EXPLORING THE PHYSIOLOGICAL IMPACT OF EXCESSIVE SCREEN TIME ON THE MENTAL HEALTH OF YOUTH OF HYDERABAD, SINDH

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ABSTRACT

BACKGROUND: The growing popularity of electronic devices in entertainment and education has encouraged young adults, especially adolescents, to spend more time in front of screens. There are growing incidences of anxiety, depression, and suicidal attempts among them. In 1990, 170 million people were suffering from depression, which rose to 270 million in 2019, accounting for a 64% rise in the prevalence of the disease.

Aims & Objectives: The objective of this study was to investigate link between increasing anxiety and depression among young adults and their duration of screen time exposure.

Material & Method: The current study was a survey-based study that was carried out at the Sindh University of Jamshoro from March 2024 to April 2024 (2 months) after obtaining ethical approval from the Physiology Department via latter no Physiol/77. The sample size was 550 participants in the 15- to 19-year-old age group. After written consent, a comprehensive and modified DASS 21 questionnaire was distributed among the participants, who were the students of Sindh University Jamshoro.

Results: The result shows increase in screen time contributes more to the incidence of anxiety and depression (*P* value 0.02, df: 2, x^2 = 7.5), while excessive screen exposure at night is more contributory to anxiety and depression than daytime (df = 2, x^2 = 6.9, *P* value = 0.03).

Conclusion: It was concluded that there is a definite link between excessive screen exposure and an increased ratio of anxiety and depression among adolescents.

Keywords: Screen time, anxiety, Depression, DASS21 Questionnaire

INTRODUCTION

Adolescence is a growing period in which tremendous physical, mental, and hormonal changes take place. In this period, these young adults may indulge themselves in healthy or unhealthy activities. The unhealthy activities may ultimately lead to depression, anxiety, and other disorders. [1] In today's world, young adults are immersed in an ocean of electronic media.

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They are using television, cell phones, and tablets for the purposes of education and entertainment. They are indulging in this activity day and night without any consideration of time duration, which may deteriorate their mental health. [2] College students are more vulnerable to screen hazards because all day long they use computers for study purposes, and at night they spend most of the time for entertainment and talking to friends. Researchers believe that the duration of exposure leads to effects on mental health. [3]

Most mental disorders begin in adolescence and persist for the rest of life. Most of the victims are males (35%), while in males it rises to 65% in females. It is necessary to evaluate the cause and treat it to prevent further complications. [4] The consumption of excessive time before the screen leads to increased exposure to short-wavelength radioactive waves, which leads to disruption of the circadian rhythm, which is produced by a decrease in the release of the melatonin hormone. [5] Since the time of the internet invasion, the world has been converted into a global village. Most adolescents are involved in searching the internet most of the time without knowing its hazards. Excessive screen exposure leads to a decrease in the release of

well-being hormones, e.g., dopamine, endorphin, oxytocin, and serotonin. [6]

Increased screen exposure leads to decreased sleep, which may lead to anxiety, depression, and other mental disorders. [7] Spending more time in front of screen leads to disturbance in initiation of sleep and quality of sleep. Many researchers believe that sleep disorders are the most important factor for anxiety disorders.[8] when the children spend more time in front of a digital screen; they actually change their lifestyle and isolate themselves, which may lead to depression unintentionally. [9]

Excessive screen time, particularly at night, leads to obesity, eating disorders, mental disorders, and defects in the cardiovascular and visual systems.[10] Excessive on-line screen time leads to depression, which is a major problem in adolescence and may lead to suicidal tendencies, cognitive impairment, and aggressive behavior. It also leads to an increase in the incidence of morbidities and mortalities. [11] Spending more time at night leads to elevated cholesterol levels, disturbed glucose levels, and cardiovascular and neurological disorders. It may also lead to obesity. [12]

In the COVID-19 era, when people were restricted to homes and forced to work from home, children and adolescents were forced to pursue online education, spending much of their time in front of a digital screen. Increased screen time leads to an increased sense of isolation and physical inactivity. All these factors produce anxiety. Depression deteriorates the lifestyle of a person, especially in adolescence.[13]

In 1990, 170 million people were suffering from depression, which rose to 270 million in 2019, accounting for a 64% rise in the prevalence of the disease. Depression leads to 1.2 million suicides throughout the world, including adolescence. One of the most important factors in the etiology of depression is spending more time in front of a digital screen. [14]

MATERIAL AND METHOD

The current study was a survey-based study that was carried out at the Sindh University of Jamshoro from March 2024 to April 2024 (2 months). The approval of the study was granted by the ethical committee of Physiology Department via latter no Physiol/77. The sample size was 550 participants. The sample for the study was randomly collected from the Sindh University Jamshoro. Both male and female genders were included in the study. The age group ranges from 15 to 19 years old. All the participants were unmarried. Only those students were collected who were either normal or suffering from anxiety or depression. All the students who were suffering from any disease or were not using mobile or laptop were excluded from the study. All the students below 15 and above 19 were also excluded from the study. Before the collection of data, written consent was obtained from the participants, and the aims and objectives of the study were completely explained to the patients. A comprehensive DASS 21 questionnaire was distributed to the patients, and they made sure that it was easy and understandable to the participants. All the participants were given equal environmental conditions to fill out the questionnaire. All the participants who were suffering from any disease except anxiety and depression were excluded from the study.

The students were asked about their mode of exposure to screens, i.e., video gaming, filming, video chatting, and studying both at night and during the day. Worrying, palpitations, tachycardia, and fear of losing were included in the category of anxiety. Each answer was assigned a number, and the maximum aggregate was considered to be a more severe form of anxiety. Similarly, the depression questions were comprised of feelings of rejection, not feeling good, frustration, not taking an interest in anything, and loneliness. Maximum aggregate was considered a positive sign of depression. Specific questions were asked about the duration and quality of sleep.

Statistical analysis: All the data was statistically analyzed by Graph Pad Prism9. Descriptive statistics were analyzed by column option and the P value was derived by applying chi square test and was considered significant < 0.05.

Aims & Objectives: The objective of this study was to investigate any link between increasing anxiety and depression among young adults and their spending more time in front of screens.

Rationale of the Study: The rationale of the study was to use the results of this study to promote awareness among adolescents about the hazards of excessive screen sharing**.**

Conflict of interest: No conflict of interest was found.

RESULTS

Table 1: Demographic count down, screen time <5 hrs versus > 5 hrs.

n= 550	Mean	Stdev	Stdev error of Mean	Median	Min-Max	*P value*
Age of participants	17.37	1.81	0.05	17	15-19	0.0001
Systolic Bp in lesser screen time	118.6	6.630	1.918	120	110-130	
Systolic BP in more screen time	123	7.34	2.216	125	110-130	
Pulse in lesser screen time	73.91	2.42	0.73	74	70-78	
Pulse in greater screen time	94.09	11.28	3.40	98	78-110	
BMI in lesser screen time	18.85	1.722	0.108	18.50	16.50-22	
BMI in more screen time	22.72	2.09	0.12	23	18-26	
Sleep in day time exposure	5.8	0.87	0.08	6	4-7	
Sleep in night time exposure	4.21	0.64	0.03	4	3-5	

Table 1: Describe the demographic count of participants who were exposed to screen time versus those who were exposed to screen time for more than 5 hours. The more time consumers spent, the higher their systolic blood pressure, pulse rate, BMI, and sleep duration. The P value was statistically significant (0.0001).

Table 2: **Association of anxiety depression according to screen time exposure**

Gender	Normal	Anxiety	Depressed	Total	*df*	X^2	*p*-value
Screen time more than 5 hours n=300	100(18.18%)	125(22.72%)	75(13.63%)	300(54.54%)	2	7.5	0.02
Screen time less than 5 hours n=250	110(20%)	80(14.54%)	60(10.90%)	250(45.45%)			
Total	210(38.18%)	205(37.27%)	135(24.55%)	550(100%)			

Table 2 discusses the association of screen time duration with depression and anxiety. The increased duration of exposure to screens leads to an increased incidence of anxiety and depression. (*P* value: 0.02, df: 2, $x2^{:}$ 7.5)

Table 3: Association of anxiety and depression with day and night time exposure

Visual period	Normal	Anxiety	Depressed	Total	*df*	X^2	*p*-value
Night screen time viewers n=400	140(25.45%)	160(29.09%)	100(18.18%)	400(72.72%)	2	6.9	0.03
Screen time less than 5 hours n=150	70(12.72%)	45(8.18%)	35(6.36%)	150(27.27%)			
Total	210(38.18%)	205(37.27%)	135(24.54%)	550(100%)			

Table 3 discusses the association between nighttime and daytime screen exposure and depression and anxiety. The nighttime screen exposure leads to more depression and anxiety (*P* value 0.03, df = 2, $x^2 = 6.9$).

DISCUSSION

The increasing use of smartphones, tablets, and digital televisions with the internet has attracted youth to spend more time in front of screens, both during the day and at night. This has compelled researchers to study the relationship between increasing incidences of anxiety and depression. The current study was an attempt to investigate this relationship in the youth of Hyderabad. It was concluded that increased screen time leads to anxiety and depression, and this relationship becomes stronger when the duration of exposure increases (*P* value 0.02). It was also concluded that this association becomes binding when the screen time is in the night hours (*P* value 0.03).

Multiple studies throughout the world have confirmed that excessive exposure to screen time increases the incidence of anxiety and depression. The study conducted by Hunt et al. (2018) revealed that increased use of social media leads to an increased ratio of depression and anxiety,[15] and this fact was confirmed by Primack et al (2017) [16]. Additionally, a 2017 study by J. Firth emphasized the negative effects of excessive screen use, particularly social media, on the psychological health of adolescents. [17]

The current study suggests that increasing screen time in the night hours decreases sleep hours and leads to physical sluggishness and mental fatigue in the daytime. Another reason for depression is that increased screen time leads to a feeling of loneliness and a sense of dissociation from the external world. These facts were confirmed by a study conducted by Fatima et al. in 2023. [18] similar types of results were also deduced from a study conducted by Samntha Tang in 2021.[19]

All these studies indicate a suspicious element in inducing the etiology of depression and anxiety in youths who spend much of their time in front of screens, especially at night.

CONCLUSION

A positive association was found between increased screen time and anxiety and depression.

LIMITATIONS

The first limitation is that this study is cross sectional. Secondly the sample size is small. Thirdly the study was conducted in one hospital only

RECOMMENDATIONS

The result of this study should be used to educate youth involved in excessive screen time exposure.

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