

# **Computer Usage and Prevalence of Computer Vision Syndrome among Basic Nursing Students in University of Benin Teaching Hospital, Benin City**

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## **Abstract**

The widespread integration of computers and digital devices into academic life has transformed learning practices, with students increasingly relying on online resources and electronic texts. While this shift enhances access and efficiency, it also promotes prolonged screen exposure, predisposing users to Computer Vision Syndrome (CVS), a constellation of ocular and visual symptoms resulting from sustained use of digital screens. This study examined patterns of computer and digital device use and the prevalence of CVS among basic nursing students at the University of Benin Teaching Hospital, Benin City. Specifically, it assessed the level of device utilisation, estimated the prevalence of CVS, evaluated students' knowledge of the condition, and examined their practice of preventive measures. A descriptive survey design was employed, and a sample of 160 students was drawn from a population of 269 using the Taro Yamane formula. Data were collected through a structured questionnaire and analysed using INSTAT statistical software, with associations between categorical variables tested at a significance level of  $p < 0.05$ . Findings revealed universal use of computers and digital devices among respondents, a high prevalence of CVS, and a moderately high level of knowledge of the condition. Despite this awareness, the practice of preventive measures was notably low. These results indicate a substantial burden of CVS within this population and highlight a critical gap between knowledge and protective behaviour. The study underscores the need for sustained educational interventions, including seminars, mass media campaigns, and printed materials, to promote practical preventive strategies and safeguard the visual health, academic productivity, and overall well-being of nursing students in an increasingly digital learning environment.

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## Introduction

The exponential growth of information and communication technologies (ICTs), particularly computers and smartphones, has transformed the organisation and management of work across all professions globally (Ghufran et al., 2020). Digital screen devices have become indispensable in offices, institutions, businesses, and homes, serving both vocational and non-vocational purposes (Parihar et al., 2018). This technological revolution has significantly improved administrative efficiency, educational delivery, healthcare services, and organisational productivity, making work processes easier and more efficient (Ranasinghe et al., 2017). In Nigeria, the adoption of ICT has expanded rapidly, with most organisations and educational institutions now relying almost entirely on digital systems for daily operations. Students increasingly depend on electronic materials, online resources, and digital platforms for learning, communication, and assessment, reflecting a global shift from printed materials to soft copies and screen-based learning environments.

Despite these advantages, prolonged and unregulated use of digital screen devices has been associated with an emerging occupational health problem known as Computer Vision Syndrome (CVS) (Logaraj et al., 2018). CVS refers to a cluster of ocular and visual symptoms resulting from extended exposure to computers and visual display terminals (Bali et al., 2014). The American Optometric Association defines CVS as a group of eye- and vision-related problems that arise from activities placing excessive stress on near vision, particularly during prolonged computer use. Empirical evidence consistently demonstrates that visual display terminal exposure is associated with increased ocular discomfort and visual symptoms (Rosenfield, 2019; Blehm et al., 2015). Globally, an estimated 60 million people suffer from CVS, with approximately one million new cases recorded annually (Sen & Richardson, 2019). In the United States alone, over 143 million individuals work on digital devices daily, with nearly 90% reporting ocular symptoms (VCA, 2019). The severity of CVS is closely linked to the visual demands of tasks performed and the duration of exposure (American Optometric Association, 2017).

Computer Vision Syndrome has become a significant public health concern in the twenty-first century and is now recognised as one of the leading occupational health hazards, affecting up to 70% of computer users (Ranasinghe et al., 2016). Prevalence rates reported in the literature range from less than 20% to over 80%, reflecting variations in exposure patterns, work environments, and awareness levels (Logaraj et al., 2019). Yet, many users remain unaware of this ocular condition and its potential consequences. Lack of awareness predisposes individuals to persistent visual strain, reduced quality of life, and, in severe or untreated cases, long-term visual impairment (Ihemedel & Omolase, 2018). Vision loss, once established, may be irreversible if not detected and managed promptly.

In contemporary educational settings, particularly in higher and professional education, students are increasingly exposed to prolonged screen time. Nursing students, in particular, rely heavily on ICT devices for accessing textbooks, research materials, clinical information, and academic communication. This pattern of use places them at heightened risk of CVS. Observations during clinical postings in the ophthalmic complex of the University of Benin Teaching Hospital reveal that many basic nursing students report symptoms consistent with CVS, yet possess limited knowledge of the condition and its preventive strategies. As future healthcare professionals, their vulnerability is of particular concern, both for their personal well-being and for their capacity to model healthy practices in clinical environments.

Against this backdrop, this study explores computer usage patterns and the prevalence of Computer Vision Syndrome among basic nursing students at the School of Nursing, University of Benin Teaching Hospital. It further examines students' knowledge of CVS and their engagement in preventive practices. By focusing on this population who spend substantial

portions of their day engaged with digital screens for learning, communication, and patient care, the study seeks to illuminate the magnitude of CVS within an academically and clinically active group. Understanding this relationship is essential for informing targeted interventions, promoting ocular health awareness, and safeguarding the visual well-being of future healthcare practitioners.

The main objectives of this work was to investigate the use of computer and digital devices and the prevalence of computer vision syndrome among basic nursing students in the School of Nursing, UBTH, Edo state. The specific research objectives of this study are to;

1. Assess the level of utilization of computer among basic nursing students in the School of Nursing, UBTH – Edo State.
2. Estimate the prevalence rate of CVS among basic nursing students in the school of Nursing, UBTH – Edo State
3. Assess the level of knowledge of CVS among basic nursing students in the School of nursing, UBTH – Edo state
4. Investigate the level of practice of preventive measures to CVS among basic nursing students in the School of Nursing, UBTH – Edo State.

### Literature Review

Empirical evidence across diverse contexts indicates that the utilisation of computers and digital screen devices has become pervasive, yet the level of knowledge and patterns of use remain uneven, particularly in developing countries. Kalid et al. (2018), in a study on computer knowledge and utilisation among health professionals, reported that practitioners especially those in primary healthcare settings demonstrated low levels of computer literacy and limited utilisation habits. This finding underscores a persistent digital competence gap within health systems in low-resource environments. Similarly, Ihemedu and Oluwole (2018), in their investigation of awareness and utilisation of computer shields among users in Nigeria, found that although the majority of respondents were aware of screen-protective devices, only a small proportion actively used them. These studies suggest that awareness alone does not necessarily translate into protective behaviour, exposing users to preventable visual strain.

Among students and young adults, the intensity and pattern of digital device use appear to have direct implications for ocular health. Fargul et al. (2020) conducted a study among 394 medical students in Pradesh, India, to explore the relationship between smartphone use and the development of dry eye disease. Their findings demonstrated a statistically significant increase in both dry eye disease and computer vision syndrome (CVS) symptoms with increasing duration and frequency of smartphone use. Notably, smartphone use was found to exacerbate CVS symptoms even more than traditional computer work, highlighting the growing relevance of mobile technologies in ocular health research. The study concluded that duration of exposure plays a critical role in determining the severity of symptoms. In a related investigation, Abida et al. (2018) examined mechanical and aeronautical engineering students in Pakistan and confirmed that prolonged computer use exceeding four hours daily was significantly associated with the concurrent development of CVS and musculoskeletal disorders such as carpal tunnel syndrome. Their findings emphasised that adherence to ergonomic and visual hygiene practices can substantially mitigate the impact of CVS, reinforcing the importance of behavioural interventions.

A substantial body of literature documents the high prevalence of CVS among students and occupational groups engaged in intensive screen-based activities. Mowatt et al. (2018), in a study conducted at the University of the West Indies in Jamaica, assessed 409 medical sciences students and reported a high prevalence of CVS, with neck pain, eye strain, and burning sensations among the most frequently reported symptoms. This study illustrates the

multidimensional nature of CVS, encompassing both ocular and musculoskeletal manifestations. Heba et al. (2020), in a large-scale study involving 651 undergraduate medical students at King Abdulaziz University in Saudi Arabia, reported that 95% of respondents experienced at least one CVS symptom during computer use. Longer daily duration of screen exposure emerged as the most significant risk factor, while adherence to the 20-20-20 rule was identified as the most effective preventive strategy. The authors concluded that CVS is highly prevalent among medical students, with excessive tearing and neck or back pain being dominant symptoms, and stressed the need for increased awareness. Identified risk factors included female gender, astigmatism, pre-existing dry eye disease, extended duration of computer use, and high screen brightness.

Comparable findings were reported by Mani et al. (2016) in South India, where 339 information technology students were assessed using retinoscopy and a structured questionnaire. The prevalence of CVS was found to be 55.46%, with 76.08% of students who worked for more than two hours daily developing symptoms. The study revealed a marked protective effect of periodic breaks: only 38.2% of students who took breaks experienced symptoms, compared with 82.0% among those who did not. This evidence highlights the behavioural dimension of CVS prevention and the importance of structured work-rest patterns. Kana et al. (2016), in a study among computer office workers in Sri Lanka, reported a CVS prevalence of 67.4%. Significant risk factors included duration of computer use, pre-existing ocular conditions, absence of screen filters, contact lens use, and poor ergonomic practices. Together, these studies demonstrate that CVS is widespread across both academic and occupational settings and is strongly influenced by duration of exposure and environmental conditions.

Despite the high prevalence of CVS, knowledge and awareness among users remain limited. Awrajaw and Akinbinu (2018) examined knowledge of CVS among staff of the Securities and Exchange Commission and found that 74% of respondents experienced at least one symptom, yet only 40% were aware of CVS, and merely 27% possessed meaningful knowledge of the condition. The authors concluded that there exists a significant knowledge gap within the studied population, reflecting a broader deficiency in public understanding. Getasew et al. (2020), studying bank workers in Gondor City, Ethiopia, reported that although 90.2% of respondents had heard of CVS, only 26.9% demonstrated good knowledge of the disorder. This disparity between awareness and understanding mirrors findings from other contexts and suggests that superficial familiarity does not equate to informed practice. Similarly, Senthil (2020), in a study among medical students in Tamil Nadu, India, found that 85% experienced one or more CVS symptoms, yet most were unaware of the condition and the ocular consequences of prolonged screen use. The author concluded that creating sustained awareness is critical for global CVS mitigation.

Risk factor analyses further clarify the mechanisms underlying CVS development. Ranganatha et al. (2019), studying computer science students in Bengaluru, identified statistically significant associations between CVS and sitting arrangement, screen height relative to eye level, presence of glare filters, and hours spent daily on computers, with duration showing particularly strong significance ( $p < 0.001$ ). These findings confirm that both ergonomic and temporal factors contribute to symptom development. In contrast, Aashish et al. (2020), in a cross-sectional study of 234 computer engineering students in Kathmandu Valley, reported a CVS prevalence of 76.5%, but found that only 39.39% adhered to correct posture and 81.2% did not practice the 20-20-20 rule. Interestingly, their analysis suggested that some ergonomic variables, such as screen level and contrast adjustment, were not significantly associated with CVS, indicating potential contextual variations in risk dynamics.

Beyond knowledge and prevalence, empirical studies reveal poor adoption of preventive practices among students. Shadrack (2019), in a cross-sectional study of 384 university students in Western Kenya, found that two out of five students experienced at least five CVS symptoms, while awareness and perception of CVS as a health problem remained low. The study concluded that CVS is highly prevalent yet under-recognised, and that adherence to conventional preventive measures is minimal. Loh and Redd (2018) similarly reported that university students lacked sufficient knowledge of CVS prevention and therefore rarely practiced protective strategies. These findings collectively underscore a critical gap between exposure, symptom experience, and preventive behaviour.

The reviewed literature consistently demonstrates that CVS is a pervasive and growing occupational and educational health concern. High prevalence rates are documented across countries, disciplines, and age groups, with duration of screen exposure, poor ergonomics, and inadequate breaks emerging as dominant risk factors. Simultaneously, knowledge deficits and low engagement with preventive measures persist, even among populations with high educational attainment such as medical and engineering students. This convergence of high exposure, limited awareness, and poor preventive practice underscores the urgency of targeted interventions. For nursing students, who rely heavily on digital technologies for learning and clinical engagement, these dynamics are particularly salient. The literature therefore provides a strong empirical foundation for investigating computer usage patterns, CVS prevalence, knowledge levels, and preventive practices within this population, and for designing evidence-informed strategies to safeguard ocular health in digitally intensive learning environments.

### **Methods and Materials**

The study adopted a survey research methodology using a structured questionnaire within a cross-sectional descriptive design. This approach was considered appropriate because it enables the systematic description of characteristics, behaviours, and conditions within a defined population at a single point in time, thereby providing an accurate account of real-life situations (Migenda & Mugenda, 2008). The target population comprised all basic nursing students at the University of Benin Teaching Hospital (UBTH), totalling 269 across Years I, II, and III. Using the Taro-Yamane formula with a 5% margin of error, a sample size of 160 students was determined. Participants, aged 16–30 years, were selected through a non-probability voluntary sampling technique. This age range was chosen to exclude presbyopia-related visual changes that typically occur from 40 years and could confound findings related to computer vision syndrome (CVS). Eligible participants included students who consented voluntarily and had been exposed to computer or digital screen use for at least two to six hours daily over a continuous period of two months. Students who were absent during data collection or declined participation were excluded. All students across the three academic levels were given equal opportunity to participate, including those with pre-existing ocular conditions or low-vision aids, provided they met the inclusion criteria.

Data were collected using a self-administered structured questionnaire comprising five sections. Section A captured sociodemographic characteristics, including age, gender, academic level, and marital status. Section B assessed the level of computer utilisation through six dichotomous items. Section C estimated the prevalence of CVS using six symptom-related items. Section D explored knowledge of CVS with four items, while Section E examined the practice of preventive measures using five items. The instrument was subjected to content validation by the project supervisor and two domain experts in computer science and ophthalmic nursing, who assessed clarity, relevance, and appropriateness of language in line with the study objectives (Migenda & Mugenda, 2008). Reliability was established through a pilot test using 10% of students from the School of Midwifery, UBTH, employing a test-retest

method. Pearson's product-moment correlation coefficient yielded a reliability index of 0.9, indicating high internal consistency and stability. Two ophthalmic nurses were trained as research assistants, and data were collected over three days during students' break periods. Participants received detailed explanations of the study's purpose, procedures, and academic significance before providing informed consent, and completed questionnaires were checked daily for completeness and accuracy.

Data analysis was performed using chi-square statistics via INSTANT (GraphPad Inc., La Jolla, CA, USA) to examine relationships corresponding to the research questions, with results presented in frequencies, percentages, and charts. Ethical approval was obtained from the University of Benin Teaching Hospital Ethics and Research Committee, alongside institutional permission from the School of Nursing. Participants were informed that the study was strictly for academic purposes, and that participation was voluntary with the right to withdraw at any time. Confidentiality and anonymity were assured, no data were falsified, and respondents were treated with dignity and respect throughout the research process.

## Results

**Table 1: Socio- demographic data of the respondents**

Variables	Level	Frequency	Percentage (%)	P value P<0.05 is significant.
Gender	Male	24	15%	P<0.0212
	Female	136	85%	P>0.4681
Age(in years)	16-20	48	30%	P=0.2291
	21-25	92	57.2%	
	26-30	20	12.5%	
Marital Status	Single	151	94.4%	
	Married	8	5%	
	Separated	1	0.6%	
Academic Year	First year (100 level)	56	35%	
	Second year (200 level)	72	34%	
	Third year (300 level)	32	20%	

Table 1 shows that 85% of the respondents were female, while 15% were male. 57.2% of the respondent was within the age range of 21-25years, 30% were within 16-20years, while 12.5% falls within 26-30years. For marital status, 94.4% of the respondents were single, 5% were married, and while 0.6% was separated. 72 (45%) of the respondent were in their second year, followed by 56 (35%) of the respondent in their first year, while 32 (20%) of the respondent were in their third year of study.

**Table 2: Presentation of responses on level of utilization of computer**

Variables		Frequency	Percentage	P value
Do you own a computer/ digital devices?	Yes	130	81.25%	<b>P=0.2566</b>
	No	30	18.755	
	<b>Total</b>	<b>160</b>	<b>100.00%</b>	
If No , do you use the cybercafé?.	Yes	30	18.75%	<b>P=1.0000</b>
	No	0		
	<b>Total</b>	<b>30</b>	<b>18.75%</b>	
specify the nature of work you use the computer/ digital devices for.	For assignment	38	23.75%	<b>P=0.9506</b>
	For learning/ academic work	60	37.5%	
	For trading/business	16	10%	
	For watching film	16	10%	
	For clinical purpose	30	18.75%	
	<b>Total</b>	<b>160</b>	<b>100.00%</b>	
How long have you been using the computer/digital devices?	0-2 years	20	12.5%	<b>P= 0.0798</b>
	3-5 years	40	25%	
	6-8 years	80	50%	
	9 years and above	20	12.5%	
	<b>Total</b>	<b>160</b>	<b>100%</b>	
How many hours do you use the computer/ digital devices per day?	less than 3 hours	30	18.75%	<b>P=3787</b>
	3-6 hours	60	37.5%	
	More than 6 hours	70	43.75%	
	<b>Total</b>	<b>160</b>	<b>100.00%</b>	
How often do you use the computer/digital devices?	Never	0	0%	<b>P=0.0146</b>
	Rarely	48	30%	
	Very often	90	56.25%	
	All the time	22	13.75%	
	<b>Total</b>	<b>160</b>	<b>100.00%</b>	

Table 2 shows that majority who claimed they have computers, and use it very often for more than six(6) hours a day for both vocational and non-vocational purposes. 18.75% of the respondent that doesn't own a computer uses Cyber Café. The entire respondent uses computer, this infers 100% utilization of computer/ digital devices. 50% of those that own computer has used it for the period of 6-8 years, while (43.75%) of the respondent uses the computer less than 6 hours a day. This infers a high level of computer utilization amongst the basic nursing students.

**Table 3: Presentation of responses on Prevalence of Computer Vision Syndrome**

Variables	Frequency	Percentage
What are the symptoms experienced by you during and after use of computer eye strain?		
Eye strain	90	56.25%
Headache	82	51.25%
Watering eye	62	38.75%
Itching of the eye	54	33.75%

Neck pain	50	31.25%
Blurred vision	46	28.75%
Pain in the eye	44	27.5%
Light sensitivity	44	27.5%
Foreign body sensation	28	17.5%
Double vision	14	8.5%
Dryness of the eye	12	7.5%
Twitching of the eye	12	7.5%
Redness of the eye	10	6.25%
No symptom	30	18.75%
Have you ever visited ophthalmologist for any of these symptoms.		
Yes	95	59.4%
No	65	40.6%
<b>Total</b>	<b>160</b>	<b>100%</b>
Do you use Glasses or contact lens?		
Yes	40	25%
No	120	75%
<b>Total</b>	<b>160</b>	<b>100%</b>
If yes, for what purpose.		
diagnosed ocular disease	14	8.5%
computer use	26	16.5%
cosmetic reason	Nil	0%
<b>Total</b>	<b>40</b>	<b>25%</b>
If yes specify .....		
Refractive error	12	7.5%
Glaucoma	2	1.0%
<b>Total</b>	<b>14</b>	<b>8.5%</b>

Table 3, above shows that 130(81.25%) of the respondent had 2-4 self-reported symptoms of CVS, while 30(18.75%) claimed they have no symptoms of CVS as listed. 90 (56.25%) of the respondent experienced eye strain during and after using the computer for a prolonged period, the second most experience symptoms by the respondent was headache with frequency of 82 (51.25%) this was followed by watering eye 62 (38.75%). The next symptom experienced by the respondent was itching of the eye 54 (33.76) followed by neck pain 50 (31.255%).

The next occurring symptom of CVS experienced by the respondents was blurred vision with percentage of 46(28.75%), followed by pain in and around the eye (44(27.5%), next was light sensitivity 44 (27.5%), foreign body sensation experience symptom was double vision 14(8.5%) followed by dryness of the eye 12(6.5%) and twitching of the eyelid 12 (6.5%). The respondent without symptoms was 30 (18.75%).The total percentage of students with symptoms of CVS was 81.25%. this revealed a high percentage rate of CVS amongst the students. 59.4% (95) of the respondent also claimed they had visited ophthalmologist for one or two experienced/ self-reported symptoms of CVS, while 40.6% of the respondent said they have never visited the ophthalmologist, for any ocular symptoms.

The Table 3 also shows that 40 (25%) of the respondent uses glasses while 120 (75%) do not use glasses, 26 (16.5%) of the respondent use glasses for computer use, while 8.5% use

glasses for ocular condition known as refractive error and glaucoma. This may likely influence the prevalence rate. Hence this was separated from the calculated prevalence rate of Ocular symptoms.

$$\text{Prevalence rate} = \frac{\text{Total population} - \text{Frequency of no symptoms}}{\text{Total population}} \times 100$$

Let P be the total population

NS be the frequency of no symptoms of CVS

Therefore,  $P^1 = P - NS$

Where  $p^1$  is the population with at least one symptom of CVS

Then Prevalence rate (PR) =  $(P^1/p) \times 100$

In this work,  $P^1=130$ ;  $P=160$ ;  $NS=30$

Therefore,  $PR = (130/160) \times 100 = 81.25\%$

Since the percentage of ocular disease was 8.5%, this may likely influence the prevalence rate.

Hence same is subtracted from the calculated value to get the actual prevalence rate.

Actual PR= Tab. Cal. PR – Ocular diseases %

$PR=81.25\% - 8.5=72.75$  (app73%)

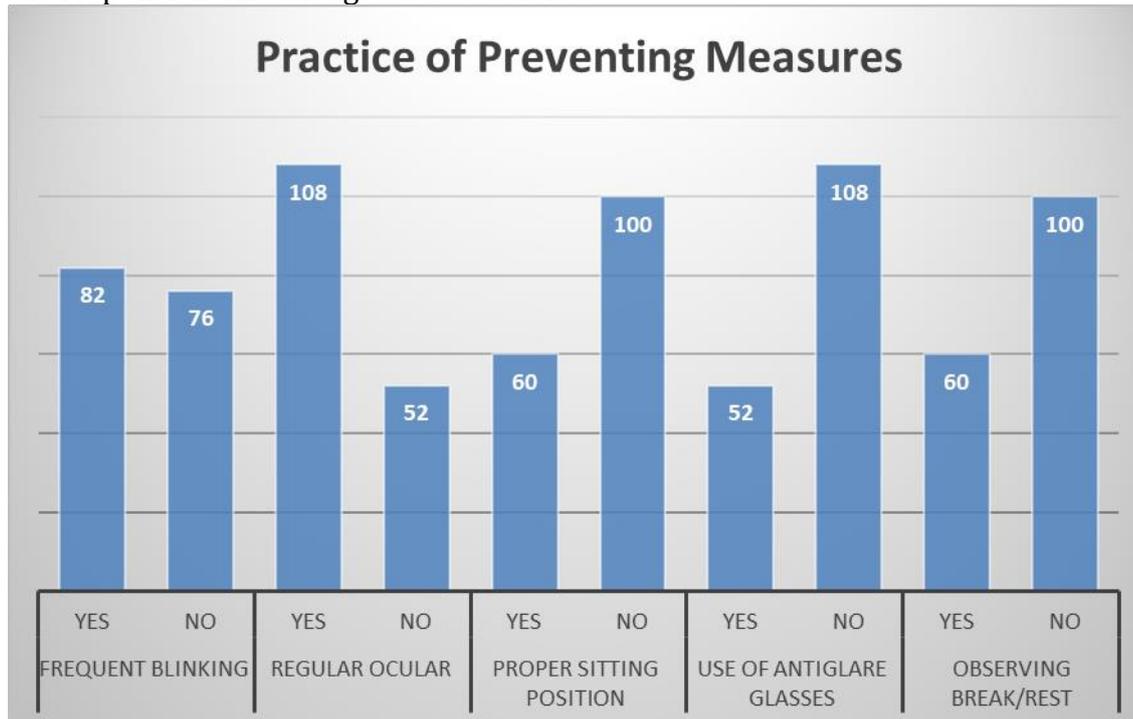
Therefore, the actual Prevalence rate of CVS among basic nursing students in UBTH is 73% i.e. three of every four of the students studied have CVS.

**Table 4: Presentation of responses on knowledge of computer vision syndrome**

Variables	Response	Frequency	Percentage	P value
Have you heard of the term computer vision syndrome?	Yes	96	60%	P=0.0212
	No	64	40%	
	<b>Total</b>	<b>100</b>	<b>100%</b>	
If yes, what is your source of information?				P=0.5073
	Radio	10	6.25%	
	Television	5	3.125%	
	Eye care provider	15	9.375%	
	Internet	50	31.25%	
	Newspaper and magazine	10	6.25%	
	Public library	6	3.75%	
<b>Total</b>		<b>96</b>	<b>60%</b>	
What do you understand by the term computer vision syndrome?				P=0.0071
	Digital eye strain due to prolonged use of computer	90	56.25%	
	Ocular diseases due to old age	34	21.25%	
	Diseases of the orbit	30	18.75	
	Sudden blindness	6	3.75	
<b>Total</b>		<b>160</b>	<b>100%</b>	



Table 4 above shows that majority of the respondent had a good knowledge of CVS and was able to define CVS as an eye strain that result from prolonged use of computer, while few of the respondent knowledge on CVS was low



**Figure 1: A bar chart showing the frequency distribution of respondent practice of preventive measures on CVS.**

The figure above revealed that majority of the respondents does not practice the preventive measures of CVS, despite their knowledge on CVS and ocular health care.

### Discussion of Findings

The present study examined patterns of computer utilisation, the prevalence of Computer Vision Syndrome (CVS), knowledge levels, associated risk factors, and preventive practices among 160 basic nursing students aged 16–30 years at the University of Benin Teaching Hospital. The demographic distribution revealed a predominance of female participants, with 136 (85%) females and 24 (15%) males, reflecting the gender composition commonly observed in nursing training institutions. The findings demonstrated a high level of computer utilisation among the students, underscoring the central role of digital technologies in contemporary nursing education. This outcome contrasts with the findings of Kalid et al. (2016), who reported low knowledge and limited utilisation of computers among health professionals, particularly within primary healthcare settings. Similarly, the present results differ from those of Ihemedu and Oluwole (2018), who found that although many respondents were aware of computer shields, only a few actively used computers. These discrepancies may be attributed to differences in study populations and contextual variables. Unlike practising health professionals, nursing students are immersed in digitally mediated learning environments that necessitate frequent and prolonged computer use for accessing academic resources, completing assignments, and engaging in virtual communication. Consequently, their level of utilisation is naturally higher, reflecting the evolving pedagogical landscape and the increasing integration of ICT into nursing education.

The prevalence of CVS among the respondents was found to be 73%, indicating that nearly three-quarters of the students experienced one or more symptoms associated with prolonged computer use. This prevalence is substantial and positions CVS as a significant occupational

health concern within this population. Males reported the highest self-reported symptom, particularly eye strain, with a statistically significant association ( $P < 0.0001$ ). Overall, more than 80% of participants were symptomatic, reinforcing the magnitude of the problem. These findings align closely with those of Heba et al. (2020), who reported a CVS prevalence of 95% among medical students at King Abdulaziz University in Saudi Arabia, and Mani et al. (2019), who observed a prevalence rate of 76.08% among individuals who used computers continuously for more than two hours. The results also corroborate the findings of Gupta et al. (2019), who reported that 70–75% of computer workers globally experience ocular problems, making CVS one of the most frequently encountered work-related health issues. The high prevalence observed in this study reflects the intensity of screen exposure among nursing students and supports the growing body of evidence that CVS is pervasive in populations engaged in sustained digital activities.

Eye strain emerged as the most common symptom, affecting approximately 90% of respondents. This high prevalence is physiologically plausible, as prolonged screen use is associated with a reduced blink rate, leading to decreased tear film stability and inadequate ocular surface lubrication. As tear production diminishes, the cornea becomes increasingly sensitive to light and environmental stimuli, predisposing users to visual discomfort and asthenopic symptoms. This mechanism explains the prominence of eye strain among students who spend extended periods focusing on digital displays. Headache was the next most frequently reported symptom, affecting 51.25% of participants. This finding is consistent with Bali et al. (2017), who reported that 82.1% of their study population experienced headaches during computer use. However, it contrasts with the findings of Logaraj et al. (2018), who reported a lower prevalence of headache (43.3%) among engineering students, and Mohammed et al. (2021), who observed similar variations. These differences may reflect contextual factors such as duration of exposure, ergonomic conditions, screen brightness, and individual susceptibility. The occurrence of headaches may be attributed to sustained contraction of the ciliary muscles during prolonged near work and repeated exposure to electromagnetic radiation emitted by computer screens, which can trigger ocular fatigue and neuromuscular strain, culminating in cephalalgia.

With regard to knowledge of CVS, 56.25% of respondents demonstrated good knowledge of the condition, suggesting that a majority possessed an appreciable understanding of the disorder. This finding contrasts sharply with that of Getasew et al. (2020), who reported that only 27% of bank workers in Gondor City, Ethiopia, had significant knowledge of CVS. The relatively higher level of awareness among nursing students may be explained by their exposure to health-related curricula and clinical training, which likely enhances their understanding of disease processes and health risks. Nonetheless, the persistence of a high prevalence rate despite this level of knowledge underscores a critical gap between awareness and behaviour. Possessing information about CVS does not necessarily translate into effective preventive practices. This highlights the need for targeted educational interventions that go beyond theoretical knowledge to emphasise practical strategies for risk reduction, including ergonomic adjustments, scheduled breaks, and visual hygiene techniques.

The study further revealed that male students exhibited significantly higher levels of knowledge regarding CVS compared with their female counterparts ( $P > 0.0212$ ), despite their smaller representation in the sample. This finding diverges from the observations of Maissa and Guillen (2016), who reported that female students tend to experience greater tear film instability, predisposing them to CVS. While Maissa and Guillen focused primarily on physiological vulnerability, the present study highlights a gender disparity in knowledge acquisition. This difference may reflect variations in information-seeking behaviour, technological engagement, or educational exposure between male and female students. The

result suggests that female students, who constitute the majority of the nursing workforce, may require more targeted educational support to enhance their understanding of CVS and its preventive strategies.

Risk factors such as poor screen contrast, inappropriate sitting posture, prolonged duration of computer use, and uncorrected refractive errors were identified by respondents as being associated with the development of CVS. The association between these risk factors and CVS prevalence was statistically significant ( $P < 0.0179$ ), confirming the multifactorial nature of the syndrome. This finding is consistent with Ranganathan et al. (2019), who demonstrated significant associations between CVS and ergonomic variables such as sitting arrangement, screen height relative to eye level, and the presence of glare filters, with strong statistical significance ( $P < 0.001$ ). These results emphasise that CVS is not solely a function of exposure duration but is also shaped by environmental and ergonomic conditions. Improper workstation setup, inadequate lighting, and failure to correct refractive errors compound visual stress and accelerate symptom onset.

Despite the high prevalence of CVS and moderate levels of knowledge, the adoption of preventive measures was generally low among the students. Although regular ocular care practices were significantly more common among female students ( $P < 0.0003$ ), overall engagement in preventive behaviours remained inadequate. This pattern aligns with the findings of Shadrack et al. (2019), who reported that two out of five students at the University of Massena, Kenya, experienced at least five CVS symptoms, despite high awareness and low practice of preventive measures. The authors concluded that CVS is highly prevalent yet poorly recognised as a serious ocular health threat. The present study similarly demonstrates that frequent computer use predisposes students to CVS while preventive practices remain underutilised. This disconnect between awareness and action underscores the need for behavioural change strategies that encourage consistent application of protective measures such as periodic breaks, screen filters, proper posture, and routine eye examinations.

Furthermore, a significant association was observed between age and the development of CVS ( $P < 0.0004$ ). As age increases, the likelihood of developing CVS during prolonged computer use also rises. This trend may be attributed to age-related changes in visual accommodation and tear production, which reduce ocular resilience to sustained near work. The finding is consistent with Fargul et al. (2020), who demonstrated that the duration of exposure plays a critical role in determining the severity of CVS symptoms among digital device users. Although the study population was limited to individuals aged 16–30 years, the observed age-related gradient suggests that cumulative exposure over time may amplify vulnerability, reinforcing the importance of early preventive education.

In summary, the findings of this study reveal a high level of computer utilisation and a correspondingly high prevalence of CVS among basic nursing students. While knowledge levels are relatively better than those reported in some occupational groups, they remain insufficient to curb symptom development. Gender differences in knowledge, the strong influence of ergonomic and behavioural risk factors, and the low uptake of preventive measures collectively highlight the complexity of CVS as a public health issue within educational settings.

### Conclusion

This study demonstrates that basic nursing students at the University of Benin Teaching Hospital are extensively exposed to digital devices and consequently experience a substantial burden of Computer Vision Syndrome. Despite a moderate level of awareness about CVS, many students continue to experience multiple ocular and musculoskeletal symptoms, while the practice of preventive measures remains inadequate. The findings highlight that knowledge alone is insufficient to reduce the occurrence of CVS unless it is translated into

consistent protective behaviours. Factors such as prolonged screen time, failure to take regular breaks, poor ergonomic practices, and uncorrected visual problems were identified as key contributors to symptom development, with variations observed across age and gender. Collectively, these outcomes underscore the need for structured eye health education, routine screening, and the integration of ergonomic and visual hygiene practices into nursing training. Enhancing practical knowledge and promoting behavioural change are essential for protecting students' visual health, improving academic productivity, and sustaining quality of life in an increasingly digital learning environment.

### Recommendations

Based on the findings of the study and discussion that followed, the following recommendations were made:

1. Continuous health education on the effects of prolonged digital device use and the prevention of Computer Vision Syndrome should be institutionalised through seminars, print, and electronic media in schools and the wider community.
2. National policies should be developed and enforced to regulate workplace and educational screen use, including routine risk assessment and clear preventive guidelines to safeguard ocular health.
3. Educational curricula at all levels should formally integrate ethical ICT use, digital ergonomics, and eye health education to promote responsible and healthy screen practices among learners.
4. Eye care practitioners should consistently educate patients on the risks of prolonged computer use and provide counselling on preventive strategies against Computer Vision Syndrome.
5. The management of health and educational institutions should implement regular enlightenment programmes and provide routine, accessible ocular screening services for staff and students.

### References

- Aashish, V., Ved, P. M., Kanchan, S., & Navaraj, I. K. (2020). Prevalence and associated factors of computer vision syndrome amongst computer engineering students of Pokhara University affiliated colleges in Kathmandu Valley. *International Journal of Community Medicine and Public Health*, 7, 23–31.
- Airtim, E., Rios, E. M., Sánchez-Lasheras, F., Suárez-Sánchez, A., Iglesias-Rodríguez, J., & Sequi-Crespo, M. M. (2018). A hybrid algorithm for the prediction of computer vision syndrome in health personnel based on trees and evolutionary algorithms. In *Lecture Notes in Computer Science* (Vol. 10870, pp. 597–608). Springer.  
[https://doi.org/10.1007/978-3-319-92639-1\\_51](https://doi.org/10.1007/978-3-319-92639-1_51)
- Akinbinu, R. (2018). Knowledge of computer vision syndrome among computer users in the workplace in Abuja, Nigeria. *Journal of Physiology and Pathophysiology*, 4(1).  
<https://doi.org/10.5897/JPAP2013.0078>
- Alemayehu, A. M., & Alanayehn, M. M. (2019). Pathophysiological mechanisms of computer vision syndrome and its prevention. *World Journal of Ophthalmology and Vision Research*, 2(5), Article WJOUR.MS.ID.000547.
- American Optometric Association. (2017). *Computer vision syndrome*.  
<https://www.aoa.org/patient-and-public/caring-for-your-vision/protecting-your-vision/computer-vision-syndrome>
- American Optometric Association. (2018). *The effect of computer use on eye health and vision* (pp. 1–9). <http://www.aoa.org/documents/optometrist/effect-of-computer-use.pdf>
- Anshel, J. (2005). *Visual ergonomics handbook*. CRC Press.

- Bali, N. N., & Thakur, B. R. (2017). Computer vision syndrome: A study of knowledge, attitude, and practices in India. *Indian Journal of Ophthalmology*, 55, 289–293.
- Blehm, C., Vishnu, S., Khatta, K. A., Mitra, S., & Yee, R. W. (2015). Computer vision syndrome: A review. *Survey of Ophthalmology*, 50, 253–262.
- Chang, P. C., Chou, S. V., & Shieh, K. K. (2013). Reading performance and visual fatigue when using electronic paper displays in long-duration reading tasks under various lighting conditions. *Displays*, 34(3), 208–214.
- Coles-Brennan, C., Sulley, A., & Young, G. (2019). Management of digital eye strain. *Clinical and Experimental Optometry*, 102(1), 18–29.
- Faryqui, S., Agarwal, R., & Kumar, R. (2020). Correlation between smartphone usage and dry eye in medical students at a tertiary care centre. *Tropical Journal of Ophthalmology and Otolaryngology*, 5(7).
- Ghufran, A. A., Heba, M. A., & Mawaf, K. A. (2020). Computer vision syndrome among undergraduate medical students in King Abdulaziz University, Jeddah, Saudi Arabia. *Journal of Ophthalmology*, 30.
- Gupta, N., Moudgil, T., & Sharma, B. (2019). Computer vision syndrome: Prevalence and predictors among college staff and students. *IOSR Journal of Dental and Medical Sciences*, 15(9), 28–33. <https://doi.org/10.9790/0853-1509022831>
- Hayes, J. R., Sheedy, J. E., Stelmack, J. A., & Heaney, C. A. (2017). Computer use symptoms and quality of life. *Optometry and Vision Science*, 84, 738–744.
- Heba, A., Konooz, E., Arwa, N., Noura, N., Rayana, E., Renad, A., Alhibshi, D., & Shehana, A. (2021). Digital eye strain during COVID-19 lockdown in Jeddah, Saudi Arabia. *Journal of Contemporary Medical Science*, 7(1), 40–45.
- Internet World Stats. (2019). *Internet users in the world*. <https://www.internetworldstats.com>
- Ihemedu, C. O., & Oluwole, O. C. (2018). Level of awareness and utilization of computer shields among computer users in a Nigerian community. *Asian Journal of Medical Sciences*.
- Kalid, A., Ayeke, T. A., & Tilahun, B. (2016). Knowledge and utilization of computers among health professionals in a developing country: A cross-sectional study. *Journal of Medical Internet Research: Human Factors*.
- Lee, D. S., Ko, Y. H., Shen, I. H., & Chao, C. Y. (2011). Effects of light source, ambient illumination, character size, and interline spacing on visual performance and fatigue with electronic paper displays. *Displays*, 32(1), 1–7.
- Logaraj, M., Madhupriya, V., & Hegde, S. (2018). Computer vision syndrome and associated factors among medical and engineering students in Chennai. *Annals of Medical and Health Sciences Research*, 4, 179–185.
- Loh, K. Y., & Redd, S. R. (2018). Understanding and preventing computer vision syndrome. *Journal of the Academy of Family Physicians*, 3(3), 120–130.
- Maissa, C., & Guillon, M. (2016). Tear film evaporation: Effect of age and gender. *Contact Lens and Anterior Eye*, 33(4), 171–175.
- Mani, S., Menon, L. A., Harishankar, S., & Mathew, A. (2019). Prevalence of computer vision syndrome among information technology students in a rural engineering college. *International Journal of Current Research*, 8(12), 43845–43848.
- Mohammed, I. S., Yohannes, M., & Ieyla, T. A. (2021). Prevalence and predictors of computer vision syndrome among secretarial employees at Jimma University, Ethiopia. *Journal of Ophthalmic Research*.
- Parihar, J. K., Jain, U. K., Chaturvedi, P., Kaushik, D., Jain, G., & Parihar, A. K. (2016). Computer and visual display terminal vision syndrome. *Medical Journal of Armed Forces India*, 72, 270–276.

- Ranganatha, S. C., & Jailkhani, S. (2019). Prevalence and risk factors of computer vision syndrome among computer science students in Bengaluru. *Galore International Journal of Health Sciences and Research*, 4(3), 10–15.
- Ranasinghe, R., Wathurapatha, W. S., Perera, Y. S., Lamabadusuriya, D. A., Kulatunga, S., Jayawardana, M., & Katulanda, P. (2018). Computer vision syndrome among office workers in a developing country. *BMC Public Health*, 18, 150.
- Rosenfield, M. (2015). Computer vision syndrome: A review of ocular causes and potential treatments. *Ophthalmic and Physiological Optics*, 35, 502–515.
- Sen, A., & Richardson, S. A. (2017). Computer-related upper limb discomfort and computer vision syndrome. *Journal of Human Ergology*, 36(2), 45–50.
- Sheppard, A. L., & Wolffsohn, J. S. (2018). Digital eye strain: Prevalence, measurement and amelioration. *BMJ Open Ophthalmology*, 3(1), e000146.
- Vaz, F., Henriques, S., Silva, D., Roques, J., & Lopes, A. S. (2019). Digital asthenopia: Portuguese Ergophthalmology Survey. *Acta Médica Portuguesa*, 34(4), 260–265.
- Weisenthal, R. (2016). *Basic and clinical science course: External disease and cornea* (Section 8). American Academy of Ophthalmology.
- Wimalasundera, S. (2019). Computer vision syndrome. *Galle Medical Journal*, 11(1).

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