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Effect of Screen Time on Compulsive Eating Behavior and Nutritional Status of Children

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Commentary

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Abstract

Objectives: A study to assess the correlation between screen time exposure and nutritional status and compulsive eating behaviors.

Background: Screen time is a sedentary activity that affects child's physical and mental development. Eating behavior research focuses on the prevention and treatment of obesity and eating disorders. Restrained or emotional eating in children and adolescents suggests relationships with body weight or obesity. Childhood overweight and obesity can lead to many health-related conditions, including cardiovascular disease, diabetes, sleep apnea, arthritis, and cancer.

Method: The sample was composed of 100 subjects ranging from 5-12 years old. A growth chart from the IAP (Indian Academy of Pediatrics) was used to record nutrition status. Kagan et al. Compulsive eating was examined with a questionnaire. Screen time was assessed by AAP (American academy of paediatrics) screen time by age guidelines. All data were analysed through probability value, correlation was done by Pearson's correlation and chi-square test.

Result: The result showed that out of 100, 14 % of participants had moderately used screens and 86% had excessive use of screens. 38% of participants had low- compulsive eating, 48% of participants had moderate compulsive eating and 14% of participants had high-compulsive eating.

Conclusion: The correlation between screen time, compulsive eating, and junk food consumption showed that participants who had higher screen time had higher compulsive eating, lower physical activity, and more junk food consumption.

Keywords: Screen Time; Compulsive Eating, Junk Food; Physical Activity; Child Obesity; Screen Time Guidelines; Eating Habits; Child Health

Introduction

Screen Time

The amount of time a person spent using a device with a screen such as a smartphone, computer, video game, or television console. It's a sedentary activity, meaning you are not being physically active. Energy used during screen time is very less [1]. Screen time directly affects child's physical and mental development [2,3]. The screen time influence shows positive and negative impact on child's health. The positive or negative health effects of screen time are influenced by

levels and content of exposure [4,5].

Global Scenario: The American Academy of Pediatrics recommends that children between 2 and 5 years of age should restrict their screen time exposure to 1h per day of high-quality programs. The committee discourages media use in children below 2 years of age. Video-chatting is allowed in children above 18 months [6].

According to the American Academy of Child and Adolescent Psychiatry [6] children of 8 -12 years in united states on an average spends 4-6 hours a day watching or using screens and teens spend up to 9 hours.

Increased screen time during the COVID-19 pandemic is associated with negative lifestyle behaviors among Indian adolescents. The results are consistent with previous studies that have shown a negative association between screen time and physical activity, sleep, and dietary habits in adolescents [7,8], positive association between overall TV viewing and commercial TV viewing with addictive-eating and addictive phone use [9-12].

Compulsive Eating

Behavioral patterns of compulsive eating, defined as repetitive bouts, without homeostatic function, with adverse consequences, and as ways to relieve stress, are common across several eating-related conditions [13]. Binge eating in children has increased while watching television, and this includes consuming more high-fat, high-sugar and carbohydrate meals and beverages on an ongoing basis, as well as fewer fruits and vegetables [14]. Although these changes in intake are negligible, their combined impact could help explain why eating while watching television is associated with a higher risk of childhood obesity. Eating behavior research focuses on the etiology prevention, and treatment of obesity and eating disorders [15,16].

In the Preadolescence developmental period many eating problems are appearing. Restrained or emotional eating in children and adolescents suggests relationships with body weight or obesity, and the development of eating disorders (anorexia, bulimia). The study also confirms the childhood overweight and obesity association and psychological factors (from compulsive eating behavior) [17-21].

Materials & Methods

Study Type

The cross-sectional observational study was conducted on children of Ahmedabad, Gujarat.

Study Period

This study was conducted from January 2021 to march 2021.

Sampling Type

100 subjects and with age range of 5-12 were selected through random sampling technique. Such selection allowed distribution of participants from various socio- economic groups. Only those children who came under the following criteria were selected in the study. Demographic and anthropometric data were collected from the subjects. This study was approved by the professor of Gujarat university, Ahmedabad, Gujarat.

Sampling Technique

The snowball sampling technique was used for the Sample size: sample size was calculated based on the following parameters: Assessment of screen time, food frequency and compulsive eating.

Inclusion Criteria

The subjects were aged 5 – 12 years. Healthy subjects both male and female were part of the study. Exclusion Criteria: the subjects possess a history of any disease conditions, age group less than 5 and more than 12 were excluded.

The structured survey questionnaire was developed to asses screen time, food frequency, eating behavior. The review of questionnaires was done by professional guide of Gujarat university department. The reliability, and correlation score of pilot study using 10 participants was 0.99. The questionnaires were prepared using previous literature papers and briefing out the common.

The questionnaires were consisting of demographic data, anthropometry evaluation, screen time, food frequency and compulsive eating.

The demographic data were collected including: Age, gender, education, family background, number of family members, parent's occupation and food habits. For the anthropometric assessment height, weight and BMI was calculated and Nutritional status was recorded using IAP (Indian Academy of Pediatrics) growth chart [22].

Screen time was assessed by AAP (American academy of pediatrics) screen time by age guidelines and a questionnaire was designed, where use of screen time was categorized in 3

categories: limited, acceptable and excessive [23].

Nutritional Evaluation was assessed by the Food Frequency Questionnaire (FFQ). where a checklist of foods and beverages with a frequency response section for subjects to report how often each food item was consumed over a specified period [24]. For every food different frequency was prepared and scoring of 0 to 4 was given

Binge eating assessment was done by compulsive eating questionnaire designed by kagan and squires were used. The questionnaire was modified as per need with the guidance of professional guide [3,25,26]. The multiple-choice options were scored from 0 to 3. Where each question's maximum scoring will be 1, 2 or 3 that basis researchers conclude the severity of compulsive eating.

Statistical Methods

Mean average values were calculated for anthropometric measures and daily equivalent for food frequency and compulsive eating. Standard deviation (SD) and standard error mean (SEM) was calculated for background information, anthropometric measures, screen time and compulsive eating.

Pearson's correlation and non-parametric correlation was performed for checking significant correlation between screen time, compulsive eating, fruits and vegetables and junk food. Chi- square test was done to know the statistical difference of the different parameters of background information, anthropometric measures and screen time.

Ethical Approval

The study was approved by the school of science, GU, Navarangpura, Ahmedabad, Gujarat, India with reference number IECHR- GU (2021/03) dated 15/03/2021. All the study subjects verbally explained the study's intention, motive and future scientific publication.

Results

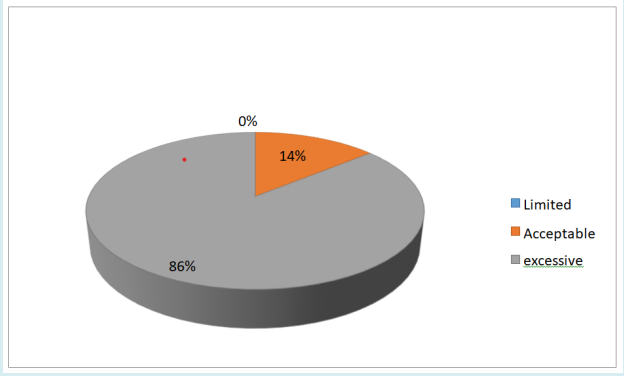
In this observational study 100 patients were included. The patients had mean age of (7.31+12.66) years. Of the participants 54% were girls and 46% were boys. There was a significant difference in age, education level and family background of subject and no significant difference in gender, no. of family members, occupation, and food habits. There was no significant difference in BMI of the subjects and their total screen time.

Categories	SD	SE	P Value
Age	12.66	7.31	0.008
Gender	5.65	9	0.424
Education level	17.03	9.83	0.0002
Family background	19.79	14	0.005
No. Family members	2.88	1.66	0.778
Occupation			
• Father	52.57	30.35	8.869
• Mother	69.29	49	1.125
Food habits	29.39	16.95	5.669
Height	-	11.66	-
Weight	-	5.28	-
BMI	-	0.535	-
BMI Categories			
• Acceptable	2.08	1.2	0.067
• Excessive	23.27	11.63	1.306
Total screen time	50.91	36	6.021
Compulsive eating	17.47	10.08	-

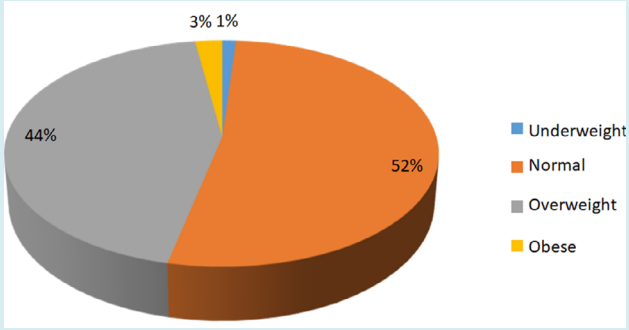
Table 1: SD and SE values of background information, anthropometric data, total screen time and compulsive eating.

As per the use of screen time subjects were divided into categories - limited, acceptable and excessive screen time. It showed 86% had excessive screen time. Compulsive eating was observed in categories - low (0-5), moderate (6-11) and

high (12-17) as per their daily equivalence score. Where 48% of participants had moderate compulsive eating and 14% ng. (SD=17.47, SEM=10.08)



Screen Time Subjects into Categories



Percentage Distribution of Subjects

Percentage Distribution of Subjects as per BMI

The individuals were separated into four groups based on their BMI: underweight, normal, overweight and obese. out of which 44% were overweight and 3% were obese.

There exists a significant relationship between compulsive eating (CE) and screen time (ST) and junk food (JF) These studies demonstrate a rise in screen time increases respondents' compulsive eating (CE), increases their consumption of junk food, and increases their screen time respondents with higher Compulsive eating also consume more junk food. Fruits and vegetables and junk food do not significantly correlate with one another, despite respondents' high overall food consumption.

		CE	ST	FV	JF
CE	Pearson Correlation	1	.173*	-0.101	.372**
	Sig. (1-tailed)		0.043	0.159	0
	N	100	100	100	100
ST	Pearson Correlation	.173*	1	-0.057	.273**
	Sig. (1-tailed)	0.043		0.287	0.003
	N	100	100	100	100
FV	Pearson Correlation	-0.101	-0.057	1	.339**
	Sig. (1-tailed)	0.159	0.287		0
	N	100	100	100	100
JF	Pearson Correlation	.372**	.273**	.339**	1
	Sig. (1-tailed)	0	0.003	0	
	N	100	100	100	100

* Correlation is significant at the 0.05 level (1-tailed).
** Correlation is significant at the 0.01 level (1-tailed).

Table 2: Pearson's cross correlation values of screen time with compulsive eating, fruits and vegetables and junk food.

Table 2 shows There was a significant difference in age, education level and family background of subject and no significant difference in gender, no. of family members, occupation, and food habits. There was no significant difference in BMI of the subjects and their total screen time.

Discussion

In this study, a food frequency questionnaire was created to assess the subjects' nutritional status. It asked about the frequency with which they consumed foods from all food

groups, including cereal, pulses, fruits, vegetables, nuts, milk products, and junk food, on a scale of daily to fortnightly to weekly to never [27].

For the assessment of their screen among individuals, different types of questions were framed related to their gadgets, screen time, their behavior [28]. The different screen-time-related questions were explained to the participants' parents. The American Academy of Pediatrics' (AAP) age-specific recommendations for screen time were used to determine scoring [29], where the amount of screen time was divided into three categories—limited, reasonable, and excessive obese.

For the assessment, compulsive eating questionnaire designed by Kagan and squires was used. The questionnaire was modified as per need with the guidance of professional guide [5]. The questionnaire included a psychological factor that influences dietary habits of respondents [30].

It was a close ended multiple-choice questionnaire. It was used to measure uncontrollable eating patterns of participants. The scale has 12 items that asses the inability to control one's eating behavior in terms of overeating and eating when not hungry among the children of Ahmedabad city.

According to this study, children's development, physical health, and mental health are all negatively impacted by their increasing use of screens during the COVID19 pandemic [18], the statistical analysis for the demographic data was done with standard deviation and mean and there were no significant differences in the individuals' gender, number of family members, occupation, or eating habits. Out of 100 individuals, 86 per cent reported having excessive use of screens. the Pearson's correlation and daily equivalent showed with regard to acceptable and excessive screen time, participants on average consumed food at levels between moderate and high, and those with more screen time consumed more junk food than fruits and vegetables. Screen time and compulsive eating were significantly positively correlated, with excessive use being associated with higher levels of compulsive eating.

Conclusion

This study's findings suggest a strong link between children's excessive screen time and their consumption of junk food as well as the emergence of obsessive eating habits. According to the findings, kids who spent too much time in front of screens— including television, laptops, smartphones, and video games—exhibited a higher intake of harmful, nutrient-poor meals. The study also discovered a connection between excessive screen usage and compulsive eating habits. In contrast to physiological hunger, compulsive eating refers to the practice of eating in response to emotional impulses. Increased emotional arousal in children who spend more time in front of screens may increase their propensity to use compulsive eating as a coping technique.

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