IMPACT OF WORKLOAD DURING WORK FROM HOME AGAINST COMPUTER VISION SYNDROME

Nelly Yardes[1], Eska Riyanti [2], Suratun [3], Pudjiati[4], Aranya Wikantari[5]

[1,2,3,4]Lecturers of the Nursing Study Program, Undergraduate Applied Nursing Program, Department of Nursing, Poltekkes Kemenkes Jakarta III
[5]Nursing Study Program Students, Applied Undergraduate Program, Nursing Department, Poltekkes Kemenkes Jakarta III

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Abstract: New policies made by the government aimed at breaking the chain of COVID-19 spread, such as the Work From Home (WFH) policy. Previous research explains how WFH policies can increase the workload of employees. This can cause health problems, such as computer vision syndrome. The purpose of this study was to determine the impact of workload during WFH on computer vision syndrome. This research is quantitative and uses a descriptive-analytic method with a cross-sectional design. The study sample consisted of 148 samples and was taken using purposive sampling. The research instrument was a questionnaire on Google Form. The analyses used in this research are univariate and bivariate analysis. The results showed that 57.4% of employees had a high workload, 42.6% had a low workload, 72.3% had CVS, and 27.7% had no CVS. The results of the bivariate analysis showed that there was a relationship between workload, duration of work, and CVS health problems (p = 0.025 and p = 0.002). Meanwhile, there was no relationship between age, gender, frequency of eye rest, duration of short rest, and CVS health problems (p = 1.000; p = 0.595; p = 0.270; p = 0.750). There is a relationship between workload during work from home and the duration of working at a computer with CVS.

Keywords: Workload; Work From Home; Computer Vision Syndrome

INTRODUCTION

Almost all countries in the world have been shocked by a new virus that attacks the respiratory tract, known as COVID-19. This virus is still a global concern to this day. WHO defines this virus as a new virus that attacks the respiratory system and can cause diseases such as MERS or SARS (WHO, 2020). The COVID-19 outbreak began in Wuhan, China, in December 2019, then spread to various countries, so that on March 11, 2020, this virus was officially declared a global pandemic by the World Health Organization, or WHO. Based on data from Worldomater, it is recorded that 218 countries in the world have been affected by COVID-19, with a total of 70,941,762 confirmed cases and a total of 1,592,542 deaths in the world (Worldomater, 2020). To date, Covid-19 cases in Indonesia have reached 605,243 positive confirmed cases, 496,886 recovered patients, and 18,511 deaths as of December 2020 (Covid-19 Handling Task Force, 2020a). The highest addition of cases in Indonesia was in Jakarta, with the addition of 1,232 cases and a total number of positive cases of 150,250 cases as of December 11, 2020 (Indonesian Ministry of Health, 2020).

The high number of COVID-19 cases has an impact on various aspects of Indonesia. With this pandemic, the government is required to establish new policies to break the COVID-19 chain, one of which is the Work From Home (WFH) policy (Tuwu, 2020). WFH is a new term used during this pandemic to mean that workers are encouraged to work from home or do it online. The WFH policy was determined based on the SE Minister of PANRB Number 19 of 2020 concerning adjustments to the ASN work system in an effort to prevent the spread of COVID-19 within government agencies (Menpan RB, 2020c). Based on the latest regulations from the Minister of Administrative and Bureaucratic Reform Number 67 of 2020, it is stated that offices in red or high-risk zones must implement 25% WFO and 75% WFH (Menpan RB, 2020).

Based on research (Fajar, 2020) during the COVID-19 pandemic workload The amount that must be completed in one day is doubled. In line with research (Jaiswal, 2020), which shows that the majority of respondents said there was an increase in working hours during WFH, namely more than 40 hours a week (Mungkasa, 2020), according to Pujiati and Affandi (2018), workload is a collection of tasks given to employees and must be completed within a certain time period. Workload is influenced by internal and external factors (Daeli, 2016) and can be analyzed based on three aspects, namely time norms, work volume, and effective working hours (Ministry of Home Affairs, 2008).

The increasing workload has an impact on workers' health, one of which can be seen from the results of a survey conducted (Susilowati, 2020), which shows that the highest complaint during WFH is neck pain with a percentage of 86.4%. Apart from that, various eye health problems occur in employees due to working in front of a computer screen for long periods of time, such as dry eyes, headaches, and red eyes (CNN, 2020), which are symptoms of Computer Vision Syndrome (CVS). The Ministry of Health of the Republic of Indonesia defines CVS as a collection of symptoms in the eyes and neck that occur due to the use of excessive computers. Clinical manifestations of CVS include asthenopia (eye strain, tired eyes, and sore eyes), symptoms on the ocular surface (dry eyes, watery eyes, eye irritation, and contact lens problems), visual symptoms (blurred vision, double vision, and changes in focus), and extraocular symptoms (pain in the neck, shoulders, and back) (Blehm et al., 2005).

Government employees who work under government agencies have working hours of approximately 7.5 hours per day, or it could be said to be 37 hours and 30 minutes in five working days. Based on the problems and data described above, researchers want to conduct research on the impact of workload during WFH on computer vision syndrome. This research aims to determine the relationship between workload during WFH and Computer Vision Syndrome while working at the computer and workload and its relationship with CVS.

Method

This research uses descriptive analytical methods with a cross-sectional design. The population in this study was all government employees who implemented WFH. The research sample was determined using sample size determination by S.K. Lawanga and S.Lameshow and obtained a sample size of 126, with a 20% drop out of 157 samples. The sample used was 148 samples, meaning it was still within the minimum number of samples. The sampling technique was purposive sampling. The research was conducted in November 2020 at the office of the Directorate General of Regional Development, Ministry of Home Affairs.

Results and Discussion

Table 1 Frequency Distribution of Respondents Characteristics

Variable	Category	Frequency	Presentage
Age			
	< 42 Yo	74	50.0
	≥ 42 Yo	74	50.0
Gender			
	Man	76	51.4
	Woman	72	48.6
Duration working with computer			
	≥ 4 hours	122	82.4
	< 4 hours	26	17.6
Frequent of time to Rest Eyes			
	≥ 2 hours after using computer	74	50.0
	< 2 hours after using computer	74	50.0
Duration of resting eyes			
	< 10 minute	37	53.1

Workload @ day	≥ 10 minute	111	46.9
	High	40	62.5
	Low	24	37.5
Computer Vision Syndrome			
	CVS (+)	107	72.3
	CVS(-)	41	27.7

Table 2. Frequency Distribution of Respondents Based on CVS Complaints/symtoms

CVS COMPLAINT/SYMTOMS	HAVE		DON'T HAVE	
	N	%	N	%
EYES STRAIN	99	66.9	49	33.1
STRICT EYES	98	66.2	50	33.8
DRY EYES	65	43.9	83	56.1
IRITATED EYES	44	29.7	104	70.3
BLURRED VISION	63	42.6	85	57.4
HEADACHE	58	39.2	90	60.8
HURTS EYES	41	27.7	107	72.3
WATERY EYES	61	41.2	87	58.8
DOUBLE VISION	36	24.3	112	75.7
DIFFICULT TO FOCUSING VISION	54	36.5	94	63.5
NECK PAIN	89	60.1	59	39.9
SHOULDER PAIN	85	57.4	63	42.6
BACK PAIN	79	53.4	69	46.6

The results of the univariate analysis (Table 1) showed that the majority of respondents were male, worked more than 4 hours, took short breaks of more than 10 minutes, had a high workload, and experienced CVS. Meanwhile, age and frequency of time to rest the eyes were balanced between ≥ 42 years and < 42 years and ≥ 2 hours and < 2 hours of computer use. The results of this research are in line with research (Dessie et al., 2018), which shows that the majority of respondents are male with a percentage of 55.5%. The results of this research are also similar to those of Perin et al. (2017), who found that someone works more in front of a computer or laptop for between 4 and 8 hours per day, with a percentage of 47.8%, and are in line with previous research, which said CVS (+) was higher with a percentage of 56%. However, the results of this study are different from previous research, which showed that ages < 45 years were more common, with a percentage of 74% (Bilal et al., 2020). There are more people who take a short break for more than 2 hours of computer use than those who use the computer for less than 2 hours, with a percentage of 44.6% and 34.9%, respectively (Hidayati and Woferst, 2017). Table 2 shows that the majority of respondents complained of tired eyes, with the highest percentage being 66.9% and eye strain being 66.2%. The results of this study are in line with research (Nursyifa and Santoso, 2016), which states that the most common complaint is tired eyes, with a percentage of 77.6%.

Table 3 Relationship between Workload, Age, Gender, Duration of Work, Frequency of Resting Eyes, and Duration of Rest with Computer Vision Syndrome

Variables		Chi-Square			
		CVS (+)	CVS (-)	P-Value	OR (95%CI)
Workload	High	68	17	0,025	2,462 (1,180-5,136)
	Low				
Age	< 42 Yo	53	21	1,000	0,935

	≥ 42 Yo	54	20		(0,455-1,921)
Sex	Man	53	23	0,595	0,768 (0,372-1,584)
	Woman	54	18		
Duration working with computer	≥ 4 hours	95	27	0,002	4,105 (1,700-9,912)
	< 4 hours	12	14		
Frequent of time to Rest Eyes	≥ 2 hours after using computer	57	17	0,270	1,609 (0,777-3,334)
	< 2 hours after using computer	50	24		
Duration of resting eyes	< 10 minute	28	9	0,750	1,260 (0,535-2,966)
	≥ 10 minute	79	32		

The results of bivariate analysis (Table 3) showed that there was a significant relationship between workload and duration of working in front of a computer with CVS, with P = 0.025 and P = 0.002. Meanwhile, the variables age, gender, frequency of resting the eyes, and duration of short breaks did not have a significant relationship with CVS. The research results show that there is a significant relationship between workload during WFH and CVS, with a p value of 0.025. The OR value for workload is 2.462, meaning that employees who have a high workload have a 2.462 times higher risk of experiencing CVS than those who have a low workload. One of the ways in which employee workload can be seen is from the aspect of work volume, where if they work more than 8 hours a day, the workload is said to have increased. The results of previous research (Bahqir and Grandee, 2020) showed a similar thing: after the lockdown or working-home was implemented, working time increased to 9 hours a day. Workload during WFH has a significant relationship with CVS. This can happen because when the workload during WFH increases, employees are required to continue looking at the computers or laptop screens continuously throughout the day. Activities such as meetings, webinars, and so on are carried out online using computers or laptops. The increasing use of gadgets affects a person's accommodation, convergence, and refraction (Munsamy and Chetty, 2020). According to Hidayati and Woferst (2017), when someone looks at a computer or laptop screen, the eyes will try to focus their vision on the screen, meaning in this case the accommodation ability of the lens and the convergence of the eyeball are very needed. If left continuously, it can cause eye strain and fatigue. Research conducted (Susilowati, 2020) states that health complaints arise during implementing WFH, with the highest percentage of complaints being neck pain at 86.4%. This is in accordance with research results, which show neck pain as the third highest complaint with a percentage of 60.1%. Another similar study by Munsamy and Chetty (2020) states that during the pandemic, computer users also often complained of pain in the neck, shoulders, and back.

The results of this study show that there is no relationship between gender and CVS. In accordance with research (Perin et al., 2017) which states there is no relationship between gender and CVS. Research (Subaie, Dossari and Bougmiza, 2017) also says the same thing, namely that there is no relationship between gender and CVS with a p value = 0.859. Different from previous research, Muchtar et al's research stated that there was a relationship between gender and CVS with p value = 0.000. According to theory, physiologically, as women age, the tear film layer thins more easily than men, thus easily causing dry eyes (Muchtar and Sahara, 2016). Although the results of this study do not show a relationship between gender and CVS, the results of the analysis show that women who experience CVS have a higher percentage than men who experience CVS, namely with percentages of 75% and 69.7%. This means that the results of this study are in accordance with the theory above which says that women are more at risk of experiencing CVS.

The results of this study show that there is a relationship between the duration of working in front of a computer and CVS (p value = 0.002). In line with research (Bilal et al., 2020), which suggests that someone who continuously works in front of a computer for ≥ 4 hours is more likely to suffer from CVS than those who work < 4 hours in front of a computer with a p value < 0.0001, Fradisha in her research also explained that CVS is mostly suffered by someone who works in front of a computer or laptop for ≥ 4 hours with a p value = 0.000, meaning that there is a significant relationship between the duration of working in front of a computer or laptop and CVS (Fradisha, 2017). Other research that suggests the same thing, namely research (Dessie et al., 2018), states that someone who works in front of a computer > 4.6 hours has a 2.29 times higher risk of experiencing CVS than someone who works in front of a computer < 4.6 o'clock. So, it can be concluded that the results of this study are in accordance with previous research, where, after data analysis, an OR of 4.105 was obtained. This means that employees who work ≥ 4 hours have a 4,105 higher risk of experiencing CVS. Apart from complaints of tired eyes, eye strain, and neck pain, other complaints with

a fairly high percentage in this study were shoulder pain with a percentage of 57.4% and back pain with a percentage of 53.4%. This is relevant to what Fradisha stated: working in front of a computer or laptop for a long period of time can reduce the eye's accommodation ability, thereby affecting the eye, skin, and musculoskeletal organs, including pain in the shoulders, neck, and back. When someone stares at a computer or laptop screen for a long period of time, it causes the eye muscles to try to focus on one point continuously, resulting in decreased blinking frequency (Fradisha, 2017). Hidayati, in her research, said that a person's normal blinking frequency is 10–12 times per minute. However, when someone stares at a computer screen continuously, the blinking frequency will decrease to around 6–8 times per minute (Hidayati and Woferst, 2017). If this is allowed to continue continuously, it will speed up the process of tear evaporation. This is what causes the eyes to become dry (Sari et al., 2018).

The results of this study show that employees who rested their eyes briefly after ≥ 2 hours of computer or laptop use experienced more CVS than after < 2 hours of computer use, with a p value of 0.270, meaning there is no relationship between the frequency of resting their eyes and CVS. This research is in line with research results (Asnel and Kurniawan, 2020), which show that the majority of respondents rest their eyes for 15 minutes in 2 hours of work with a p value of 0.345. This means that there is no relationship between eye rest and CVS. According to Hidayati and Woferst (2017), one way to avoid CVS is to take the time to rest your eyes while working on a computer or laptop. In line with Tribley et al. (2011), taking a short break of at least 1 hour after using a computer or laptop is highly recommended to prevent eye strain and fatigue. Although the results of this study do not show a relationship between the frequency of resting their eyes and CVS, they show that someone who takes the time to rest their eyes for ≥ 2 hours using a computer is more likely to experience CVS. Asnel explained that when someone works in front of a computer for a long period of time without taking breaks for the eyes, it can cause eye fatigue. This can happen because, over time, the lens will lose its elasticity due to focusing on the computer screen for too long at a close distance (Asnel and Kurniawan, 2020). screen for too long at a close distance (Asnel and Kurniawan, 2020).

The results of this study show that there is no relationship between the duration of short breaks and CVS, with a p value of 0.750. In line with research results (Michael, 2020), which show there is no relationship between the duration of short breaks and CVS with a p value of 0.221, However, research (Michael, 2020) shows that taking regular breaks has a significant relationship with the occurrence of CVS, with a p value of 0.049. In contrast to previous research, research (Pratiwi, Safitri and Junaid, 2020) shows that there is a relationship between length of rest and CVS with p value = 0.004. This means that someone who takes a break of <10 minutes has a higher chance of experiencing CVS than someone who rests ≥ 10 minutes. The results of this study showed that employees who rested their eyes for ≥ 10 minutes experienced more CVS. This can happen due to other factors such as poor room lighting, poor body posture when working at the computer, or perhaps employees don't really understand how to take good breaks between work. So even though you have taken a short break of ≥ 10 minutes, you still experience CVS.

Acknowledgements

Based on the results of this research, it can be concluded that the majority of respondents were male, worked more than 4 hours, took short breaks of more than 10 minutes, had a high workload, and experienced CVS. Meanwhile, for age and frequency of time to rest their eyes, the number of respondents was balanced between ≥ 42 years and < 42 years and ≥ 2 hours and < 2 hours of computer use. Workload during WFH has a significant relationship with the occurrence of CVS (p value = 0.025); apart from that, the duration of working in front of the computer also has a significant relationship with the occurrence of CVS (p value = 0.002). Meanwhile, the variables age, gender, frequency of resting the eyes, and duration of short breaks did not have a significant relationship with CVS. When working, workers are advised to apply the 20-20-20 rule, namely, after every 20 minutes of work, they are advised to rest their eyes by looking at an object 20 feet away or the equivalent of 6 meters and doing this for approximately 20 seconds.

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