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Alarming Increase in Electronic Gadget Usage among Students during a Layer of the Global Pandemic

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Abstract

Purpose: Every day, new technologies and appealing devices are released that are aimed at a large portion of our population, particularly youth, and students. These devices get young people addicted; the addiction is to frequently utilize or grow depending on the gadget. People spend a lot of time on it, and it can induce psychological and neurological disturbances, which can lead to significant problems. This study aims to determine the association between the usage of electronic gadgets on students' physical health and cognitive skills. As COVID-19 indicated extensive use of technology, the main outcome of this study is to intervene in the impact of electronic gadgets either positive or negative on student life.

Methodology: Over 01 year (Feb 21 to Jan 22), this Quantitative- Analytical Cross-sectional study was conducted at Indus University of Health and science, Korangi Crossing, Karachi. Students of three academic departments of the university participated in the study i.e., Indus College of Allied Health Sciences, Indus College of Physical Therapy, and College of Nursing. Sample size of 170 with the margin of error as 4.6% and 95% confidence level. Both male and female age group between (16 to 35) active user of social media and electronic gadgets was enrolled in study from any discipline (nursing, allied health, biosciences, medical technology etc.). Any person with mental and physical disorder previously diagnosed or under any psychological treatment or medication was not included in the study

Findings: 35 participants (20.5 %) average time spent on a smartphone is 1 to 4 hours and 135 participants (79%) average time spent on a smartphone is more than 4 hours. Statistical significance was found for cervical pain & fatigue with more time spent on a smartphone. No Statistical significance among other symptoms while using a laptop and other gadgets.

Recommendations: The present study highlights one public health issue because nowadays exposure to electronic gadgets is increasing day by day and in our society, youth are getting high exposure. All stakeholders including parents, teachers, and decision (policy) makers must have voiced this serious concern about excessive exposure to social media and gadgets' dependency effects on the generation's physical and psychological health. If the study is repeated with a larger and more representative sample (which was not possible due to COVID Pandemic) significant influence or otherwise, of time spent on electronic gadgets on physical health could also be detected.

Keywords: *Electronic Gadgets, Nomophobia, COVID-19, Addiction.*

1.0 INTRODUCTION

Individuals all across the world had to face a variety of mental health issues during COVID19 Global Pandemic, ranging from panic, fear, health anxiety, sleep difficulties, and dissociative-like symptoms [1]. People, on the other hand, spend a significant amount of time watching television and using their electronic devices since their sources of enjoyment are confined to indoor activities. While the pandemic's influence lasts for a long time, binge-watching of television and technological gadgets is also likely to endure, perhaps leading to behavioural addiction. Combined with these, addictive behaviours may be possible sources of annoyance during the lock-down time, and fresh behavioural addictions, particularly among teenagers, may form as a result [2]. Before the layer of COVID19 pandemic, Pakistan nutrition survey report 2019 highlighted the excessive smartphone use not only has an impact on personal life and relationships with family members, but it also has a negative impact on physical health. Every day, new technologies and appealing devices are released that are aimed at a large portion of our population, particularly youth and students, because these are the most vulnerable groups and, eventually, they become buyers of these gadgets, with smartphones topping the list. These devices get young people addicted; the addiction is to frequently utilise or grow dependent on the gadget. People spend a lot of time on it, and it can induce psychological and neurological disturbances, which can lead to significant problems. Technology advancement as a coping method to avoid competition [3].

Classically Society usually worrying, and we have phobia with drug addiction, but social networking and electronic gadgets addiction is also very serious concerned in present time, this cannot be ignored, our people day by day attracting and becoming habitual to social networking and latest electronic gadgets such as smartphone, tablets laptops etc. Their social life is totally finished and ruined by excessive use of electronic gadgets. They spend their life whole day on mobile phone, laptops and tablets by using multiple social websites like WhatsApp, twitter, Facebook, Instagram etc., by spending more time on using these electronic gadgets. Terminology Nomophobia, "the dread of being out of mobile phone touch," is the addiction associated with excessive smartphone use, now abundantly described by the psychologist. Nomophobia is the result of the user's repetitious activity. These motivations for smartphone use serve as positive reinforcement. These variables include smartphone functionality such as the camera, internet, gaming, and other apps [4]. In Pakistan, the Pakistan Telecommunication Authority (2015) reported 114.7 million mobile customers at the end of June 2015 in its annual reports. It was also shown that the majority of smartphone users were young people. In addition, it is estimated that 77% of smartphone users are between the ages of 21 and 30 [5]. Many studies suggest that adolescents are suffering psychologically, physically, and behaviorally on a daily basis. Their growth and development were severely hampered. It is past time to consider this. This is a concerning condition for our younger children; their future is jeopardised as a result of these technological devices. Therefore, this study aims to determine the association among the usage of electronic gadgets on students' physical health and cognitive skills. As COVID19 indicated extensive use of technology, the main outcome of this study is to intervene the impact of electronic gadget either positive or negative on student life.

2.0 METHODOLOGY

Over 01 year (Feb 21 to Jan 22), this Quantitative- Analytical Cross-sectional study was conducted at Indus University of health and science, Korangi Crossing, Karachi. Students of three academic departments of university participated in study i.e., Indus College of Allied health Sciences, Indus

College of Physical Therapy and College of nursing. Sample size of 170 with the margin of error as 4.6% and 95% confidence level. Both male and female age group between (16 to 35) active user of social media and electronic gadgets was enrolled in study from any discipline (nursing, allied health, biosciences, medical technology etc.). Any person with mental and physical disorder previously diagnosed or under any psychological treatment or medication was not included in the study. The official ethical approval was taken from Head of Academic Department IUHS.

A purposive sampling method was followed to collect data from 170 students of allied health students from different academic departments of university randomly. For data sample collection investigator physically visited multiple times with Covid-19 SOP, after introduction with participants, investigator had explained about purpose of study and taken written consent form with signature of participant. Two questionnaires were distributed; the first part of the questionnaire was contained bio data profile of the respondent of this study. The second part of questionnaire was related to electronic gadgets usage duration, purpose, average time spend, physical health issue participant self-perception, second questionnaire was related to cognitive assessment.

Cognitive assessment scale was used for study, this scale consisted of 25 questions and three sections. For Physical Health assessment, questionnaire was related to electronic gadgets usage duration, purpose, average time spend, and physical health issue participant self-perception has been taken. Through the Likert Scale, participant reception and feeling regarding symptoms cervical pain, fatigue, shortness of breathing, sleep issues, back pain, headache, stress, numbness in fingers and nomophobia were measured. Participant reception and feeling regarding their cognitive functions, thought process like ability to recall, analyses, responds, Cognitive skills are thinking ability or thought process and mental capacity, use information, analyses situation, creativity and new idea thinking abilities or mental functioning, such as memorizing and remembering and focusing attention. Cognitive assessment dependent variables was divided into three categories i.e., Forgetfulness- ability of recalls thing's participant ability, Distractibility- person unable to pay attention or stay on task, and False Triggering- Interrupted processing of sequences of cognitive and motor actions.

Personal information and data of participants was confidential, participants had a right to know about details of this study and reason of data collection. This study maintained confidentiality via only relevant person had handle data, after before and after data entry in SPSS. All data was encrypted by keeping anonymity of the person i.e., instead of name we used ID number only. This study is an adopted version of thesis submitted for the MSPH degree program. The study protocol has been approved from IRB (Reference no# IERB (8)/SZABIST KHI(LIFE)/19104154/210058).

The data had analyzed on SPSS, all collected data had been entered in SPSS software with ID number. Means, frequencies of participant were analyzed. The inferential statistical independent t-test has been applied for association determination of hypothesis of study. Two questionnaires have been used for cognitive assessment, cognitive assessment scale and second scale for physical health self-made questionnaire after validity testing through pilot study. For association determination statistical independent t-test applied.

3.0 FINDINGS

Medical and Allied Health 170 students participated in this study. 79 males and 91 female voluntaries participated in study. Mostly participant of this study had age between 19 years to 24 years. Large number of persons participated were belong to BS Nursing [Fig 1].

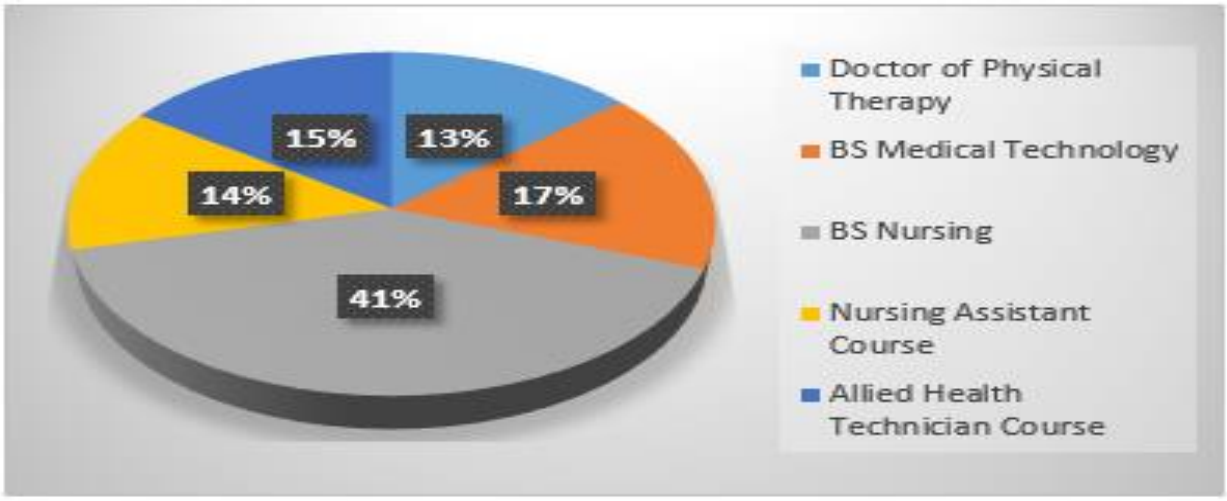

Figure 1: Frequency of Medical and Allied Health Students Enrolled in this Study

Mostly participants of this study had more than one electronic gadget, like smartphone, laptop, and computer. All participants were active users of social networking. In order to analyze the cognitive assessment, responses were divided into two groups. Group A-usage ≤4 Hours, and Group B-usage ≥4 Hours. 35 participants (20.5 %) average time spent on smartphone is 1 to 4 hours and 135 participants (79%) average time spent on smartphone is more than 4 hours. 164 participants (96 %) average time spent on Laptop/Computer is 1 to 4 hours and 21 participants (4 %) average time spend on Laptop/Computer is more than 4 hours [Table 01].

Table 1: Stratification of Smartphones and Laptop Users with Their Physical Health Affecting Parameters on 95% Confidence Interval (P Value=0.005). Independent T-Test Applied

Smartphone User				
	Group A (usage ≤4 Hours) N= 130		**Group B (usage ≥4 Hours) N= 40**	
	Mean ± S.D	**P Value**	**Mean ± S.D**	**P value**
Cervical pain and fatigue	2.25 ± 0.499	0.002	2.58 ± 0.747	0.01
Shortness of breathing and back ache	2.29 ± 0.616	0.162	2.45 ± 0.639	0.173
Sleep issues	2.84 ± 0.581	0.155	3.00 ± 0.751	0.217
Headache and stress	2.70 ± 0.743	0.716	2.75 ± 0.809	0.729
Feel numbness in fingers and eye pain	2.61 ± 0.84	0.652	2.68 ± 0.764	0.067
Nomophobia	2.65 ± 0.71	0.271	2.80 ± 0.823	0.314
Laptop User				
	Group A (usage ≤4 Hours) N= 164		**Group B (usage ≥4 Hours) N= 06**	
	Mean ± S.D	**P Value**	**Mean ± S.D**	**P value**
Cervical pain and fatigue	2.31 ± 0.582	0.142	2.67 ± 0.516	0.155
Shortness of breathing and back ache	2.32 ± 0.626	0.496	2.50 ± 0.548	0.472
Sleep issues	2.86 ± 0.606	0.69	3.33 ± 1.033	0.314
Headache and stress	2.71 ± 0.767	0.690	2.83 ± 0.408	0.502
Feel numbness in fingers and eye pain	2.60 ± 0.826	0.99	3.17 ± 0.408	0.179
Nomophobia	2.68 ± 0.698	0.622	2.83 ± 1.472	0.813

Assessment of Electronic gadgets revealed Physical health issues symptoms such as cervical pain, fatigue, shortness of breathing, backache, sleep issue, headache and stress, numbness in fingers & eye pain and nomophobia increases with more time spend on electronic gadgets. Statistical significance found for cervical pain & fatigue with more time spent on smartphone. No Statistical significance among other symptoms while using laptop and other gadgets [Table 02].

Table 2: Correlation of Smartphones and Laptop Users with Their Physical Health Affecting Parameters on 95% Confidence Interval (P Value=0.005). Chi Square Test Applied

	Mean Score		Difference in Mean score	P-value
	Group A (usage ≤4 Hours)	Group B (usage ≥4 Hours)		
Smartphone User				
Cervical pain and fatigue	2.25	2.58	0.33	0.00***
Shortness of breathing and back ache	2.29	2.45	0.16	0.162
Sleep issues	2.84	3.00	0.16	0.155
Headache and stress	2.70	2.75	0.05	0.716
Feel numbness & eye pain	2.61	2.68	0.07	0.652
Nomophobia	2.65	2.80	0.15	0.271
Laptop User				
Cervical pain and fatigue	2.31	2.67	0.36	0.142
Shortness of breathing and back ache	2.32	2.50	0.18	0.496
Sleep issues	2.86	3.33	0.47	0.69
Headache and stress	2.71	2.83	0.12	0.690
Feel numbness & eye pain	2.60	3.17	0.57	0.99
Nomophobia	2.68	2.83	0.15	0.622
Statistical significance: **= P value is <.01, ** =P-value is <.05, and * =p value is <.0.1 Higher mean score shows symptoms increase with more than 4 hours use				

Discussion

Electronic Gadgets use is one of significant impact on health, because continually use of electronic gadgets causes many health issues, for example backache, headache, overweight, stress, eye strain, and cervical pain. Dependence and time spent duration have association with health issues or adverse effect on physiology and psychology. Dependence on electronic gadgets with lack of physical activity not only affect the physical health it also affects the cognitive and behavior of individual. As per the recent investigation in 2018 there is effect in cognitive and behavior of students due to usage of electronic gadgets [6]. These results are similar to this study finding where majority of participant dependency on electronic gadgets was high. Due to more time spent on electronic gadgets causing negative effect on cognitive skills and causing stress and depression. Excessive use of gadgets among youth throughout a time may be a growing threat. There has been a longtime relationship between excessive net use and loneliness, delinquent values, lower emotional intelligence and depression. According to Praveena D et al. excessive usage of electronic gadgets health hazards on youth revealed participants had complained of health such as headache, anxiety, stress, Nomophobia and disturbances in logical thinking 25% of the respondents said they are using gadgets more than 8 hours and now they are having problem in logical thinking [7].

The participant resulted in this study spends more time on electronic gadgets such as smartphone, laptop or computer and headphone having several health issues like, Cervical pain, headache, eye pain, shortness of breathing, numbness in fingers and nomophobia and sleep issues etc. but mean score of these issues is low in group those spend less time on electronic gadgets. This resulted due

to improper technique of using electronic gadgets they injured themselves repetitive strain injury is a chronic condition that develops because of repetitive, forceful, or difficult hand movements for continued periods leading to impairment to muscles, tendons, and nerves of the neck, shoulder, forearm, and hand, which can cause pain, weakness, numbness, or impairment of motor control. Muscles of eyes, neck, arm and wrist are affected badly with prolonged use of electronic gadgets. There is a critical need to address lack of knowledge on how to use electronic gadgets in a healthy way and there also a need to develop the need of connectedness between social relations. In 2020, Pachiyappan et al analyzed excessive usage of electronic gadgets on students (Youth) physical health and psychological health. Their study results showed health issues insomnia, headache, eye issues and restlessness were high among participants of this study [8]. This was again confirmed by K et al, as physical health is deteriorated badly and day by day in our children and teenagers therefore, they become overweight, obese, and lethargic etc [9].

Technological gadgets influence the health and lifestyle of the user in a negative direction. In addition, Fowler & Noyes, concluded that excessive use of mobile phones lead risk of muscular system disorders due to impaired body posture of user, as well as causes neck pain and sleep disturbance [10]. Similarly, van Velthoven et al quoted with their study result that Students are totally excluding themselves from the social gathering, family relationship etc. Students have weak cognitive skills, poor memory, and poor concentration skills. Students have harmful physical effects also like Road traffic accidents, Repetitive strain injury RSI etc. due to loss of concentration while driving [11]. Due to excessive use of mobile phones, especially at night causing sleep disorders, trouble to fall asleep due to increase level of melatonin level. Sleep deprived people are emotions disabled people they can't control the emotions [12]. Dependency on smartphone and social media decline cognitive skills of person, in this study showed smartphone-induced brain drain for consumer decision-making they remain anxious about their gadgets when gadgets are not with them [13]. In Pakistan, Shakoor et al in its empirical evidence on "Impact of Smartphones Usage on the Learning Behaviour and Academic Performance of Students", about 80% of students believe that they used cellphones to search for information, and nearly 70% of students strongly think that smartphones assist students enhance their academic performance and effectively finish their projects and assignments. On the other hand, 40% believe that cellphones hinder their learning process during class lectures [14]. Similarly, another study in Karachi in 2020 to find out the Effects of COVID-19 pandemic and lockdown on lifestyle and mental health of students, reported three-fourths (72.9%) believed that avoiding quarantine would have been more difficult if they had no electronic devices. There was also a significant link between higher use of electronic goods and longer sleep times ($P = 0.005$) [15].

4.0 CONCLUSION AND RECOMMENDATIONS

The present study highlights one of public health issue because now a days exposure of electronic gadgets is increasing day by day and in our society, youth are getting high exposure. Nowadays, youth nows days playing electronic sports and spend a long time on electronic gadgets. These habits also cause negative effect on both mental and physical health. This study found more time is spent on electronic gadgets which affect physical heath and cognitive skills. However, statistically significant effect was found in Forgetfulness, and Distractibility only. All stakeholders including parents, teachers and decision (policy) makers must have voiced this serious concern about excessive exposure of social media and gadgets dependency have effects on generation physical and psychological health. Due to covid-19 pandemic, lockdown and safety measures, only

a limited number of participants were present at institute that's why we did not include a large number of participants in this study. Moreover, Sample size of study was small. If the study is repeated with a larger and more representative sample (which was not possible due to COVID Pandemic) significant influence or otherwise, of time spent on electronic gadgets on physical health could also be detected.

Statements and Declarations

This study does not receive any funding for publication prior to submission to this journal.

Competing Interests

None

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