Digital Device Use, Computer Vision Syndrome, and Sleep Quality among Saudi Arabia's Undergraduate Population

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ABSTRACT

Study design: Cross sectional

Background: Computers and visual display terminals are now an essential part of both our personal and professional lives thanks to phenomenal advancements in technology. Universities make substantial use of computers as a teaching and learning tool. Medical professionals can now access tools like medication formularies and medical calculators on their smart phones while holding textbooks. This necessitates reflection on the possible harmful health conditions that digital natives' increased screen time.

Methods: Data for this cross-sectional study were gathered using a specially designed questionnaire that included demographic questions as well as questions about CVS and sleep disorders. After the group of experts had several conversations, a questionnaire was created. A language expert, a researcher, and a subject specialist made up this panel.

Result: We had 60% prevalence of CVS, we did not observe any significant differences while comparing gender with 20-20 rules.

Conclusion: In summary, a significant number of college students have both poor sleep quality and CVS. This is a serious public health concern that requires consideration.

Key words: Computer, Vision, Syndrome, Sleep, Diseases

INTRODUCTION

Computers and visual display terminals are now an essential part of both our personal and professional lives thanks to phenomenal advancements in technology. Universities make substantial use of computers as a teaching and learning tool. Medical professionals can now access tools like medication formularies and medical calculators on their smart phones while holding textbooks. This necessitates reflection on the possible harmful health conditions that digital natives' increased screen time[1-3].

When people use computers for extended periods of time during the day or night, either compulsively or routinely, they might develop a constellation of ocular and extraocular symptoms known as computer vision syndrome (CVS). These symptoms include dry eyes, irritated eyes, headaches, light or glare sensitivity, blurred vision, red eyes, burning eyes, excessive tear production, double vision, discomfort from contact lenses, changes in color perception, slowness in focusing, and pain in the neck, shoulders, and back. Ocular (anomalous ocular surfaces or accommodative spasms) and/or extraocular (ergonomic) etiologies can cause CVS[4,5].

Being aware is a crucial first step toward recovery. It is critical that aspiring physicians understand the current state of society. The foundation of managing CVS continues to be prevention. Reasonable information leads to understanding, and comprehension of the illness provides the means to put early preventive measures into place and start therapy[6,7].

A variety of visual and ocular issues related to or occurring during the usage of digital devices are together referred to as computer vision syndrome (CVS). Headaches, double vision, blurred vision, eye strain, weariness, teary eyes, sensitivity to light, burning sensation, and dryness of the ocular surface are among the symptoms of CVS. It is impossible to exaggerate the importance of CVS for public health, and policymakers, physicians, and researchers must take note of this. The most common occupational hazard of the twenty-first century is computer vision syndrome, which, depending on the population under study, affects 63% to 89% of computer users[8,9].

Millions of people of all ages are at risk of CVS because to the increasing expansion of digital gadgets, which has become an indispensable part of daily life. All age groups' use of digital gadgets has significantly expanded in developed nations in recent years. Furthermore, the use of digital gadgets has grown in developing nations, leading to a high

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burden of CVS because of low accessibility, low use of PPE, and little time for breaks from using devices. A significant public health issue, CVS increases the risk of errors at work, impairs vision, lowers productivity, and lowers job satisfaction[10].

A large portion of the population uses digital gadgets frequently, particularly computers and smartphones: university students. Even though the majority of university students in Aseer (KSA) possess and operate a laptop or desktop computer, students who use digital devices frequently are predicted to have lower-quality sleep. University students will be particularly negatively impacted by worse sleep quality because sleep is crucial for learning functions such as memory and focus[11,12]. The association between undergraduates' usage of digital devices and their quality of sleep has not yet been investigated. Examining CVS and its relationship to sleep quality in an Aseer undergraduate population was the goal of the current study.

METHODS

Data for this cross-sectional study were gathered using a specially designed questionnaire that included demographic questions as well as questions about CVS and sleep disorders. After the group of experts had several conversations, a questionnaire was created. A language expert, a researcher, and a subject specialist made up this panel. The questionnaire Cronbach alpha was computed. Data were coded and entered into the SPSS ver. 20 program after collection in order to perform descriptive statistics mean, standard deviation, frequencies, and %ages were computed. At the 5% level of significance, chi-square test was employed to assess significance differences. Using an electronic version of the questionnaire, information was gathered from respondents, social media channels were also used to distribute the questionnaire. King Khalid University provided ethical approval. The time frame for the study was January 2023– July 2023.

RESULTS

The cronbach alpha of the questionnaire was 0.85, mean SD of age was 26.9 (12.5)

As per table 1, 66.67% were single while 26.67% were married, 42.0% were using spectacles 95.6% using Electronic devices in bedtime.

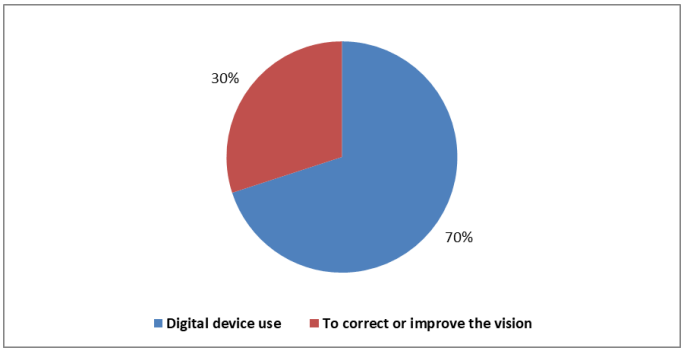

Figure 1: Reasons for usage of spectacles
As per figure 1, 30% used spectacles for to correct or improve the vision, while 30% for usage of E- devices.

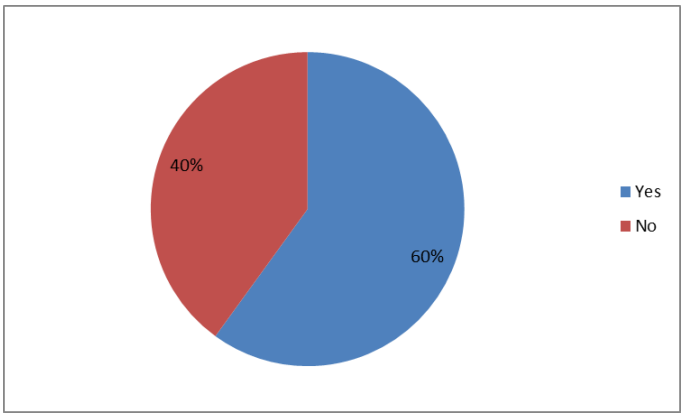

Figure 2: Prevalence of CVS
As per figure 02, we had 60% prevalence of cvs.

DISCUSSION

The objective of this study is to Examining CVS and its relationship to sleep quality in an Aseer undergraduate population. In the current study, the prevalence of CVS was 60.0%. According to other research,

Table 1: Demographics and practices

Factors	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Marital status	Single		Married		Widowed		Divorced	
	300	66.67%	120	26.67%	15	3.33%	15	3.33%
Monthly Income (In SAR)	Less than 5000		5000 -10000		Above 10000			
	125	27.78%	200	44.44%	125			
Year of college	1		2	3			above 4	
	130	28.89%	75	16.67%	80	17.77%	170	38%
Bedtime Smartphone use	Yes		No					
	430	95.56%	20	4.44%				
Spectacle use	189	42.00%	261	58.00%				

Table 2: Practices

Years of digital device use	Less than	5- 10	above 10 years
	20%	45%	35%
How many hours do you spend on electronic devices a day?	less than 3 hours	3- 6 hours	above 6 hours
	19%	41%	40%
Do you take breaks during the use of electronic devices?	Yes	No	
	71%	29%	

As per table 02, 45% using E –devices from 5-10 years, 41% used for 3-6 hours,71% were taking breaks during usage of E-devices.

Table 3: Diseases

	No symptoms	Mild	Moderate	Severe
Headache	20%	25%	25%	30%
Burning eye sensation	45%	10%	8%	37%
Eye redness	33%	19%	17%	31%
Blurred vision	29%	15%	11%	45%
Dry eyes (tearing)	12%	19%	18%	51%
Neck and shoulder pain	30%	19%	25%	26%

As per table 03, 30% had severe headache issues, 51& had severe dry eyes issue, 37% had severe burning yes issues,31% eye readiness, 45% severe blurred vision

Table 4: Sleep disorders

	once a week	Three or more times a week	Not during the past month	twice a week
Can not get to sleep within 30 minutes	28%	12%	39%	21.00%
During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?	18%	19%	31%	32.00%

As per table 04, 39% cannot get the sleep during the past month, while ,32% took twice a week medication for sleep

Table 5: Age wise comparisons between awareness regarding 20-20 rule

Age	Are you aware of the 20-20-20 rule? (Every 20 min, look at an object 20 ft away for 20s.)	
	Yes	No
Less than 25	46%	54%
Above 25	44%	56%

N.S (Not significant)

As per table 05, we did not observe any significant differences while comparing gender with 20-20 rule awareness.

the frequency of CVS varies among different populations, ranging from 63% to 89%. Additionally, although statistically not significant, our study revealed that the prevalence of CVS was not significantly higher in men (75.22%) than in women (81.3%)[12-14].

People need to be made aware of the detrimental consequences continuous use of electronics has on eyesight, as CVS is currently under diagnosed. According to a study, knowledge and practices related to ergonomics were shown to be significantly higher in people who use computers frequently than seldom. This increased risk of acquiring CVS was attributed to higher knowledge in ergonomics among frequent computer users[13].

When using digital gadgets continuously without interruptions, the eye is forced to focus for extended periods of time, which can cause visual tiredness and asthenopia symptoms. Because of the present COVID-19 pandemic, numerous institutions have shifted their lectures online, and it is anticipated that university students globally will utilize more digital devices, this result is important for both physicians and students. It is anticipated that average time spent on digital devices would rise as nearly all students take programs online. In certain populations, this could lead to a rise in the frequency and severity of CVS. Some of these individuals may experience a decline in their quality of life and productivity at work as a result of CVS symptoms[11-14].

Concern over how using digital devices affects sleep quality is growing. With the rapid growth of technology and the transition to a digital world, digital gadgets are now an essential and vital part of our daily lives. The majority of study participants experienced poor quality sleep. These findings are consistent with other research showing that excessive use of digital devices negatively affects sleep quality in a variety of populations, including college students. Exposure to screen light from digital devices might throw off a person's circadian cycle. Additionally, a study found a direct correlation between widespread sleep issues and heavy digital device use. While the current study found a strong correlation between the usage of digital devices and the quality of sleep[12-14].

Being a cross-sectional study, one of the study's weaknesses was that it only provided a picture of CVS at one particular point in time, providing little insight into the circumstances that may have caused it. The diagnosis of CVS was made solely based on self-reported symptoms; no ocular examination was performed.

CONCLUSION

In summary, a significant number of college students have both poor sleep quality and CVS. This is a serious public health concern that requires consideration. Moreover, medical students have a low level of awareness and knowledge of CVS. It is necessary to put knowledge into practice. In medical students, CVS is strongly linked to poor sleep quality.

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