IJBPAS, September, 2025, 14(9): 5105-5117

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

PREVALENCE AND ASSOCIATED RISK FACTORS OF COMPUTER VISION SYNDROME AMONG ACADEMIC STAFF: AN INSTITUTIONAL- BASED CROSS-SECTIONAL STUDY

ASHIFA KP[1], DEEKSHA K[2*] AND VARGHESE LS[3]

1: Postgraduate Student, Department of Optometry, Yenepoya School of Allied Health Sciences, Yenepoya Deemed to be University, Mangalore, Karnataka, India

2: Assistant Professor, Department of Basic Sciences, Yenepoya School of Allied Health Sciences, Yenepoya Deemed to be University, Mangalore, Karnataka, India

3: Assistant Professor, Department of Optometry, Yenepoya School of Allied Health Sciences, Yenepoya Deemed to be University, Mangalore, Karnataka, India

***Corresponding Author: Dr. Deeksha K: E Mail: deekshak@yenepoya.edu.in**

Received 29th June 2024; Revised 28th Aug. 2024; Accepted 25th Sept. 2024; Available online 1st Sept. 2025

https://doi.org/10.31032/IJBPAS/2025/14.9.9422

ABSTRACT

In the modern era, rapidly developing technologies have led academicians to engage in a wide range of activities involving prolonged and repetitive computer use, for writing, reading, preparing notes, manuscript preparation, administrative duties, and community service programs. Therefore this study aimed to assess the prevalence and associated risk factors of computer vision syndrome among academic staff of Yenepoya Deemed to be University. This institutional-based, cross-sectional study was conducted from September 2023 to April 2024. A Purposive sampling technique was used to select 96 study participants. Data were collected using a pretested self-administered structured questionnaire. In this study, result shows that 96 academic staff members participated, with the majority being female (73.96%) and a median age of approximately 30 years. However, despite these measures, the prevalence of computer vision syndrome among the academic staff was high (79.16 %). Common symptoms include eye strain (44.8%), headaches (38.5%), and eye fatigue (22.9%). In Logistic regression

analysis, taking breaks [OR 1.717,95% CI (0.408,7.229)], working hours with computer [OR2.154, 95%CI (0.693,6.693)], usage of an anti-glare screen [OR = 1.130, 95% CI (0.264, 4.849)] are show potential association with the likelihood of developing computer vision syndrome, but these associations were not statistically significant. Study concluded that Computer vision syndrome is common among academics. Universities can run campaigns to inform everyone about computer vision syndrome and its effects. Spreading awareness and educating people can help reduce computer vision syndrome problems in Universities.

Keywords: Computer Vision Syndrome, Prevalence, Associate factors, Academician

INTRODUCTION

The computer is a component of the "Video Display Terminal" (VDT) which includes tablets, cell phones, e-book readers, and other digital devices, plays a big role in our daily lives, especially in the rapidly evolving landscape of technology, research, and science. Almost every university, institution, and college, as well as families, regularly use computers for an easy lifestyle **[1]**. Excessive gazing at VDT screens without appropriate visual hygiene might result in Computer Vision Syndrome (CVS) **[2]**. The term "Computer Vision Syndrome"(CVS) also known as “digital eye strain” (DES) refers to a variety of vision and eye issues brought on by extended computer, tablet, e-reader and mobile phone use **[3]**. The main symptoms reported by VDT users include eyestrain, eye fatigue, irritation, burning sensations, redness, blurred vision, double vision, headaches, and pain in the shoulders or neck **[4, 5]**. Studies estimate that 90% of the 70 million US workers who use computers for more than three hours per day experience CVS in some way **[6]**. The US government's Occupational Safety and Health Administration (OSHA) defines CVS as a complex of eye and vision problems that are experienced during and related to computer use **[6]**. The general population, particularly teachers and Students, can find resources and books online via smartphones, which has reduced the use of paper-based reading materials. Additionally, some jobs require continuous staring at the computer screen for prolonged hours each day **[7]**. Despite being preventable **[8]**. The prevalence of CVS is higher in developing countries than in developed countries due to restricted factors such as computer break time, high workloads, and a lack of access to and usage of personal protective equipment **[9]**. Gondol BN reported that CVS, which leads to a lower quality of life and reduced work efficiency, affected almost 90% of computer users **[10]**. Therefore, to ensure adequate allocation of healthcare resources to manage this growing public health issue, it is essential to ascertain the prevalence and

associated risk factors of CVS. Academicians, along with teachers, spend many hours in front of computers for reading, preparing notes, and writing manuscripts for publication, as well as in administrative activities and community service programs, so, academic staff members are among the group of persons who are more likely to develop CVS. However, there have been few studies on the magnitude and risk factors of CVS among academicians, particularly in South India. The prevalence of CVS among academicians and its contributing factors in developing nations, including India, remain uncertain to conclude. Therefore, this study aims to explore the prevalence and associated risk factors of computer vision syndrome among the academic staff of Yenepoya Deemed to be University. The objective to examine the prevalence of computer vision syndrome and Associated risk factors for developing computer vision syndrome among the academic staff of Yenepoya Deemed to be University.

MATERIAL AND METHODS

Study design and Participants:

A cross-sectional study was conducted from September 2023 to May 2024.The target population consisted of 96 academic staff of Yenepoya School of Allied Health Sciences, Mudipu, Mangalore.

Inclusion criteria:

Academic staffs members who had used a computer for more than six hours daily in the month preceding the study.

Exclusion criteria:

Academic staffs who are already diagnosed with binocular vision anomalies and who are undergoing treatment for ocular diseases like acute, chronic, infective conjunctivitis, and eyelid disorder, migraine, were excluded from the study.

Sample size was calculated Sample size calculation

$$n = \frac{Z^2 p(1-p)}{E^2}$$

- Z= 1.96, standard normal score
- p = 50%, anticipated prevalence
- E= 10%, margin of error

To estimate the expected prevalence of CVS with 95% confidence and a 10% Margin of error, 96 Academic staffs were included in the study.

The purposive sampling technique was used to select academic staff from Yenepoya deemed to be University.

Data collection

This institutional-based cross-sectional study was conducted after obtaining approval from the scientific review board and the Yenepoya Ethics Committee-1(Protocol No.YEC-1/2023/160). Pre-tested self-administered structured questionnaires (Google survey format) were distributed to every faculty of allied health care professionals at Yenepoya Deemed to be the

University, Mangalore district, via E-mail and WhatsApp. The purpose of the study was clearly explained to participants, and their email addresses or WhatsApp numbers were collected. Informed consent was obtained from all participants. The confidentiality of the data was strictly maintained throughout the study period.

The questions of CVS were adopted from a previous study done by Tesfaye *et al*. **[9]**. The questionnaire consisted of four sections, each containing different items. The first section assessed Socio-demographic characteristics, included age, sex, marital status, educational qualification, and estimated duration of computer use. The second section included questions related to knowledge of CVS. In this section, 10 questions assessing knowledge of safety precautions taken when use a visual display terminals (VDT) such as adjustment of computer brightness, use of eyeglasses, and taking a regular break. Responses were coded as "True"(score =1), and "False" (score=2). The knowledge score were computed and sorted into poor knowledge for <70% and good knowledge for ≥ 70% correct responses. The third category included questions about CVS information. To assess CVS symptoms, a structured self-administered questionnaire adapted from the American Optometric Association was used. The tool addressed ten symptoms such as blurred vision, eye strain, double vision, eye dryness, redness, watery eyes, eye irritation, eye fatigue, burning sensations, and headaches during the use of visual display terminals. The 10 symptom scores were added to create the CVS. Each symptoms scored as 1 (presence of symptom) or 0(absence of symptoms).A Total score of ≥ 1 indicated the presence of CVS. The fourth section included personal and behavioural characteristic factors, including cigarette smoking (yes/no), alcohol consumption (yes/no), working hours(hours/day), the habit of taking breaks (yes/no), eyeglass use (yes/no), etc., which affect the CVS. The questionnaire was in English and did not include any sensitive questions.

Statistical analysis

All statistical analyses were performed using SPSS 27 software. The socio-demographic variables were summarized using frequency and percentage. The prevalence of Computer vision syndrome among academic staff was estimated along with a 95% confidence interval. The association between socio-demographic variables and CVS was examined using the chi-square test of association. Logistic regression analysis was used to identify the associated risk factors involved in causing Computer Vision Syndrome. P ≤0.05 was considered statistically significant

RESULTS

A total of 96 academic staff members participated in this study (100% responds

rate). The socio-demographics characteristics of academic staffs are shown in **(Table 1)**. There were 73.96% were females. The median age of the academic staff was 30 years (range, 22–60 years). The majority 58 (60.4 %) of the academic staff were single. Regarding educational status, 77 (80.21%) academic staff members held a master's degree.

Socio demographic characteristics and its association with computer vision syndrome are shown in **(Table 2)**. Eye strain (P=0.021) and the use of computers for teaching (P= 0.028) are showed significant association with both gender, followed by the use of other visual display technologies (e.g.: smart phones, tablet) are demonstrated a significant association with the level of education (p=0.009). The Significant associations ($P \leq 0.05$) were observed.

More than half of academic staffs are aware of measures taken to prevent Computer Vision Syndrome (CVS), such as taking regular breaks. Additionally, the majority of academic staffs were aware about adjusting the brightness and contrast of a computer, using materials to reduce screen glare, maintaining proper seating positions, and maintaining an appropriate distance from the screen while using a computer are shown in the **(Figure 1)**.

Percentage of computer vision syndrome symptoms reported among academic staff is shown in the **(Figure 2)**. Prevalence of computer vision syndrome (CVS) among academic staff was 79.16%. The most common symptoms were eye strain (43%), headache (39%), fatigue (20.8%), and dryness (16.6%). Additionally, 18.8% of the academic staffs reported no symptoms of CVS.

The logistic regression analysis is carried out with computer vision syndrome as the dependent variable, personal and behaviour factors as the independent variable. While some factors show associations with CVS, these associations are not statistically significant are shown in **(Table 3)**. Logistic regression analysis identified several risk factors associated with computer vision syndrome (CVS), including working hours, taking breaks, using glasses, antiglare filters, and other visual terminals. For instance: Academic staffs who reported working more than 8 hours a day with a computer more likely to develop CVS than those who worked fewer hours (OR = 2.154, 95% CI (0.693,6.693) p = 0.185). Academic staff who did not take breaks after 1-2 hours of continuous work were 1.72 times more likely to develop CVS compared to those who took breaks [OR = 1.717, 95% CI (0.408, 7.229), p = 0.461]. similarly academic staff who did not use an anti-glare screen were 1.13 times more likely to develop CVS compared to those who used an anti-glare screen [OR = 1.130, 95% CI (0.264, 4.849), p = 0.869]. However, none of these associations were statistically significant.

Table 1: Socio-demographic characteristics of academic staff (N=96)

Variable	Frequency	Percentage %
Sex		
Male	**25**	**26.04**
Female	**71**	**73.96**
Age		
21-30	**77**	**80.1**
31-40	**11**	**11.6**
>41	**8**	**8.7**
Marital status		
Single	**58**	**60.42**
Married	**38**	**39.58**
Educational status		
Degree	**13**	**13.54**
Master	**77**	**80.21**
PhD	**6**	**6.25**

Data was summarized using frequency and percentage

Table 2: Socio-demographic variable associated with CVS

Variable	Categories	Gender (p-value)	Marital Status (p-value)	Education (p-value)
Do you use any eye drops?	**Yes/No**	**0.589**	**0.746**	**0.797**
Do you take breaks?	**Yes/No**	**0.174**	**0.4619**	**0.171**
Do you use eyeglasses?	**Yes/No**	**0.160**	**0.930**	**0.4688**
Use of other visual display technologies?	**Yes/No**	**0.528**	**0.2808**	**0.009 ***
Glare on a computer screen?	**Yes/No**	**0.881**	**0.5212**	**0.260**
Use of anti-glare screen?	**Yes/No**	**0.952**	**0.589**	**0.720**
Headache	**Yes/No**	**0.367**	**0.08**	**0.296**
Blurred vision	**Yes/No**	**0.874**	**0.32**	**0.770**
Eye strain	**Yes/No**	**0.021***	**0.56**	**0.930**
Double vision	**Yes/No**	**0.369**	**0.25**	**0.770**
Eye dryness	**Yes/No**	**0.176**	**0.71**	**0.380**
Redness	**Yes/No**	**0.296**	**0.15**	**0.130**
Watery eyes	**Yes/No**	**0.278**	**0.04 ***	**0.140**
Burning sensation	**Yes/No**	**0.462**	**0.03 ***	**0.650**
Eye fatigue	**Yes/No**	**0.206**	**0.97**	**0.422**
Eye irritation	**Yes/No**	**0.105**	**0.48**	**0.600**
No symptoms	**Yes/No**	**0.650**	**0.11**	**0.177**
Reason for using a computer: Checking mail	**Yes/No**	**0.816**	**1.000**	**0.956**
Reason for using a computer: Data entry	**Yes/No**	**0.432**	**0.114**	**0.983**
Reason for using a computer: Word processing	**Yes/No**	**0.678**	**0.131**	**0.545**
Reason for using a computer: Reading and writing	**Yes/No**	**0.297**	**0.277**	**0.718**
Reason for using a computer: Teaching material	**Yes/No**	**0.028 ***	**0.001 ***	**0.104**
Reason for using a computer: Others	**Yes/No**	**0.293**	**0.212**	**0.624**

Association between socio demographic variables and CVS was studied using the chi-square test of association.

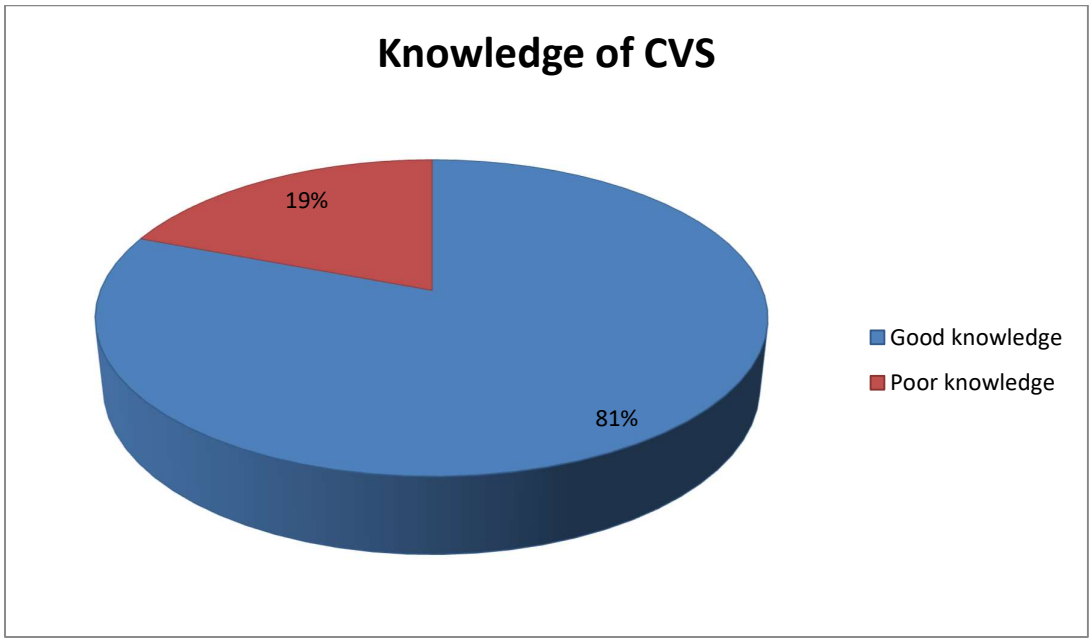

Figure 1: Knowledge about Computer vision syndrome among the academic staffs

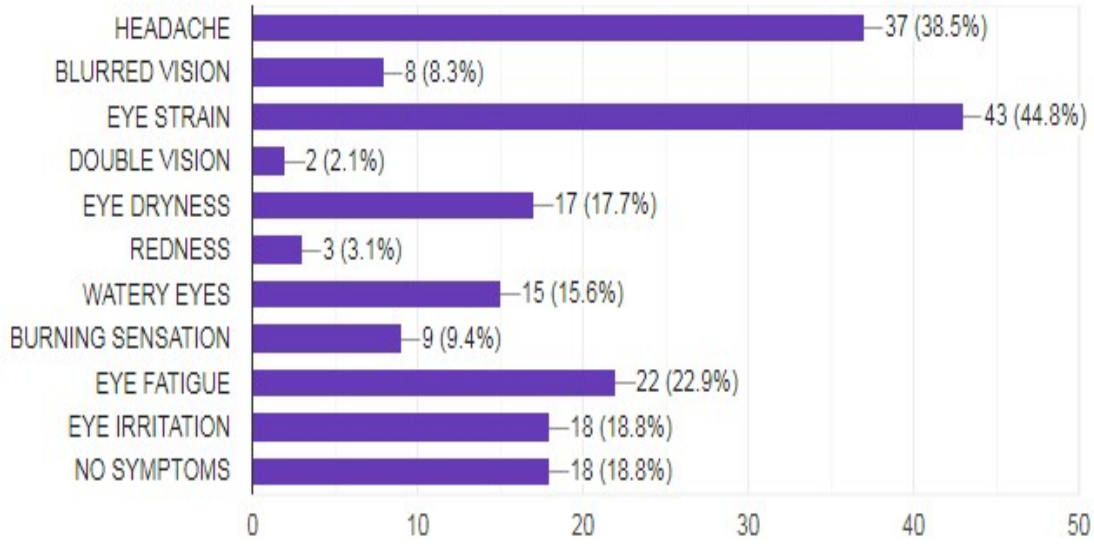

Figure 2: Symptoms of Computer vision syndrome
Percentage of computer vision syndromes reported among academic staffs.

Table 3: Logistic regression showing the Factors associated with computer vision syndrome among the academic staffs

Variable	Categories	Frequency	Percent	Odds ratio	p value	95% Confidence interval for Odds Ratio	
						Lower	Upper
Do you use any eye drops?	yes	6	6.25	1			
	no	90	93.75	0.578	0.702	0.035	9.585
what is the working hours with computer/day?	<8hrs	61	63.54	1			
	>8hrs	35	36.46	2.154	0.185	0.693	6.693
Do you have a habit of taking break (after 1-2 hours of continuous work) while using computer?	yes	79	82.29	1			
	no	17	17.71	1.717	0.461	0.408	7.229
Do you use eye glass?	yes	50	52.08	1			
	no	46	47.92	0.553	0.309	0.176	1.734
Do you use eye droplets for any of your eye problems in the past 12 months?	yes	19	19.79	1			
	no	77	80.21	1.401	0.642	0.338	5.814
Do you use other visual display technologies/terminals e.g. tablet, smartphone etc?	yes	85	88.54	1			
	no	11	11.46	1.356	0.723	0.252	7.303
Is any glare on your computer screen?	yes	22	22.92	1			
	no	74	77.08	0.917	0.892	0.264	3.185
Do you use of anti-glare for your computer screen?	yes	15	15.63	1			
	no	81	84.38	1.130	0.869	0.264	4.849
Have you ever taken any training regarding problem of CVS and its prevention methods?	yes	5	5.21	1			
	no	91	94.79	0.662	0.765	0.045	9.837

The logistic regression analysis is carried out with computer vision syndrome as the dependent variable and personal and behavioural factors as the independent variable. While some factors show associations with CVS, these associations are not statistically significant

DISCUSSION

The use of computers has grown rapidly as a result of socioeconomic growth and technological advancements. Computer vision syndrome is one of the most prevalent concerns among computer users **[11]**. So the current study aimed to examine the prevalence of CVS and associated risk factors for developing CVS among the academic staff of Yenepoya Deemed to be University. In our study, out of a total of 96 participants, the majority of the study population consisted of younger females aged between 22 and 30 years. Most of the academic staffs were Post graduates.

In our study, the prevalence of CVS symptoms among the academic staffs was 79.16%. This was consistent with findings from Tesfaye *et al*. (78.80%) (9), Zalat MM (81.2%) **[12]** and Setyowati DL **[13]** (79.4%), but the prevalence is not high among the administrative universities in Ghana at 51.5% **[14]** Logaraj M *et al*., found that male were higher risk of developing CVS symptoms such as blurred vision **[15]**. In our study we found an association between gender and having eye strain (p = 0.021). Also continuous use of computers for teaching purpose is associated with CVS (p= 0.028) similarly educational status are also associated with use of other visual display technologies (e.g.: smart phone, tablet) there were statistically significant. (p = 0.009)

We examined the risk factors associated with computer vision syndrome by using logistic regression analysis and found that the some factors show associations with CVS. But these associations are not statistically significant. Factors including such as working hours, habit of taking break, wearing eyeglasses, use of antiglare etc. are found to be risk factors for developing CVS.

Among the examined variables, individuals who reported working more than 8 hours a day with a computer more likely to develop CVS than those who worked fewer hours (odds ratio = 2.154, p = 0.185) According to the previous study, there is a considerable increase in the risk of CVS with an increase in computer hours **[15]**. Additionally, Rahman and Sanip (2011) discovered that computer workers were more likely to develop CVS if they spent more than 7 hours a day on a computer **[16]**. Our findings show that most of the academic staff use computer for teaching purpose. In many academic settings professors and staff often have similar responsibilities such as teaching and conducting research so they spend long hours in front of computer leading to shared experiences and challenges with computer vision syndrome **[1]**.

In our study, a significant majority of academic staffs (80.4%) were revealed that they are aware of Computer Vision Syndrome (CVS). They reported knowledge of various preventive measures, such as taking regular breaks, adjusting the brightness and contrast settings of a computer, and using materials that reduce glare from screens. Additionally, more than 80% of the academic staffs were aware of the importance of maintaining a proper seating position and appropriate distance while using a computer to prevent CVS.

In our findings, the most common CVS symptom was eye strain (43 %).This may be due to a decrease in the blink rate. The normal blinking rate was approximately 15-20/ min **[23]**. In addition, previous study found that, small screen and text size lead to incorrect eye focus, which exacerbates eye strain and fatigue **[17]**. Agarwal S *et al*., found that eye strain was the most common ocular complaints among computer users working for more than 6 hours. Eye fatigue (20.8%) may be depends on the distance between the user and devices. Other studies have suggested that prolonged periods of constant stiffing of gaze and accommodating put stress on the extra ocular muscles and the eye, ultimately leading to headache and eye fatigue **[5]**.

In our study 39% participants experienced Headache. Several studies have found that headache was the commonly reported symptoms in computer users **[18-20]**. Other symptoms reported in our study was blurred vision (7.29%), double vision (2%), eye dryness (16.6%), watery eyes (14%), and eye irritation (13%), whereas the least commonly reported symptom was redness (3%).

According to result we found that ,academic staff who did not take breaks after 1-2 hours of continuous work were 1.72 times more likely to develop CVS compared to those who took breaks [OR = 1.717, 95% CI (0.408, 7.229), p = 0.461]. So, this emphasizes the importance of taking regular breaks during computer work to prevent CVS. It has been suggested to do this at every 1 to 2 hours interval and refresh the eyes every 20 minutes while using computers and other visual display terminals. Prevention efforts can be done by 20/20/20 rule. With this method someone who works with a computer is advised that she/he should look away from 20 feet or 6 meters every 20 minutes for a total of 20 second **[21]**.

In this study Usage of eye drop while using computer is not associated risk factors of CVS but Eye drops help prevent dryness, maintain moisture on the ocular surface, and boosting

tear volume, potentially reducing the onset of visual discomfort associated with CVS **[22]**.

As it was a questionnaire based study, there were few limitations; firstly, the sample size used for the study was small. Secondly, we did not perform any ophthalmic examinations and self-reported symptoms were analysed which might have caused bias in the study results. Not including neck and shoulder pain as symptoms of CVS. The depth of analysis is limited by the small number of predictor factors. Additionally, the cross-sectional design impedes establishing causal relationships between CVS and its associated factors. Hence, we suggest that future researchers consider ophthalmic examinations in their studies**.**

CONCLUSION

This study marks the first attempt to gauge the prevalence of Computer Vision Syndrome (CVS) among the academic staffs of Yenepoya Deemed to be University. This study revealed that the prevalence of computer vision syndrome was common among university academic staff, with more than three-quarters of the academicians suffering from the condition. Working hours with Computer, taking regular break, using antiglare filters were found to be protective factors of CVS in this study. Raising awareness about CVS among the faculty of Allied healthcare professionals of Yenepoya Deemed to be University is crucial. Practice good visual hygiene such as taking regular breaks in between work, reducing exposure to display screens, and using lubricant eye drops, are also important. Overall, spreading awareness and educating people can help reduce CVS problems in Universities. Additionally, implementing regular screening programs and organizing awareness camps can significantly help in identifying and mitigating the symptoms of Computer Vision Syndrome (CVS).

ACKNOWLEDGEMENTS

We would like to express our sincere gratitude to Mr. Amensisa Hailu Tesfaye for his valuable support, along with heartfelt thanks to all the participants. Special thanks to Yenepoya Institute of Allied Health Science for their unwavering support in contributing to this study.

Funding: No funding sources

Conflict of interest: None declared

REFERENCES

[1] Sengo DB, da Deolinda Bernardo Pica A, Dos Santos II, Mate LM, Mazuze AN, Caballero P, *et al* Computer vision syndrome and associated factors in university students and teachers in Nampula, Mozambique. BMC ophthalmology. 2023 Dec 13;23(1):508.

[2] Dessie A, Adane F, Nega A, Wami SD, Chercos DH. Computer Vision Syndrome and Associated Factors among Computer Users in Debre Tabor Town, Northwest Ethiopia. J Environ Public Health. 2018 Sep 16;(1)

[3] American Optometric Association, *Guide to the ClinicalAspects of Computer Vision Syndrome*, Association AO, St.Louis, MO, USA, 1995.

[4] Thomson WD. Eye problems and visual display terminals—the facts and the fallacies. Ophthalmic and physiological optics. 1998 Mar 1;18(2):111-9.

[5] Altalhi A, Khayyat W, Khojah O, Alsalmi M, Almarzouki H. Computer vision syndrome among health sciences students in Saudi Arabia: prevalence and risk factors. Cureus. 2020 Feb 20;12(2).

[6] Bali J, Navin N, Thakur BR. Computer vision syndrome: a study of the knowledge, attitudes and practices in Indian ophthalmologists. Indian journal of ophthalmology. 2007 Jul 1;55(4):289-93.

[7] Hassan HA. Computer Vision Syndrome Among Medical Students at the University of Khartoum, Sudan: Prevalence and Associated Factors. Cureus. 2023 May 9;15(5).

[8] Agarwal S, Goel D, Sharma A. Evaluation of the factors which contribute to the ocular complaints in computer users. Journal of clinical and diagnostic research: JCDR. 2013 Feb;7(2):331.

[9] Tesfaye AH, Alemayehu M, Abere G, Mekonnen TH. Prevalence and Associated Factors of Computer Vision Syndrome Among Academic Staff in the University of Gondar, Northwest Ethiopia: An Institution-Based Cross-Sectional Study. Environ Health Insights. 2022 Jul 12;16:11786302221111865.

[10] Gondol BN, Areba AS, Kanno GG, Mamo TT. Prevalence of visual and posture related symptoms of computer vision syndrome among computer user workers of Ethiopian Roads Authority. J Environ Occup Health. 2020 Oct 22;10(3):73-8.

[11] Alemayehu M, Nega A, Tegegne E, Mule Y. Prevalence of self-reported computer vision syndrome and associated factors among secretaries and data processors who are working in University of Gondar, Ethiopia. 2014;4:33-37.

[12] Zalat MM, Amer SM, Wassif GA, El Tarhouny SA, Mansour TM. Computer vision syndrome, visual ergonomics and amelioration among staff members in a Saudi medical college. International Journal of Occupational Safety and Ergonomics. 2022 Apr 3;28(2):1033-41.

[13] Setyowati DL, Nuryanto MK, Sultan M, Sofia L, Gunawan S, Wiranto A. Computer vision syndrome among academic community in Mulawarman University, Indonesia during work from home in Covid-19 Pandemic. Ann Trop Med Public Health. 2021;24(01).

[14] Boadi-Kusi SB, Abu SL, Acheampong GO, Adueming PO, Abu EK. Association between Poor Ergophthalmologic Practices and Computer Vision Syndrome among University Administrative Staff in Ghana. J Environ Public Health. 2020 Apr 27;2020(1):7516357.

[15] Logaraj M, Madhupriya V, Hegde S. Computer vision syndrome and associated factors among medical and engineering students in chennai. Ann Med Health Sci Res. 2014 Mar;4(2):179-85.

[16] Rahman ZA, Sanip S. Computer user: Demographic and computer related factors that predispose user to get computer vision syndrome. Int J Bus Humanit Technol 2011;1:84-91.

[17] Pavel IA, Bogdanici CM, Donica VC, Anton N, Savu B, Chiriac CP, *et al*.Computer vision syndrome: An ophthalmic pathology of the modern era. Medicina. 2023 Feb 20;59(2):412.

[18] Akinbinu TR, Mashalla YJ. Knowledge of computer vision syndrome among computer users in the workplace in Abuja, Nigeria.2013

[19] Reddy SC, Low CK, Lim YP, Low LL, Mardina F, Nursaleha MP. Computer vision syndrome: a study of knowledge and practices in university students. Nepalese journal of ophthalmology: a biannual peer-reviewed academic journal of the Nepal Ophthalmic Society: NEPJOPH. 2013 Jul 1;5(2):161-8.

[20] Shrestha GS, Mohamed FN, Shah DN. Visual problems among video display terminal (VDT) users in Nepal. Journal of Optometry. 2011 Apr 1;4(2):56-62.

[21] Boulet C. The '20/20/20 rule' – when good intentions and axiomatic habit displace best practices. *Can J Optom*. 2016;78:6-6.

[22] Bucolo C, Fidilio A, Fresta CG, *et al*. Ocular pharmacological profile of hydrocortisone in dry eye disease. *Front Pharmacol*. 2019;10:1240.

[23] Abusharha AA. Changes in blink rate and ocular symptoms during different reading tasks. Clinical optometry. 2017 Nov 20:133-8.