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The Relation Between Vision Distance, Body Posture, And Long Use of Computer with Computer Vision Syndrome in Faculty of Medicine Universitas Sumatera Utara

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Abstract

Background: The COVID-19 pandemic affects all activities of human life, including education. Educational activities that are usually carried out face-to-face in class have now been stopped to avoid the expansion of the spread of COVID-19. The cessation of face-to-face learning activities is shifted to online-based learning (distance) by utilizing technology that is connected to the internet. This distance learning system applies to all levels of education. Learning with an online system using a computer all day makes various complaints experienced by students such as computer vision syndrome. The most common eye complaints condition is computer vision syndrome, some eye and vision problems that originate from prolonged use of computers, tablet computers, electronic readers and mobile phones. Computer Vision Syndrome is a collection of symptoms in the eyes and neck caused by excessive use of computers/monitors. Symptoms vary but mostly involve eye strain, headache, blurred vision, dry eyes, irritation, slowed focusing of the eyes, pain in the neck, back, and sensitivity to light. Objective: The purpose of this study was to analyse the relationship between visibility, body posture, and duration of computer use with Computer Vision Syndrome (CVS) in USU Medical Faculty students Methods: This type of research is analytic with a cross sectional study approach. The sample of this study amounted to 100 students who were randomly selected using stratified random sampling. The data used is primary data from questionnaires filled out online through the Line, WhatsApp, and Instagram applications. Data analysis using SPSS with chi square statistical test ($p < 0.05$). Results: The results showed that the most visibility was < 50 c, frequent bad posture, and duration of use was > 4 hours. Conclusion: The results showed that there was a relationship between visibility, body posture, and duration of using a computer with CVS for USU Medical Faculty students.

Keywords: Computer Vision Syndrome; Knowledge; USU Medical Faculty Students;

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Introduction

The COVID-19 pandemic affects all activities of human life, including in the field of education. Educational activities that are usually carried out face-to-face in class have now been stopped to avoid the expansion of the spread of COVID-19. The cessation of face-to-face learning activities is shifted to online-based learning (distance) by utilizing technology that is connected to the internet. This distance learning system applies to all levels of education (Ismawati and Prasetyo 2020).

American Optometric Association (AOA)defines vision syndrome on computer use or Computer Vision Syndrome as multiple eye problems related to near work that a person experiences while or related to computer use. Symptoms vary but mostly involve eye strain, headache, blurred vision (for near or far vision), dry eyes, irritation, slowed eye focus, neck and back pain, and sensitivity to light (Baqir, 2017).

Based on WHO in 2010 there were 285 million people or 4.24% of the total population in the world experiencing visual impairment with a distribution of 39 million people suffering from blindness, 246 million people in the world experiencing low vision and 82% experiencing visual impairment (Pratiwi et al. 2020).

Research conducted by Rahman et al., (2011) found 68.1% of the incidence of CVS in 436 respondents of academic and administrative staff in Malaysia. They reported that respondents who used the computer more than 5 hours per day had a higher risk of CVS. The study was conducted by Reddy et al., (2016) on 795 students aged 18-25 years at 5 universities in Malaysia.

They reported that the incidence of CVS was 89.9%, the most common symptoms being headaches (19.7%) and eye fatigue (16.4%). CVS not only has an impact on vision, but also on work productivity. Rosenfield in 2011 stated that between 64% and 90% of computer users complain of symptoms of eye and vision problems. Research conducted at a regional medical school in India stated that watery eyes (62.6%) and neck pain (58%) were the most common complaints (Purushottam et al., 2010).

This gives rise to the fact that most of the respondents work longer hours without intermittent breaks. In addition, based on research conducted by Logaraj et al., (2014) on 201 medical students in Chennai found 76.8% CVS incidence in 85% of students who use computers for more than 4 hours.

Method

This study was an analytical study design with a cross sectional study. The aim is to find out the relation between vision distance,body posture, and long use of computer with computer vision syndrome in faculty of medicine Universitas Sumatera Utara.

This research will be carried out for 3 months which will start drom August until October 2021. The research location will hel in Fakultas Kedokteran Universitas Sumatera Utara, Medan

The number of samples in this study was determined based on the sample size formula with the Slovin formula:

$$n = \frac{N}{1 + Ne^2}$$

Total population of 760 people, the number of samples obtained using these techniques was 100 people. The sampling technique used is to divide the population into sub-population/strata. This technique is carried out by collecting data on the total student class of 2018, 2019, anda 2020 which will then determine the number of samples needed for each class with the formula No of Samples = No of Subpopulations/No of Populations x No of Samples required.

So based on the calculation of the formula above, in this study the number of samples used were 88 people. Then the number of stratified sample members (strata) is divided by force using the proportional allocation formula:

$$ni = \frac{Ni}{n} = N$$

$$2018 = \frac{256}{760}\,88 = 29{,}64 = 30$$

$$2019 = \frac{243}{760}\,88 = 28{,}13 = 38$$

$$2020 = \frac{261}{760}\,88 = 30{,}22 = 30$$

Results

The collection of the data was conducted from August to September 2021 by giving questionnaires to the FK USU students.

The following are data on results collected from respondents:

Table 1. Frequency distribution of respondent characteristics

Karakteristik	Orang	%
Jenis Kelamin		
Perempuan	58	58%
Laki – laki	42	42%
Angkatan		
2018	34	34%
2019	33	33%
2020	33	33%
Rentang Usia		
18- 20	69	69%
21- 24	41	41%

The most samples in this study were women, as many as 58 people (58%) and 42 men (42%). Based on the batch, it is known that the 2018 batch is 34 people (34%), the 2019 class is 33 people (33%) and the 2020 class is 33 people (33%). Based on the age range, the most were 18-24 years (69%).

Table 2. Frequency distribution of respondents based on CVS complaints.

Keluhan	Ya		Tidak	
	Frekuensi (orang)	Persentasi (%)	Frekuensi (orang)	Persentasi (%)
Mata Lelah dan Tegang	77	77%	23	23%
Mata Kering dan Teriritasi	41	41%	59	59%
Mata Melihat Kabur/Blur	59	59%	41	41%
Nyeri Kepala	53	53%	47	47%
Mata Terasa Sakit	39	39%	61	61%
Mata Berair	46	46%	54	54%
Mata Melihat Kembar	15	15%	85	85%
Kesulitan Dalam Memfokuskan Pengelihatan	32	32%	68	68%

It can be seen that the symptoms most complained by respondents were tired and tense eyes (heavy eyes, sore) as many as 77 people (77%), followed by blurred vision/blur as many as 59 people (59%), headaches 53 people (53%), watery eyes as many as 46 people (46%), dry and irritated eyes as many as 41 people (41%), eyes hurt as many as 39 people (39%) difficulty in focusing vision as many as 32 people (32%), and the most common symptom slightly complained about the eyes seeing twins as many as 15 people (15%).

Table 3. Frequency distribution of respondents based on positive and negative CVS symptoms.

Kejadian CVS	Frekuensi (orang)	Persentase (%)
Positif CVS	50	50%
Negatif CVS	50	50%
Total	100	100%

The number of students who experienced CVS was as much as those who did not experience CVS, namely 50 people (50%).

Table 4. Frequency distribution of respondents based on the duration of computer use.

Lama Penggunaan Komputer	Frekuensi (orang)	Persentase (%)
≥4 Jam	89	89%
< 4 Jam	11	11%
Total	100	100%

That the majority of students use the computer every day for more than 4 hours as many as 89 people (89%).

Table 5. Frequency distribution of respondents based on the distance of the eye to the computer.

Jarak Pandang	Frekuensi (orang)	Persentase (%)
< 50 cm	57	57
≥ 50 cm	43	43
Total	100	100

It can be seen that the majority of respondents are respondents whose eye distance to the computer is less than 50 cm as many as 57 people (57%), followed by 43 people (43%).

Table 6. Frequency distribution of respondents based on body posture when using a computer.

Postur Tubuh	Frekuensi (orang)	Persentase (%)
Buruk	53	53%
Baik	47	47%
Total	100%	100%

It can be seen that the majority of respondents are respondents who have bad posture when using computers, as many as 53 people (53%).

Table 7. The relationship between computer vision and computer vision syndrome.

Jarak Pandang	CVS(+)		CVS(-)		Total	P	CI
	n	%	n	%			
<50 cm	34	34	23	23	57		1.029-
≥ 50 cm	16	16	27	27	43	0,026	2,497
Total	50	50	50	50	100		

Regarding the relationship between visibility when using a computer and CVS complaints, it was found that the value of p = 0.026 (p < 0.05) with a prevalence ratio of 1.603 (95% CI = 1.029-2.497). This shows that visibility when using a computer is significantly associated with CVS complaints.

Table 8. The relationship between body posture and computer vision syndrome.

Postur Tubuh	CVS(+)		CVS(-)		Total	P	CI
	n	%	n	%			
Buruk	32	32	21	21	53		1,032-
Baik	18	18	29	29	47	0,028	2,408
Total	50	50	50	50	100		

Regarding the relationship between body posture when using a computer and CVS complaints, it was found that the value of p = 0.028 (p < 0.05) with a prevalence ratio of 1.577 (95% CI = 1.032-2.408) This shows that body posture when using a computer is significantly related to complaints. CVS.

Table 9. The relationship between duration of use and computer vision syndrome.

Lama Penggunaan Komputer	CVS(+)		CVS(-)		Total	P	CI
	n	%	n	%			
> 4 jam	48	48	41	41	89		0,835 –
< 4 jam	2	2	9	9	11	0,025	10,544
Total	50	50	50	50	100		

Regarding the relationship between length of use when using a computer and CVS

complaints, it was found that the value of p = 0.025 (p < 0.05) with a prevalence ratio of 2.966 (95% CI = 0.835-10.544). This shows that the length of use when using a computer is significantly related to CVS complaints.

Discussion

Computer Vision Syndrome describes a group of eye and vision-related problems that result from prolonged use of computers, tablets, e-readers, and cell phones. Nearly 60 million people suffer from CVS globally, which results in decreased productivity in the workplace and decreased quality of life for computer workers. work and monitor distance as well as symptoms that often arise from CVS events (Alfitriana et al., 2019). Occupational safety and health administration (OSHA) CVS as a complex eye and vision complaint experienced when using a computer (Nopriadi et al., 2019). This study is in accordance with the research of Nopriadi, et, al. Where it is stated that employees with a vision distance of less than 50 cm or more than 50 cm have a 3.3 times risk of experiencing CVS compared to employees whose vision distance from the monitor is 50 cm.

It was found that posture has an important role in a person's psychology which will have an impact on their position or work. Posture has the effect of making a person think and act more powerfully. This is because working with a normal posture reduces stress and strain on muscles and reduces the risk of musculoskeletal disorders. The principle of ergonomics for posture is to be natural and loose, so avoid postures that are too heavy for the body. Harahap (2021) explained that the body postures that must be considered when using a computer are head position, sitting position, hand position, and foot position. This study is in accordance with Harahap's study, that poor posture is associated with CVS.

The use of laptops can cause a health complaint called Computer Vision Syndrome. This syndrome is influenced by the application of an ergonomic system that is not good for students who use laptops. (Anggraeni et al., 2018). The computer as a tool that is widely used by humans, also causes occupational diseases such as the use of machines in industry. Vision problems caused by computer use, the AOA calls CVS a work-related compound eye problem experienced by a person at close range or related to computer use (Permana et al., 2015). This research is in accordance with the research of Ranasinghe, et, al. Where it is mentioned that using a computer for 2 hours per day increases the risk of developing CVS by 1.16 times.

Conclusion

The results were found to be p = 0.026, p = 0.028, and p = 0.025 (p <0.05). Based on the results, the H_1 was accepted, so that there was the relation between vision distance, body posture, and long use of computer with computer vision syndrome in FK USU.

References

Baqir M. *Hubungan Lama Penggunaan Komputer Dengan Kejadian Computer Vision Syndrome Pada Pegawai Pengguna Komputer Di Universitas Muhammadiyah Palembang* (Doctoral Dissertation, Universitas Muhammadiyah Palembang).

Gyamfi-Bannerman, Cynthia et al. 2016. "Antenatal Betamethasone for Women at Risk for Late Preterm Delivery." *New England Journal of Medicine* 374(14): 1311–20.

Ismawati, Dwi, and Iis Prasetyo. 2020. "Efektivitas Pembelajaran Menggunakan Video Zoom Cloud Meeting Pada Anak Usia Dini Era Pandemi Covid-19." *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini* 5(1): 665.

Logaraj, M, V Madhupriya, and S K Hegde. 2014. "Computer Vision Syndrome and Associated Factors among Medical and Engineering Students in Chennai." *Annals of medical and health sciences research* 4(2): 179–85.

Pratiwi, Arum Dian, Aulia Safitri, Junaid Junaid, and Lisnawaty Lisnawaty. 2020. "FAKTOR YANG BERHUBUNGAN DENGAN KEJADIAN COMPUTER VISION SYNDROME (CVS) PADA PEGAWAI PT. MEDIA KITA SEJAHTERA KENDARI." *An-Nadaa: Jurnal Kesehatan Masyarakat* 7(1): 41–47.

Rahman, Zairina A, and Suhaila Sanip. 2011. "Computer User: Demographic and Computer Related Factors That Predispose User to Get Computer Vision Syndrome." *Int J Bus Humanit Technol* 1(2): 84–91.