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Original Article

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Consortium of Electronic Gadgets on Oral Health, General Health and Quality of Life of Children in Jammu Province

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ABSTRACT

Background: Just another hour, please! This is what most parents hear from their children every time it is time to stop using an electronic gadget. In this fast-moving world, Electronic gadgets, the latest exquisite invention, have become an inevitable part of our everyday life and are popular among children as well. While they are convenient to use, can have adverse effects on the oral health, general health and quality of life of children. Thus, it is imperative to explore its effect of daily life of the children.

Aim: The aim of this study was to determine the impact of duration of electronic gadget usage on oral health, general health, and the quality of life of children.

Method: The study was conducted among 531 dyads of parents and children aged between 3 to 14 yrs using electronic gadgets. For adequate and effective quantification of data, the research instruments used in this study were, a structured questionnaire for interview, DMFT/deft scores, scales for measurement of height and weight, review of result card and vision test.

Result: The results of this study indicated that use of electronic gadgets for ≥ 5 hrs by children significantly affected their oral health, general health and overall quality of life.

Conclusion: Children are the foundation of our country's future. Therefore, it is imperative to safeguard children against the potential risks associated with increased duration of electronic gadget use. There is a need to optimize gadget usage and promote oral and general health measures in children.

Key Words: *Electronic Gadgets, Smartphone, Oral Health, General health, Television, Quality of life, Pediatric dentistry*

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INTRODUCTION

Technology is an integral part of our daily lives and has profoundly influenced the way we live, work, play, and socialize. As the technology has flourished in recent decade, the use of electronic gadgets has grown at an unprecedented pace all around the world [1]. In this fast-moving world, electronic gadgets, the latest exquisite invention, have become an inevitable part of our everyday lives. These gadgets have evolved into an inexorable tool that propels the rhythm of our daily chores. Our daily lives start and end with the use of these electronic gadgets. Almost everyone is equipped with some form of electronic gadget. These include smartphones, televisions, laptops, computers, tablets, etc. In modern times, not just adults but also children have become unduly engrossed in these electronic gadgets. The use of electronic gadgets can have a negative as well as a positive impact on children [2]. Children of this generation belong to Generation Alpha, who are the true generation of the digital world, having round-the-clock access to these electronic gadgets. While electronic gadgets have made our lives convenient, they may have adverse effects, raising concerns regarding their impact on children in terms of their oral health and general health. These captivating screens may also present a number of long-term health risks. The exorbitant use of these gadgets may have a significant impact on an individual's lifestyle. According to the Centre for Disease Control and Prevention in the United States, on an average, children aged between 8-10 yrs spend approximately 6 hours each day watching electronic devices [3]. Electronic gadgets represent one of the most important and under recognized contrivance influencing children's overall quality of life. It is acceptable to own a technology, but what is not acceptable is to be owned by one. Globally, today's gadget-dependent population is

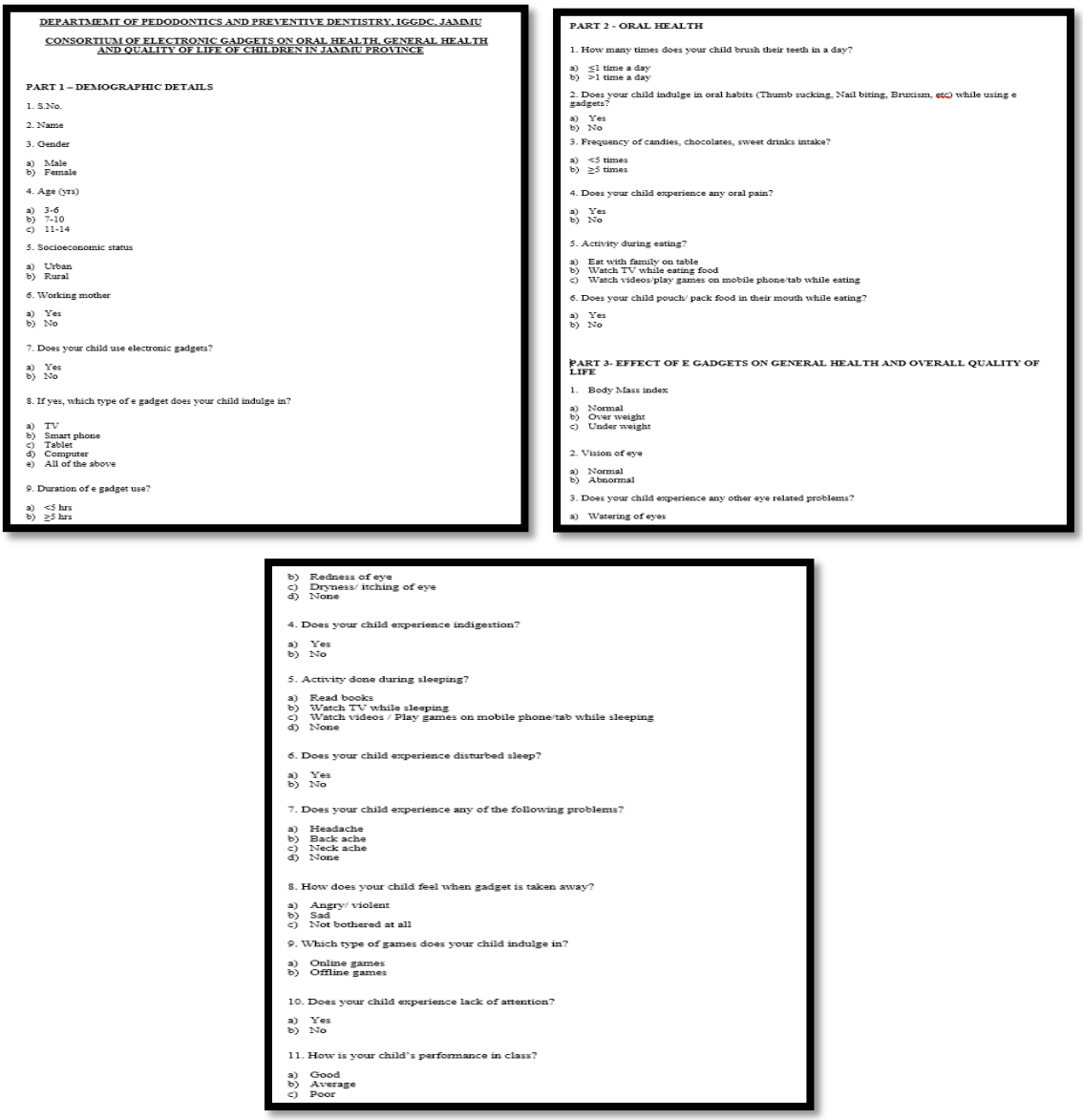
continually adopting an unhealthy, sedentary lifestyle, endangering their health. Thus, it is imperative to explore the effect of use of electronic gadgetson the daily lives of children.

AIM

The aim of this study was to determine the impact of duration of electronic gadget usage on oral health, general health, and the quality of life of children.

METHODOLOGY

This cross-sectional study was conducted in the Department of Pedodontics and Preventive Dentistry, IGGDC, Jammu from June to Dec 2022. This study included 531 dyads of parents and children aged between 3 to 14 yrs using electronic gadgets. For adequate and effective quantification of data, the research instruments used in this study were, a structured questionnaire for interview, DMFT/deft index, scales for measurement of height and weight, review of result card and vision test. Data was gathered through face-to-face interview using a structured questionnaire. The questionnaire was validated and consisted of 3 parts [Figure 1]. Part 1 included information regarding their socio-demographic features and the duration of usage of electronic gadgets by children. Part 2 included the information regarding their oral health and part 3 included the information regarding their general health and quality of life. The questionnaire was framed in a simple manner that can be easily understood by everyone. The oral health status of children was determined clinically by determining their DMFT/deft index scores. Children's physical test were carried out for determining their body mass index by measuring their height and weight and reviewing their vision test. Children's result cards were collected to review their academic performance. The marks were expressed in percentage and interpreted as good academic performance for more than or equal to 75%, average academic performance for 60-75% and poor academic performance for < 50%.The incomplete data including inappropriate responses were managed by exclusion of the same.



DEPARTMENT OF PEDODONTICS AND PREVENTIVE DENTISTRY, IGGDC, JAMMU

CONSORTIUM OF ELECTRONIC GADGETS ON ORAL HEALTH, GENERAL HEALTH AND QUALITY OF LIFE OF CHILDREN IN JAMMU PROVINCE

PART 1 – DEMOGRAPHIC DETAILS

1. S.No.

2. Name

3. Gender

a) Male
b) Female

4. Age (yrs)

a) 3-6
b) 7-10
c) 11-14

5. Socioeconomic status

a) Urban
b) Rural

6. Working mother

a) Yes
b) No

7. Does your child use electronic gadgets?

a) Yes
b) No

8. If yes, which type of e gadget does your child indulge in?

a) TV
b) Smart phone
c) Tablet
d) Computer
e) All of the above

9. Duration of e gadget use?

a) <5 hrs
b) ≥5 hrs

PART 2 - ORAL HEALTH

1. How many times does your child brush their teeth in a day?

a) ≤1 time a day
b) >1 time a day

2. Does your child indulge in oral habits (Thumb sucking, Nail biting, Bruxism, etc) while using e gadgets?

a) Yes
b) No

3. Frequency of candies, chocolates, sweet drinks intake?

a) <5 times
b) ≥5 times

4. Does your child experience any oral pain?

a) Yes
b) No

5. Activity during eating?

a) Eat with family on table
b) Watch TV while eating food
c) Watch videos/play games on mobile phone/tab while eating

6. Does your child pouch/ pack food in their mouth while eating?

a) Yes
b) No

PART 3- EFFECT OF E GADGETS ON GENERAL HEALTH AND OVERALL QUALITY OF LIFE

1. Body Mass index

a) Normal
b) Over weight
c) Under weight

2. Vision of eye

a) Normal
b) Abnormal

3. Does your child experience any other eye related problems?

a) Watering of eyes
b) Redness of eye
c) Dryness/ itching of eye
d) None

4. Does your child experience indigestion?

a) Yes
b) No

5. Activity done during sleeping?

a) Read books
b) Watch TV while sleeping
c) Watch videos / Play games on mobile phone/tab while sleeping
d) None

6. Does your child experience disturbed sleep?

a) Yes
b) No

7. Does your child experience any of the following problems?

a) Headache
b) Back ache
c) Neck ache
d) None

8. How does your child feel when gadget is taken away?

a) Angry/ violent
b) Sad
c) Not bothered at all

9. Which type of games does your child indulge in?

a) Online games
b) Offline games

10. Does your child experience lack of attention?

a) Yes
b) No

11. How is your child's performance in class?

a) Good
b) Average
c) Poor

Figure 1: Questionnaire

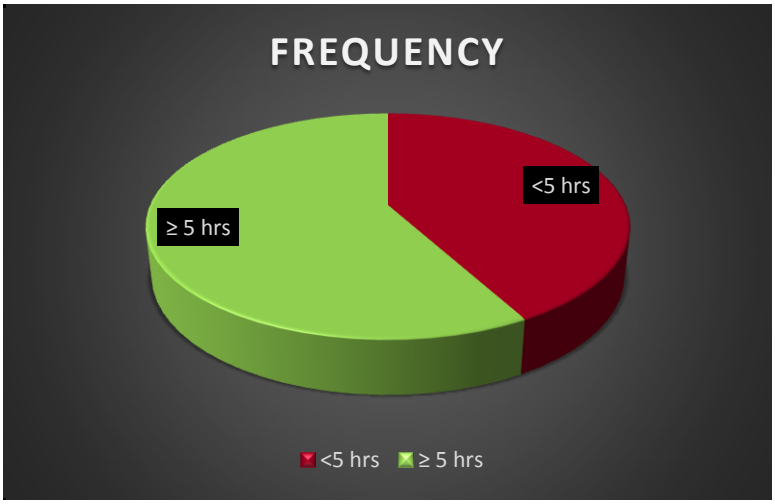
STATISTICAL ANALYSIS

The information was collected manually and entered into a Microsoft Excel sheet. Statistical analysis was done using IBM SPSS 21 Statistics Software. The frequency was calculated for categorical data and the mean was calculated for continuous data. Chi-square statistics and independent t test were used to find out the statistical association. The p values less than 0.05 was considered as statistically significant.

RESULTS

Socio-Demographic Characteristics

The duration of use of electronicgadget was less than 5 hrs in 42% of children while 58% children used electronic gadgets for≥ 5 hrs[Graph 1].The duration of use of electronic gadget was significantly higher i.e. ≥ 5 hrs in children aged between 11-14 yrs (69%) followed by 7-10 yrs (67.2%).Comparatively, duration of electronic gadget usage was lessin children aged between 3-6 years where in 79.71% of children used electronic gadget for less than 5 hrs.59.7% children belonging to urban area used electronic gadgets for ≥ 5 hrs duration in contrast to children belonging to rural area where 35.2% children used electronic gadgets for ≥ 5 hrs. In urban population, most commonly used electronic gadget was smartphone while in rural population the most commonly used electronic gadget was television.70 % of children whose mothers were working indulged in electronic gadget usage for ≥ 5 hrs. No significant difference was seen in duration of electronic gadget usage in both genders. [Table 1]



Graph 1: Frequency of Electronic Gadget Usage According to Duration

Table 1: Socio-Demographic Characteristics

SOCIO DEMOGRAPHIC FEATURES	TOTAL	DURATION OF USE		P VALUE	CHI SQUARE
		<5 HRS	≥ 5 HRS		
GENDER					
MALE	267	112	155	0.977	0.0008164
FEMALE	263	110	153		
AGE					
3-6	138	98	40	0.0001*	66
7-10	183	60	123		
11-14	210	90	145		
REGION					
URBAN	318	128	190	0.0001*	30.72
RURAL	213	138	75		
MOTHER'S OCCUPATION					
WORKING MOTHER	160	48	112	0.0001*	13.53
NON WORKING MOTHER	371	175	196		

ASSOCIATION OF ORAL HEALTH WITH DURATION OF ELECTRONIC GADGET USAGE

The average frequency of tooth brushing per day, indulgence in oral habit, frequency of sweet intake and experience of oral pain differed significantly with duration of electronic gadget usage. It was observed that 67.1 % of children who brushed their teeth ≤ one time a day generally used electronic gadget for ≥ 5 hrs. Also, a significant association was seen with increased duration of electronic gadget usage and indulgence in oral habits (p <0.0001). 71.6% ofchildren who

indulged in oral habits used electronic gadgets ≥ 5 hrs as compared to those using gadgets for less than 5 hrs. It was also observed that frequency of sweet intake and experience of oral pain was significantly associated with increased duration of electronic gadget usage(p <0.0001).Frequency of sweet intake was more than 5 times a day in 67.1 % of children with duration of gadget use ≥ 5 hrs.67.7% of children who experienced oral pain used gadgets ≥ 5 hrs than those using gadgets for less than 5 hrs (32.2%) [Table 2]. A significant association was observed between mean DMFT/deft scores and increased duration of electronic gadget usage. It was observed that children using electronic gadgets ≥ 5 hrs had mean dmft score of 5.4±2.1[Table 3].

It was also observed that 30.1% children watch television and 48.4% children watch videos or play games on their smartphones while eating. This has been significantly linked to food pouching leading to plaque accumulation (p <0.0001). 57.5% and 65.7% children pouch food while eating when engaged in watching television and watching videos or playing games on their smartphones respectively. [Table 4]

Table 2: Association of Oral Health with Duration of Electronic Gadget Usage

ORAL HEALTH	MEASURES	FREQUENCY	DURATION OF USE		P	Chi square
			<5 hrs	≥ 5 hrs		
FREQUENCY OF BRUSHING	≤1 time a day	274	90	184	0.0001*	19.46
	>1 time a day	257	133	124		
INDULGENCE OF ORAL HABITS WHILE E -GADGET USE	YES	279	79	200	0.0001*	45.17
	NO	252	144	108		
FREQUENCY OF SWEET INTAKE	<5 times	257	133	124	0.0001*	19.46
	≥5 times	274	90	184		
EXPERIENCE OF ORAL PAIN	YES	251	81	170	0.0001*	18.18
	NO	280	142	138		

Table 3: Association of Dmft Score with Duration of Electronic Gadget Usage

ORAL HEALTH	MEASURES	FREQUENCY	DURATION OF USE		P
			<5 hrs	≥ 5 hrs	
DMFT INDEX	MEAN±SD	3.75±1.75	2.1±1.4	5.4±2.1	0.0001*

Table 4: Association of Activity Done During Eatingwith Pouch/Pack Food While Eating

ACTIVITY DURING EATING	FREQUENCY	POUCH/PACK FOOD WHILE EATING		P-VALUE	Chi square
		YES	NO		
EAT WITH FAMILY ON TABLE	114	17	97	0.0001*	84.28
WATCH TV WHILE EATING FOOD	160	92	68		
WATCH VIDEOS/PLAY GAMES ON MOBILE PHONE/TAB WHILE EATING	257	169	88		

ASSOCIATION OF GENERAL HEALTH WITH DURATION OF ELECTRONIC GADGET USAGE

A significant association was seen between the duration of electronic gadget usage and body mass index of the child (p <0.0001). It was observed that 75.8% of children who were overweight used electronic gadgets for ≥ 5 hrsin comparison to those using electronic gadget for less than 5 hrs (24.2%).Also, abnormal vision, other eye related problems such as watering, redness, dryness/ itching of eyes were significantly associated with increased duration of electronic gadget use. 77% of children having abnormal vision used electronic gadget ≥ 5 hrs (p <0.0001).65.8%, 70%, 69.3% of children who experienced watering, redness, dryness/ itching of eyes respectively were using electronic gadgets ≥ 5 hrs as compared to those using electronic gadget for less than 5 hrs (p <0.0001). Also, a disturbed sleep pattern was significantly associated with increased duration of electronic gadget usage (p <0.0001) where in 76.2%of children experiencing sleep disturbances used electronic gadgets ≥ 5 hrs as compared to those using electronic gadgets for less than 5 hrs.70.8%, 69.9%,61.7% of children who experienced neck ache, head ache and back ache respectively were using electronic gadgets for ≥ 5 hrs than those using electronic gadget for less than 5 hrs(p <0.0001). While no significant association was found between indigestion and duration of electronic gadget usage [Table 5].

Table 5: Association of General Health with Duration of Electronic Gadget Usage

PHYSICAL ATTRIBUTES OF GENERAL HEALTH	MEASURES	FREQUENCY	DURATIONOF USE		P	Chi square value
			<5 hrs	≥ 5 hrs		
BODY MASS INDEX	NORMAL	244	136	108	0.0001*	52.91
	OVERWEIGHT	231	56	175		
	UNDERWEIGHT	56	31	25		
VISION	NORMAL	287	167	120	0.0001*	67.22
	ABNORMAL	244	56	188		
OTHER EYE RELATED PROBLEM	WATERING OF EYES	164	56	108	0.0001*	58.61
	REDNESS OF EYE	110	33	77		
	DRYNESS/ ITCHING OF EYE	111	34	77		
	NONE	146	100	46		
INDIGESTION	YES	95	46	49	0.161	1.961
	NO	436	177	259		
SLEEP DISTURBED	YES	282	67	215	0.0001*	82.11
	NO	249	156	93		
OTHER ASSOCIATED PROBLEMS	NECKACHE	79	23	56	0.0001*	46.84
	HEADACHE	133	40	93		
	BACKACHE	183	70	113		
	NOTHING	136	90	46		

ASSOCIATION OF OVERALL QUALITY OF LIFE WITH DURATION OFELECTRONIC GADGET USAGE

Electronic gadget usage has been observed to affect child's behavior significantly. When the electronic gadget was taken away from the child, 53.2% children using electronic gadgets ≥ 5 hrs showed a violent/aggressive behavior. A significant association was observed in children using electronic gadgets and lesser indulgence in outdoor activities ($p < 0.0001$).60% of children who indulged in outdoor activities out of which used electronic gadgets for less than 5 hrs. 63.8% of children who showed lack of attention were using electronic gadget ≥ 5 hrs($p < 0.002$). Also, increased duration of electronic gadget usage significantly affected children's academic performance ($p < 0.0001$). 83.3 % of children who showed poor performance in academics were using electronic gadgets ≥ 5 hrs as compared to those using electronic gadgets for less than 5 hrs [Table 6].

Table 6: Association of Overall Quality Of Life with Duration of Electronic Gadget Usage

BEHAVIOR	MEASURES	FREQ	DURATION OF USE		P	Chi square
			<5 hrs	≥ 5 hrs		
FEELING WHEN GADGET IS TAKEN AWAY/ SWITCHED OFF	ANGRY/ VIOLENT	198	34	164	0.0001*	51.51
	SAD	156	77	79		
	NOT BOTHERED AT ALL	177	112	65		
TYPE OF GAMES CHILD LIKES TO PLAY	ONLINE	274	90	184	0.0001*	19.46
	OFFLINE	257	155	102		
LACK OF ATTENTION	YES	288	104	184	0.002*	8.948
	NO	243	119	124		
PERFORMANCE IN SCHOOL	GOOD	133	80	53	0.0001*	56.57
	AVERAGE	153	80	73		
	POOR	126	21	105		

DISCUSSION

The early exposure to electronic gadgets grows as an addiction to these gadgets in the children at very tender age and can affect the child's mental, physical, cognitive and psychological development [4].Hence, in this new era of virtual technologies and globalization, it becomes our utmost responsibility to raise our children in a healthy environment. In 2013, according to a report by Daily Mail, 29% of toddlers can easily use electronic gadgets and the remaining 70% master it by primary school age [5].

The screen-related "addictive" behavior is referred to as Screen dependency disorders. Screen dependency disorder is described as intensive routine exposure to certain screen activities during critical phases of neural development which may alter gene expression resulting in structural, synaptic, and functional changes in the developing brain. Withdrawal symptoms, developing tolerance, refusal to lessen or quit screen activities, loss of outside interests, continuance despite negative effects, use as an escape to unfavorable moods, lying about the level of usage are all diagnostic criteria for Screen dependency disorders. Several researchers suggest that Screen dependency disorders causes neuroadaptation and changes in the brain as a result of excessive involvement with electronic gadgets [6].

In the present study, a questionnaire regarding the duration of use of electronic gadgets and its effect on oral health, general health and quality of life was put forward to the parents and children and their DMFT/deft scores, height and weight, result card and vision test were reviewed. To the best of our knowledge, this is the first-ever study in Jammu region, aimed to assess the relation between duration of use of electronic gadgets and its effect on oral health, general health and the quality of life of children.

Comparison of oral health behaviors according to duration of electronic gadget usage showed that 67.1 % of children brushing their teeth one or less than one time a day were using electronic gadget for ≥ 5 hrs. Children using electronic gadget for more duration showed an indifferent attitude towards brushing their teeth. Namkoong and Ma also reported negative experiences with smartphone use, which included changed interests in oral health [7]. Comparison of daily consumption of sweets revealed that67.1 % of children taking sweets more than 5 times a day had duration of gadget use ≥ 5 hrs. Previous research established a critical role for screen time, including television viewing, in children's sugar sweetened food intake [8]. It was observed that 67.7% of children who experienced oral pain used gadgets ≥ 5 hrs than those using gadgets for less than 5 hrs. Doet al also reported an association between longer internet usage time and increased risk of oral symptom experience [9]. Thus, lack of interest caused by electronic gadget usage affect oral health. Nevertheless, the poor oral health behaviors in children suggest the need to optimize the usage of electronic gadgets. It was reported that 30.1% children watch television and 48.4% children watch videos or play games on their smartphones while eating. Das A et alcorrelated the food chewing completion time while watching TV or multimedia devices with the caries status of that population and found that there was prolonged eating time during screen usage leading to food pouching habit within the mouth during screen viewing act as a predisposing factor for dental caries [10,11]. Similar results were observed in this study and a significant association was seen between gadget use while eating food and food pouching where57.5% and 65.7% children pouched their food while eating when engaged in watching television and watching videos or playing games on their smartphones respectively. A significant association was observed between higher mean DMFT/deft scores (5.4±2.1) and ≥ 5 hrs duration of electronic gadget usage. Arikan and Bekar also reported that the dmft score among the children who watch various screens for a longer duration were higher with highly significant results [12].

Many observational studies have reported the association between increased duration of screen media exposure and risk of obesity [13]. It was observed that 75.8% of children who were overweight used electronic gadgets for ≥ 5 hrs in comparison to those using electronic gadget for less than 5 hrs. The possible reason includes reduced physical activity, increasing calorie intake from eating while viewing, etc. Beaming lights, high contrast screens, and dazzling images may make a game or video more engaging, but really take toll on children's vision. The results of this study was in accordance with findings of a 2015 survey conducted by the American Optometric Association (AOA), which determined that excessive screen time can result in digital eye strain, manifesting as burning, itchy, or fatigued eyes [14].A significant association was seen between increased duration of electronic gadget use and abnormal vision, other eye related problems such as watering, redness, dryness/ itching of eyes ($p < 0.0001$). Computer vision syndrome, which presents as eye strain, dryness, irritation, burning feeling, redness, blurred vision, or double vision, may be caused by prolonged usage of electronic gadgets. Children who spend more than 8 hours a day on devices have a higher risk of developing myopia, according to the Centers for Disease Control and Prevention in the United States. People tend to blink less when viewing electronic screens. While an average person blinks 15 times per minute, spending more time in front of a screen might reduce that pace to less than 5 times per minute [15]. Electronic gadgets emit high-energy blue and violet light with short wavelengths. This light has the potential to impair vision and prematurely age the eyes. In terms of wavelength and energy, blue light is also somewhat similar to UV radiation and is readily absorbed by the retina causing cumulative damage over lifetime of exposure [16]. National Eye Institute has recommended 'the 20-20-20 rule' for computer users which implies that that after 20 minutes of continuous usage of a device, taking a 20-second break by looking at a distant object 20 feet away and often blinking your eyes will help prevent dry eyes and additional eye strain [17].

It has been observed that most children spend their time using mobile phones or other electronic gadgets at night before sleeping which was found significantly concomitant in this study with76.2% of children experiencing sleep disturbances who used electronic gadgets ≥ 5 hrs. The blue light emitted by display screens suppress the release of melatonin, an essential hormone for sleep. This, consequently, can contribute to sleep disturbances in children. When children are exposed to screens shortly before bedtime, their circadian rhythms and sleep patterns are disturbed [18].Thus, it is particularly important to limit blue-light exposure before bed to settle into healthy sleeping patterns. A significant association between increased duration of electronic gadget use and overall musculoskeletal problems (neck

ache, back ache) was observed in this study (p <0.0001). Figure hunched over a device is a readily discernible silhouette that can be observed in children who use electronic gadgets for excessively. Soon, this hunch persists even when the electronic gadget is not there. The complaints of arm, neck, and shoulder (CANS) are widely seen among gadget users and is defined as 'musculoskeletal complaints of arm, neck, and/or shoulder not caused by acute trauma or by any systemic disease [19]. Text neck syndrome refers to a repetitive stress injury to the neck caused by having your head tilted forward for an extended amount of time while using handheld mobile device [20].These musculoskeletal problems and pain mainly results from improper posture or technique in handling electronic gadgets. Good posture, stretch exercises and adequate break should be taken whenever possible. Our study reported that headache was also significantly associated with duration of time spent on gadgets (p <0.0001). Montagni I et al. also noted that very high exposure raised the risk of migraine by 37% when compared to teenagers with very little exposure to screen time [21].

Through the usage of gadgets, the cognitive skills of the children are reduced. These cognitive skills are obtained through playing outdoor games, drawing books and so on. Being occupied with the gadgets, the participants showed less tendency of spending time through outdoor activities including playing games, walking, and doing physical exercises. In the present study, a significant association was observed in children using electronic gadgets ≥ 5 hrs and lesser indulgence in outdoor activities (p <0.0001). Similar results were observed by SM Rashid et al who reported that children who used gadgets showed less tendency to spend time in outdoor activities [2].This gives us an insight on the future development of health problems due to reduced physical activities among children. Interestingly, it was also found that 53.2% children using electronic gadgets ≥ 5 hrs became extremely aggressive and threw temper tantrums when they were forcefully separated from the devices. Similar kind of behavioral change in children addicted to excess use of electronic gadgets in a study done by Sundus et al. He reported that anxiety was the cause of this particular behavioral alteration. Although this stage is typically innocuous and transient, but children suffering from anxiety experience nervousness, shyness and fear. They strive to avoid people, places, activities, and as a result, may exhibit aggression or temper tantrums when they can't get their electronic gadget, but this emotion disappears once their devices are returned [5]. In the present study, it was also noted that increased duration of electronic gadget use was significantly associated with fall in children's grades (p <0.0001) and lacking concentration in the class or at home while studying (p <0.002).Excessive screen usage and Attention Deficit Hyperactivity Disorder (ADHD) in children have been linked in several studies [22].

The American Academy of Pediatrics recommends that physicians and other health-care providers should counsel parents and caregivers of young children on optimum screen time use to promote child health and development. For children younger than 2 years screen time is not recommended. For children aged 2–5 years, routine or regular screen time should be limited to <1 h per day. Sedentary screen time should not be a routine part of child care for children < 5 years. Screens should be avoided for at least 1 h before bedtime, to recover from melatonin suppressing effects. Daily "screen-free" times, especially for family meals and book sharing should be maintained. Adults should model healthy screen use, better alternatives, such as reading, outdoor play, and creative hands-on activities should be promoted. Screens should be turned off when not in use and background TV should be avoided. Parenting strategies that teach self-regulation, and limit-setting should be sought [23].

CONCLUSION

A significant association was observed between ≥ 5 hrs duration of electronic gadgets usage and its impact on the oral health, general health and overall quality of life of children. Electronic gadgets per se can be rightly said as a double edged sword. The use of electronic devices may have both beneficial and detrimental consequences on children's health. As rightly said, excess of everything is bad. We need to find ways to optimize the role of gadgets in children's life, taking advantage of their positive attributes, and minimizing their negative ones. Effective and efficient use of electronic gadgets by children may promise to be a better tool in shaping the life of children and adolescents.

REFERENCES

1. Jamir L, Duggal M, Nehra R, Singh P, Grover S. (2019). Epidemiology of technology addiction among school students in rural India. *Asian J Psychiatr*. 40:30-38. doi: 10.1016/j.ajp.2019.01.009.
2. Rashid SMM, Mawah J, Banik E, Akter Y, Deen JI, Jahan A, Khan NM, Rahman MM, Lipi N, Akter F, Paul A, Mannan A. (2021). Prevalence and impact of the use of electronic gadgets on the health of children in secondary schools in Bangladesh: A cross-sectional study. *Health Sci Rep*. 4(4):e388. doi: 10.1002/hsr2.388.
3. CDC. Infographics—Screen time vs. Lean time. 2018 January 29. Available from : https://www.cdc.gov/nccdphp/dnpao/multimedia/infographics/getmoving.html
4. Zain ZM, Jasmani FNN, Haris NH, Nurudin SM. (2022). Gadgets and Their Impact on Child Development. Proceedings. 82(1):6. https://doi.org/10.3390/proceedings2022082006
5. Sundus M. (2018). The Impact of using Gadgets on Children. *J Depress Anxiety*. 7: 296.doi:10.4172/2167-1044.1000296.
6. Sachin K S, Mihir Y P. (2018). Screen Dependency Disorders (SDD): An Innovative Contest for Brain of Children. Glob *J Add & Rehab Med*. 6(1): 555677. DOI: 10.19080/GJARM.2018.06.555677.
7. Namkoong EJ, Ma DS (2019). Correlation between oral health behaviors and problematic experiences associated with smartphone use in adolescents. *J Korean Acad Oral Health*. 43: 157-162. DOI: 10.11149/jkaoh.2019.43.3.157

8. Jensen ML, Dillman Carpentier FR, Corvalán C, Popkin BM, Evenson KR, Adair L, Taillie LS. (2022). Television viewing and using screens while eating: Associations with dietary intake in children and adolescents. Appetite. 168:105670. Doi 10.1016/j.appet.2021.105670.
9. Do KY (2013). Impact of health risk factors on the oral health of Korean adolescents: Korea youth risk behavior web-based survey. *J Dent Hyg Sci*. 16: 193-199. https://doi.org/10.17135/jdhs.2016.16.3.193
10. Feldman S, Eisenberg ME, Neumark-Sztainer D, Story M. (2007).Associations between Watching TV during Family Meals and Dietary Intake among Adolescents. *J Nutr Educ Behav*. 39(5):257–263. doi: 10.1016/j.jneb.2007.04.181.
11. Das A, Agarwala P, Kar S, Kundu GK. (2020). Influence of food pouching habit during television and multimedia device viewing on dental caries: A cross-sectional study. *Int J Health Allied Sci*. 9:258-61
12. Arikan D, Bekar P. (2017). Children's eating habits and obesity while watching television. *Iran J Pediatr*. 27:1-6.
13. Robinson TN, Banda JA, Hale L, Lu AS, Fleming-Milici F, Calvert SL, Wartella E. (2017). Screen Media Exposure and Obesity in Children and Adolescents. Pediatrics. 140(Suppl 2):S97-S101. doi: 10.1542/peds.2016-1758K.
14. American Optometric Association. Computer vision syndrome. (2017). http://www.aoa.org/patients-and-public/caring-for-your-vision/protecting-your-vision/computer-vision-syndrome?ss0=y.
15. Blehm C, Vishnu S, Khattak A, Mitra S, Yee RW. (2005). Computer vision syndrome: a review. Surv Ophthalmol. 50(3):253-62. doi: 10.1016/j.survophthal.2005.02.008.
16. Ham WT Jr, Mueller HA, Sliney DH. (1976). Retinal sensitivity to damage from short-wavelength light. Nature. 260(5547):153-5. doi: 10.1038/260153a0. PMID: 815821.
17. Tribley J, McClain S, Karbasi A, Kaldenberg J. (2011). Tips for computer vision syndrome relief and prevention. Work. 39(1):85-7. doi: 10.3233/WOR-2011-1183.
18. Lee SI, Matsumori K, Nishimura K, Nishimura Y, Ikeda Y, Eto T, Higuchi S. (2018). Melatonin suppression and sleepiness in children exposed to blue-enriched white LED lighting at night. Physiol Rep. 6(24):e13942. doi: 10.14814/phy2.13942.
19. Ahmed, S., Mishra, A., Akter, R. et al. (2022). Smartphone addiction and its impact on musculoskeletal pain in neck, shoulder, elbow, and hand among college going students: a cross-sectional study. Bull Fac Phys Ther**27**, 5. https://doi.org/10.1186/s43161-021-00067-3
20. David D, Giannini C, Chiarelli F, Mohn A. (2021). Text Neck Syndrome in Children and Adolescents. *Int J Environ Res Public Health*. 18(4):1565. doi: 10.3390/ijerph18041565.
21. Montagni I, Guichard E, Carpenet C, Tzourio C, Kurth T. (2016). Screen time exposure and reporting of headaches in young adults: A cross-sectional study. Cephalalgia. 36(11):1020-1027. doi:10.1177/0333102415620286.
22. Liza MM, Iktidar MA, Roy S, Jallow M, Chowdhury S, Tabassum MN, Mahmud T. (2023). Gadget addiction among school-going children and its association to cognitive function: a cross-sectional survey from Bangladesh. *BMJ Paediatr Open*. 7(1):e001759. doi: 10.1136/bmjpo-2022-001759.
23. Screen time and young children: Promoting health and development in a digital world. Paediatr Child Health. (2018), 23(1):83. doi: 10.1093/pch/pxx197.