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Description of Computer Vision Syndrome (CVS) Knowledge in PSSK Students of Medical Faculty Udayana University

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ABSTRACT

Computer Vision Syndrome (CVS) is a group of visual and extraocular symptoms associated with the continuous use of visual display terminals caused by the use of devices with a long-time intensity. This study was conducted to determine the description of the knowledge of undergraduate medical students of the Faculty of Medicine, Udayana University Class of 2020 regarding Computer Vision Syndrome (CVS) and the complaints they feel. This study used a cross-sectional descriptive method in collecting data. The research subjects were selected using a simple random sampling technique, consisting of 83 students enrolled in the Undergraduate Medical Study Program, Faculty of Medicine, Udayana University, Class of 2020. Data collection was carried out by distributing quizzes online to assess knowledge about Computer Vision Syndrome (CVS). The collected data were analyzed using SPSS software version 27. The study found that 45 subjects (54.2%) had a good level of knowledge, 32 subjects (38.6%) had a sufficient level of knowledge, and 6 subjects (7.2%) had a poor level of knowledge. The description of the knowledge of undergraduate medical students of the Faculty of Medicine, Udayana University, Class of 2020 regarding Computer Vision Syndrome (CVS) is mostly in the good category. Education through lectures, seminars or workshops needs to be carried out in order to increase awareness and the importance of Computer Vision Syndrome (CVS) and treatment efforts need to be implemented.

Keywords: Computer Vision Syndrome, CVS, knowledge, medical students

INTRODUCTION

Computer Vision Syndrome (CVS) has become a health issue related to the widespread use of gadgets among the public. In this advancing digital era, the use of devices such as computers, smartphones, tablets, and other monitors has shifted from a tertiary need to a necessity in daily life. One group that frequently utilizes gadgets actively is medical students, given their involvement in learning, research, and medical documentation through these devices. However, the comfort and productivity offered by this technology are often not accompanied by sufficient knowledge, leading to health complaints. In this regard, having adequate knowledge in using these devices becomes crucial to gain a deeper understanding of eye health, proper device usage, and the prolonged impact of gadget use.

According to the American Optometric Association (AOA), Computer Vision Syndrome, also known as "Digital Eye Strain," refers to a group of problems that occur in the eyes and vision due to prolonged use of computers, phones, tablets, and other electronic devices.[1] Visual symptoms, ocular symptoms, asthenopia, and light sensitivity are some symptoms

indicating someone is experiencing CVS. Visual symptoms may be related to blurry vision, either constantly, blurred distance vision after work, or intermittent blurred vision up close. Ocular surface-related symptoms may include itchy eyes, burning eyes, a sensation of foreign objects, and stinging eyes. In some cases, staring at a laptop screen for more than 4 hours can lead to dry eye disease associated with meibomian gland dysfunction, and some people also complain of excessive tearing and excessive blinking. If these complaints persist for a long time, they can affect the severity of symptoms experienced by the patient and may disrupt the daily activities of the individual.[2]

The results of a survey conducted by the Property & Consumer Good Industry at MarkPlus on 124 subjects show that 31.4% of them experienced an increase in the use of video call services during the pandemic period. Additionally, online video conference usage increased by 33.5%, and the use of video streaming or online viewing increased from 76.6% to 85.5%.[3] If this condition persists for a long time, it can trigger problems with the eyes leading to Computer Vision Syndrome (CVS). A study conducted on 306 students of the Faculty of General Medicine at Malahayati University found that 73.9% of the subjects experienced CVS. The subjects in this study were also reported to actively use laptops every day, with a duration of use ranging from 2 to 4 hours per day.[4] Not only among students, but cases of CVS are also prevalent among workers, such as employees of Bank RK Pekanbaru who actively use computers. The results found in 117 subjects showed that 54.3% experienced tired and tense eyes, 28.7% experienced neck pain, 27.7% experienced shoulder pain, 25.5% experienced headaches, 20.2% experienced blurred vision, 17% experienced double vision, 14.9% experienced watery eyes and difficulty focusing, 11.7% experienced back pain, and 5.3% experienced burning and irritated eyes.[5]

Today, cases of CVS are increasingly found due to a lack of knowledge about the causes and a lack of further information about this syndrome. Information is crucial in raising awareness among digital media users about the occurrence of CVS. The lack of information about CVS results in many users forgetting the ergonomic value of using gadgets, ultimately leading to the occurrence of this syndrome.

Based on the description, it is necessary to conduct research on the knowledge about Computer Vision Syndrome (CVS) among students in the Bachelor of Medicine Program (PSSK) at the Faculty of Medicine, Udayana University.

MATERIALS & METHODS

Study Design

This research employs a descriptive observational research design using a cross-sectional or cross-cutting study approach. In this research design, data will be collected at a single point in time simultaneously without any interventions. The study was conducted from early February to April 2023 by students of the Bachelor of Medicine Program at the Faculty of Medicine, Udayana University, from the 2020 cohort who agreed to participate as research subjects.

Samples

The data collection was done using a Google Form containing an informed consent form, the subjects' identities, their eye health history, questions about knowledge regarding Computer Vision Syndrome, and a history of Computer Vision Syndrome symptoms. The questionnaire was filled out by 86 research subjects, with 3 of them meeting the exclusion criteria.

Data Collection

The questionnaire used in this research underwent modification based on the questionnaire created by Mersha et al. to suit the specific needs of this study.[6] The questionnaire has undergone reliability

testing, and a Cronbach's alpha value of 0.83 was obtained, indicating very reliable results. The questionnaire includes questions about knowledge regarding the occurrence of Computer Vision Syndrome (CVS), and subjects choose statements based on their knowledge.

STATISTICAL ANALYSIS

After collecting this data, the next step will involve descriptive analysis to obtain an overview of the knowledge level and complaints experienced by the subjects. The results of this analysis will be presented in the form of tables consisting of univariate analysis, frequency (quantity and percentage), as well as a narrative description.

RESULT & DISCUSSION

The distribution of the characteristics of research subjects based on gender in this study is divided into 58 female respondents (69.9%), while the number of male respondents is 25 (30.1%). The higher proportion of females in this study is due to a larger number of female medical students in the population under investigation compared to male students. The average age of the study subjects is 20.84 ± 0.51 years, with an age range between 20-22 years. The majority of subjects in this study use their devices for 4 to 8 hours per day, totaling 57 subjects (68.7%). This is followed by the group of gadget users for less than 4 hours a day, comprising 20 subjects (24.1%), and the group of users for more than 8 hours a day, consisting of 6 subjects (7.2%). This usage pattern is quite common, considering that the respondents in this study are medical students who have a higher intensity of gadget usage. The distribution of characteristics of research subjects can be seen in Table 1.

Table 1 Distribution of Medical Students in the Bachelor of Medicine Program, Faculty of Medicine, Udayana University, Class of 2020, Based on Individual Characteristics

Variable	Proportion (N=83)	Mean ± SD (Years)	Median Min-Max (Years)
Gender			
Male	25 (30.1%)		
Female	58 (69.9%)		
Age		20.84 ± 0.51	21 20-22
Duration of Gadget Usage			
< 4 Hours	20 (24.1%)		
4 Jam – 8 Hours	57 (68.7%)		
> 8 Hours	6 (7.2%)		

In this study, 11 symptoms of Computer Vision Syndrome were included and asked to the subjects. These symptoms include eye strain, eye irritation, dry eyes, itchy eyes, eye fatigue, double vision, blurry vision, headaches, neck pain, shoulder pain, and lower back pain. The results of this study, as presented in Table 2, indicate that the majority of research subjects experience more than 5 symptoms of Computer Vision Syndrome, totaling 55 subjects (66.4%), and there are 2 subjects (2.4%) who do not experience any symptoms related to Computer Vision Syndrome. This aligns with a study conducted by Irawati E., where most of the subjects experienced at least more than 5 symptoms of Computer Vision Syndrome, with 220 subjects (82.7%), and only 4 subjects (1.5%) reported no symptoms related to Computer Vision Syndrome.[7] There is not a significant difference between the two studies, as both were conducted during the COVID-19 period.

The analysis results in this study, as indicated in Table 2, show that complaints such as eye irritation and itching are the most commonly reported by the subjects, with 63 subjects (75.9%) experiencing each. This is followed by complaints of neck pain, reported by 59 subjects (71.1%). The least reported complaint by the subjects is double vision, with 32 subjects (38.6%). Complaints of eye irritation and dryness are very common, especially among medical students who are required to focus on

screens for an extended period, exacerbating these complaints. These complaints may also result from increased evaporation of tears combined with decreased tear production in users caused by the use of air conditioning that produces dry air quickly, affecting the working environment quality, or may be caused by high levels of lighting in the working environment, creating excessive contrast between the monitor screens, leading to discomfort in the eyes.[8] In addition to experiencing eye complaints, the monotonous and non-ergonomic use of computers will also trigger musculoskeletal complaints in users. This can be caused by poor body posture due to efforts to adjust the monitor position to be horizontally aligned with the eyes, ultimately causing muscle tension in the neck or back of the user. The results of this study are in line with the research conducted by Muliarta et al, which stated that complaints such as upper neck pain, lower neck pain, and shoulder pain are the most frequently occurring musculoskeletal complaints in long-term computer users.[9]

Another study with similar results is the research conducted by Hassan, where the majority of his research subjects complained of shoulder pain, with a total of 78.5% of the research subjects choosing this complaint.[10] This is followed by complaints of headaches by 70.5%, and red eyes with 36.2% of research subjects complaining about this symptom. Another study that has similar research findings to the study conducted by Irawati E. found that eye fatigue was the most commonly complained about symptom in her research subjects, with a percentage of 90.6%.[7] This was followed by complaints of eye strain and headaches, each reported by 80.5%. Similarly, a study conducted by Marteen Halawa E. found that the most common Computer Vision Syndrome symptom experienced by his research subjects was sensitivity to light, reported by 81.1%. Then, pain in the neck and back, with 79.3% of research subjects complaining about it.[11]

Table 2 Distribution of Computer Vision Syndrome Complaints in Subjects

Variable	Proportion (N=83)
Number of CVS Symptoms	
No Symptom	2 (2.4%)
1 Symptom	2 (2.4%)
2 Symptoms	3 (3.6%)
3 Symptoms	6 (7.2%)
4 Symptoms	6 (7.2%)
5 Symptoms	9 (10.8%)
>5 Symptoms	55 (66.4%)
Types of Complaints	
Tense eyes	52 (62.7%)
Burning eyes	63 (75.9%)
Dry eyes	63 (75.9%)
Itchy eyes	46 (55.4%)
Fatigued eyes	53 (63.9%)
Double vision	32 (38.6%)
Blurry vision	52 (62.7%)
Headache	54 (65.1%)
Neck pain	59 (71.1%)
Shoulder pain	45 (54.2%)
Lower back pain	38 (45.8%)

The description of the subjects' knowledge in this study was obtained by using 10 questions about Computer Vision Syndrome given to the subjects. As shown in Table 3, the average knowledge score of the 83 subjects is 7.45. The median knowledge score is 8, with a mode knowledge score also of 8. The lowest recorded knowledge score is 4, while the highest knowledge score reaches 10, with a standard deviation of 1.290.

The knowledge scores of the subjects are categorized into three levels: low, moderate, and high. This categorization follows the knowledge criteria proposed by Arikunto, where knowledge is considered low if the score is less than 56, moderate if the score is between 56-74, and good if the score is 75 or more. From Table 3, it can be seen that the majority of subjects in this study have good knowledge, with 45 subjects (54.2%). Furthermore, there are 32 subjects (38.6%) with moderate knowledge, and 6 subjects (7.2%) have poor knowledge.

The results of this study differ slightly from the research conducted by Dava Prihandoyo, where the majority of knowledge descriptions among college students in Surabaya regarding Computer Vision Syndrome were considered moderate, with 100 out of 133 subjects (75.19%).[12] On the other hand, looking at the research conducted by Irawati E., the results are somewhat reversed. In this study, the

majority of subjects still had a somewhat lacking knowledge of CVS, with 114 out of 266 subjects (42.9%). Subjects in this study, who are medical students, show awareness of the negative consequences of prolonged computer use on their eye health.[7]

Table 3 The Level of Knowledge of Subjects Regarding Computer Vision Syndrome

Variable	Proportion (N=83)	Mean (SD)	Median (Min-Max)
Mean Value		7.45 (1.29)	8 (4-10)
Knowledge Level			
Poor	6 (7.2%)		
Sufficient	32 (38.6%)		
Good	45 (54.2%)		

Based on Table 4, the knowledge overview of female subjects shows that 31 subjects have a good knowledge category, which is higher compared to male subjects, where only 14 subjects have good knowledge. This result contradicts the theory presented by Budiman and Riyanto, which states that gender is not among the factors influencing an individual's knowledge level. According to this theory, an individual's knowledge level is more influenced by factors such as education level, prior information history, social, cultural, and economic factors, environment, experience, and age.[13]

In this study, data on the characteristics of subjects based on the duration of gadget use and knowledge level were obtained (Table 4). The majority of subjects who use gadgets for 4 to 8 hours each day show the highest knowledge level about Computer Vision Syndrome with a good category, totaling 33 subjects. On the other hand, subjects with a gadget usage duration of less than 4 hours a day also show good knowledge, with 10 subjects. Meanwhile, in subjects who spend more than 8 hours a day using gadgets, only 2 subjects were able to answer questions about Computer Vision Syndrome in the good category. The findings in this study are supported by previous research conducted by Bilal M. in his study, which confirms a significant relationship between the duration of computer use and Computer Vision Syndrome.[14] This is also consistent with research conducted by Azkadina, stating that staring at a gadget screen for more than 4 hours can increase the risk of an individual developing Computer Vision Syndrome. In this case, when an individual uses their gadget for a considerable duration, complaints related to Computer Vision Syndrome gradually start to be felt. In connection with these research findings, an individual's knowledge level is closely related to their ability to reduce the negative impacts of long-term gadget use, one of which is by limiting the duration of gadget use.[15]

Table 4 Distribution of Knowledge Level Categories Based on Gender and Duration of Gadget

Variable	Category of Computer Vision Syndrome Knowledge Level N = 83		
	Poor	Sufficient	Good
Gender			
Male	3	8	14
Female	3	24	31
Duration of Gadget Use			
< 4 Hours	1	9	10
4 Hours – 8 Hours	5	19	33
> 8 Hours	0	4	2

CONCLUSION

Out of the 86 subjects who participated in this study, 83 subjects met the research criteria. There were 25 male subjects (30.1%) and 58 female subjects (69.9%). The average age of the study subjects was 20.84±0.51, ranging from 20 to 22 years. The majority of subjects chose to use gadgets for 4 to 8 hours per day, accounting for 68.7% (n=57). In conclusion, this study

provides an overview of knowledge about Computer Vision Syndrome for the majority of subjects falling into the good category, which is 54.2% (n=45). Most subjects with good knowledge were found among female subjects. In terms of the duration of gadget use, subjects who spent between 4 and 8 hours per day had a higher level of knowledge in the good category.

Based on the results of this study, out of the 11 symptoms of Computer Vision Syndrome provided to the subjects, the majority chose complaints of dry and sore eyes as the most frequently reported. This was followed by complaints of headaches.

It is hoped that students in the Bachelor of Medicine Program at Udayana University can increase their knowledge about Computer Vision Syndrome and related symptoms to be more aware of the risks associated with Computer Vision Syndrome and take appropriate preventive measures. Additionally, students are expected to provide education to the wider community about Computer Vision Syndrome and ways to reduce the negative impacts of long-term gadget use. Moreover, education about Computer Vision Syndrome can also be conducted through socialization activities and seminars by students within the Faculty of Medicine at Udayana University. This will help disseminate information about Computer Vision Syndrome and the symptoms that need to be monitored. Medical training such as workshops, focusing on prevention and therapy for Computer Vision Syndrome, can help understand the clinical aspects and manage complaints effectively.

In future research, it is hoped to explore the relationship with Computer Vision Syndrome more deeply using analytical studies. Additionally, it is recommended that in subsequent research, studies on subjects be conducted under optimal conditions to ensure that questionnaire completion can be done with optimal performance.

Declaration by Authors

Ethical Approval: This research was approved by the Ethics Committee of the Faculty of Medicine Udayana University (No: 89/UN14.2.2.VII.14/LT/2023).

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REFERENCES

1. American Optometric Association. Computer Vision Syndrome [Internet]. American Optometric Association. American Optometric Association; 2023. Available from: https://www.aoa.org/healthy-eyes/eye-and-vision-conditions/computer-vision-syndrome?sso=y
2. Bogdănici CM, Săndulache DE, Nechita CA. Eyesight quality and Computer Vision Syndrome. Romanian Journal of Ophthalmology [Internet]. 2017 Jul 15;61(2):112–6. Available from: https://rjo.ro/images/rjo_issue_2_2017/7.bogdanici_camelia_m_final_PR.pdf
3. Dhiya Alriye S. Peningkatan Konsumsi Internet Saat Pandemi [Internet]. forshei.org. 2020 [cited 2024 Jan 10]. Available from: https://www.forshei.org/2020/11/pandemi-covid-19-telah-mengubah.html
4. Helmi Muchtar, Sahara N. Hubungan Lama Penggunaan Laptop Dengan Timbulnya Keluhan Computer Vision Syndrome (CVS) Pada Mahasiswa/I Fakultas Kedokteran Umum Universitas Malahayati. Jurnal Medika Malahayati. 2016 Jan 1;3(4):197–203.
5. Pratiwi AD, Safitri A, Junaid J, Lisnawaty L. Faktor Yang Berhubungan Dengan Kejadian Computer Vision Syndrome

(CVS) Pada Pegawai PT. Media Kita Sejahtera Kendari. An-Nadaa: Jurnal Kesehatan Masyarakat (e-Journal) [Internet]. 2020 Jun 30 [cited 2022 Feb 26];7(1):41–7. Available from: https://ojs.uniska-bjm.ac.id/index.php/ann/article/view/3111

6. Mersha GA, Hussen MS, Belete GT, Tegene MT. Knowledge about Computer Vision Syndrome among Bank Workers in Gondar City, Northwest Ethiopia. Occupational Therapy International. 2020 Apr 23; 2020:1–5.
7. Irawaty E, Rasyid M, Tirtasari S, Novendy N, Lontoh SO. A Descriptive Study about Students' Symptoms and Knowledge of Computer Vision Syndrome. Muhammadiyah Medical Journal [Internet]. 2021 Oct 28;2(2):41–8. Available from: https://jurnal.umj.ac.id/index.php/MMJ/article/view/10043/5921
8. Megawati Nur Anggraeni, Atti Yudiernawati, Ani Sutriningsih. Hubungan Perilaku Pemakaian Laptop Dengan Kejadian Computer Vision Syndrome (CVS). Nursing News: Jurnal Ilmiah Keperawatan. 2018 Dec 27;3(3).
9. I Made Muliarta, I Nyoman Adiputra, Made I, Luh, I Ketut Tunas. Active Stretching And Working Posture Correction To Improve Psycho-Physiological Response Among Computer Operators For High School Students. Journal of human ergology. 2020 Jan 1;49(1):9–16.
10. Gadain Hassan HA. Computer Vision Syndrome Among Medical Students at the University of Khartoum, Sudan: Prevalence and Associated Factors. Cureus. 2023 May 9;
11. Evan Marteen Halawa, Ristarin Paskarina Zaluchu, Hendra Jirwanto. Gambaran Gejala Computer Vision Syndrome Pada Mahasiswa Fakultas Kedokteran Universitas HKBP Nommensen MedanTahun 2019/2020. NJM (Nommensen Journal of Medicine). 2022 Aug 27;8(1):39–42.
12. Prihandoyo AD, Putra GPT, Gunawan L, Khalifi NNA, Ma'rufah NA, Saraswati PA, et al. Pengetahuan Dan Perilaku Mahasiswa Terkait Computer Vision Syndrome (CVS) Serta Penggunaan dan Penyimpanan Obat Tetes Mata Sebagai Penanganannya. Jurnal Farmasi Komunitas [Internet]. 2021 Dec 6 [cited 2022 Mar 15];8(2):32–7. Available from: https://e-journal.unair.ac.id/JFK/article/view/24084
13. Budiman, Riyanto, Agus. Kapita Selekta Kuesioner Pengetahuan dan Sikap Dalam Penelitian Kesehatan [Internet]. Salemba Medika; 2013. Available from: https://www.penerbitsalemba.com/
14. Bilal M, Maeda I, Fitri A, Amalia R. Faktor-Faktor Yang Berhubungan Dengan Computer Vision Syndrome (CVS) Pada Karyawan PT. Depoteknik Duta Perkasa Tahun 2020.
15. Azkadina A, Julianti H, Pramono D. Hubungan Antara Faktor Risiko Individual Dan Komputer Terhadap Kejadian Computer Vision Syndrome. Jurnal Kedokteran Diponegoro; 2012.

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