



IMPACT OF SCREEN TIME ON ANTHROPOMETRIC MEASURES, SLEEP QUALITY AND DURATION OF SLEEP, MENTAL HEALTH: A CROSS-SECTIONAL STUDY

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ABSTRACT

Aims: To assess the impact of screen time on anthropometric measures, mental health, duration and quality of sleep in undergraduates.

Settings and Design: Cross-sectional study

Materials and Methods: A comparative cross-sectional study was carried out in different UG colleges for 6 months. UG student's age 18-24 years were included in this study. The impact of the screen on anthropometric measures, mental health problems, quality and duration of sleep was analyzed by using questionnaires and SPSS for statistical analysis.

Results: A total of 1965 participants (695 males and 1270 females), aged 19.57 ± 1.172 were included in the study. Positive correlation were found between screen time and anxiety ($r = +1.000, p = 0.0001$) and depression ($r = +0.510, p = 0.0001$), Negative correlation was found between screen time and sleep ($r = -0.369, p = 0.0001$), there is no association between screen time and BMI ($r = -0.069, p = 0.002$).

Conclusions: The study showed that increased screen time is associated with poor sleep quality and the symptoms of anxiety and depression was also increased with an increase in screen time. Despite this, students with poor sleep quality are associated with an increased risk of depression. There is no association between screen time and body mass index and the students are more dependent on the gadgets.

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INTRODUCTION

Presently the use of gadgets has been increased enormously and has become an integral part of our daily routine life.¹ Excessive screen time leads to Internet addiction it is characterized by a maladaptive pattern of internet use leading to clinically significant impairment or distress.² Sedentary time spent in front of a television or computer screen has become one of the major unhealthy lifestyle habits, and some studies showed that there is an association of screen time and obesity and anthropometric indices.³ Excessive Smartphone usage is associated with a wide range of negative impacts on social and health outcomes.⁴

MATERIALS AND METHODS

The study is aimed to assess the impact of screen time on anthropometric measures, mental health and duration and quality of sleep in undergraduates.

A cross-sectional study was conducted in Under Graduate colleges in and around Guntur, selecting the colleges in a random sampling method. Adult students of age between 18-24 years with no history of psychological disorders like depression and anxiety and any other sleep disorders using electronic gadgets like a Smartphone, television, tablets, laptops, desktops, and video game consoles were included in the study and obtained written consent. Students who are not willing to consent and who are not interested to participate in the study were excluded. Information regarding demographics, screen time, previous mental health history, and anthropometric measures were gathered using a validated Data Collection Form. The following instruments were administered to gather data regarding the subject's mental health and sleep quality and duration:

1. The Sleep-quality questionnaire also known as Sleep Condition Indicator was developed by Colin Espie, a professor of sleep medicine at the University of Oxford and it is an eight-item scale that was developed based on DSM-5 workgroup draft criteria.⁵

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2. The Hamilton anxiety rating scale (HAM-A) was one of the first rating scales developed to measure the severity of anxiety symptoms and is still widely used today in both clinical and research settings. The scale consists of 14 items, each defined by a series of symptoms, and measures both psychic anxiety (mental agitation and psychological distress) and somatic anxiety (physical complaints related to anxiety).⁶
3. The Hamilton Depression Rating Scale (HDRS) is the most widely used clinician-administered depression assessment scale. The original version contains 17 items (HDRS17) about symptoms of depression experienced over the past week.⁷
4. The data obtained were entered into an advanced Microsoft excel spreadsheet and evaluated. For statistical analysis, we have used Pearson's correlation analysis from IBM SPSS Statistics (version 1.0.0.118) to assess the relationship between the variables.

RESULTS

Students using gadgets and age above 18 years are recruited. The total population was 2100 and 1965 were included into the study remaining 135 students are below the age of 18 years and not willing to participate in the study.

The demographics analysis showed that 35% were males and 65% were females with a mean age of 19.57 ± 1.172 years. The average screen time of the subjects is $85.08 + 34.95$ min and the average screen time of male subjects was 92.02 min and female subjects was 81.12 min, this indicates that average screen time of male subjects is more than female subjects.

The responses towards the screen time and anxiety were mixed [Table 1 and Figure 1], and HAM-A revealed that 32% ($n=631$) of the subjects are having symptoms of anxiety. There is a positive linear correlation between the screen time and anxiety ($r= +1.00$; $p= 0.0001$).

The responses towards the screen time and depression were analyzed [Table 2 and Figure 2], and HDRS revealed that 12.5% ($n= 247$) of the subjects are facing the symptoms of depression and there is a positive correlation between screen time and depression ($r= +0.510$; $p= 0.0001$).

The responses towards the screen time and sleep quality and duration and BMI were mixed [Table 3 and 4, Figure 3 and 4], and the Sleep-quality questionnaire revealed that 0.5 % ($n=9$) and 3% ($n=67$) of the subjects having poor sleep and moderate sleep and there is a negative linear correlation between screen time and sleep quality and duration ($r=-.369$; $p= 0.0001$) and there is a negative correlation between screen time and BMI ($r= -0.69$; $p= 0.002$).

Our study found that as the screen time increases the symptoms of mental health (anxiety and depression) are also increasing and they are statistically significant. The increase of screen time may lead to poor sleep quality and there is no effect of screen time on Body mass index (BMI) and it statistically non-significant.

Table 1 Correlation between screen time and anxiety

		Screen time	Anxiety score
Screen time	Pearson Correlation	1	1.000**
	Sig. (2-tailed)		.000
	N	1965	1965
Anxiety score	Pearson Correlation	1.000**	1
	Sig. (2-tailed)	.000	
	N	1965	1965

** . Correlation is significant at the 0.01 level (2-tailed).

Table 2 Correlation screen time and depression

		Screen time	Depression score
Screen time	Pearson Correlation	1	.510**
	Sig. (2-tailed)		.000
	N	1965	1965
depression score	Pearson Correlation	.510**	1
	Sig. (2-tailed)	.000	
	N	1965	1965

** . Correlation is significant at the 0.01 level (2-tailed).

Table 3 Correlation between screen time and sleep

		Screen time	Sleep score
Screen time	Pearson Correlation	1	-.369**
	Sig. (2-tailed)		.000
	N	1965	1965
sleep score	Pearson Correlation	-.369**	1
	Sig. (2-tailed)	.000	
	N	1965	1965

** . Correlation is significant at the 0.01 level (2-tailed).

Table 4 Correlation between Screen time and BMI

Correlations		BMI	Screen time
BMI	Pearson Correlation	1	-.069**
	Sig. (2-tailed)		.002
	N	1965	1965
Screentime	Pearson Correlation	-.069**	1
	Sig. (2-tailed)	.002	
	N	1965	1965

** . Correlation is significant at the 0.01 level (2-tailed).

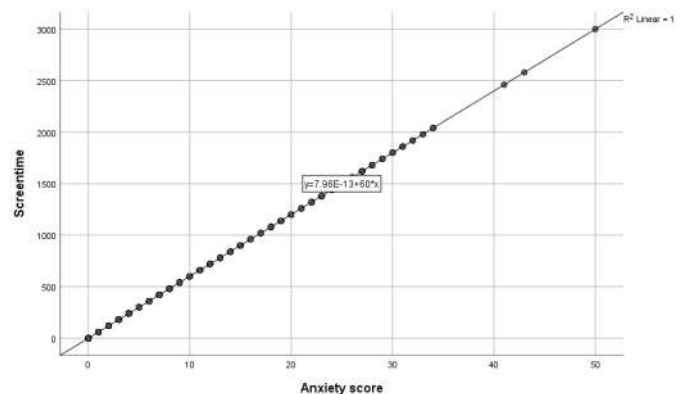


Figure 1 Correlation between screen time and anxiety

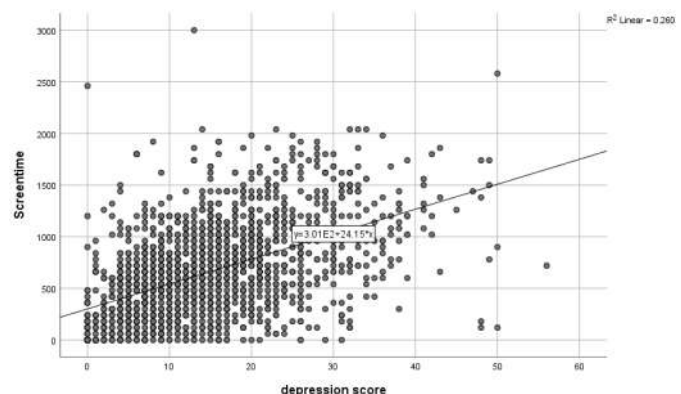


Figure 2 Correlation between screen time and depression

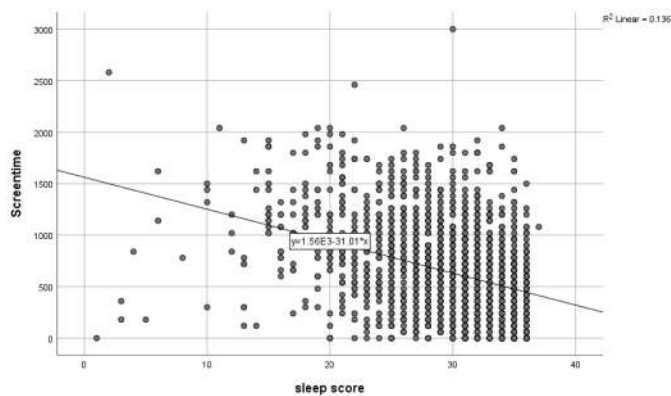


Figure 3 Correlation between screen time and Sleep quality

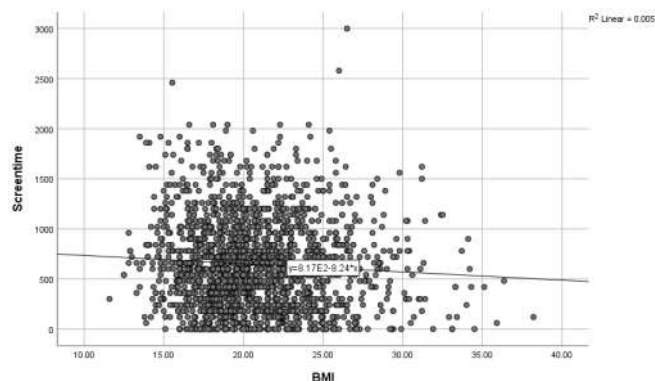


Figure 4 Correlation between screen time and BMI

DISCUSSION

The primary objective is to determine the impact of screen time in undergraduates, to evaluate the relationship between the screen time and participant's characteristics (age, gender, eating habits, relationship with parents and sibling's), and to explore the possible association between screen time and anthropometric measures, sleep quality and mental health (anxiety and depression).

The current study found that subjects who are using gadgets excessively were more likely to have insufficient sleep compared to those who did not use the gadgets in excess. This trend is observed by *Rian Kusuma Dewi et al (2018)*, *Xiaoyan Wu et al (2015)*, who reported that there is the relationship between excessive use of gadgets and insufficient sleep.^{8,9} There is a significant positive correlation between screen time and mental health (anxiety and depression); the participants with higher screen time exhibit the symptoms of anxiety and depression. In addition, depression and anxiety predict poor sleep quality. A few studies, it proved that addiction to mobile phones/ videogames have an increased risk of anxiety and depression.¹⁰

Similarly, a cross-sectional study, conducted by Chinese in college students indicated the increase in screen time is significantly associated with a higher risk of mental health problems.¹¹ Previously published studies have already indicated a potential correlation between pathological internet use and anxiety.¹² In a study, it suggested that there is a positive association between computer usage and anxiety/depression.¹³ In some studies by, *Jocelyne MatarBoumosleh et al (2017)*, *JavadSajedifar et al (2019)*, suggested that individuals who are not accessed to use Smartphones or computers become anxious and their desire

towards to the use of Smartphone and other gadgets is increased.^{14, 15}

Our results showed that participants who are dependent on the mobile phone are more while compared to other participants, who are not dependent on the mobile phone. In a study, the dependence on the social media became a behavioral addiction.¹⁶ Our study also showed that most of the participants feel discomfort when their mobile phone is running out of battery and also missed their planned work because of using a mobile phone in excess.

CONCLUSION

The study showed that poor sleep quality is associated with increased screen time and the symptoms of anxiety and depression were also increased with an increase in screen time. Despite this, students with poor sleep quality are associated with an increased risk of depression. There is no association between screen time and body mass index and the students are more dependent on the gadgets.

Limitations

- The sample size is less for an epidemiological study design.
- Most of the data were collected from pharmacy students, especially female students.

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Conflict Of Interest:

There is no conflict of interest between the authors.

Abbreviations Used:

UG: Under Graduate
 BMI: Body Mass Index
 HAM-A: Hamilton Anxiety Rating Scale
 HDRS: Hamilton Depression Rating Scale
 IBM SPSS: International Business Machines Statistical Package for the Social Sciences
 DMS-5: Diagnostic and Statistical Manual of Mental Disorders

References

1. Naveen Kumar Muniraja, Amarnath. HK, *et al.* 2018. A Review on Effects of Electronic Gadgets on Eye, *Journal Of Ayurveda Physicians And Surgeons (Japs)/Review Article*, Vol 5 No 1.
2. Jin-Liang Wang *et al.* 2019. "The Association between Mobile Game Addiction and Depression, Social Anxiety and Loneliness," *Public Health*; 7:247.
3. Leandro D. DELFINO *et al.* March 2018. "Screen Time by Different Devices in Adolescents: Association with Physical Inactivity Domains and Eating Habits," *The Journal of Sports Medicine and Physical Fitness*; 58(3):318-325.
4. KadirDemerci *et al.* 2015. "Relationship of Smartphone use severity with sleep quality, depression and anxiety in university student," *Journal of Behavioral Addictions*; 4(2), pp. 85-92.

5. Colin A Espie *et al.* 2014. "The Sleep Condition Indicator: a clinical screening tool to evaluate insomnia disorder," *BMJ Open*; 4:e004183.
6. Hamilton M. A rating scale for depression. *J Neurol Neurosurg Psychiatry* 1960; 23:56–62.
7. Hamilton M. The assessment of anxiety states by rating. *Br J Med Psychol* 1959; 32:50–55.
8. Rian Kusuma Dewi *et al.* 2018. "Adolescents Smartphone use at night, sleep disturbance and depressive symptoms," *International Journal of Adolescent Medicine and Health*; 20180095.
9. Jean M. Twenge *et al.* 2018. "Associations between screen time and lower psychological well-being among children and adolescents: Evidence from a population-based study,," *Preventive Medicine Reports* 12 271–283.
10. Xiaoyan Wu *et al.* 2016. "Impact of screen time on mental health problems progression in youth a 1-year follow-up study," *BMJ Open*; 6: e011533.
11. Elroy Boers, *et al.* 2019. "Temporal Associations of Screen Time and Anxiety Symptoms Among Adolescents." *The Canadian Journal of Psychiatry / La Revue Canadienne de Psychiatrie* ;1-3.
12. Jin-Liang Wang *et al.* 2019. "The Association between Mobile Game Addiction and Depression, Social Anxiety and Loneliness," *Public Health*;7:247.
13. Mehmet Akdag *et al.* 2018. "Exposure to non-ionizing electromagnetic fields emitted from mobile phones induced DNA damage in human ear canal hair follicle cells," *Electromagnetic Biology And Medicine* , VOL. 37, NO. 2, 66–75.
14. Jocelyne MatarBoumosleh *et al.* 2017. "Depression, Anxiety and Smartphone Addiction in University Students," *PLOS ONE*;12(8): e0182239.
15. Pizzo A *et al.* 2019. "Active behaviors and screen time in offspring of parents with major depressive disorder, bipolar disorder and schizophrenia," *Psychiatry Research*, available at <https://doi.org/10.1016/j.psychres.2019.112709>.
16. Sampath H, Kalyani S, Soohinda G, Dutta S. Patterns. 2017. Attitudes and Dependence toward what's App among College Students. *J Mental Health Hum Behav*; 22:110-5.

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