ASSESSMENT OF MACRONUTRIENTS AND MICRONUTRIENTS(CALCIUM, IRON) AND PHYSICAL ACTIVITY AMONG CHILDREN AND ADOLESCENTS AGED 8 - 17 YEARS AND ASSOCIATION WITH SCREEN TIME FROM MEDIA AND TECHNOLOGICAL TOOLS

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ABSTRACT

Screen time has risen dramatically in the technological age. The formation of long-lasting, healthy food and activity habits begins during adolescence. As excessive time spent on screens and technological devices usage is linked to a number of health issues, including obesity and overweight, changes in blood sugar and cholesterol levels, poor academic performance, decreased social interaction and lower levels of physical activity and has become a concerning factor that has impacted children and the adolescent population. Additionally, screen usage has been frequently linked to negative traits including poor eating patterns. The majority of studies, however, have analyzed the relationship between each variable of dietary intake, physical activity and screen time and device usage separately and in specified age groups. The World Health Organization (WHO) has warned against introducing infants to digital devices throughout their first year of life. As per the guidelines observed, children between the ages of 2 and 5 should not spend more than one hour on screens daily. Infants and young children should avoid electronic device use and be restricted to 30 minutes per day for preschoolers; 60 minutes per day for primary schoolers; and 120 minutes per day for Teenagers. Additionally, there are few nationally representative studies about children that have examined how more screen usage affects lifestyle variables. Literature has reported that longer self-reported screen time has been closely linked to eating an unhealthy diet. This study has focused on analyzing the relationship between duration of screen time, usage of technological devices with dietary patterns and food consumption among children and adolescents along with physical activity. In this study, 200 participants (both boys and girls from the age group 8-17 years) were included. Participants were administered a questionnaire tool that included questions related to screen time, dietary patterns measured with a semi-quantitative food frequency questionnaire and Physical Activity and Sleep habit questions. The results indicated that screen time usage for mobile was noted to be the highest at 65.5% followed by television use at 42.5% among study participants. Fast food consumption, including chips/wafers (61%) in boys (39%) in girls, Frankie rolls in boys (54.3%) and, in girls (45.7%) was found to be high. Older children were observed to have unhealthy eating habits as consumption of processed high-fat, salt and sugar foods while attending college and school. The consumption of chocolate was also (50%) in both boys and girls. Girls reported higher consumption of sweet mithais (Indian sweets) (63%) as compared to boys (37%). It was observed that there was a positive association between screen time and dietary habits.

Keywords:- *Screen time, physical activity, poor dietary habits, healthy eating, school children*

1. INTRODUCTION

Technology has a great impact on children's lives, especially when using phones for social media or educational purposes. Screen time is linked with many media and technological devices such as watching television, using tablets, and using mobile phones or computers for emailing or texting and playing video games. Screen time usage has seen an increase in recent times during COVID -19 pandemic and might affect cognitive ability in children and adolescents. Sedentary behaviors are the leading cause of being overweight and obese leading to onset of metabolic diseases in the younger generation. Digital device viewing and usage have emerged as one of the influencing factors for an increase in the sedentary lifestyle among children and indirectly leading to unhealthy dietary habits. Eating habits among young children and adolescents have changed drastically in recent years due to the craze of advertisements in media. Consumption of high-fat-sugar and salt foods in children and adolescents has seen a rise according to literature due to easy accessibility and availability. The most recent researches confirm the dose-response relationship between lack of physical activity and chronic conditions like coronary heart disease, brain hemorrhage, high blood pressure, colorectal cancer, breast cancer, type 2 diabetes, and osteoporosis and report that higher levels of physical activity can lower the risk of premature all-cause mortality [1]. Increased sedentary behaviors and using digital tools such as watching television, playing video games, playing computer games, and playing electronic games, have been linked to poor body composition, decreased fitness, lower self-esteem and poor social behavior, and lower academic achievement in school-aged children.

1.1 Changes in dietary patterns related to screen time

Furthermore, there is a wealth of scientific data showing a link between screen time and childhood obesity, which is partly explained by rising calorie consumption and a lack of time for physical activity (PA). In particular, it is thought that the amount of time spent in front of a screen is closely related to the intake of unhealthy meals throughout the day. Numerous professional organizations have suggested limiting screen usage for students and younger children in light of these worries. The main outcome observed in all recommendations in the literature has been to keep screen time for leisure (such as TV, video games, computers, and mobile phones) to no more than two hours per day [2]. As a result, this study aimed to identify associations with the duration of screen time, eating patterns, and lifestyle characteristics in a representative sample of school children aged 8 to 17 years. The relationship between eating habits, higher usage of technological tools, physical activity, and mental health is gaining more attention. Numerous credible studies indicate that eating highly processed foods—such as FFs (Fast Foods), sweet foods, fried foods, processed meat, etc., is linked to depression, but not the other way around. On the other hand, eating healthy foods such as fruits, vegetables, nuts, whole grains, etc, has a positive impact on mental health.

1.2 Physical Activity and screen time

Individually, having high levels of physical activity, low levels of sedentary behavior, and getting enough sleep have been linked to good mental health in kids and teenagers. From the review of the literature, it has been observed that physical activity, inactive time (sedentary behavior), and sleep have been considered separate variables in the majority of research conducted. However, it has been inferred from a majority of studies that these three behaviors are interdependent and should be considered concurrently. Both childhood and teenage unhealthy dietary habits and patterns are linked to sedentary time. For instance, television viewing for more than 60 minutes increases the chance of gaining weight due to binge eating. Physical inactivity and sedentary behavior are major risk factors for physical and mental ill-health as well as for a decrease in physical and mental well-being [1]. An increasing amount of sedentary screen time is another sign of social isolation policies, according to recent studies (SST). For instance, (during the COVID-19 pandemic, American kids reported a surge in gaming activity, and game downloads hit a record high,[11]

2. METHODOLOGY

The study was a cross-sectional study where the sample size was 200 participants (children and adolescents) who were recruited through the convenience sampling technique. Participants were students from schools and neighborhoods who were studying, were between the ages of 8-17 years, and were willing to participate voluntarily with parental consent. The questionnaire tool was administered to the participants which included recording anthropometric measurements of height (using a stadiometer) and weight (using a weighing scale). The other sections in the questionnaire included questions about daily schedules (time of waking up, getting ready, going to school, having lunch or dinner, and spending time with family and friends), with the option of watching television or using a mobile phone, or not using screen time. The section also recorded the frequency of screen time usage of the

devices for weekdays (Monday to Friday) and weekends (Saturday and Sunday). The frequency timings included- less than 30 minutes, 30 minutes to 1 hour, 1-2 hours, more than 2 hours, more than 4 hours, and more than 5 hours. The Food consumption was recorded by the use of a semi-quantitative food frequency questionnaire for the amount and type of food group and food consumed.

Data was collated, coded, and analyzed using Statistical Package for Social Sciences (SPSS) software (version 20.) All descriptive data were expressed as mean ±standard deviation (SD) at 95% CI. Descriptive statistics such as mean, standard deviation, frequency distribution, and range values were computed for quantitative variables. Student's independent t-test with equal variance assumed was used to determine whether there was a significant difference between the two sample groups. One-way analysis of variation (ANOVA) was used to observe the difference in the anthropometric measures, BMI, symptom severity scores, quality of life scores, and nutrient intake between the groups. A p-value of less than 0.05 was considered statistically significant. The study was approved independent ethics committee in a protocol dated (I S B ECIN R- 7 2 I KM-RNII 2022) by Inter System Biomedica Ethics Committee (ISBEC).

3. RESULTS

The study was conducted to assess screen time in relation to Nutrient and Physical Activity among children and adolescents. The nutrient intake among study participants was recorded using a semi-quantitative food frequency questionnaire to measure energy, carbohydrate, protein and fat, and micronutrients like calcium and iron. The maximum number of participants were from the age group 13-17 years old (56.5%) and the remaining were from 8-12 years old (43.5%). The study included equal participation from both genders (Boys 50% & Girls- 50%). A maximum number of participants lived in the nuclear type of family (58%) and joint family (28%). The occupational status of fathers for most participants was self-employed (36%), whereas mothers (29%) were employed in-full-time Jobs.

3.1 Anthropometric measurements

It was observed, the mean height of all study participants (n=200) was 147.29 cm, and the mean weight was found to be 42.76 kg. The minimum age was 8 years old where the minimum height measured was 122 cm and the maximum height was 185.4 cm for 17 years old. In the case of weight, the minimum weight was 21 kgs, while the maximum was 88 kgs for 17 years old.

3.2 Screen devices usages

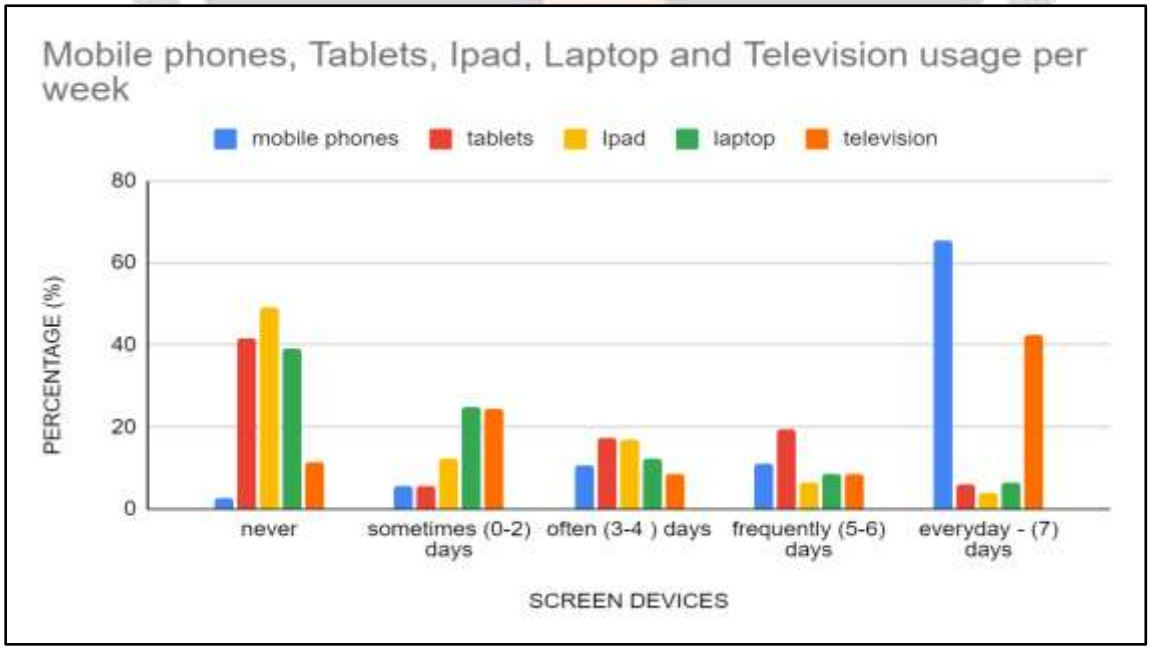

Figure -1 Classification of different technological devices usage

Fig 1 exhibited the classification of different technological devices usages such as mobile phones, tablets, I-pad, laptops, and television by study participants. Tracking weekly gadget usage, various screen usage frequencies were determined as - Never, sometimes (0-2 days), Often (3-4 days, frequently (5-6 days), and every day 7 days) were considered. It can be observed from the above figure that the usage of mobile phones daily is seen the highest at 65.5% followed by television viewing at 42.5% among study participants. The usage of Tablets and I-pad is minimum which is 41.5 % and 49%. The reason could be that the cost of this equipment could be high. And between the weeks, laptops, I-pads, and Tablets were often utilized. As can be observed from demographic details most of the families were nuclear families and mostly all members use a mobile phone. Additionally, as a result of an increase in technology use in schools, mobile phones are now more frequently used for homework assignments and virtual learning than tablets and iPads. And, since Mobile phones are portable and features are usable by children, their usage has increased. Tablets were used frequently 19.5% and 17.5% of the time, respectively, depending on the usage patterns over the course of the week.

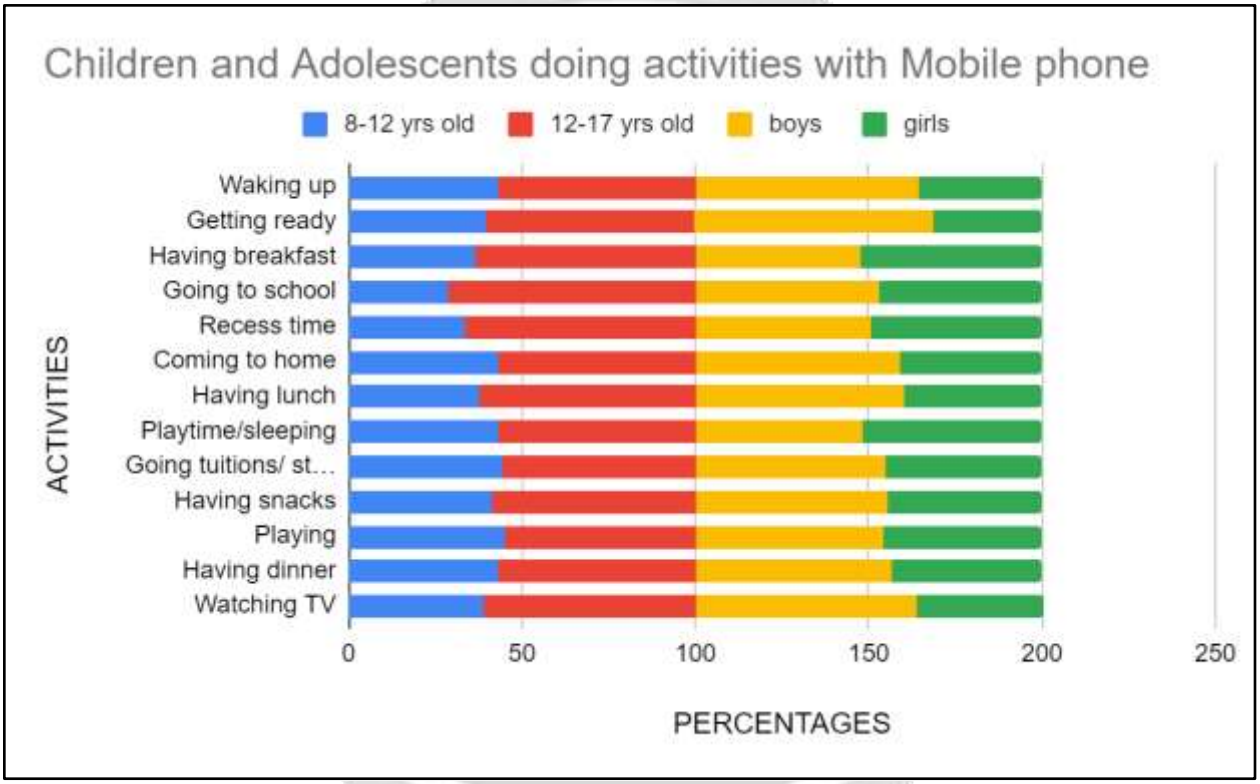

Figure - 2 depicts the daily schedule activities with the usage of mobile phones in boys and girls aged 8-12 and 12-17 years. The above graph illustrates the everyday activities that are carried out during the weekdays, i.e. Monday to Friday. It was seen that older children (12 -17 years) tend to use mobile phones at a higher percentage when compared to younger children (8 to 12 years old). For older kids, time spent on a mobile device was most prevalent while going to school which is a maximum of 71%, and during recess time (66.2%). Since colleges and universities permit the use of mobile devices on campus or in the building, it is more likely that older children use electronic devices. These older adolescents are primarily junior college students between the ages of 16 and 17. Here young children and adolescents were seen using their phones most during breakfast (63.4%) and the usage during other meal times like lunch (62.1%), supper (56.8%), and snacking (58.8%). There is a tendency as quoted in the literature that children and adolescents tend to view electronic devices while eating.[4] While eating lunch or dinner, people frequently watch certain videos, text material, or messages shared on social media. Particularly older children who tend to watch television and eat while using a mobile device on the couch have been reported in the literature and these adolescents have little to no physical activity [4]. On the contrary, children (ages 8 to 12) were seen using mobile devices while playing (45%) online games on a longer duration, communicating with peers in class (44.1%) and at the same time reported binge eating. In addition, in comparison between boys and girls or between genders,

greater percentages of mobile phone usage were seen in boys than in girls. Other activities which had a higher percentage in the daily schedule were getting ready for school (68.7%) in boys and (31.23%) in girls. However, girls (52.1%) displayed higher percentages of mobile usage during breakfast meal time.

3.3 Frequency of food consumption according to the gender

Table -1 Frequency of different food Items

FOOD ITEMS	NEVER		ONCE / TWICE A WEEK		3-4 TIMES A WEEK		ONCE OR TWICE A DAY		3-4 TIMES A DAY		P value
	boys	girls	boys	girls	boys	girls	boys	girls	boys	girls	
	N%	N%	N%	N%	N%	N%	N%	N%	N%	N%	
chips/ wafers	12 (70.6)	5 (29.4)	12 (26.1)	34 (73.9)	12 (40)	18 (60)	28 (60.9)	18 (39.1)	36 (61)	23 (39)	**0.001**
Kurkure	7 (41.2)	10 (58.8)	18 (37.5)	30 (62.5)	23 (67.6)	11 (32.4)	27 (67.5)	13 (32.5)	24 (46.2)	28 (53.8)	0.013
Franky rolls	10 (43.5)	13 (56.5)	24 (39.3)	37 (60.7)	20 (58.8)	14 (41.2)	27 (65.9)	14 (34.1)	19 (54.3)	16 (45.7)	0.077
Pizzas	11 (40.7)	16 (59.3)	29 (40.8)	42 (59.2)	16 (72.7)	6 (27.3)	33 (66)	17 (34)	11 (45.8)	13 (54.2)	0.011
Veg burger	16 (40)	24 (60)	20 (37)	34 (63)	28 (59.6)	19 (40.4)	18 (78.3)	5 (21.7)	18 (62.1)	11 (37.9)	0.003
Pepsis / colas	18 (52.9)	16 (47.1)	15 (30.6)	34 (69.4)	17 (63)	10 (37)	25 (64.1)	14 (35.9)	20 (51.3)	19 (48.7)	0.015
Carbonated drinks	11 (29.7)	26 (70.3)	27 (56.3)	21 (43.8)	15 (55.6)	12 (44.4)	23 (65.7)	12 (34.3)	21 (51.2)	20 (48.8)	0.033
Sodas	22 (50)	22 (50)	15 (30.6)	34 (69.4)	26 (65)	14 (35)	18 (78.3)	5 (21.7)	18 (50)	18 (50)	**0.001**
Ice cream	8 (38.1)	13 (61.9)	30 (40)	45 (60)	27 (79.4)	7 (20.6)	23 (67.6)	11 (32.4)	10 (33.3)	20 (66.7)	0.00
FRUITS											
Apple	20 (48.8)	21 (51.2)	23 (37.1)	39 (62.9)	19 (59.4)	13 (40.6)	24 (66.7)	12 (33.3)	14 (48.3)	15 (51.7)	.054
Banana	16 (57.1)	12 (42.9)	30 (41.1)	43 (58.9)	23 (57.5)	17 (42.5)	19 (70.4)	8 (29.6)	10 (41.7)	14 (58.3)	.065
Grapes	38 (61.3)	24 (38.7)	31 (44.3)	39 (55.7)	14 (53.8)	12 (46.2)	8 (61.5)	5 (38.5)	7 (33.3)	14 (66.7)	.127
Guava	27 (44.3)	34 (55.7)	35 (57.4)	26 (42.6)	15 (55.6)	12 (44.4)	12 (63.2)	7 (36.8)	9 (39.1)	14 (60.9)	.315

*Data represented as n (%), $p \leq 0.05$, $p \leq 0.01$ is considered statistically significant

Table 1- The frequency of food consumption table included fast food items like packaged foods, outside foods, and drinks. Fast food and packaged items including chips, wafers, and Kurkure were found to be highly consumed by children and adolescents among both genders. Burger consumption in boys (both vegetarian and non-vegetarian) was seen to be high (62.1%). Consumption of Frankie rolls was also seen to be higher (54.3%) in boys and (45.7%) in girls. The majority of school and college canteens have these foods included in the menu and are available in local stores and street food vendors outside of schools and colleges which frequently sell fast food items, thus providing easy access to consumption of these foods. As a result, there is a higher-than-average intake of these types of foods as part of the dietary intake. Additionally, a lot of carbonated beverages, particularly sodas, and high-sugar foods like ice cream were observed to be consumed. Fruit consumption was low on a daily basis -Grapes (33.3%), and guava (39.1%), in boys (were found to be consumed less) whereas there was high consumption of fruits such as grapes (66.7%), bananas (58.1%) and guava (60.9%) in girls. As per the results observed, the average consumption of fruits and vegetables is less among participants. The reasons could be increased purchasing power of children for processed foods, easy accessibility of highly processed foods, peer pressure to consume the foods in a group, change or variety required from a normal lunch box, not bringing a lunch box to school, and like. In addition, the participant's daily intake of proteins, fiber and fruits rich in micronutrients such as calcium and iron was reported to be less. Also, foods like pulses, which included dals, and green leafy vegetables were much lower than their consumption of fast food and burgers.

Table -2 Macro Nutrient and micronutrients values according to the Gender

	MEAN(SD)			
Nutrient values	Boys n=100	Girls n=100	t value	P value
ENERGY (kcal)	**1705.97(496.16)**	1379.96(206.73)	6.065	0.000
PROTEINS (g)	24.47(6.77)	24.23(5.99)	0.266	0.791
CHO (g)	**183.71(56.69)**	147.29(41.62)	5.178	0.000
FATS (g)	34.78(8.29)	29.7(8.33)	4.322	0.000
CALCIUM (mg)	627.41(696.24)	421.57(150.44)	2.89	0.004
IRON (mg)	10.44(2.78)	9.45(3.07)	2.387	0.018

*Data represented as M(SD), p≤0.05, p≤0.01 is considered statistically significant

In Table 2, describes the mean consumption of Energy, Proteins, carbohydrates, Fat, Calcium, and Iron values for boys and girls. It can be observed that there was a statistically significant difference (p=0.000) in the total energy value and mean nutrient values of Carbohydrates (p=0.000), Fats (p=0.000), as well as micronutrients, mean values such as Calcium (p=0.004) and Iron (p=0.018) between both genders. The energy, carbohydrates and fats values were significantly higher in boys whereas the protein consumption was almost seen to be equal in both genders. This could be attributed to the type of foods consumed, portion and amount, and number of meals consumed as well.
A cross-sectional study conducted in Japan related to the relationship between screen time and physical activity reported that boys were more likely than girls to have higher values of carbohydrates and total energy (p 0.001). Protein, fat, and sugar consumption were all higher among girls (p =0.027, p 0.001), (Tsujiguchi et al, 2018). [3]

Table 3- Macro Nutrient and micronutrient values Consumption according to the age

	MEAN(SD)			
Nutrient values	8-12 YEARS n= 87	13-17 YEARS n=113	t value	P value
ENERGY (kcal)	1441.22(348.80)	1621.30(441.78)	-3.125	0.002
PROTEINS (g)	23.13(6.96)	25.29(5.75)	-2.402	0.017
CHO (g)	142.82(35.08)	182.95(57.55)	-5.733	0.000
FATS (g)	29.71(8.10)	34.18(8.62)	-3.732	0.000
CALCIUM (mg)	466.43(427.64)	569.18(567.76)	-1.408	0.161
IRON (mg)	7.94(2.19)	11.48(2.53)	-10.379	0.000

*Data represented as M(SD), p≤0.05, p≤0.01 is considered statistically significant

The first group consisted of children (8–12 years old), whereas the second group consists of adolescents (12–17 years old). As seen in the table above the mean values for Energy [621.30(441.78)], Proteins [25.29(5.75)], Carbohydrates [182.95(57.55)], and Fats [34.18(8.62)] were found to be higher in adolescents. Protein intake majorly came from the consumption of non -vegetarian items (as observed in the food frequency table) on a daily basis by many students such as chicken (66.7%) in girls and boys (33.3%). Prawns were consumed by boys (85.7%) and girls (14.3%) which has an amount of iron present in it. There is a significant difference observed in the calorie intake p-value (=0.002) and daily protein intake (p=0.017), as well as the intake of carbohydrates (p= 0.000), fats (0.000), and iron (0.000) among the participants in the age groups. Some sources for micronutrients reported include methi sabzi by (66.7% of boys) and (33.3% of girls) by girls. Green leafy vegetables were consumed moderately by the children, specially palak (40%) by boys and (60%) by girls. Foods such as milk was consumed by boys (55.6%) and girls (44.4%) on a daily basis which could be a source of calcium. Curd was consumed by boys

(67.9%) and girls (32.1%). Literature has cited that intake of micronutrients from dietary sources is hampered by children's food preferences and their fussiness with green leafy vegetables and fruits. To maintain integrity and to perform at its best, the immune system needs micronutrients. Children who have subclinical micronutrient deficiencies were more likely to get frequent and more severe everyday infections, which can lead to undernutrition and recurrent infections. [8]

3.4 Physical activity levels in schools overall participants

The majority of participants enjoyed physical activity, particularly boys (52.9%) and girls (47.1%). And when younger and older children were compared, a majority (57.5%) of older children reported that they were fond of playing sports. Badminton was the game that the majority of girls (76.9%) preferred to play and boys (53.8%) preferred to play football. Additionally, it was discovered that adolescents preferred outdoor games, particularly badminton (69.2%).

Table 4- Physical activity levels of children and adolescents

	GENDER					AGE				
	Boys (n=100)	Girls (n=100)	X2 value	Df	P value	8-12 yrs (n=87)	12-17 yrs (n- 113)	X2 value	df	P value
Do you have a Physical Activity period in your school?										
yes,	88(52.4)	80(47.6)	4.433	3	0.241	71(42.3)	97(57.7)	1.968	3	0.58
no	7(31.8)	15(68.2)				10(45.5)	12(54.5)			
How much time is your PE period?										
30 mins	18(23.4)	59(76.6)	38.819	2		39(50.6)	38(49.4)	2.835	2	0.24
45 mins	60(70.6)	25(29.4)				34(40)	51(60)			
1 hr	20(64.5)	11(35.5)				11(35.5)	20(64.5)			
What do you do in your PE period?										
sitting	14(53.8)	12(46.2)	13.006	4	0.011	11(42.3)	15(57.7)	2.548	4	0.636
walking a little bit with friends	30(71.4)	12(28.6)				16(38.1)	26(61.9)			
ran or played a bit	42(47.7)	46(52.3)				38(43.2)	50(56.8)			
ran around and played hard	12(33.3)	24(66.7)				19(52.8)	17(47.2)			
Do you participate in sports or other physical activities after school?										
very rarely or never	18(38.3)	29(61.7)	6.962	4	0.138	23(48.9)	24(51.1)	3.198	4	0.525
sometimes	64(57.7)	47(42.3)				44(39.6)	67(60.4)			
everyday	15(44.1)	19(55.9)				15(44.1)	19(55.9)			

*Data represented as n (%), Chisquare values

Table 4 explains the physical activity period in school-going children. It was found out that almost all kids had Physical Exercise (PE) period in their schools and junior colleges for at least a minimum of 30 mins to 45 mins and a maximum of 1 hour on an everyday basis. The majority of students, particularly the boys (71.4%), were observed spending time with friends during the PE period. During the PE period, boys (53.8%) and girls (46.2%) reported not participating in physical activity and preferred only sitting down. However, only a small percentage of boys (33.3%) were observed playing during the morning break, while girls engaged in more playtime than boys (66.7%).

3.4.1 Correlation of Physical Activity with screen time in overall participants

It was observed that only participants (24.7%) were seen training themselves for outdoor activities such as playing badminton, football, etc., and also reported the usage of mobile phones which came to 27.3% for more than 1-2 hours daily on weekdays and on weekends it was (26%) of mobile usage daily for 1-2 hours. Male students were found to be more physically active at school than female students and those living in a hostel were more physically active at school than those staying at home, whereas no such significant association was found outside of school. According to a study, the majority of children spend between 1 to 4 hours daily on physical activity, children with longer screen time tend to be less physically active.[10]

3.4.2 Correlation between nutrient intake and physical activity

The results demonstrate that there is a negative correlation in terms of calorie intake and daily carbohydrate consumption. On comparing the preference for playing games and on devices other than mobile, it was discovered that proteins (r= -0.104), carbohydrates (r= -0.074), fats (r= 0.129), calcium (r= 0.004), and iron (r= 0.111) were inversely correlated with physical activity in the large population of children who participated in physical education activity in their schools. This could be due to the fact that the foods consumed were not healthy and as per the nutrient requirements for the age group and gender.

3.5 Correlation of Screen Time and Nutrient Intake of Overall Participants

For weekdays TV viewing and energy and calcium intakes were shown to be significantly correlated (r=0.173 and r=0.148, respectively). A substantial difference was identified between protein (r= 0.168), calcium (r= 0.155), and iron (r=0.150) intake. The intake of calcium and iron-rich foods was found to be lower through the food frequency questionnaire measured. Regarding gaming, a negative association between daily protein intake and fat intake (r= -0.021 and r= -0.076, respectively) was discovered. This was because of the time spent on playing games and participants reported lower consumption of protein-rich foods. Foods such as dals, and milk rich in proteins were consumed in lower amounts. A substantial association was discovered between watching YouTube and other films or television shows and mean values of fats and iron (r= 0.149 and r=0.193, respectively). Using social media reported a positive association for iron (r= 0.21) and protein (r= 0.18) respectively. Social media has a big impact on today's generation since so many food vloggers are creating a trend of eating particular things like burgers, pizzas, etc., which may influence the choice of foods.

On the other hand, it was found that watching TV during the weekends had a positive correlation with calorie value (r=0.210), and carbohydrate intake (r=0.171). negative correlation with protein intake (r=-0.094) and fat intake (r=-0.015). Fats and iron were shown to be significantly correlated with studying or doing assignments (r=0.262 and r=0.182). On weekends the consumption of foods for nutrients is lower as compared to weekdays because most of the time children are at home and watching mobile phones or watching television. While watching YouTube, significant correlations were found for energy intake (r= 0.158), carbohydrates (r= 0.167), calcium (r= 0.156), and protein (r= -0.076). Only iron and social media usage showed a statistically significant correlation (r=0.163). In a study conducted, the main impact of screen time on nutrient consumption was considerable. Boys who watched more television had lower intakes of protein (p = 0.005), minerals (excluding sodium; potassium, p = 0.064; calcium, p = 0.005; iron, p = 0.034), vitamin K (p = 0.018), vitamin B-2 (p = 0.050), and total dietary fiber (p2 = 0.082). Girls who watched more TV had lower intakes of protein (p2 = 0.027), sodium (p = 0.071), calcium (p 0.001), vitamin D (p = 0.079), and vitamin B-2 (p = 0.032). Girls who watched more TV had greater n-6 fatty acid intake (p = 0.028), (Tsujiguchi et al,2018). [3]

It was discovered that the likelihood of developing unhealthy eating behaviors increased and the likelihood of developing healthy eating habits decreased with greater screen time. Similar research findings among 9 to 11-year-old Canadian children suggested that, regardless of covariates, screen time was inversely related to the frequency of consumption of vegetables and fruits and positively correlated with that of sweets, pastries, and fast food. A review study on children found a significant correlation between screen time and unhealthy eating habits, such as less consumption of fruits and vegetables and more consumption of sugar and energy-dense snacks. A systematic review

of reviews also found a correlation between screen time and less healthy diet quality, including less consumption of healthy foods in children and adolescents. Potentially, the physiological signals of satiety and hunger are interfered with by screens, which leads to bad eating choices and increased consumption of high-calorie, low-nutrient meals. Additionally, after adjusting for a number of covariates, the current study found a link between longer screen time and higher odds of both total and central obesity. (D. Tambalis et al 2020).[4]

As observed from the results of this study a negative correlation was seen between physical activity, screen time, and nutrient intake in children and adolescents. The screen time usage for mobile was noted to be the highest at 65.5% followed by television use at 42.5% in overall participants. Older children were observed to have unhealthy eating habits as they munched on fast food while attending college and school.

4. CONCLUSION

In conclusion, screen time has an impact on children's and adolescents' lifestyle choices. The majority of children, according to this survey, were exposed to screens during meals. The choice of foods and frequency of consumption of foods that are high energy sources may increase the risk of obesity. Effective techniques must be implemented to monitor, and discourage youngsters from spending too much time on screens and using technical devices and to encourage them to engage in physical exercise and consume a balanced diet. It may be possible to develop targeted parental control plans with the aid of an understanding of the mechanisms underlying the effects of screen time on children's food and physical activity, which could have long-term consequences like lowering the risk of obesity in the future. In conclusion, schoolchildren's food habits and lifestyle are positively associated with the duration of usage of technological devices. Independent of other covariates, screen time was strongly correlated with unhealthy eating behaviors such as skipping breakfast and fast food consumption. Future interventions should focus on reducing screen time as a way to improve nutritional practices, and maybe reduce childhood obesity, and children's lifestyles.

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