetened beverages, along with poor dietary patterns, significantly contributes to the development of dental caries. It has been found that having the television on during meals reduces diet quality by increasing the intake of unhealthy foods and decreasing the consumption of fruits and vegetables, further increasing the risk of dental caries.[2]

In today's digital age, the increasing prevalence of screens and electronic devices has significantly altered the lifestyle and habits of children across the globe. While these technological advancements have undoubtedly brought about numerous benefits in terms of education, entertainment, and communication, concerns have also emerged regarding their potential impact on the oral and overall health and wellbeing of children.[3]

The American academy of Paediatrics 2016 recommended limiting screen time for children aged 2-5 years to 1 hour/day of high-quality programmers and for parents to limit screen time in agreement with CYP 6 years and older. In their 2016 statement, they revised their recommendation for no screen time for children under 24 months.[3] The American Academy of Paediatrics recommends that the screen time of children and adolescents should be limited to no more than 2 h/day.[4]

The Indian academy of Paediatrics 2021 recommends that children below 2 years age should not be exposed to any type of screen, whereas exposure should be limited to a maximum of one hour of supervised screen time per day for children 24-59 months age, and less than two hours per day for children 5-10 years age.[5] The inadequate dietary habits associated with excessive screen time, such as consumption of energy-dense high-fat high-sugar foods and beverages and reduced consumption of fruit and vegetables, apart from other metabolic disorders, can also lead to a higher prevalence of dental caries and increased plaque accumulation.[6] In addition, the unhealthy lifestyle constituting excess screen viewing might influence oral health behaviours such as tooth brushing frequency, routine dental check-ups and oral hygiene status.[7]

Oral health problems are significant issues that impact not only children's dental health but also their psychosocial wellbeing, including dental pain, anxiety and missed school days. This observational study seeks to explore the effect of screen time on oral health among children aged 5-12 years in the Rishikesh population.

MATERIALS AND METHOD:

This cross-sectional observational study was conducted over a period of three months. A total of 200 healthy and cooperative children aged between 5-12 years visited the department of Paediatric and Preventive dentistry. Ethical clearance was obtained from the Institutional Ethical Review Board prior to the commencement of study. After obtaining informed consent from the parents or guardians and assent from the children, each participant underwent a clinical oral examination using a mouth mirror and probe under operating light. DMFT/deft and OHI-S scores were recorded to assess dental caries and oral hygiene status, respectively.

A pre- validated open ended Digital Screen Exposure Questionnaire (DSEQ)[1] **(Figure. 1)** was provided to the parents of the participating children. The observer completed the questionnaire during a face-to-face interview to ensure accuracy and consistency in data collection. Each child- parent pair was assigned a unique identification code to maintain confidentiality.

Development and evaluation of the digital screen exposure questionnaire (DSEQ) for young children

1. What is the frequency of watching television in a typical week?	
2. Duration of watching television on a typical working day?	
3. Duration of watching television on a typical holiday?	
4. Does the child watch television supervision frequency by an adult?	
5. What is the frequency of using smartphone in a typical week?	
6. Duration of using smartphone on a typical working day?	
7. Duration of using smartphone on a typical holiday?	
8. Does the child us smartphone supervision frequency by an adult?	
9. What is the frequency of watching laptop/ computer in a typical week?	
10. Duration of watching laptop/ computer on a typical working day?	
11. Duration of watching laptop/ computer on a typical holiday?	
12. Does the child watch laptop/ computer supervision frequency by an adult?	
13. Do you have any rules regarding when, where, what & how to watch digital screen?	
14. Average duration of screen time per day of the caretaker	
Domain 3: Level of physical activity	
15. Average duration of outside play per day on working/ school days	
16. Average duration on holidays of outside play per day	
Domain 4: Media behaviours of the child	
17. The child uses digital media gadgets for completing homework assignments online	
18. The child uses video calling applications to talk to the family/ friends	
19. The child uses digital media gadgets for learning poems, rhymes, alphabets etc	
20. The child uses digital media gadgets to learns math's, numbers, tables	
21. The child uses digital media gadgets to recognize shapes/ sounds/ colours	
22. The child uses digital media gadgets to learns various sciences online	
23. The child uses digital media gadgets to learns to draw/ write	
24. The child plays video games on digital media gadgets	
25. The child uses digital media gadgets to watches stories	
26. The child uses digital media gadgets to watch adult programs (soap opera, news, sports, movies etc.) on media screens online	
27. The child uses digital media gadgets to learns letters, words, vocabulary, language online	
28. Digital media gadgets to watch random things for enjoyment (music, advertisements, click photos etc.)	

Figure1: Digital Screen Exposure Questionnaire (DSEQ) used in the study.[1]

Based On The Reported Screen Time, Children Were Categorized Into 2 Groups:
Group 1: Screen time less than 2 hours/ day
Group 2: Screen time 2 hours/day or more

All data were compiled and statistically analyzed to assess the relationship between screen time DMFT/deft and OHI-S scores.

Inclusion Criteria:-
- Cooperative children b/w 5-12 years of age with 'positive' rating on Frankel's behavior rating scale
- Parents of children aged between 5-12 years
- Participants willing to take part in the study
- Participants having at least 1 smartphone, TV Laptop, computer, videogame

Exclusion Criteria:-
- Uncooperative children
- Specially abled children, medically compromised children
- Lack of Parental/Guardian Consent
- Participants who does not have access to electronic gadgets

RESULTS:

Table 1: Association Of Screen Time With OHIS Score:

Screen time group	OHIS Score (Mean± SD)	t-value	P-value
Group 1: <2 hrs	1.161±0.4478	-11.062	<0.001*
Group 2: >= 2 hrs	2.046±0.6692		

Independent t test; * indicates significant difference at $p \leq 0.05$.

Table 1. illustrates the association between screen time duration and oral hygiene status measured using the OHI-S (Oral Hygiene Index-Simplified) score. In **Group 1,** children had a significantly better oral hygiene status with a mean OHI-S score of **(1.161±0.4478),** compared to **Group 2** where the mean score was higher **(2.046±0.6692)**. The difference therefore was statistically significant **(t=11.062, p< 0.001),** indicating that increased screen time is associated with poorer oral hygiene in children.

Table 2: Association Of Screen Time With DMFT Score

Screen time group	DMFT Score (Mean ±SD)	t-value	P-value
Group 1: <2 hrs	1.41±1.094	-10.127	<0.001*
Group 2: >= 2 hrs	3.28±1.454		

Independent t test; * indicates significant difference at $p \leq 0.05$.

Table 2. illustrates the association between screen time duration and prevalence of dental caries, as measured by the DMFT (Decayed, Missing, and Filled Teeth) score. In **Group 1,** the mean DMFT score was **(1.41 ± 1.094),** indicating a relatively lower prevalence of dental caries. In contrast, **Group 2 ,** exhibited a significantly higher mean DMFT score of **(3.28 ± 1.454)**. This difference was statistically significant **(t = -10.127, p < 0.001),** suggesting a positive association between increased screen time and the prevalence of dental caries in children.

Table 3: Correlation Between Screen Time and OHI-S Score using Pearson Correlation Coefficient

Variable	Pearson Correlation Coefficient (r)	p-value	Sample Size (N)	Interpretation
Screen time	.638	<0.001*	200	Strong positive correlation with OHI-S score.
OHIS Score				

Increased screen time is strongly associated with poorer oral hygiene.

Table 3. illustrates a **strong positive correlation (r = 0.638)** between screen time and OHIS score. This suggests that as screen time increases, the OHIS score (indicating poorer oral hygiene) also increases. The correlation is statistically significant **(p < 0.001)**, demonstrating that higher screen time is strongly correlated with poorer oral hygiene.

Table 4. shows a **strong positive correlation (r = 0.593)** between screen time and DMFT scores. This indicates that children with higher screen time tend to have more decayed, missing, or filled teeth. The result is statistically significant (**p <0.001**), reinforcing the correlation between increased screen time and greater risk of dental caries.

Table 4: Correlation Between Screen Time and DMFT Score using Pearson Correlation Coefficient:

Variable	Pearson Correlation Coefficient (r)	p-value	Sample Size (N)	Interpretation
Screen time	.593	<0.001*	200	Strong positive correlation with OHI-S score.
OHIS Score				

Increased screen time is strongly associated with increased prevalence of dental caries.

DISCUSSION:

The finding of the study demonstrates a significant association between increased screen time and poorer oral health among children aged between 5-12 years, as evidenced by higher DMFT/deft and OHI-S scores in children with ≥2 hours of daily screen exposure. These results align with a growing body of literature emphasizing the detrimental effects of excessive screen time on paediatric oral health.

Numerous studies have reported the detrimental effects of excessive screen time on obesity, metabolic syndrome, sleep disorders, cardiovascular diseases and even chronic non-communicable diseases such as dental caries.[8-10] The American Academy of Paediatrics recommends that the screen time of children and adolescents should be limited to no more than 2 h/ day.[11]

Excessive screen time is often associated with poor dietary habits, including increased intake of energy-dense, high-fat, and high-sugar foods and beverages, along with decreased consumption of fruits and vegetables.[12] These behaviours not only contribute to metabolic disorders but also increase the risk of dental caries and plaque accumulation.[13] Furthermore, a sedentary lifestyle characterized by prolonged screen exposure may negatively impact oral health behaviours such as tooth brushing frequency, routine dental visits, and overall oral hygiene practices.[14]

Garg N et al[15] in a similar study concluded that children who spend two or more hours daily viewing screen devices may develop an inclination toward consuming junk food, acidic food and pouching food in oral vestibule. As a result, they may experience higher levels of DMFT, GI and PI which is in accordance with our results.

In a study by AlSaffan et al [16] they analyzed the content of online advertisements and found that platforms like YouTube use a person's browsing history to show targeted ads. Accounts that often played children's videos were shown more food and beverage ads, especially those high in sugar and fat.[17] In contrast, healthy foods like fruits, vegetables, and protein- rich items (such as meat, fish, eggs, dairy and nuts) were rarely promoted. Among all food types, candy was the most frequently advertised. Arikan D et al[18] found a significant correlation between the time children spend on watching television and their eating habits, Specifically, it was found that increased screen time was associated with higher consumption of soft drinks among children which can in turn negatively impact oral health by contributing to higher risk of dental caries and enamel erosion due to frequent intake of sugary and acidic beverages.

In other study done by Naik SS et al[19] results revealed a statistically significant correlation between higher screen time and adverse oral health indicators, including increased DMFT scores and poor OHIS scores. These findings align with our study suggesting that prolonged screen time contributes to sedentary lifestyles and dietary habits rich in sugar and processed foods- factors known to elevate the risk of dental caries and other oral health issues. Robin A et al[20] reported a correlation between higher screen time and an increase number of cavitated lesions. Although their study found no significant difference in early-stage (non-cavitated) lesions across screen time groups, the overall trend indicated a detrimental impact of screen time on oral health, likely mediated by associated behavioral and dietary factors. These findings are in line with present study, further emphasizing the role of screen habits in paediatric oral health outcomes.

Certain limitations of the study need to be considered. First, the study was conducted on a relatively limited number of participants, which may affect the generalizability of the findings to a broader population. Second, potential confounding factors such as parental education, dietary habits, socioeconomic status, and access to dental care were not controlled, all of which can significantly influence oral health

outcomes in children. Third, the absence a long-term follow-up restricts the ability to assess how screen time habits may impact oral health behaviours and outcomes over time.

Dentists play a crucial role in promoting healthy practices by guiding parents and caregivers on the importance of limiting screen time and encouraging nutritious eating habits as a part of daily oral hygiene routines, at a community level, they can actively support school health programs by participating in teacher training and offering child-parent counselling sessions, helping to raise awareness about the impact of screen time on oral and overall health.

CONCLUSION:

The findings of the study highlight a significant link between increased screen time and poorer oral health in children aged 5-12 years, as reflected by higher DMFT/deft and OHI-S scores in those with ≥2 hours of daily screen exposure. These results supports existing evidence that excessive screen time is a potential risk factor for compromised paediatric oral health, underscoring the need for early interventions and preventive strategies.

Importantly The American Academy of Paediatrics (AAP) recommends limiting screen time for children and adolescents to not more than 2 hours per day. Our study also align with this guideline, indicating screen exposure beyond this limit may contribute to adverse oral health outcomes. Therefore, adherence to these recommendations becomes crucial. Raising awareness among parents and schools about how excessive screen time adversely affects oral health is essential for developing effective parental control strategies and encouraging healthier dietary habits in children. Providing accurate information can play a key role in preventing dental problems and supporting better overall health outcomes in the paediatric population.

REFERENCES:

1. Kaur N, Gupta M, Kiran T, Malhi P, Grover S. Development and evaluation of the digital-screen exposure questionnaire (DSEQ) for young children. PLoS One. 2021 Jun 22;16(6):e0252952.
2. Shqair AQ, Pauli LA, Costa VPP, Cenci M, Goettems ML. Screen time, dietary patterns and intake of potentially cariogenic food in children: A systematic review. J Dent. 2019;86:17–26.
3. Beatty C, Egan SM. Screen time in early childhood: A review of prevalence, evidence and guidelines. An Leanbh Óg. 2020 Aug 22;13(1):17–31.
4. Reid Chassiakos YL, Radesky J, Christakis D, Moreno MA, Cross C, Hill D, et al. Children and adolescents and digital media. Pediatrics. 2016 Nov 1;138(5):e20162593.
5. Gupta P, Shah D, Bedi N, Galagali P, Dalwai S, Agrawal S, et al. Indian Academy of Pediatrics guidelines on screen time and digital wellness in infants, children and adolescents. Indian Pediatr. 2022 Mar;59(3):235–44.
6. Garg N, Khatri A, Kalra N, Tyagi R. The association of screen time with intake of potentially cariogenic food and oral health of school children aged 8–14 years: A cross-sectional study. J Clin Pediatr Dent. 2023 Sep 1;47(5):314–9.
7. Olczak.Kowalczyk D, Tomczyk J, Gozdowski D, Kaczmarek U. Excessive computer use as an oral health risk behaviour in 18.year.old youths from Poland: A cross.sectional study. Clin Exp Dent Res. 2019;5(3):284–93.
8. Silva RDNMT, Duarte DA, Oliveira AMG. The influence of television on the food habits of schoolchildren and its association with dental caries. Clin Exp Dent Res. 2020;6(1):24–32.
9. Carra MC, Schmitt A, Thomas F, Danchin N, Pannier B, Bouchard P. Sleep disorders and oral health: A cross-sectional study. Clin Oral Investig. 2017;21(3):975–83.
10. Alberga AS, Sigal RJ, Goldfield G, Prud'homme D, Kenny GP. Overweight and obese teenagers: Why is adolescence a critical period? Pediatr Obes. 2012;7(4):261–73.
11. Bomfim RA, Frias AC, Cascaes AM, Mazzilli LE, Souza LB, Carrer FC, et al. Sedentary behavior, unhealthy food consumption and dental caries in 12-year-old school children: A population-based study. Braz Oral Res. 2021;35:e041.
12. Al-Zahrani MS, Borawski EA, Bissada NF. Poor overall diet quality as a possible contributor to calculus formation. Oral Health Prev Dent. 2004;2(4):345–9.
13. Olczak.Kowalczyk D, Tomczyk J, Gozdowski D, Kaczmarek U. Excessive computer use as an oral health risk behaviour in 18.year.old youths from Poland: A cross.sectional study. Clin Exp Dent Res. 2019;5(3):284–93.
14. Al-Mazyad M, Flannigan N, Burnside G, Higham S, Boyland E. Food advertisements on UK television popular with children: A content analysis in relation to dental health. Br Dent J. 2017;222(3):171–6.
15. Garg N, Khatri A, Kalra N, Tyagi R. The association of screen time with intake of potentially cariogenic food and oral health of school children aged 8–14 years: A cross-sectional study. J Clin Pediatr Dent. 2023 Sep 1;47(5):314–9.
16. AlSaffan AD, AlDayel E, AlZamami M, Satout A, AlMotairi Y, Pani SC. A content analysis of food and beverage advertisements associated with Arabic children's videos on the internet and its relation to dental health. Saudi J Oral Sci. 2017 Jul 1;4(2):96–100.
17. Farsi DJ, Elkhodary HM, Merdad LA, Farsi NM, Alaki SM, Alamoudi NM, et al. Prevalence of obesity in elementary school children and its association with dental caries. Saudi Med J. 2016;37(12):1387–94.
18. Arikan D, Bekar P. Children's eating habits and obesity while watching television. Iran J Pediatr. 2017;27(2):e8125.
19. Naik SS. Influence of screen time on oral health. Int J Health Sci Res. 2024 Jul;7 (4):463–8.
20. Austin R, Vaishnavi P, Kavitha S, Vignesh KC, Vivek K, Selvakumar H. Association between screen time, dietary patterns, and oral health among children: A cross-sectional study. Cureus. 2025;17(3):e36285