Disease Prevention and Public Health Journal
Vol. 19, No. 2, September 2025, pp. 19-29

e-ISSN: 2720-9997

Risk Factors of Computer Vision Syndrome in Lecturers and Academic Staff: A Literature Review

Aswin Fauziah[1], Solikhah Solikhah[2]*, Widodo Hariyono[3]

1,2,3 Faculty of Public Health, Universitas Ahmad Dahlan, Indonesia
*Solikhah: solikhah@ikm.uad.ac.id

ARTICLE INFO

Article history
Received January 5, 2025
Revised September 5, 2025
Accepted September 7, 2025

Keywords
Computer Vision Syndrome
Lecturer
Academic staff
Management

ABSTRACT (10PT)

Background: Computer Vision Syndrome (CVS) is becoming an important issue among lecturers and academic staff due to the increasing use of digital devices. CVS causes symptoms such as dry eye fatigue, headaches, and neck and back pain that can affect teaching quality and individual well-being. This study aims to understand the relationship of CVS variables in lecturers and academic staff and management with existing literature**; Method**: A literature review was conducted by searching electronic data-based articles including Google Scholar and Pubmed using the keywords Computer Vision Syndrome, lecturer, academic staff, management. Inclusion criteria included articles from national and international accredited publications 2019-2024, full text, open access and cross sectional study research design. 10 articles were selected for analysis according to Prisma Guidelines**; Results**: Analysis of the literature showed that CVS risk factors consisted of individual factors, namely male, computer use more than four hours a day; for environmental factors, ergonomics and lighting were also influential. The importance of eye health awareness, educational interventions, adjustments to work ergonomics and the practice of eye exercises can reduce the risk of CVS and **Conclusion**: CVS is a significant problem among computer users especially in academic settings. Individual and environmental factors influence CVS symptoms. Prevention and management require a comprehensive approach with ergonomic adjustments, regular breaks and educational interventions. Eye exercise programs are effective in reducing symptoms. The challenge lies in developing evidence-based strategies to address individual responses. It is hoped that these measures can reduce the prevalence of CVS, improving the health and well-being of computer users.

Introduction

Computer Vision Syndrome (CVS) is a specific form of eye strain, or asthenopia, characterized by a collection of symptoms related to visual, ocular, and musculoskeletal issues. It occurs when the eye muscles are overworked, particularly when focusing on objects at close range for extended periods. CVS is becoming an increasingly important issue among lecturers and academic staff due to the increased use of digital devices in academic activities during pandemic COVID 19. CVS is characterized by a variety of symptoms, including dry eyes, eyestrain, headaches, and neck and back pain that can affect teaching quality and personal well-being (1)(2)(3). Major risk factors contributing to the occurrence of CVS include long duration of screen use, inadequate lighting and poor sitting position (4).

Approximately 13 million workers experience occupational vision problems, with an estimated 3.5 million occupational eye injuries each year. Workers who are visually impaired are 30.2% less likely to work compared to their counterparts who do not experience similar problems(5). Among academic staff, the prevalence of CVS is very high, as seen in a Saudi medical university including lecturers, assistant professors, associate professors, and professors, where it reached 81.2% (3). In addition, at Gondar University, Ethiopia, the prevalence of CVS among academic staff was also quite high, at 78.8% (6). Only 38.4% of lecturers adhered to recommended ergonomic practices, such as maintaining proper screen spacing (7). The implementation of ergonomic training and awareness programs in educational settings can significantly reduce symptoms among faculty (2). By improving understanding of good working practices and providing appropriate training, educational institutions can help lecturers and academic staff reduce the risk of CVS and improve their well-being and productivity.

Individual factors contribute significantly to the increased risk of CVS among lecturers. Research shows that male lecturers have a higher tendency to experience CVS symptoms compared to their female counterparts (6). Duration in front of a computer screen >4 hours per day 9x increases the risk of CVS (8). In addition, lecturers who have uncorrected refractive errors or do not wear corrective lenses show an increased risk of experiencing such symptoms (9). Environmental factors, such as inadequate lighting (below 300 lux) in the workspace, contribute to eye strain (10). Monitor positioning that is inappropriate for eye level may also exacerbate the manifestation of CVS symptoms. In relation to computer devices, a screen distance of less than 50 cm is 7.787 times more at risk of CVS incidence compared to more than 50 cm(11). In addition, inadequate screen brightness settings and anti-glare features can exacerbate visual discomfort (12).

Although there have been many studies on CVS, there is still a paucity of literature regarding the prevalence of CVS among computer users especially in workers in academic settings and what individual and environmental factors contribute to the appearance of CVS symptoms. In addition, what is the relationship between ergonomic conditions in the workplace and the prevalence of CVS symptoms, and how effective are various prevention and management strategies to reducing the impact of CVS on computer users' health.

Materials and Method

This literature review was conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure that the methodology employed was both systematic and transparent. The eligibility criteria included articles published between 2020 and 2024, a timeframe that coincides with the significant shift to online learning and remote work initiated by the COVID-19 pandemic in early 2020. During this period, numerous educational institutions and organizations transitioned to remote learning and working methods, which were open access and freely available in full text. Articles considered should have Computer Vision Syndrome (CVS) as the main dependent variable and include a population of faculty and academic staff. In addition, articles with a focus on primary empirical data will be prioritized, while literature reviews or systematic reviews/meta-analyses will be excluded to ensure a focus on primary data. To assess relevance and quality, the Joanna Briggs Institute (JBI) critical appraisal tool will be used, tailored to the relevant research design, such as cross-sectional. Articles will be assessed in quality categories: high (score ≥85%), medium (score 60-85%), and low (score <60%).

The search process was conducted systematically through Google Scholar and PubMed using relevant keywords in English and Indonesian, such as “computer vision syndrome,” “lecturer,” and “academic staff,” as well as “computer vision syndrome,” “lecturer,” and “academic staff.” A combination of Boolean logic (AND/OR) was applied to ensure that the retrieved articles were relevant to the topic. The selection process followed PRISMA steps, including identification, title and abstract screening, and inclusion of relevant articles based on full-text assessment.

Data from the selected articles will be analyzed descriptively to identify individual and enviromental risk factors for CVS in lecturers and academic staff. The purpose of this article is to identify risk factors that contribute to the incidence of CVS through a systematic review of the literature.

Results and Discussion

Results

Nine articles were analyzed using matrix tables (Table 1) to identify the variables studied, namely risk factors for CVS in lecturers and academic staff and management. Literature research from all nine articles showed that CVS is associated with these groups. Previous research explains that risk factors include length of computer work, duration, length of breaks, eye-to-screen distance and monitor position at eye level, which have the most influence on CVS. A person who has 5 risk factors together has an 83% chance of developing CVS.

The focus of this literature review is to assess the risk factors of CVS in the group of lecturers, academic staff and management. The results of the article analysis showed that individual and environmental factors influence CVS symptoms, while educational interventions and eye exercises can reduce CVS symptoms. The results of the article synthesis can be seen in Figure 1.

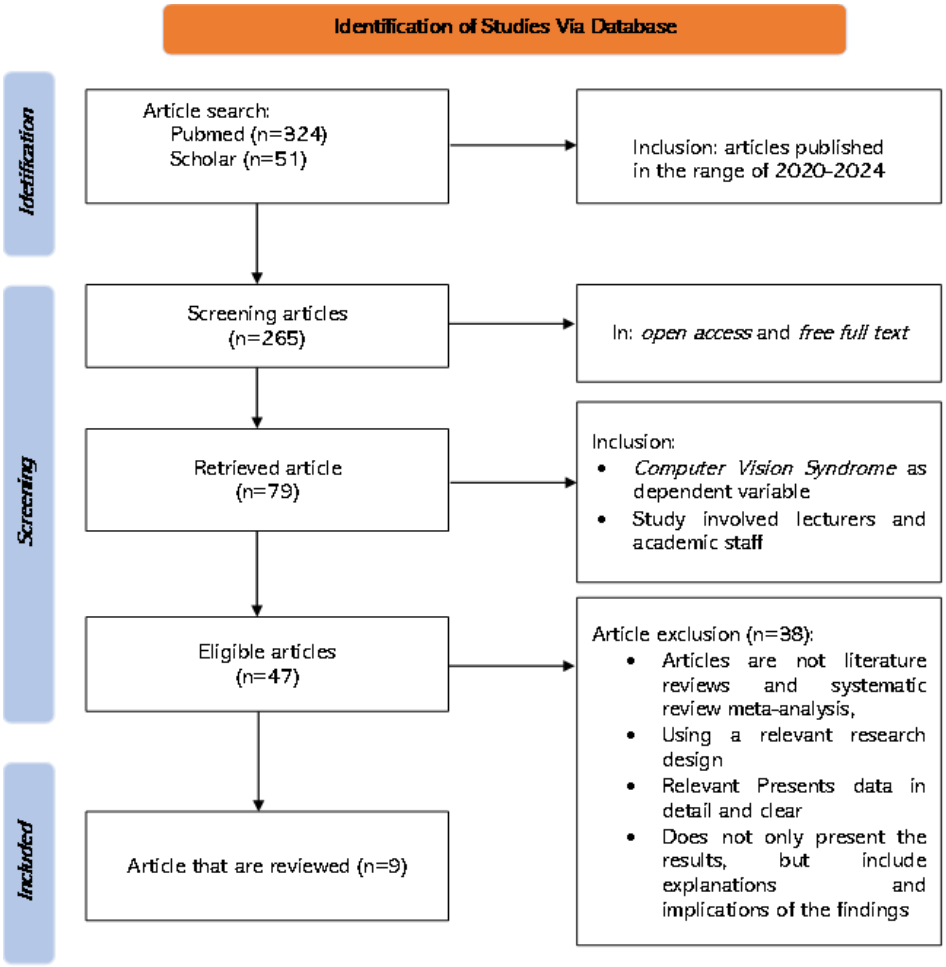

Figure 1. Identification of Studies Via Database

Discussion

This study reveals data on the prevalence and contributing factors of CVS in academic settings. Symptoms of CVS such as itchy eyes, fatigue and blurred vision were common, along with complaints of pain around the eyes, eye redness and strain. Musculoskeletal pain in the neck, shoulders and back were also experienced, especially by respondents who used computers frequently. A total of 64% of teachers had a high level of psychological impact, namely depression, due to CVS. The prevalence of CVS varied among the population studied, reaching 78.8% in academic staff at Gondar University, Ethiopia. Individual factors such as gender and duration of computer use influence CVS risk, with males having a higher prevalence of CVS symptoms. Environmental factors such as ergonomics and lighting were also influential, with the importance of a comprehensive survey to understand the impact of computer use on physical and mental health in a university setting.

Table 1. Analysis of Article Synthesis

No	Citation	Methods	Sample/ Place	Results
1	Amelia Septiyanti, R., Fathimah, A., & Asnifatima, A	Cross sectional study	68 workers of Ibn Khaldun University Bogor	workers who experience CVS complaints prevalence 63.2%, men suffer more than women, the most complaints are tired and tense eyes 69.1%, variables associated with CVS are variables of length of work with computers, length of rest, visual distance, lighting levels. The variable length of work in front of the computer >4 hours a day, 9 times the risk of causing CVS in computer user workers at Ibn Khaldun University of Bogor.
2	Amensisa Hailu Tesfaye, Mekuriaw Alemayehu, Giziew Abere and Tesfaye Hambisa Mekonnen	Cross sectional study	525 academic staff at Gondar University Ethiopia	The prevalence of CVS was found to be 78.8% among the total of 500 participants, with the majority (71.60%) being male. Using a computer for more than 9 years, utilizing visual display terminals outside working hours, and working in inappropriate lighting conditions (<300 and >500 lux) increased the risk of CVS, while using eye drops and taking breaks were identified as protective factors.
3	Dulnério Barbosa Sengo1*, Abel da Deolinda Bernardo	Cross sectional study	325 students and lecturers	The occurrence rate of Computer Vision Syndrome (CVS) stood at

	Pica2, Isaura Ilorena d'Alva Brito Dos Santos2, Laura Mavota Mate3, Avelino Nelson Mazuze2, Pablo Caballero4 and Inmaculada López-Izquierdo5	questionnaire (CVS-Q)		76.6%. Risk factors for developing CVS included being male, aged ≤ 20 years, having insufficient knowledge about ergonomics, using a computer for study purposes, working over 6 hours daily, lacking anti-glare treatment, utilizing additional devices, and sitting on an unsuitable chair. Conversely, being a teacher was identified as a factor that reduced the likelihood of experiencing CVS.
4	Demisu Zenbaba, Biniyam Sahiledengle, Mitiku Bonsa, Yohannes Tekalegn, Jember Azanaw, Vijay Kumar Chattu	Web-based cross sectional study Research tool: questionnaire using Google Forms distributed to teachers via email address, Facebook account, and Telegram.	416 teachers in several universities in Ethiopia	Out of the entire group of 416 individuals, around 293 (70.4%) disclosed experiencing CVS of which 54.6% were aged 24-33 years, with males outnumbering females. The primary symptoms highlighted were blurred vision, discomfort in and around the eyes, and redness in the eyes. Working in a stand-alone university, being female (44 years and above, working frequently in front of a computer, and sitting with a hunched back were factors associated with computer vision syndrome.
5	Jabar, Jamaluddin, Nurul, Izzah, Abd Rahman	cross sectional study online questionnaire	245 lecturer in universities in Malaysia	56% of lecturers used ergonomic principles when working with computers, the most significant ergonomic factor causing CVS was improper eye distance to the monitor. CVS symptoms in the head, neck and shoulder area were most significant at 42.1%.
6	Yrene Cecilia Uribe-Hernandez, et all	Cross sectional study Digital survey with CVS questionnaire and psychological scales	98 lecturer in Cañete Distric	CVS symptoms were categorized into low and medium symptoms, 64% of teachers had low levels of CVS symptoms. For psychological impact categorized into low (stress), medium (anxiety) and high

				(depression), 64% of teachers had a high level of psychological impact (depression).
7	Brian Meneses-Claudio, et all	Cross sectional Digital survey with sociodemographic data and CVS-Q instrument	63 lecturer in Lima Distric	Only a meager 19% of lecturers experienced computer vision syndrome. This study correlated whether eyeglass use, length of computer time per day and eye disorders were associated with CVS symptoms but statistical tests were not significant.
8	Boadi-Kusi SB, Abu SL, Acheampong GO, Adueming PO,	Cross sectional study Self-administered questionnaire, eye health examination, computer workstation and lighting assessment	200 administrative staff universities in Ghana	Among 103 participants, the prevalence of Computer Vision Syndrome (CVS) was 51.5%, with a higher proportion of males than females affected. A notable correlation was identified between CVS and inadequate ergonomic habits, such as incorrect monitor screen viewing angles (73.5%) and inadequate lighting conditions (99%). The predominant symptoms encompassed moderate to severe manifestations like burning sensations, sensation of obstruction, eye pain, itching, and blurred vision.
9	Md Golam Kibria * , Md Shohel Parvez , Palash Saha , Subrata Talapatra	Cross sectional study Instrument: OSHA checklist	271 academic and administrative staff in the Mechanical Engineering faculty of Khulna University Bangladesh	The study identified common visual discomforts associated with Computer Vision Syndrome (CVS) among participants, including itchy eyes (69%), tired eyes (83%), and blurred vision (56.83%). Ergonomic factors were assessed in the study through demographic variables, CVS symptoms using the OSHA checklist, and Musculoskeletal Disorder (MSDs) symptoms with the Nordic

	Musculoskeletal Questionnaire.
	The research highlighted significant ergonomic challenges at computer workstations, particularly concerning their design, layout, and duration of use. Workstation ergonomic elements such as seating, workspace, and monitor positioning were notably inadequate. A considerable number of university employees experienced both MSDs and visual symptoms.
	Various factors including age, gender, years of work experience, workstation ergonomics, and computer usage duration were statistically significant predictors for MSDs. A significant correlation was observed between deficits in monitor ergonomics and visual symptoms. These factors were reliable predictors of both visual discomforts and MSDs among the participants.

Computer Vision Syndrome (CVS) manifests physical symptoms such as blurred vision, eye discomfort, and eye redness. Notably, 42.1% experienced CVS symptoms in the head, neck, and shoulder regions (7) . These symptoms ranged from moderate to severe, including sensations of burning, eye pain, itching, and blurred vision (13). On the mental front, 64% of teachers reported a high level of psychological impact, specifically depression, categorized as low stress, medium anxiety, and high depression (14).

Individual factors contribute significantly to the risk of developing CVS. Research shows that males are more likely to experience CVS symptoms, with a prevalence of 71.6%. Duration of computer use is also a key factor, with individuals who use computers for more than four hours a day having a nine times greater risk of experiencing CVS-related symptoms (15). A study at Nampula University confirmed that six hours of computer use can increase the risk of CVS among students and lecturers (16). In addition to duration, individual characteristics such as age and habitual computer use without adequate rest also contribute to the severity of symptoms. A Lima study found no significant link between eyeglass use and CVS symptoms (17), while 52% of lecturers at Islamic University of Bandung who wear glasses reported CVS (18) in contrast, CVS prevalence was significantly higher among those with refractive errors and contact lenses users, particularly myopia ($p<0.001$) (19)(20). For further research to achieve significant results, it is necessary to increase the sample size, improve methodology, control confounding variables, use control groups, and conduct more in-depth data analysis.

Environmental factors also contribute significantly to the occurrence of CVS, especially in the context of ergonomics and lighting. Improper body position, such as slouching while working and inappropriate viewing angles while using a computer, can increase muscle tension and visual discomfort (4)(21). Research shows that inadequate lighting, either too dim (<300 lux) or too glaring (>500 lux), can worsen CVS symptoms (6). This aligns with research in office areas with

an average light intensity of 219.5 lux, where 57.5% of workers experience CVS. Attention should be given to the cleanliness of walls, ceilings, lighting, and their fixtures (22). In addition, the use of non-ergonomic equipment, including unsupportive chairs, increases the risk of symptoms. Research shows that many computer users do not maintain the correct distance between their eyes and the keyboard, with only 38.4% of participants adhering to the recommended distance of between 63cm-82cm (7). Another study shows that the position of the top of the monitor more than 10 cm above the horizontal height of the eyes is identified as a risk factor for CVS, with subjects in this position experiencing approximately a 17-fold increased risk of developing the syndrome (23).

This review article highlights the importance of eye health awareness among computer users, especially lecturers and academic staff, and the need for educational interventions to reduce the risk of CVS through regular breaks and eye relaxation techniques (24). Ergonomic adjustments, such as proper screen placement and optimal lighting, and eye refreshment practices, including the use of artificial eye drops, are also highly recommended to reduce discomfort (25)(26)(27). Computer-based interventions such as LiquidEye, as well as the PERMATA-KU eye exercise program combined with ergonomics education, have shown effectiveness in managing CVS symptoms (28)(29)(30). Educational modules have also been shown to be effective in increasing knowledge of CVS among computer professionals (31). Challenges faced in this study include the need to develop a more holistic and evidence-based approach, and address the diversity of individual responses to existing treatments and strategies.

This study has several strengths and weaknesses that need to be noted. The main strength of this study is the use of comprehensive data from multiple universities, which provides a broad and representative picture of the prevalence of CVS among computer users in academic settings. In addition, the study was able to identify a range of individual and environmental factors that contribute to the onset of CVS symptoms, which could form the basis for more effective interventions. However, there are some shortcomings that need to be noted, one of which is the variation in data collection methods that may affect the consistency of the results, given that some studies may have used different questionnaires or diverse analysis techniques. In addition, this study may not have fully considered other factors that could affect visual health, such as previous eye health conditions or individual lifestyle habits. Thus, while this study provides valuable insights, further research with more uniform methodologies is needed to strengthen the findings and recommendations.

Conclusion

The conclusion of this article emphasizes that Computer Vision Syndrome (CVS) is a significant health issue among computer users, especially in academic settings. The high prevalence of CVS, with symptoms such as itchy eyes, fatigue, and blurred vision, underscores the need for serious attention to visual health. Individual factors, such as gender and duration of computer use, as well as environmental factors like ergonomics and lighting, contribute to the emergence of CVS symptoms. Interventions that can be implemented in university environments to prevent CVS include organizing educational programs on the importance of ergonomics and proper workstation setup, applying the 20-20-20 rule which encourages users to look at an object 20 feet away for 20 seconds after every 20 minutes of screen time providing regular eye examinations for staff and offering resources on minimizing the impact of digital device use, such as using anti-glare filters and ensuring appropriate lighting in workspaces. The challenge lies in developing evidence-based strategies to address individual responses. It is hoped that these measures can reduce the prevalence of CVS, improving the health and well-being of computer users

Declaration

Acknowledgments: The authors declare that there were no sources of funding for this study. No grants were received in support of the research work, nor were any funds obtained for covering the costs to publish in open access.

Conflicts of Interest: There are no personal circumstances or interests that may be perceived as inappropriately influencing the representation or interpretation of the reported research results.

References

1. Jalali M, Esmaeili R, Hesam G, Moradpour Z, Farhadi S. Investigating computer vision syndrome and associated factors before and during the COVID-19 pandemic: A comparative cross-sectional study in faculty members. WORK [Internet]. 2025;80(3):1202–14. Available from: https://doi.org/10.1177/10519815241290055
2. Estrada-Araoz EG, Quispe-Mamani YA, Incacutipa-Limachi DJ, Puma-Llanqui JS, Quispe-Aquise J, Jara-Rodríguez F, et al. the Challenge of Teaching in the Digital Era: Computer Visual Syndrome in Basic Education Teachers. J Law Sustain Dev. 2023;11(6):1–14.
3. Marwa M. Zalat Soliman M. Amer GAWSAET, Mansour TM. Computer vision syndrome, visual ergonomics and amelioration among staff members in a Saudi medical college. Int J Occup Saf Ergon [Internet]. 2022;28(2):1033–41. Available from: https://doi.org/10.1080/10803548.2021.1877928
4. Zenbaba D, Sahiledengle B, Bonsa M, Tekalegn Y, Azanaw J, Kumar Chattu V. Prevalence of Computer Vision Syndrome and Associated Factors among Instructors in Ethiopian Universities: A Web-Based Cross-Sectional Study. Sci World J. 2021;2021.
5. International Labour Organization. Eye Health and the World of Work. Geneva: ILO Pubishing Unit; 2023. 1–40 p.
6. 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;16.
7. Jamaluddin J, Abd Rahman NI, Ahmad SA. Industrial Ergonomics: Examining Ergonomic Practices and Computer Vision Syndrome (Cvs). Int J Manuf Econ Manag. 2024;4(1):15–25.
8. Nopriadi N, Pratiwi Y, Leonita E, Tresnanengsih E. Faktor yang Berhubungan dengan Kejadian Computer Vision Syndrome pada Karyawan Bank. Media Kesehat Masy Indones [Internet]. 2019; Available from: https://api.semanticscholar.org/CorpusID:199622477
9. Ilhamiyati I, Wahyunisa A. Analysis of Risk Factors in Computer Vision Syndrome: A Case Control Study. Int J Sci Adv. 2022;3(4):557–65.
10. Jehung BY, Suwarto S, Alfanan A. Hubungan Intensitas Pencahayaan Dengan Keluhan Kelelahan Mata Pada Karyawan Di Kampus Universitas Respati Yogyakarta Tahun 2021. J Formil (Forum Ilmiah) Kesmas Respati [Internet]. 2022; Available from: https://api.semanticscholar.org/CorpusID:246357176
11. Yolanda M, Ali RS, Wicaksono S. Hubungan Durasi Penggunaan Komputer Dan Jarak Mata Dengan Monitor Komputer Terhadap Kejadian Computer Vision Syndrome (CVS) Pada Karyawan Di Lingkungan Universitas Bengkulu Tahun 2020. J Kedokt Raflesia [Internet]. 2022; Available from: https://api.semanticscholar.org/CorpusID:262161735
12. Dotulong D, Rares L, Najoan IHM. Computer Vision Syndrome. e-CliniC [Internet]. 2021; Available from: https://api.semanticscholar.org/CorpusID:238004910
13. Kusi SBB, Adueming POW, Hammond FA, Antiri EO. Computer vision syndrome and its associated ergonomic factors among bank workers. Int J Occup Saf Ergon [Internet]. 2022;28(2):1219–26. Available from: https://doi.org/10.1080/10803548.2021.1897260
14. Uribe-Hernandez Y, Ochoa-Paredes F, Moran-Requena H, Pacheco-Pumaleque A. Vision syndrome due to the use of computers and psychological impact on teachers at a university in the province of Cañete. Int J Adv Appl Sci. 2023;10(3):60–5.

15. Septiyanti R, Fathimah A, Asnifatima A. Faktor-Faktor Yang Berhubungan Dengan Kejadian Computer Vision Syndrome Pada Pekerja Pengguna Komputer Di Universitas Ibn Khaldun Bogor Tahun 2020. Promotor. 2021;5(1):32–50.
16. Sengo DB, da Deolinda Bernardo Pica A, Dos Santos II d'Alva B, Mate LM, Mazuze AN, Caballero P, et al. Computer vision syndrome and associated factors in university students and teachers in Nampula, Mozambique. BMC Ophthalmol. 2023;23(1):1–11.
17. Meneses B, Mantarí K, Rios W, Huamani EL, Yauri M. Computer vision syndrome in teachers of a university of the province of Lima. Int J Adv Appl Sci. 2023;10(1):1–6.
18. Talitha Nawiryasa F, Rianti Indrasari E, Garna H. Computer Vision Syndrome pada Dosen Tahap Akademik Fakultas Kedokteran Universitas Islam Bandung selama Pandemi Covid-19. 2022; Available from: https://doi.org/10.29313/bcsms.v2i1.1828
19. Ba I, Sm H, Sem G. PREVALENCE AND ERGONOMIC RISK FACTORS OF COMPUTER VISION SYNDROME AMONGST MEDICAL ACADEMIC STAFF : A CROSS-SECTIONAL STUDY Introduction Computer vision syndrome (CVS) is an emerging public health issue in the phone is generally known as Video Display Te. 2024;48(3):77–94.
20. Ortiz-Toquero S, Sanchez I, Serrano A, Martin R. Prevalence of Computer Vision Syndrome and Its Risk Factors in a Spanish University Population. Eye Contact Lens [Internet]. 2024;50(8). Available from: https://journals.lww.com/claojournal/fulltext/2024/08000/prevalence_of_computer_vision_syndrome_and_its.1.aspx
21. Boadi SB, Abu SL, Acheampong GO, Adueming POW, Abu EK. Association between Poor Ergophthalmologic Practices and Computer Vision Syndrome among University Administrative Staff in Ghana. J Environ Public Health. 2020;2020.
22. Insani Y, N N wunaini. Hubungan Jarak Mata dan Intensitas Pencahayaan terhadap Computer Vision Syndrome. J Manaj Kesehat Yayasan RS Dr Soetomo. 2018;40(2):153–62.
23. Rochmayani DS, Cahyaningsih O. Risk Factors for the Incidence of Computer Vision Syndrome (CVS) in Lecturers During the Online Learning Period. J Heal Educ. 2021;6(2):65–72.
24. Kibria MG, Parvez MS, Saha P, Talapatra S. Evaluating the ergonomic deficiencies in computer workstations and investigating their correlation with reported musculoskeletal disorders and visual symptoms among computer users in Bangladeshi university. Heliyon [Internet]. 2023;9(11):e22179. Available from: https://doi.org/10.1016/j.heliyon.2023.e22179
25. Erdinest N, Berkow D. Computer Vision Syndrome. Harefuah [Internet]. 2021;160 6:386–92. Available from: https://api.semanticscholar.org/CorpusID:235610764
26. Anusha DJ, Vijaya DK. A Cross Sectional Study on Computer Vision Syndrome and Its Associated Factors among Computer Users. Int J Sci Res [Internet]. 2023; Available from: https://api.semanticscholar.org/CorpusID:266328970
27. Dostálová N, Vrubel M, Kachlík P. Computer vision syndrome - symptoms and prevention. Cas Lek Cesk [Internet]. 2021;160 2-3:88–92. Available from: https://api.semanticscholar.org/CorpusID:235461958
28. Hwang Y, Shin D, Eun J, Suh B, Lee J. Design Guidelines of a Computer-Based Intervention for Computer Vision Syndrome: Focus Group Study and Real-World Deployment. J Med Internet Res [Internet]. 2021;23. Available from: https://api.semanticscholar.org/CorpusID:232408193

29. Dewi MAK, Rahmi FL, Saubig AN, Julianti HP. The Effect Of “Permata-Ku” Exercises On The Improvement Of Computer Vision Syndrome Score. Diponegoro Med J (Jurnal Kedokt Diponegoro) [Internet]. 2021; Available from: https://api.semanticscholar.org/CorpusID:237965186
30. Barbizu Tanamal, Naibey R, Sri Wadiastuti, Yulidia H, Yanti Pesurnay. Computer Vision Syndrome (CVS) in Medical Students Reduced by Eye Exercise and Acupressure. Babali Nurs Res. 2023;4(2):314–29.
31. Shrivastava S. Effectiveness Of E-Module Regarding Computer Vision Syndrome And Its Management: An Experimental Study. Int J Adv Res [Internet]. 2021; Available from: https://api.semanticscholar.org/CorpusID:236417694