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# SCREEN TIME AND ITS ASSOCIATION WITH EYE PROBLEMS AMONG NURSING STUDENTS AT COLLEGE OF NURSING BADIN

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## ABSTRACT

**Background:** In this modern era, Nursing students' reliance on digital devices for academic and personal usage is increasing, which particularly vulnerable to Computer Vision Syndrome (CVS), a condition attributed to visual discomfort associated with prolonged screen exposure. Nursing students, in particular, may face higher risks due to intensive academic workloads and extended use of electronic health records.

**Objective:** This study aimed to assess the duration of screen time and its association with the prevalence of eye-related problems among nursing students at the College of Nursing, (Female) Badin.

**Methods:** A cross-sectional study was conducted among nursing students at the College of Nursing (Female), Badin. Data collection was done by a structured questionnaire, divided into three sections: 1) Participant demographics were self-directed about age, sex, gender, and year of study. 2) The screen time section had only one question, which was a self-directed and open-ended question about the average screen time of the participant. 3) The CVS-Smart questionnaire was utilized based on its validity and reliability on Computer Vision Syndrome (CVS) criteria. Data was analyzed on 144 samples for Descriptive statistics, Pearson's correlation, and linear regression were used to evaluate the relationship between screen time and eye symptoms.

**Results:** The majority of participants, 53.95% reported screen use of more than 5 hours per day. Out of 144 participants, 12 participants

were considered as Normal subjects, 33 participants were considered as Not-CVS cases, 43 participants were considered as Low-probability cases, 34 participants were considered as high-probability cases, and 22 participants were considered as Positive CVS cases based on CVS-Smart questionnaire scoring. A significant positive correlation was observed between screen time and severity of eye problems ($r = 0.785$, $p < 0.05$). Linear regression analysis indicated that each additional hour of screen time increased CVS severity scores by 0.782 ($p < 0.01$). **Conclusion:** There was a statistically significant association between prolonged screen time and eye problems among nursing students at the College of Nursing, (Female) Badin. These findings highlighted the need for preventive education, ergonomic awareness, and institutional policies to reduce screen-related eye strain in academic environments.

## INTRODUCTION

In recent years, modern technologies have made human life more luxurious than usual. They are guiding them in every aspect of their life. As smartphones are the best innovation among them, research suggests that continued growth in mobile use is also helping to fuel increases in digital adaptation and activity. The latest data revealed in April 2025 that 70.7 % of the world's total population now uses a mobile phone. Meanwhile, the number of cellular connections associated with smartphones continued to increase, and with more than 7.4 billion smartphones now in use, the latest figures indicate that these handsets now account for roughly 87 % of mobile phones in use around the world today [1]. Nowadays, Screen-based devices have become indispensable in academic and professional environments. Advanced AI tools are introduced in mobile phones to make the educational standard at the international level, and students are utilizing them as assistants in his/her academic and personal activities, particularly for female nursing students who rely mostly on digital tools for virtual classes, study resources, and clinical documentation. While these technologies enhanced the learning, they also significantly increased the exposure to potentially harmful visual stimuli. Digital Eye Strain (DES), also known as Computer Vision Syndrome (CVS), has emerged as a widespread issue among university students. A study conducted between May and June 2021 among nursing students in Peru suggested that an 87.6% prevalence of DES, with screen use over four hours/day increasing the odds of symptoms significantly (OR 1.73), while not following the 20- 20- 20 rule increased risk (OR 2.60)[2]. Similarly, among health science students in three major Saudi cities, 72% were suffering from symptoms of DES, such as blurred vision, eye burning, dryness, and headaches. Average screen time exceeded 8.9 hours/day, and ergonomic practices were often poor [3]. Furthermore, the research suggested that among college students exposed to electronic devices, 58% had digital computer vision syndrome in graduate students from a private university in Lima city [4]. A study of medical students in the UAE (late 2023 – early 2024) were reported 92.8% prevalence of at least one symptom of DES, with widespread non- compliance to preventive measures such as the 20- 20- 20 rule (only 3.8% adherence), and many using screens closer than recommended, which correlated with

increased eye fatigue and strain[6]. Therefore, it is necessary to carry out preventive and primitive activities of vision care at the beginning of the academic period. Screen Time is the amount of time spent using a digital device with a display screen, such as a Smartphone, computer/laptops, television, video games, or tablet. Frequently, the students utilized the Smartphone as an electronic gadget, so this article focuses more on Smartphone usage as screen time. In a research article, the study reveals a concerning 74.1% prevalence of DES among medical students in Peshawar, Pakistan, emphasizing the impact of prolonged screen time on ocular health. The study reveals a significant link between screen time and DES, with headache & eye pain being the prevalent symptoms[5]. DES symptoms arise from continuous near-focus on digital screen, often accompanied by reduced blinking, glare, and poor posture leading to dry eyes, headaches, blurred vision, and general discomfort[7]. Adding to the concern, a large meta-analysis highlighted that each additional hour of daily screen time increases the risk of nearsightedness by about 21%, pointing to long-term vision implications beyond immediate DES symptoms[8]. Recent public health reports from a six month survey in Pune between November 2024 and April 2025 were confirmed that 37% of patients were seeking care by reported dry eye symptoms linked to 6.3–8.3 hours of average daily screen exposure, especially among students. The study emphasized the urgent need for lifestyle changes and awareness campaigns, including adherence to the 20-20-20 rule[9].Each increasing numbers of hours/day of Smartphone usage, particularly among Nursing students were increased the vulnerability of eye problems associated with increased screen time as CVS (computerize Visual Syndrome). Meanwhile, it was necessary to understood the relationship between screen time and eye problems, it was crucial to developing preventive strategies and to promoting healthier screen time habits. This article was explored the evidenced linking to excessive screen usage and association of visual complaints, ocular surface complaints and extra ocular complaints among nursing students at college of nursing female Badin to mitigate adverse effects of computer vision syndrome.

**Aim of Study**

The study aims to assess association between the screen time and eye problems among nursing students at College of Nursing female Badin.

**Study Objectives**

1. To determine the average daily screen time among Nursing students.
2. To evaluate the relationship between eye problems and screen time among nursing students.
3. To predict a regression analysis to model the effect of screen time on eye problems.

**Research Question**

1. What is the average screen time regularly?
2. Is there any relationship between screen time and eye problems among nursing students?
3. Does daily screen time significantly predict the severity of eye problems among nursing students?

**METHODOLOGY**:

**Study Design;**

This study employed a Cross-sectional design to assess the association between screen time and eye problems among nursing students at the College of Nursing, (female) Badin.

**Study Setting;**

The study was conducted at the College of Nursing female Badin, among undergraduate Nursing students.

**Study Population;**

The target population included all Nursing students enrolled in the College of Nursing female Badin University during the academic

year 2025.

**Inclusion Criteria;**

1. Currently enrolled as a B.Sc. Nursing student at CON Badin.
2. Willing to provide informed consent.
3. Regularly use digital devices (smartphones, laptops, tablets, etc.) for academic or personal purposes.

**Exclusion Criteria**

1. Students with pre-existing severe eye conditions (e.g., glaucoma, retinal detachment) unrelated to screen use.
2. Those who were not willing to participate or provide consent.
3. Students on medications that may affect vision (e.g., steroids, antipsychotics).

**Sampling Technique and Sample Size;**

**Sampling Techniques**

This study employed a non-probability convenience sampling technique. This approach was utilized for quick data collection from participants who were readily available and willing to participate. The method was efficient and cost-effective, too.

**Sample Size;**

A total of 152 students participated and submitted their responses, in which 8 samples were excluded because 2 participants were taking medications that could affect their vision too, and the remaining 6 participants were already suffering from eye disease unrelated to screen time usage. Therefore, the sample size in this study was 144 out of 200 students from the College of Nursing (Female), Badin. This sample size was considered adequate to ensure statistical validity and to allow for meaningful analysis of the data collected.

**Data Collection Method:**

The Questionnaires for data collection were designed on Google Forms, then the link was generated and sent to students via WhatsApp groups of 1st year, 2nd year, 3rd year, and 4th year students, vice versa.

**Data Collection Tools;**

The data for this study were collected using a structured instrument consisting of three parts:

1. **Demographic Data Sheet:**

This section was designed to gather basic demographic information from the participants. It included variables such as:

Age

Gender

Year of Study

These variables were used to describe the sample and to examine potential associations between demographic characteristics and the presence or severity of Computer Vision Syndrome (CVS).

2. **Screen Time ;**

This section was designed to gather the information on the total average screen time on digital devices especially on mobile phones within 24 hours for each student. The Average screen time was the only question which were kept in this section. The question was designed as open open-ended question for the collection of continuous data for more accuracy. The screen time of students was the independent variable in this research article, and it has a direct link with the research question; therefore, it was kept as a self-directed question.

3. **CVS-Smart Questionnaire;**

The third part of the tool was the Computer Vision Syndrome (CVS) Smart Questionnaire[12] was made by Mohammed Iqbal ophthalmologist and professor at a university in Egypt. The questionnaire was utilized in this study with his permission via email. A structured and standardized instrument was used to assess the presence and severity of symptoms related to CVS. This questionnaire included items that evaluated visual complaints, ocular surface complaints, and extra-ocular complaints, frequency of symptoms, and the impact of screen time on eye health. It utilized a combination of closed-ended and Likert scale questions, allowing for quantitative analysis. It contains a total of 5 questions, each has 3 options, which were further valued as 0, 1,

and 2 sequence-wise. The CVS score was categorized to diagnose the Computer-Vision Syndrome by their total score, as from 0 to 2 considered as Normal subjects, 3 to 4 considered as Not-CVS case, 5 to 6 considered as Low-probability case, 7 to 8 considered as high-probability case, and 9 to 10 considered as Positive CVS case.

The tool was selected for its relevance, ease of use, and ability to provide reliable data on computer-related visual health issues among students.

**Ethical Considerations;**

Participants were informed about the purpose and objectives of the study, and their participation was entirely voluntary. Written informed consent was obtained from all participants before data collection. Confidentiality and anonymity were strictly maintained throughout the study. Participants were assured that the information collected would be used solely for research purposes and that they had the right to withdraw from the study at any time without any penalty.

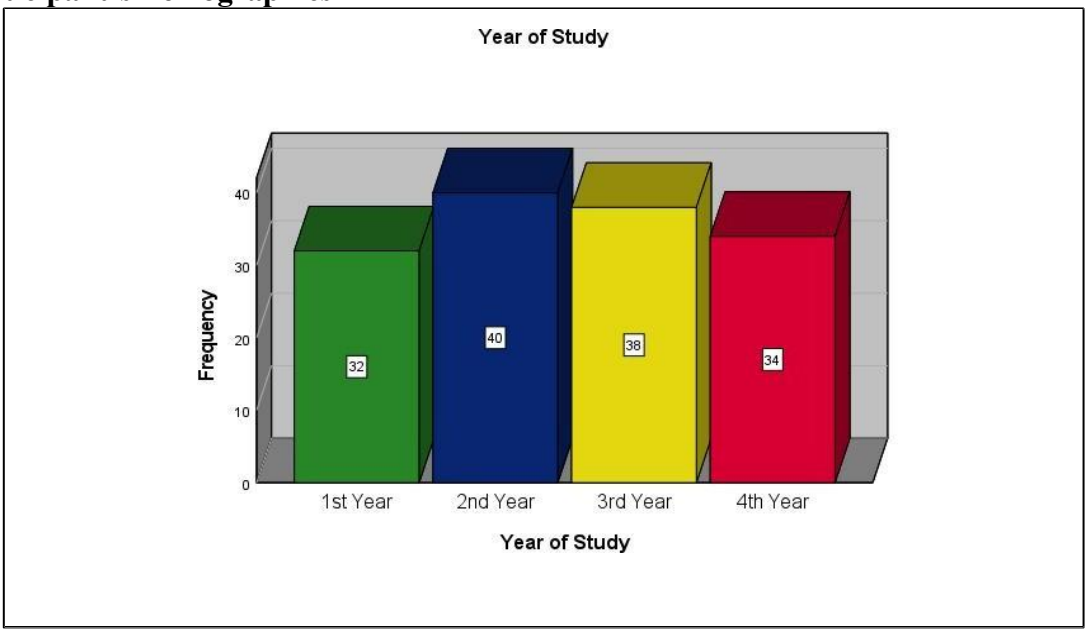
The study adhered to the ethical principles outlined in the Declaration of Helsinki for research involving human subjects.

**Data Analysis;**

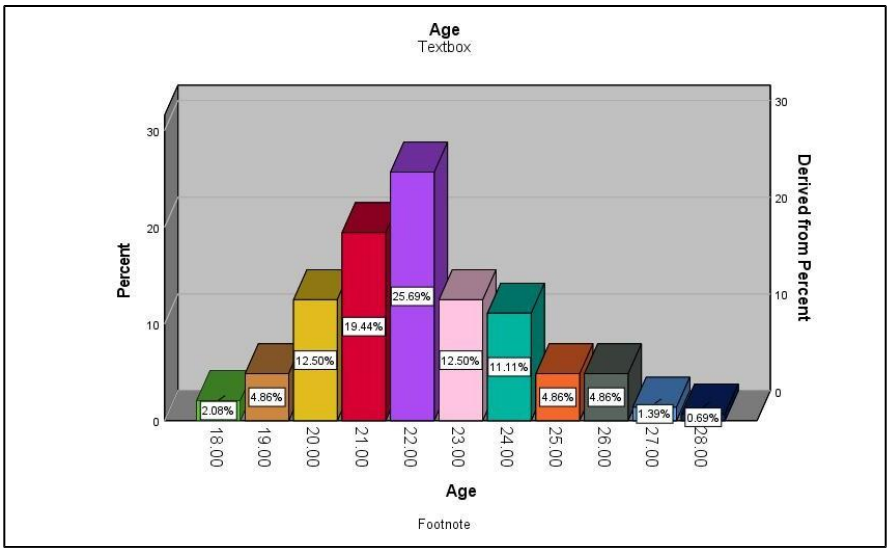
The collected data were entered, cleaned, and analyzed using the Statistical Package for the Social Sciences (SPSS) version 27. Descriptive statistics, including frequencies and percentages, were used to summarize the demographic characteristics of the participants. The Correlation Test was employed to determine the strength and direction of the linear relationship between two continuous variables. The Linear Regression test was applied to predict the effect of the relationship between a predictor (screen time) and an outcome (eye problem severity). A p-value of less than 0.05 was considered statistically significant.

## RESULT

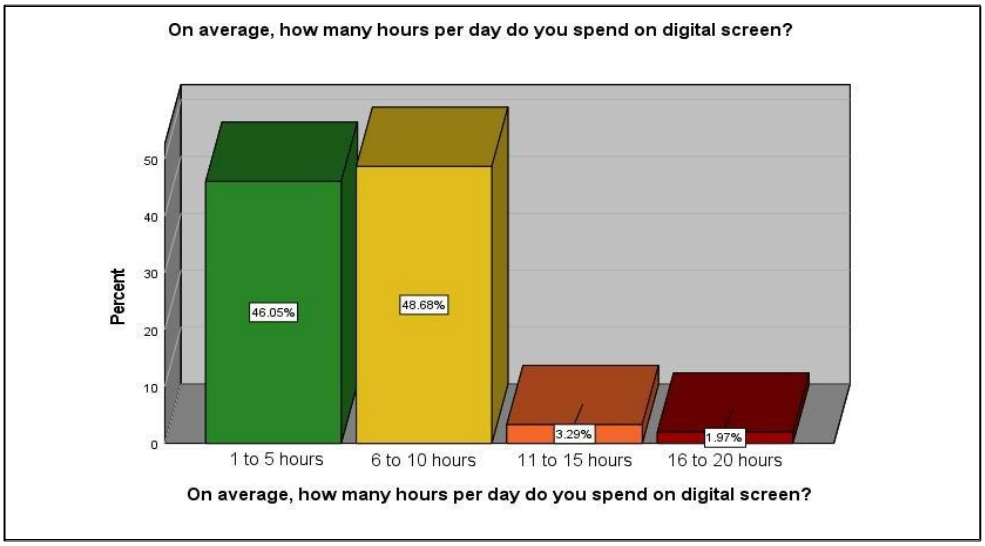
### 1) Participant's Demographics



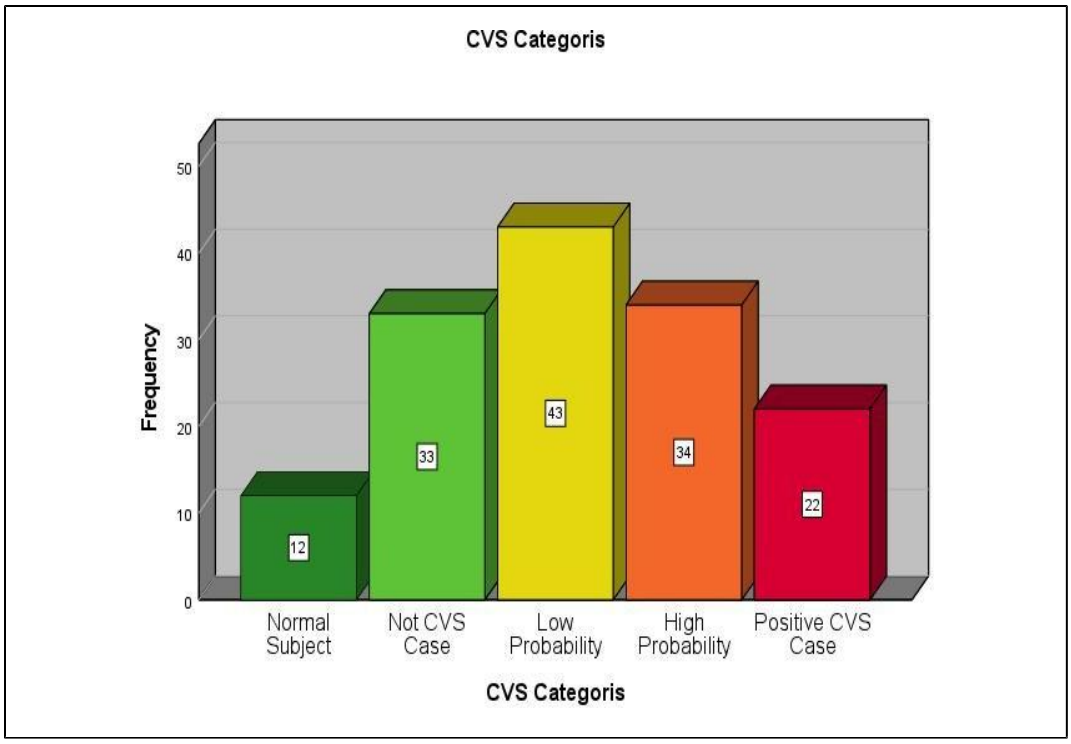

Among 144, 32 students were from 1st year class, 40 students were from 2nd year class, 38 students were from 3rdyearclass and 34 students were from 4th year class as shown in graph 1.




The mean age of participants was 22.1316 ± 2.01216 SD years. Most of them were 22 years old. The participants' ages range from 18 to 28 years, as depicted in graph 2.




The bar chart illustrates the average number of hours respondents spend per day on digital screens. The majority of respondents reported spending between 6 to 10 hours daily on digital screens, accounting for 48.68% of the sample. This is closely followed by 46.05%, who spend 1 to 5 hours per day. A relatively small proportion of participants indicated longer screen times, with 3.29% reporting 11 to 15 hours, and only 1.97% spending 16 to 20 hours per day on digital screens.




The bar chart presents the distribution of participants across different CVS (Computer Vision Syndrome) categories. The largest proportion of respondents (43 individuals) fell into the low probability category of CVS. This is followed by 34 participants categorized under high probability, and 33 individuals who were considered not CVS cases. Meanwhile, 22 respondents were classified as having a positive CVS case, and the smallest group consisted of only 12 normal subjects.

**2) Correlation Test analysis**

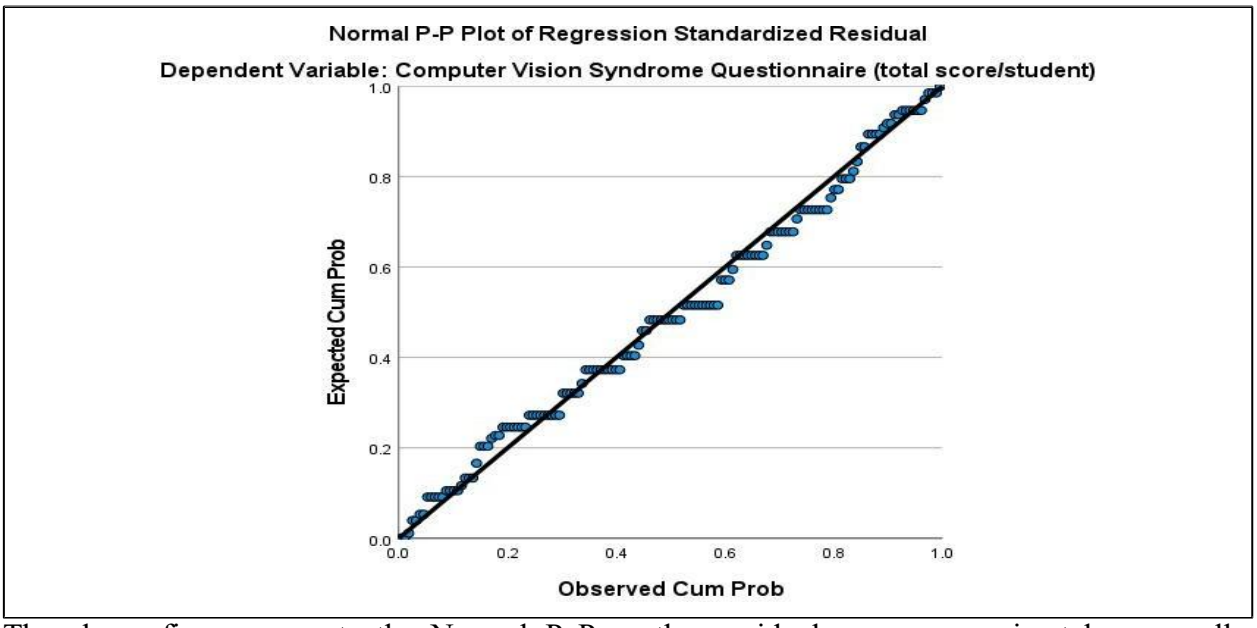
| The significant relationship between Screen Time and Computer Vision Syndrome | | | |
|---|---|---|---|
| | | **Screen Time** | **Computer Vision** |
| **Screen Time** | Pearson Correlation | 1 | .785 |
| | Sign (2 Tail) | | .000 |
| | N | 144 | 144 |
| **Computer Vision Syndrome** | Pearson Correlation | .785 | 1 |
| | Sign (2 Tail) | .000 | |
| | N | 144 | 144 |
| Correlation is significant at the 0.01 level (2-tailed) | | | |

Table 1. The correlation analysis demonstrated a statistically significant relationship between screen time and computer vision syndrome (CVS)**.** The results revealed a strong positive correlation **(**$r = .785$, $p < 0.001$**)** between the two variables, indicating that increased screen time is strongly associated with higher levels of CVS symptoms.

### 3) Regression Analysis

| | Un-standardized Coefficients | | Standardized Coefficients | t | sig |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| **Constant** | -1.187 | .361 | | -3.284 | .001 |
| **Screen Time** | .782 | .052 | .785 | 15.104 | .000 |

Table 2, shows the regression analysis indicates that screen time significantly predicts computer vision syndrome (CVS). The unstandardized coefficient (B = 0.782, $p < 0.001$) shows that for every one-unit increase in screen time, the CVS score increases by 0.782 units, holding other factors constant. The model constant was negative (B = –1.187, p = 0.001), suggesting that in the absence of screen time, the baseline CVS level would be below zero, which is not practically meaningful but reflects model adjustment. The standardized coefficient (Beta = 0.785) confirms a strong positive effect of screen time on CVS, consistent with the correlation analysis. The high t-value (15.104, $p < 0.001$) further supports the statistical significance of this predictor.




The above figure presents the Normal P–P Plot of Regression Standardized Residuals for the dependent variable *Computer Vision Syndrome Questionnaire (total score per student)*. The data points are closely aligned with the diagonal line, which represents the line of perfect normality. This indicates that the residuals are approximately normally distributed, thereby meeting one of the key assumptions of linear regression. The absence of major deviations from the line suggests that the model fits the data well and that the results of the regression analysis are statistically reliable.

**DISCUSSION:**

The most frequently used devices were the mobile phone and laptop, which represented 96.8% (n= 686) and 64.7% (n= 459), respectively[4]. Of the students exposed to the use of display devices, 58% (n= 413) had CVS. CVS was also found more frequently in students exposed to screens for 7 to 10 hours and 4 to 6 hours a day ($p< 0.001$), and in students who used two or three electronic devices ($p< 0.001$). CVS occurred mainly in students who used mobile phones and laptops ($p< 0.05$)[4]. The increasing reliance on screen-based devices for academic and clinical tasks has made nursing students particularly vulnerable to screen-related eye problems. Recent studies highlight a concerning association between prolonged screen time and ocular health issues such as digital eye strain (DES), dry eye disease (DED), myopia progression, and sleep disturbances among this population[19,20]. The demanding nature of nursing education, which involves extensive online learning, electronic health record (EHR) usage, and late-night study sessions, made it understandable that the impact of screen exposure on eye health was crucial.

Likewise, this study more focused on mobile phones usage in which 152 students were using mobile phone were range from 2 to 18 hours/day from which 48.68% were using from 6 to 10 hours/day, 46.05% were using 1 to 5 hours/day, 3.29% were using 11 to 15 hours/day, 1.97% were found that digital screen time (hours/day) were accounted for 61.6% of the variance in Computer Vision Syndrome (CVS) scores ($R^2 = .616$, $p < .001$), and that each additional hour of screen use increased the CVS score by 0.782 ($p < .001$). This highlights a strong and statistically significant positive association between screen time and eye strain symptoms among nursing students at the College of Nursing (Female) Badin. This aligned well with findings from Peruvian nursing students, where 87.6% experienced digital eye strain (DES), and using devices for more than 4 hours/day was a significant risk factor (OR $\approx 1.73$)[2]. Digital eye strain were characterized by symptoms particularly eye fatigue, blurred vision, headaches, and neck pain, is highly prevalent among nursing students. A recent cross-sectional study by Alharbi et al. (2023) found that over 70% of nursing students who spent more than 6 hours daily on screens reported DES symptoms. The study characterized this to prolonged use of laptops for lectures, mobile phones for communication, and tablets for accessing medical references[19]. Nursing students were often working in clinical settings with air conditioning and low humidity, which, combined with prolonged screen use, increased the risk of dry eye disease. A study by Gupta et al. (2022) involving nursing students in India found that those with more than 5 hours/day on screen had a 2.5 times higher risk of DES compared to those with limited exposure. The study emphasized that EHR documentation and online exam preparations contribute significantly to dry eye symptoms[20]. The result of another research article in the USA in July 2025, was also suggesting that medical students are at considerable risk for CVS, poor sleep quality, and increased fatigue. This was one of the few studies that has described significant levels of CVS in students from a United States medical school. The curriculum at our medical school was typical of most medical schools in the United States, as it relies heavily on didactic content that was accessed via computer. Thus, it is not surprising that we see a high prevalence of students who suffer from CVS[15].Similarly, in Saudi medical students, eye strain was significantly correlated with hours spent on digital devices for study, communication, and entertainment ($r = 0.161–0.206$, all $p < .05$)[11]. In a larger cohort of Saudi college students, screen time over 4-6 hours and especially above 6 hours daily was strongly associated with dry eye severity

($p < .001$)[3].Regarding the factors associated with computer vision syndrome. The CVS was more frequent in females, 56.9% (n=235) versus 43.1% (n=178) in males (p=0.003). It was also more frequent in the age group of 20 to 24 years (50.4%), compared to other age groups (p=0.022). Students from the accounting and financial sciences, and science and engineering faculties presented CVS in a higher percentage (p=0.005), as did the students who were in the first and second academic years (p=0.071). The participants who wore glasses presented CVS in a higher proportion, 63.4% (n=262), compared to 36.6% (n=151) who did not use glasses (p<0.001). According to the number of hours exposed to the use of ICT, CVS occurred in a higher proportion among users from 7 to 10 hours and 4 to 6 hours a day (p<0.001). Likewise, CVS also appeared in a higher percentage of students who used two and three devices (p<0.001)[4]. The survey was completed by 2300 undergraduate students at Chicago, which had a 11.4% response rate; among them, 154 were medical students (22.6%) response rate. The prevalence of CVS was 77.1% in undergraduate students and 69.1% in medical students. CVS-Q severity scores were highest for headaches and eye dryness, with over half of students reporting the worsening of symptoms since March 2020. Increased time spent on online learning (undergraduate: P <0.001, medical: P = 0.018), blue light glasses usage (undergraduate: P <0.001, medical: P = 0.0015), and increased number of device usage were associated with higher CVS severity scores (undergraduate: P <0.001, medical: P = 0.0032).CVS among undergraduate and medical students had increased since the start of the COVID-19 pandemic. More focus should be placed on the management of CVS for students in higher education. Physicians should be cognizant of the consequences of online learning and be proactive about providing advice regarding preventative measures[16].In Pakistan, among university students post-COVID-19, average screen time increased by ~4.3 hours, and a 56% raised in reported eye complaints was observed, with a significant link to DES ($p = 0.045$)[13]. These patterns were strongly supported by our study's focused on female nursing students at a Pakistani college, confirming both high prevalence and a clear association between screen time and eye symptoms. In Lahore, Pakistan, the study was conducted among software professionals, where out of 112 subjects, 62.5% were male and 37.5% were female. Mean age was 25.51±4.23 (range 17–45). Out of 112 subjects, 68.8% had computer vision syndrome. Computer vision syndrome was common in software professionals, which needs adjustments in the work place[17].A global meta-analysis found that the overall prevalence of computer vision syndrome (CVS) during COVID-19 averaged 70–90%, surging up to 99% in Pakistan based on limited studies[14]. While methodology and sample differences exist, our data fall within this expected range, reinforcing that extended screen time in virtual learning contexts notably heightens DES risk. These study results, with high predictive power of screen time, further suggested that integrating strategies such as regular breaks, brightness adjustment, screen distance, and environment ergonomics could reduce the impact.

## CONCLUSION

The current study shows that the average screen time of students was 6-10 hours per day. The evidence suggested a strong correlation between prolonged screen time and DES or CVS, myopia progression, and sleep disturbances. The findings of this current study robustly demonstrated that screen time is a significant predictor of computer vision syndrome symptoms among nursing students.

**Recommendation**

The findings supported the need for interventions at nursing colleges, such as educating students about the 20-20 rule and its efficacy, training on ergonomic workstations, setting up monitor height, brightness, viewing distance, anti-glare screens, and encouraging eye-friendly postures, and instituting structured screen-free intervals, especially during long study or simulation sessions. Most existing studies, including this study, are cross-sectional and limit causal inference. In future research, interventional designs (e.g., introducing screen time break protocols) or longitudinal follow-up to see the longitudinal effects and the efficacy of workplace adjustments in reducing eye strain among nursing students should be explored.

Additional variables such as sleep quality, dry eye signs (exam measures), or visual acuity could enrich understanding. For example, one Indonesian study reported that nursing students with CVS had significantly worse sleep quality (OR ≈ 71, $p < .001$)[18].

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