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PREVALENCE AND IMPACT OF ELECTRONIC GADGETS ON DAILY ACTIVITIES AND BRAIN HEALTH AMONG CHILDREN AND TEENAGE.

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Abstract

Background: Technological gadgets use has rapidly been increasing among Children and Teenage. Though it is beneficial and can make them creative but on the other side overuse of electronic gadgets can make the children rely on them, and it also can lead to addiction if they use them without proper guidance from their parents.

Aim: Principal aim of current study is comprehending the influence electronic gadgets on physical and physiological well-being of children & teenage.

Method: A descriptive cross-sectional study carried out among 110 school going children including 30 students of playground, 50 of primary& secondary level and 30 teenage students of higher secondary level participated from different colleges of district Gujrat and Gujranwala. A self-structured questionnaire was designed with 20 questions. Questionnaire consisted of 1st section asking about demographics,2nd section asked about frequency of mobile games/academic grades/social-media platform usage. Data was analyzed and descriptive statistics was applied.

Results: Among all gadgets 85(77%) of partcipants reported to use mobile phones to play games,4(4%) used laptops, 22(20%) saw LCD screen and 14(12%) played games on play-station. Among mobile users 11(14%) participant played 6 to 7 games/day and 10 (13%) were psychologically addicted to play mobile games while 44(55%) experienced headache and backache due to continuous usage, 56(50%) suffered visual disturbance, among 110 only 18(16%) used gadgets with permission of their parents. Most of partcipants >50% spent less than 1hour in outdoor activities. An association between electronic gadget usage and health problems like headache, backache, visual disturbances,

sleeping disturbance and psychological addiction towards mobile games has been observed in our study

Conclusion: In current study, a significant relation of electronic gadgets usage with the level of education and gender was found. Boys were more effected. As there is a vast array of media available, most of them often spend their free time glued to their electronic devices. Easy access to the electronic gadgets has had a noticeable impact on physical and mental health, of children and teenagers which is unfortunate. Many physical and mental health issues are on the rise, due to use of electronic devices among children and teenagers (e.g., headache, sleeping disorder). Parents should be more vigilant about setting limits on their children's device use for the sake of current and future generations' health.

Keywords: Gadget, Mental Health, screen time

Introduction:

The global adoption of technological devices is accelerating at a rate never seen before (1). Now a days, not only adults but also kids have an unhealthy obsession with their electronic devices (2). Concerns and worries raised about their impact on kids' physical and cognitive growth (3). Although it's true that technology has helped to remove physical barriers of communication and expanded access to information, it also has a track record of both positive and negative effects (4) The world's increasingly tech-reliant population is becoming sedentary and unhealthy. A prior investigation involving Asian countries found 62% of the adolescent (12-18 years) had smartphones (5) In a global review based research , it was found that compulsive use of electronic devices like smartphones and computers has been linked to an increased risk of mental health conditions. Little ones were impacted more than any other age group According to US Centers for Disease Control and Prevention average kid spends 8 hours a day in front of a screen.8 Moreover, it was found that Kids who don't get enough sleep and spend too much time in front of screens are less likely to be productive. Adverse circumstances can push teenagers over the edge, leading them to engage in anti-social behaviour.9 Excessive use of electronic devices has been linked to a variety of health problems, including behavioral issues like attention deficit hyperactivity disorder (ADHD) and physical issues like obesity, myopia, dry eyes, blurred vision, headaches, and more.

More over 1.2 billion people in the world now are adolescents (10 to 19 years old).11 A little under 22% of the population in Pakistan is under the age of 18.12 for the most part of them seem as though they are technology and digital gadget snobs.4 Digital gadgets have currently become an integral part of these young people's life in Pakistan due to the simple accessibility to the internet.4,5 A recent UNICEF research found that internet usage among teenagers in Pakistan has increased 800 times since the year 2000.13 Just like in other nations, Pakistan has a large number of teens who frequently use technology devices.90% of Pakistani teenagers use cellphones, according to a research. 14, 15.16 It is noteworthy that this group of people does not constantly use their phones, the internet, and other (Goh et al., 2015)

Due to the abovementioned facts, the current study was conducted in several places around Pakistan to determine the impact of electronic device use on secondary school students' general behavior and health. Kids who attend school. Similar research with kids were previously carried out in Western nations and also in nations with developed societies.14,15 To the best of our knowledge, this is the first study on this subject to be conducted in Pakistan with the purpose of determining the relationship between the use of gadgets and health issues among the various classes of secondary school students.

Aim: Current study is aimed to understand how daily screen time and gadget use affected the physical and physiological health of secondary school pupils from different.

Data Collection Procedure

A descriptive cross-sectional survey was conducted including school going children of pre, primary and secondary sections divided in 3 age groups, 3 to 7, 8 to 12 and 13 to 17 yrs. of District Gujrat.

Survey was conducted from October 2023 to January 2024. Questionnaire was distributed among students both in English, Urdu languages. Information about age&gender data of partcipants was included in questionnaire. Age wise distribution was based on grades in school. Parents of students (3-7 yrs.) Pre & Primary section up to grade 3 were contacted to fill questionnaire. While partcipants of age 8 to 12 yrs. were interviewed about types of gadgets used, video game used, gadget use/day, social media use/day. Questions regarding impact of gadgets and video games on social life, study, health of partcipants were also included. Current study excluded university students and students <3 yrs. Additionally, those institution who didn't permit to interview their students were excluded. Television was left off of the list of gadgets because a gadget is any tiny mechanical or electrical equipment that falls under one or more of the following categories: mobile phones, tablets, or any other wireless devices with unique uses (6).

Data Analysis Procedure

Descriptive statistics was applied on data obtained from both parents of Pre& Primary levels students. Reaction of parents and students to questions regarding above is calculated in % and descriptive statistics applied. Moreover, 2-way ANOVA was applied with Tukey's multiple comparisons test in GRAPHPAD 10.2.3.(403)

Results

Age&gender wise division partcipants mentioned in **Table:1.**

Table:1. Age&gender wise division among partcipants

Age	***n* (%)**
3-7yrs	30(27%)
8-12yrs	14(13%)
13-18yrs	66(60%)
Gender	
Boys	40(36%)
Girls	70(64%)

Parents of students from Pre& Primary section

Parents of students from Pre& Primary section were questioned about Gaming pattern of children during their mobile use and perception of Parents regarding impact of gadgets on health, daily routine and studies of their children. Among 110, 30 students and parents of students (14.67±7.018) answered yes to questions regarding knowledge about type of content their kids watching 83.3%, impact of gadgets on health causing eye problems (53.3%). Mostly questions answered by parents are in favor of less use of gadgets **Table:2.**

Table: 2. Responses from Parents of students from Pre& Primary section

3-7yrs	**Yes**	**No**
Do your child play any mobile games?	25	5
Do your child play video Games?	24	6
Do you think that Gadgets cause eye problem to your child?	16	14
Do you allow your child to use gadgets for long time?	4	26
Do you think technology can save your time?	12	18
Do you think gadgets use make your child active in class?	7	23
Do you think gadgets use affect academic grades of your child?	18	12
Do you children play mobile games Prior study in home?	14	16
Do you think use of Gadgets is waste of time for your children?	12	18
Mean&SD	**14.67±7.018**	**15.33±7.018**

Students aged 8 to 12 yrs. (Primary section)

14 Students from Primary section answered yes to questions regarding knowledge about type of content (53%) while only 29% get permission from their parents to use gadgets **Table:3.**

Table: 3. Responses from Parents of students from Students aged 8 to 12 yrs. (Primary section)

8-12yrs	Yes	No
Do you play any mobile games?	13	1
Do you play video Games?	12	2
Did you get headache after using mobile phones?	6	8
Using Gadgets cause eye problem?	6	8
Did your Parents allow to use gadgets for long time?	4	10
Do you think social media badly affect your studies?	8	6
Do you think technology save your time?	8	6
Did Use of gadgets make you active in class?	8	6
Using gadgets affect your academic grades?	11	3
Do you play mobile games Prior to studying?	4	10
Do you think use of Gadgets is waste of time?	11	3
Did Gadgets help you in researching?	12	2
Mean&SD.	**8.583±3.175**	**5.417±3.175**

Students aged 13 to 17 yrs. (Secondary section)

66 students joined to this section and answered questions (40.92±8.62). Number of students in this age group increased because students in this age group are quite conscious about their and selection of choices. Mostly students use gadgets and they answered questions regarding knowledge about type of content 73% and only 29% get permission from their parents to use gadgets **Table 4.**

Table: 4. Responses from Parents of students from Students aged 13 to 17 yrs. (Secondary section)

13 to 17 yrs.	Yes	No
Do you play any mobile games?	48	18
Do you play video Games?	41	25
Did you get headache after using mobile phones?	40	26
Using Gadgets cause eye problem?	31	35
Did your Parents allow to use gadgets for long time?	19	47
Do you think social media badly affect your studies?	45	21
Do you think technology save your time?	42	24
Did Use of gadgets make you active in class?	42	48
Using gadgets affect your academic grades?	53	13
Do you play mobile games Prior to studying?	42	24
Do you think use of Gadgets is waste of time?	45	21
Did Gadgets help you in researching?	43	23
Mean&SD	**40.92±8.62**	**27.08±10.84**

Comparative analysis between Responses:

Comparative analysis was done to observe multiple analysis between responses by parents and school students. It reveals strong correlation with significant p value

Table:5. Comparative analysis between Responses:

Comparative analysis between Responses:	Yes	No
Parents of students from Pre& Primary section	14.67±7.018	15.33±7.018
Students aged 8 to 12 yrs. (Primary section)	8.583±3.175	5.417±3.175
Students aged 13 to 17 yrs. (Secondary section)	40.92±8.62	27.08±10.84

Results of comparison showed a strong interaction with significant p-value (<0.0001) between rows and columns. Tukey's multiple comparisons test was applied and there is significant difference was found between responses of Parents of students from Pre& Primary section and Students aged 13 to 17 yrs. (Secondary section) (<0.0001) and responses from Students aged 8 to 12 yrs. (Primary section) and Students aged 13 to 17 yrs. (Secondary section) Table 5&6.

Table:6. Tukey's multiple comparisons test

Tukey's multiple comparisons test	95.00% CI of diff.	Below threshold?	Summary	Adjusted P Value
Row 1 vs. Row 3	-30.69 to -21.81	Yes	****	<0.0001
Row 2 vs. Row 3	-38.26 to -26.41	Yes	****	<0.0001

Type of Gadgets use among partcipants Children and Teenage.

Type of gadgets used among partcipants (Table:7). Showed more than half among children used mobile games (52%) followed by others electronic gadgets (7).

Table: 7. Type of Gadgets use among partcipants Children and Teenage

Mostly used gadgets among Participants	
Laptop	40(36.36)
Mobile phones	52(47.27)
TV	20(18.18)
Others	12(10.91)

Health issues observed among Children and Teenage due to gadget usage

Headache, Neck strain and eye-problems are commonly seen and observed among today's digital generation. Long-hour attachment to mobiles or laptops may develop physical and psychological problems effecting HQOL of children& Teenage of Pre & Primary and Secondary sections in school going children (8). Tukey's multiple comparisons test found significant differences (*p-value*= 0.0062) among neck strain in children 3-7yrs aged and 8-12yrs (9).

Table:8 Health issues observed among Children and Teenage due to gadget usage

	3-7yrs		8-12 yrs		13-17 yrs		Total	
	YES	**NO**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**
Headache	16	14	6	8	40	26	93	17
Neck strain	14	16	5	9	50	16	90	20
Eye Problem	15	15	6	8	31	35	62	48
Mean&SD	**15±1**	**15±1**	**5.7±0.58**	**8.3±0.58**	**40±9.5**	**26±9.5**	**82±17**	**28±17**

Summary:

The results of this study corroborate those of previous studies that excessive smartphone and tablet use among Pre, Primary and secondary school going children in 3to7, 8to 12, and 13to17 yrs. (10) During school days, 67% of students spent at least an hour playing games on mobile devices, while 19% did the same on weekends and holidays; this is more than double the amount of time recommended by the American Academy of Paedriatrics (11), (12). Furthermore, there is no statistical significance in the present study regarding the gadget use among Pre, Primary and secondary school going children, highlighting fact that current times kids and teens use electronic devices at the same rate. These findings underscore the critical importance of minimizing the development of electronic device habits in digital youth and the need for early intervention to target them. While it's important to limit screen time for entertainment purposes among today's youth, it would be unrealistic to do the same when it comes to education, since computer-assisted instruction is now fundamental. Additionally, among children and teenagers, 96% reported headaches, 90%

reported neck strain, and 62% reported eye problems which may lead to psychological issues (13) . Mental health of children may suffer if they spend too much time in front of screens in Pre, Primary and secondary school going children.

Conclusion

The executive functions of the digital generation are susceptible to the effects of fast-paced media, which can impair their intelligence, reasoning, and capacity to make sound decisions. Students in both elementary and secondary school place a premium on research and data surfing as components of device use, but there is an urgent need to reduce screen time for people of all ages in order to safeguard the mental and physical well-being of the digital generation.

Limitations

Despite Research limitations, the results shed light on how often kids and teens use devices and the links between that use and factors like age, eye problems, and mental and emotional well-being. It seems that the tried-and-true method of limiting children's access to electronics is not working (3, 22). Efforts should be made to educate children, parents, and teachers about how to use electronic devices in a healthy way, including ergonomics, taking frequent visual and postural breaks, and being physically active. Given the widespread adoption of computer-assisted learning, it is crucial to intervene early on to address children's excessive and inappropriate use of electronic devices in order to mitigate their potential long-term health effects. The youth, their parents, and their schools, in addition to the public health policies that will be established, can work together to accomplish this goal through the implementation of health education and screening programmes, as well as large-scale longitudinal studies.

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