Screen Time In Relation To Sleep Quality And Attention Span Among College Students: A Correlational Study

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ARTICLE INFO	ABSTRACT
	Background: The rise in websites and social groups has encouraged young people to spend more time on digital gadgets like computer screens. College students who have poor sleep quality experience daytime sleepiness and exhaustion that is linked to impaired concentration, cognitive function, and emotional dysfunction. These factors impede academic and learning skills, physiological as well as psychological health. Screen time and the usage of light-emitting devices in the late hours are two key contributors to sleep problems. **Study design:** A Correlational Study **Aim:** To identify the correlation between Screen time with Sleep quality and Attention span among college students. **Objective:** To evaluate the association between Screen time with Sleep quality and Attention span among college students by using Screen-time Questionnaire, Pittsburgh Sleep Quality Index, and Attention Control Scale. **Method:** A total of sixty (N=60) college students were included in the correlational study through convenient sampling identified through inclusion and exclusion criteria. Participants were recruited from Santosh Medical College, Pratap Vihar, Ghaziabad, U.P. Each participant had given Screen Time Questionnaire (STQ), Pittsburgh Sleep Quality Index (PSQI) and Attention Control Scales (ACS) in hardcopies to fill their response. Each questionnaire was firstly well explained to every participant. **Result:** The descriptive statistics for screen time (STQ) in hours, sleep quality (GPSQI), and attention span (ACS) reveal that the mean values are 13.378 hours for screen time, 6.167 for sleep quality, and 48 for attention span. The standard errors are 0.695, 0.338, and 0.877, respectively, while the standard deviations are 5.384 for screen time, 2.618 for sleep quality, and 6.792 for attention span. The sample variances are 28.992 for screen time, 6.853 for sleep quality, and 46.136 for attention span. These mean values indicate that the average screen time of approximately 13 hours negatively impacts sleep quality. The Pearson correlation coefficient between average screen time (STQ) and sleep quality (GPSQI) is 0.319, suggesting that increased screen time is associated with poorer sleep quality. The Pearson correlation coefficient between average screen time (STQ) in hours and attention span (ACS) is -0.040, indicating a very weak negative relationship between screen time and attention span. **Conclusion:** In conclusion, the study highlights significant correlation between screen time (STQ), sleep quality (GPSQI), among college students. The data reveal an average screen time of approximately 13 hours, which is associated with negative impacts on sleep quality. These findings underscore the importance of managing screen time to improve sleep quality among college students. **Keywords:** STQ, GPSQI, ACS, College Students, Screen time

INTRODUCTION:

The prevalence of computer vision syndrome is higher than 50% in users of computers. The rise in websites and social bunches has empowered youthful individuals to spend more time n computerized contraptions like computer screens. For the past ten a long time, there have been a few online learning and amusement stages with diversions and motion pictures. As a result, youth screen time has reliably expanded over various countries [1]. Duration of time dedicated using digital media on devices such computers, tablets, game consoles, cellphones, and televisions is known as the screen time. Media consumption in India has increased significantly in the last few years, both in terms of quantity and variety. A McKinsey analysis states that India ranks as one of the most rapidly advancing markets for digital consumers, following closely behind China [3].

Numerous previous research has discovered a link between health problems and increased multimedia exposure [1-16]. Although the general population is widely aware of the negative effects of cellphone radiation, they may not be as aware of the other negative impacts of increasing screen time on health, which include stress on the musculoskeletal and visual systems in addition to disrupting circadian rhythms [1]. These devices generate blue light, and the electromagnetic fields that result throw off the circadian rhythm. Blue light suppresses melatonin, which promotes sleep [4].

Sleep disturbances significantly affect a person's mental and physical health. The connection between bad quality sleep and a higher chances of increases weight, obesity, metabolic disorders, increased blood pressure, impaired glucose tolerance, and diabetes has been documented. Insufficient sleep negatively affects cognitive functions and elevates the chances of experiencing anxiety, stress, and depression [5].

Considering the negative effects of sensory overload on brain development, individuals who dedicate a significant amount of time to being in front of screens may be more susceptible to degenerative symptoms. Considering the extensive use of electronic media and its adverse effects, people might experience increased stress as they age. In comparison to earlier ages, children raised in a technological age may have early signs of cognitive impairment due to the long-term effects on their language, learning, and memory [6].

The attention system is crucial for the development of numerous functions, which comprises interpersonal as well as cognitive ones like learning and execution [12]. An individual's ability to focus on a job for the required amount of time without getting sidetracked is known as their attention span. To finish a work on time and to reach goals, it is essential to be able to concentrate on it and make use of one's attention span [8].

While there are many benefits to using a smartphone, such access to up to-date information and enhanced academic performance, there are also drawbacks, like drug abuse and addiction that negatively affect a person's social and personal life. A significant drawback is the disruption of sleep, which can result in various issues for teenagers and young adults [9].

Therefore, in this study the aim is to address if there is paucity any correlation exists between screen time in relation to sleep quality and attention span among college students.

METHODOLOGY:

A total of 60 college students were included in the correlational study through convenient sampling. Participants were recruited from Santosh Medical College, Pratap Vihar, Ghaziabad, U.P.

As per inclusion criteria, college going students, age range between 18-30yrs, both male and female and who are willing to participate were included in the study. As per exclusion criteria, students with diagnosed sleep disorders and students taking sleep medication, who were diagnosed with any medical condition, and who were diagnosed with any psychiatric condition were excluded. Participants were given a informed consent form outlining the goals, methods, possible hazards, and advantages of the study prior to its commencement. They were given sufficient time, as well

as an explanation, to go over the document and ask any questions before giving their written voluntary consent. Each participants had given Screen Time Questionnaire (STQ), Pittsburgh Sleep Quality Index(PSQI) and Attention Control Scales(ACS) in hardcopies to fill their response. Each questionnaire was firstly well explained to every participant.

Outcome measures:
1. Pittsburgh Sleep Quality Index:
PSQI evaluates how well you slept the month before. Numerous sleep-related factors are assessed by the 19 self-rated questions, including estimations of sleep length and latency, along with the occurrence and intensity of sleep-related issues. These 19 components are combined to give 7 component scores, each of which is equally weighted on a range of 0 to 3. As a whole PSQI score is calculated by adding ratings of 7 components, with scores ranging from 0 to 21; higher scores reflect poorer quality of sleep. Participants should complete the entire index within 5 to 10 minutes, and the scoring process requires an additional 5 minutes. PSQI reliability and validity research is mostly based on classical test theory (CTT). The bulk of studies have Cronbach's α values between 0.70 and 0.85 [10].

2. Attention Control Scale:

ACS is a self-assessment tool that measures control of attention and attentional shifting. It's scored on a 4 - point Likert scale (1 being virtually never and 4 being always), and it has 20 items. Attentional Control Scale is a self-report assessment developed to assess personal variations in attentional control. The anterior attentional system, which has executive control over other attentional processes, is one of the interacting networks that give rise to attention. The ACS was created as a generic scale to evaluate overall variations in voluntary attentional control because several functions of the anterior system have been hypothesized. The scale has been used to investigate the relationship between different psychopathology traits and voluntary control efforts. The ACS items have a test-retest reliability of 0.45 to 0.73, for a total score of 0.61. The internal consistency was reported as α = 0.88[11].

3. Screen Time Questionnaire:

Screen Time Questionnaire (STQ) comprises eighteen items that measure the amount of time spent using familiar screen gadgets (e.g. T.V., smart mobile, and smart tabs) at different times during the workweek (e.g. workday, evening, and weekend). The STQ measures screen time of different devices divided into five categories: TV, laptop/computer, tablet, smartphone, and TV-connected gadgets (such as streaming devices and gaming consoles). These categories were designed to accurately reflect the questionnaire's goal of quantifying various screen-time usage patterns. In particular, the rising tendency of adults viewing subscription-required videos and on specific request content rather than consistently scheduled T.V. made it vital to distinguish between TV and TV-connected devices. The scale further asks, duration of electronic screen use in the course of a normal weekday, an average evening, and a general end day of week (Saturday or Sunday) separately as time of screen usage varies throughout the general week day and end days of the week. The scale has also separate sections that examines time of screen usage as the primary use task and screen viewing in the background because watching a screen while doing some else tasks that require for physical motion would not be considered dormant behavior that negatively affects physical health and consequently health issues. With the exception of the question concerning the use of a smartphone on a normal end day of a week (ICC = 0.16, p = 0.069), every item in STQ shows fair to excellent relative reliability (ICCs = 0.50−0.90; all < 0.000) [12].

DATA COLLECTION:

A total of 60 college students were included in the correlational study through convenient sampling. Participants were 22 males and 38 females recruited from Santosh Medical College, Pratap Vihar, Ghaziabad, U.P.

DATA ANALYSIS:

After completion of questionnaires from all participants, data obtained from the results were entered into microsoft excel and data analysis was performed using Statistical Package of Social Science (SPSS) IBM Statistics Version 26 program.

Pearson's Correlation is performed to check correlation between STQ and Global PSQI , and to check correlation between STQ and ACS using SPSS IBM Statistics Version 26 software.

RESULT:

Table 1.0: Demographic Characteristics of College Students

S No.	Baseline Characteristics	Participants
1.	No. of Subjects	60
2.	Age Range (years)	18-27
3.	Gender (M/F)	22/38

Table 2.0: Descriptive Statistics of Average Screen Time (STQ), Sleep quality (GPSQI) and Attention Span (ACS)

Stats	*Average Screen Time (STQ) in hours*	*Sleep quality (GPSQI)*	*Attention Span (ACS)*
Mean	13.378	6.167	48
Standard Error	0.695	0.338	0.877
Standard Deviation	5.384	2.618	6.792
Sample Variance	28.992	6.853	46.136

Table 2.0 present the descriptive statistics for screen time (STQ) in hours, sleep quality (GPSQI), and attention span (ACS). The mean values are as follows: screen time (STQ) is 13.378 hours, sleep quality (GPSQI) is 6.167, and attention span (ATQ) is 48.
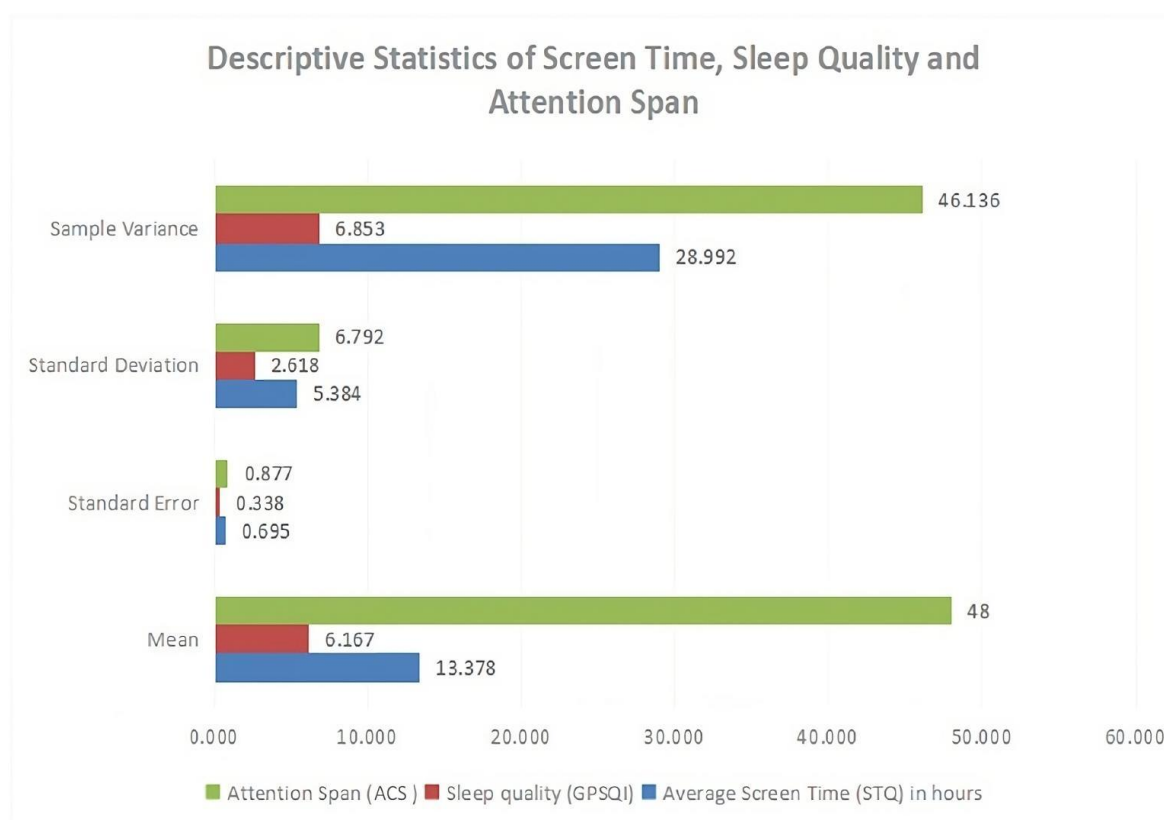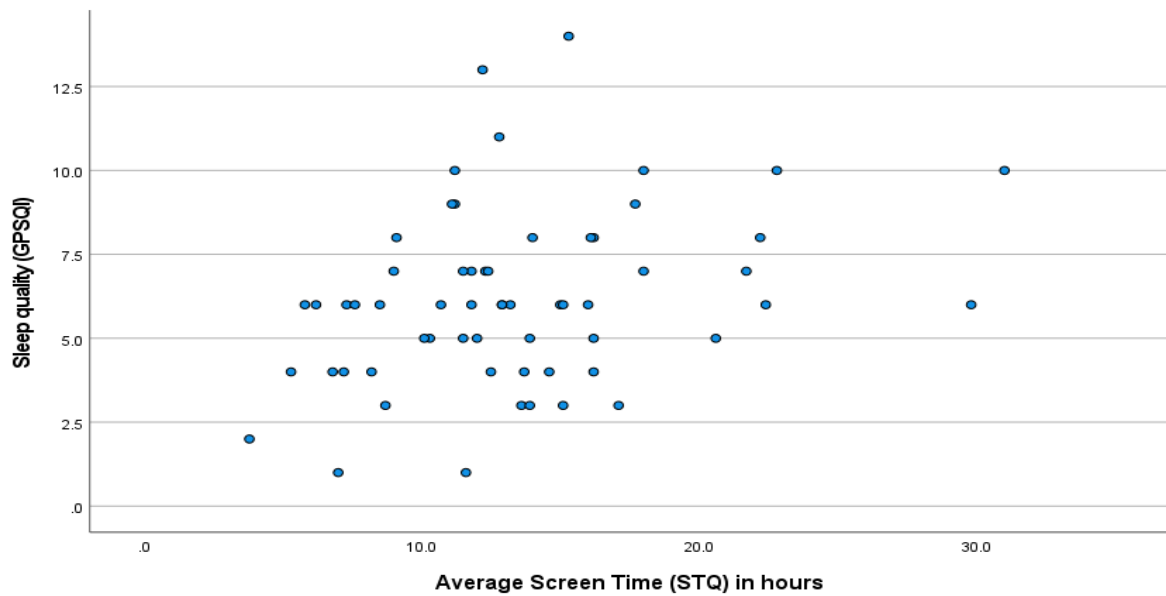
Figure 1.0 Descriptive Statistics of Average Screen Time (STQ), Sleep quality (GPSQI) and Attention Span (ACS)

Table 3.0: Pearson Correlations of Average Screen Time (STQ) and Sleep quality (GPSQI)

		Average Screen Time (STQ) in hours	Sleep quality (GPSQI)
Average Screen Time (STQ) in hours	Pearson Correlation	1	.319[*]
	Sig. (2-tailed)		.013
	N	60	60
Sleep quality (GPSQI)	Pearson Correlation	.319[*]	1
	Sig. (2-tailed)	.013	
	N	60	60
*. Correlation is significant at the 0.05 level (2-tailed).			

Table 3.0 shows the Pearson correlation coefficient is 0.319, indicating that increased screen time is associated with poorer sleep quality. The two-tailed significance value is 0.013 at the 0.05 significance level, demonstrating that the p-value is below the 0.05 threshold.
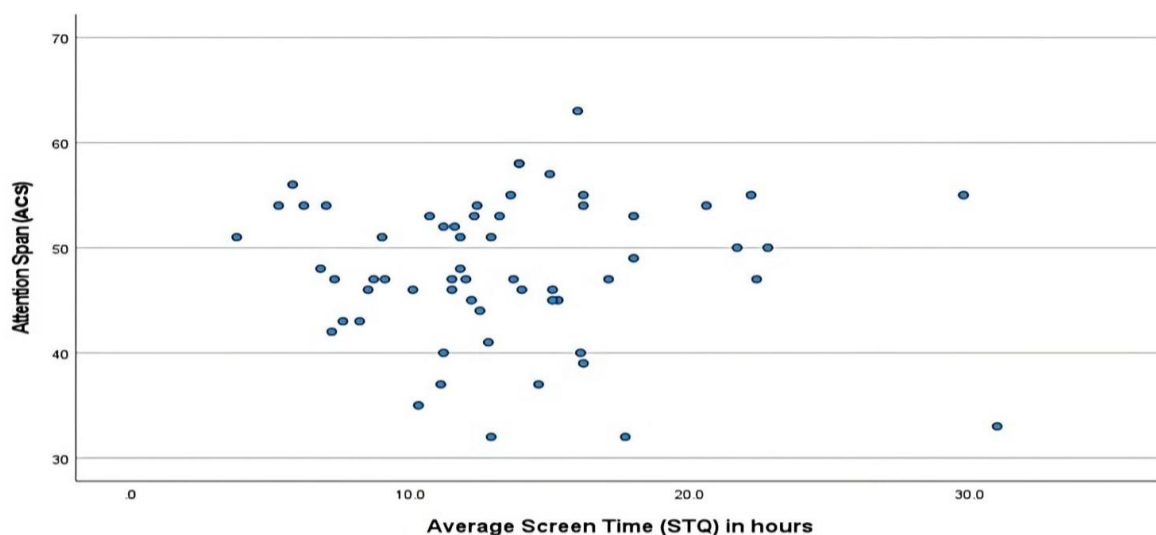
Graph 2.0: Pearson Correlations of Average Screen Time (STQ) and Sleep quality (GPSQI)

Table 4.0: Pearson Correlations of Average Screen Time (STQ) and Attention Span (ACS)

Average Screen Time (STQ) in hours and Attention Span (ATQ)		Average Screen Time (STQ) in hours	Attention Span (ATQ)
Average Screen Time (STQ) in hours	Pearson Correlation	1	-.040
	Sig. (2-tailed)		.764
	N	60	60
Attention Span (ATQ)	Pearson Correlation	-.040	1
	Sig. (2-tailed)	.764	
	N	60	60

Table 4.0 shows the Pearson correlation coefficient is -0.040, indicating a negative relationship between screen time and attention span. The two-tailed insignificance value is 0.764 at the 0.05 significance level, indicating that the p-value is above the 0.05 threshold.

Graph 3.0: Pearson Correlations of Average Screen Time (STQ) and Attention Span (ACS)

DISCUSSION:

This present study explores the correlation between screentime, sleep quality and attention span among college students. In Contrast with the study done by Gupta, Parul Chawla et.al. conducted a study in 2022 on association of screen time, quality of sleep and dry eye in college-going women of Northern India. The Study findings indicated a noteworthy link between dry eye incidence and the duration of daily use of screen (P < 0. 05) as well as quality of sleep (P < 0. 05) in college- aged females [1].

Screen time (STQ) in hours, sleep quality (GPSQI), and attention span (ATQ) provide crucial insights into the impact of screen usage on these variables. The mean values indicate an average screen time of 13.378 hours, a sleep quality score of 6.167, and an attention span score of 48. The standard errors for these measures are 0.695, 0.338, and 0.877, respectively, and the standard deviations are 5.384 for screen time, 2.618 for sleep quality, and 6.792 for attention span. Sample variances further support these statistics, with values of 28.992 for screen time, 6.853 for sleep quality, and 46.136 for attention span. These statistics suggest that the average screen time of approximately 13 hours may negatively influence both sleep quality and attention span.

Pearson correlation coefficient is 0.319, indicating that rising screen time is linked with poorer quality of sleep. This correlation coefficient of 0.319 is significantly less than 1, reinforcing the impact of screen time on quality of sleep. Average screen time encompasses TV, smartphones, tablets, Television - connected gadgets, laptops/desktops, and background screen time, all of which generally impacts their quality of sleep. Poor quality sleep is indicated by scores exceeding 5. The two-tailed significance value is 0.013 at 0.05 significance level, demonstrating that p-value is below the 0.05 threshold. Consequently, null hypothesis, is rejected. Alternative hypothesis, asserting a significant correlation between screen time and sleep quality, is accepted. Our findings are supported by previous scientific literature, **Arshad D, Joyia UM, et.al.** had done a Prospective cohort study in 2021, their results showed that 65.70% subjects showed poor quality of sleep. Long total ST was connected to bad sleep quality, according to Pearson's correlation (R=0.356, p<0.001) [13]. Another study, **Alba Cabré-Riera, Maties** Torrent in 2019 found in the study, they found that a decreased quality of sleep was connected to habitual and frequent excessive mobile usage. Reduced sleep productiveness and more minutes of wake ups after sleep initiation were linked to higher pill usage. There were no correlations between sleep measurements and other gadgets [14]. These findings also similar results supporting that increased screen time is linked with deterioration in quality of sleep.

Correlation coefficient (Pearson) is -0.040, indicating a very weak inverse relation of screen time with attention span. As amount time duration screens use increases, the attention span decreases, albeit only slightly. Two-tailed significance value is 0.764 at 0.05 significance level, indicating that the p-value is above the 0.05 threshold. Consequently, there exists a non - significant inverse relationship between average screen time and attention span.

Pearson correlation coefficient between average screen time (STQ) in hours and attention span (ACS) is -0.040, indicating a very weak negative relationship of screen time with attention span. Attention span decreases with increase in screentime but this deterioration is statistically insignificant. Two-tailed significance value is 0.764 at 0.05 significance level, indicating that p-value is above the 0.05 threshold which shows that this relationship is non-significant. Therefore, t here is non-significant negative correlation between average screen time and attention span. Very few literatures or research had been undertaken prior to explore correlation between screen time and attention span. Although a study done by **Kavin Alaparthi** in 2024, found noteworthy correlation between increased social media usage and decreased attention span [15]. Another study conducted by **Dinesh P. Sahu, Manish Taywade et.al**. didn't found any significant association of attention span with screen time. Their forward score had a really frail inverse or no relationship, and backward score had a powerless positive relationship or no relationship [16]. These results are similar to our findings where we didn't find any significant correlation between screentime and attention span. Consequently, null hypothesis stating that there is no significant correlation between screen time & attention span among college students, is accepted, and alternative hypothesis, which asserts a significant correlation between screen time and attention span, is rejected.

Overall, data reveal significant correlation between screen time sleep quality. Increased screen time is linked with poorer sleep quality. These results underlines importance of managing screen time for enhancement in sleep quality, particularly among college students.

CONCLUSION:

The study highlights significant correlations between screen time (STQ), sleep quality (GPSQI) among students. Data reveal an average screen time of approximately 13 hours, is associated with negative impacts on sleep quality. Pearson's correlation coefficient of 0.319 between screen time and sleep quality indicates moderate but significant positive correlation, suggesting that increased screen time leads to poorer sleep quality. These findings highlight the importance of regulating screen time to enhance the quality of sleep among college students.

LIMITATION OF THE STUDY:

1. A longer timeframe may be necessary to assess more robust patterns or seasonal changes in screen use and sleep.
2. Participants were included from one college only and productive screentime and leisure screen time duration are not separated.
3. Subjective questionnaire is used to measure screen time duration.

FUTURE RECOMMENDATION:

Future research could be done with a larger sample size and could be conducted including participants from different colleges and universities. More objective method of measuring screen time duration should be used in future research.

ACKNOWLEDGEMENT:

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