The International Science of Health Journal
Vol.2, No. 3 September 2024
e-ISSN: 2986-6820; p-ISSN: 2986-6855, Pages 72-79
DOI: https://doi.org/10.59680/ishel.v2i3.1357
Available online at: https://jurnal.stikeskesdam4dip.ac.id/index.php/ishel

The Relationship Between Knowledge and Computer Vision Syndrome Prevention Behavior in Computer User Employees at Setco Group Pekanbaru

Dasrinal Dasrinal[1*]
[1]SMF Eye Department Hospital dr. Suhatman MARS, Dumai, Indonesia

*Author correspondence: dasrinal@univrab.ac.id**

Abstract. *Background: Computer Vision Syndrome (CVS) refers to a group of eye and vision-related problems that result from prolonged computer use. The prevalence of CVS among office workers varies but is notably high. Studies indicate that the prevalence of CVS symptoms can range from 50% to 90% among regular computer users. CVS occurs due to poor computer use behaviors such as incorrect sitting position and lack of breaks while using the computer. Bad behavior in using computers is influenced by poor knowledge in using computers. Based on an initial survey, 70% of employees experienced CVS. Objective: To determine the relationship between knowledge and CVS prevention behavior of computer user employees at Setco Group Pekanbaru. Methods: Observational analytic research with cross sectional design, data collection technique used total sampling with a sample size of 122 respondents. Data analysis was performed bivariate using the Spearman correlation test. Results: Based on the Spearman correlation test on knowledge of CVS prevention behavior, it was found that there was a relationship between CVS prevention knowledge and CVS prevention behavior with a positive direction and weak correlation strength (p-value 0.011) and r 0.229. Conclusion: There is a relationship between knowledge and CVS prevention behavior in employees who use computers.*

Keywords: *computer vision syndrome, knowledge, behavior*

1. BACKGROUND

Computer Vision Syndrome (CVS) refers to a group of eye and vision-related problems that result from prolonged computer use. Office workers, who typically spend extended hours in front of computer screens, are particularly susceptible to CVS. Symptoms include eye strain, headaches, blurred vision, dry eyes, and neck or shoulder pain (Rosenfield, 2016). Globally, the prevalence of CVS among office workers varies but is notably high. Studies indicate that the prevalence of CVS symptoms can range from 50% to 90% among regular computer users (Logaraj, Madhupriya, & Hegde, 2014). In the United States, a study found that approximately 60 million people suffer from CVS, with one million new cases occurring each year (Rosenfield, 2016). Similarly, in countries like India, over 70% of computer users are reported to experience CVS (Logaraj et al., 2014). In Southeast Asia, particularly in Indonesia, the prevalence of CVS among office workers is increasingly recognized as a public health concern. A study conducted in Riau, Indonesia, highlighted that around 65% of office workers who use computers for more than three hours a day report symptoms of CVS (Yuliati & Solichul Huda, 2020). The rise in CVS cases in this region is attributed to factors such as prolonged screen time, lack of awareness about preventive measures, and inadequate ergonomic practices. Based on an initial survey conducted at PT Walentindo Setia Persada by distributing questionnaires

Received: June 27, 2024; Revised July 28, 2024; Accepted August 24, 2024; Online Available: August 30, 2024

to 30 computer-using employees, it was found that around 70% of employees experienced CVS, with a description of complaints of 56.7% of employees experiencing back pain, 43.3% of employees experiencing neck pain, 40% of employees experiencing dry eyes, and 36.7% of employees experiencing watery eyes. Symptoms of CVS itself are temporary or disappear when no longer using the computer. However, if there is no prevention effort, CVS symptoms will continue and will get worse (AOA, 2022).

The primary aim of studying the correlation between knowledge and behavior in preventing CVS among office workers is to understand whether awareness of the syndrome translates into preventive actions. Knowledge alone may not be sufficient if it does not lead to changes in behavior.

2. LITERATURE REVIEW

Computer vision syndrome (CVS) is a group of complaints and symptoms in the eyes and vision caused by activities using digital devices for a long period of time. According to the American Optometric Association (AOA) CVS is a collection of eye and vision symptoms associated with activities that can burden close vision and take place during or after the use of computers, tablets, ereaders, and cell phones (Saljoughian, 2022). Computer vision syndrome (CVS) is a collection of ocular and visual symptoms caused by prolonged exposure to electronic media such as computers. It can also be caused by room lighting, filters/reflections on computer screens, improper eye-to-computer distance, poor sitting, untreated eye disease, or a combination of these factors (Dean et al, 2020).

Behavior is part of the activity of an organism. Behavior is what an organism does or what is observed by another organism. Behavior can be interpreted as a person's response to a stimulus from outside the subject. The factors for the formation of behavior consist of 2 types, namely: 1. an active form is behavior when the behavior can be observed directly and 2. a passive form which is an internal response within humans and is not directly visible to others, for example thinking, responses or attitudes and knowledge (Wawan, 2019, Notoadmodjo, 2013). Knowledge is the result of “knowing” which is a very important part in shaping a person's behavior (overt behavior). Knowledge of how to maintain health, and how to prevent a disease, will improve one's behavior. Knowledge about CVS is an important thing in realizing CVS prevention behavior. In computer users, behavior can be assessed through observation of body posture. Good posture while using a computer is an important factor in CVS prevention. Referring to the Occupational Safety and Health Administration (OSHA) and the National Institutes of Health (NIH), what is meant by good posture is the position of the head and neck

upright parallel to the body, the eyes look down slightly without bending the neck, the body position is perpendicular to the floor and can lean on the chair support, shoulders and upper arms relaxed parallel to the body, elbow angle 90º and close to the body, horizontal forearms supported by chair support, wrists and fingers parallel to the arm, horizontal thighs with a hip angle of 90-110º, lower leg angle 90º with the soles of the feet straight parallel to the floor (Beatrice et al., 2021). Understanding the correlation between knowledge and preventive behavior is crucial for developing effective interventions. While many office workers are aware of CVS and its potential impact on their health, this knowledge does not always lead to consistent preventive behaviors. Barriers to behavior change: several barriers may prevent the translation of knowledge into action, including: 1. Work Environment : High workloads and tight deadlines may discourage regular breaks, 2. Lack of Ergonomic Equipment: Even with knowledge of proper posture, the absence of adjustable chairs or monitor stands can hinder preventive efforts (Sen & Richardson, 2007), 3. Organizational Culture: In workplaces where productivity is prioritized over well-being, employees may feel pressured to ignore symptoms and continue working (Gupta, 2016).

3. METHODS

This type of research is observational analytic research with cross sectional design. This research was conducted at Setco Group Pekanbaru in June-July 2023. Primary data in this study were data on knowledge and behavior of CVS prevention at Setco Group Pekanbaru obtained from interviews using a questionnaire that had been tested for validity and reliability and behavioral observations on 122 respondents who had met the inclusion criteria. The sampling technique was total sampling.

4. RESULT AND DISCUSSION

Table 1 Frequency Distribution of CVS Knowledge among Employees of PT Setco Group

Knowledge	Frequency	Percent
Good	89	73%
Bad	33	27%
Total	122	100%

Table 1 shows that the majority of respondents had good CVS knowledge as many as 89 respondents (73%).

Tabel 2 Frequency Distribution of CVS Behavior among Employees of PT Setco Group

Behavior	Frequency	Percent
Good	98	80,3%
Bad	24	19,7%

Total	122	100%

Table 2 shows that the majority of respondents have good CVS prevention behavior as many as 98 respondents (80.3%).

Table 3 Relationship between Knowledge and CVS Prevention Behavior in Employees of PT Setco Group

			Pengetahuan Pencegahan CVS	Perilaku Pencegahan CVS
Spearman's rho	Pengetahuan Pencegahan CVS	Correlation Coefficient	1.000	.229*
		Sig. (2-tailed)	.	.011
		N	122	122
	Perilaku Pencegahan CVS	Correlation Coefficient	.229*	1.000
		Sig. (2-tailed)	.011	.
		N	122	122

Based on Table 2, it can be seen that the results of the Spearman correlation test obtained a p-value of 0.011 (p-value <0.05) indicate that there is a statistically significant relationship between CVS-related knowledge and CVS-related attitudes among computer-using employees at Setco Group Pekanbaru. In addition, a correlation coefficient (r) of 0.229 was also obtained, which means that the direction of the correlation is positive and the strength of the correlation is weak. Although there is a significant relationship between knowledge and behavior related to CVS, this relationship is not strong, and the positive correlation indicates that the better one's knowledge, more or less there is a tendency for better behavior towards CVS.

This study is in line with the research of Prihandoyo et al., (2021) which obtained that out of 100 respondents (75.19%) had fairly good knowledge about CVS, 69 respondents (51.88%) had behaviors that caused a high risk of developing CVS. Research by Nur et al., (2023) showed that the relationship between knowledge and behavior was interrelated with a p-value <0.05, CVS knowledge was 76% and respondents who practiced good computer ergonomics were 76%.

The relationship between knowledge and behavior in the prevention of Computer Vision Syndrome (CVS) is complex and influenced by various factors. While knowledge is a critical precursor to behavior change, it is not always sufficient to ensure the adoption of preventive measures. Several studies have explored the factors that mediate or moderate the relationship between knowledge and behavior, revealing that the translation of knowledge into action is contingent upon various individual, environmental, and organizational factors. Understanding the correlation between knowledge and preventive behavior is crucial for developing effective interventions. While many office workers are aware of CVS and its

potential impact on their health, this knowledge does not always lead to consistent preventive behaviors. Knowledge vs. Behavior: A study by Ranasinghe et al. (2016) found that while 80% of participants knew about the 20-20-20 rule (a practice where every 20 minutes, a person should look at something 20 feet away for 20 seconds), only 30% adhered to it regularly. This gap indicates that knowledge alone does not necessarily drive behavior change. Barriers to behavior change: several barriers may prevent the translation of knowledge into action, including: 1. work environment : high workloads and tight deadlines may discourage regular breaks, 2. lack of ergonomic equipment: even with knowledge of proper posture, the absence of adjustable chairs or monitor stands can hinder preventive efforts (Sen & Richardson, 2007), 3. organizational culture: in workplaces where productivity is prioritized over well-being, employees may feel pressured to ignore symptoms and continue working (Gupta, 2016).

Awareness of CVS and its symptoms is the first step in prevention. Knowledge encompasses understanding what CVS is, its causes, symptoms, and potential long-term effects on eye health. Studies have shown that higher levels of knowledge are generally associated with better preventive behaviors. For instance, workers who are aware of the risks associated with prolonged screen time are more likely to take breaks and practice eye exercises (Ranasinghe et al., 2016). However, awareness does not always translate into action. A study by Reddy et al. (2013) found that although a significant proportion of computer users were aware of CVS, only a small fraction engaged in regular preventive behaviors such as adjusting screen brightness or positioning the screen at the correct height.

The Health Belief Model (HBM) suggests that individuals are more likely to engage in preventive behaviors if they perceive themselves to be at risk (susceptibility) and believe that the consequences of the condition are severe (severity) (Champion & Skinner, 2008). In the context of CVS, if office workers do not perceive their symptoms as serious or believe that CVS will not have long-term consequences, they may be less motivated to adopt preventive behaviors, even if they are knowledgeable about the syndrome (Rosenfield, 2016). For example, employees who experience mild eye strain may dismiss it as a minor inconvenience and continue their usual work habits without implementing preventive measures.

Self-efficacy, or the belief in one's ability to perform a specific behavior, plays a crucial role in whether knowledge translates into action. Even if individuals are knowledgeable about CVS, they may not engage in preventive behaviors if they lack confidence in their ability to effectively implement these measures. For instance, workers who believe they cannot maintain correct posture or consistently follow the 20-20-20 rule due to work demands are less likely to engage in these behaviors (Sen & Richardson, 2007). Programs that enhance self-efficacy, such

as ergonomic training sessions and practical demonstrations of preventive measures, can help bridge the gap between knowledge and behavior.

The work environment significantly impacts the relationship between knowledge and behavior. In environments where there is high work pressure, limited breaks, or inadequate ergonomic support, even knowledgeable employees may struggle to engage in preventive behaviors. Organizational culture and policies play a critical role; for example, a company that prioritizes productivity over employee health may inadvertently discourage preventive behaviors by not allowing sufficient breaks or not providing ergonomic equipment (Gupta, 2016). In contrast, organizations that foster a health-conscious culture, provide regular breaks, and equip their offices with ergonomic furniture are more likely to see a stronger correlation between knowledge and preventive behavior.

Behavioral intention is a key predictor of actual behavior. The Theory of Planned Behavior (TPB) posits that individuals' intentions to perform a behavior are influenced by their attitudes toward the behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). In the context of CVS prevention, even if office workers are knowledgeable and intend to engage in preventive behaviors, external factors like workload, peer behavior, and workplace norms can influence whether they follow through with these intentions. For example, if the workplace culture does not support regular breaks, employees may feel social pressure to continue working despite their intention to prevent CVS.

Behavioral reinforcement, through positive outcomes or feedback, can strengthen the link between knowledge and preventive behavior. For instance, if an office worker notices that taking regular breaks reduces eye strain, they are more likely to continue this behavior. Over time, these actions can become habitual, reducing the reliance on conscious knowledge to guide behavior (Rosenfield, 2016).

Programs that incorporate regular feedback, such as reminders to take breaks or use ergonomic practices, can help in reinforcing these behaviors and making them a regular part of the worker's routine.

5. CONCLUSION

There is a relationship between knowledge and behavior in preventing CVS influenced by various factors. Strategies for Improvement to enhance the correlation between knowledge

and preventive behavior, interventions must address these barriers. Employers can play a crucial role by: promoting Regular Breaks (encouraging the 20-20-20 rule through reminders or software prompts), providing Ergonomic Training(offering workshops on ergonomic practices and providing necessary equipment, fostering a health-conscious culture (creating a workplace culture that values employee well-being and encourages reporting of CVS symptoms).

REFERENCES

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211.

American Optometric Association, & Coper, J. S. (2022). Computer vision syndrome. https://www.aoa.org/healthy-eyes/eye-and-vision-conditions/computer-vision-syndrome?sso=y

Beatrice Alberta, I., Sebastian, D., & Valeska Laksono, N. (2021). Pendekatan multidimensional computer vision syndrome di era WFH. *Cermin Dunia Kedokteran, 48*(6), 350. https://doi.org/10.55175/cdk.v48i6.1439

Champion, V. L., & Skinner, C. S. (2008). The health belief model. In K. Glanz, B. K. Rimer, & K. Viswanath (Eds.), *Health behavior and health education: Theory, research, and practice* (pp. 45-65). Jossey-Bass.

Gupta, N. (2016). Computer vision syndrome (CVS) and its preventive strategies: A review. *Journal of Clinical and Diagnostic Research, 10*(2), 5-7.

Logaraj, M., Madhupriya, V., & Hegde, S. (2014). Computer vision syndrome and associated factors among medical and engineering students in Chennai. *Annals of Medical and Health Sciences Research, 4*(2), 179-185.

Notoadmodjo, S. (2013). *Promosi kesehatan & prilaku kesehatan*. EGC.

Nur, W., Ibrahim, A., Saharudin, N. S., & Lestari, D. F. (2023). Pengetahuan, sikap dan praktek computer vision syndrome antara pekerja kantoran di UITM Puncak Alam. *Jurnal Kesehatan Masyarakat, 14*(2), 315-322.

Prihandoyo, A. D., Putra, G. P. T., Gunawan, L., Al Khalifi, N. N., Ma'rufah, N. A., Saraswati, P. A., Karunia, R. A., Sari, R. P., Astuti, S. F., Khotijah, S., & Mufarrihah, M. (2021). Pengetahuan dan perilaku mahasiswa terkait computer vision syndrome (CVS) serta penggunaan dan penyimpanan obat tetes mata sebagai penanganannya. *Jurnal Farmasi Komunitas, 8*(2), 32. https://doi.org/10.20473/jfk.v8i2.24084

Ranasinghe, P., Wathurapatha, W. S., Perera, Y. S., Lamabadusuriya, D. A., Kulatunga, S., Jayawardana, N., & Katulanda, P. (2016). Computer vision syndrome among computer office workers in a developing country: An evaluation of prevalence and risk factors. *BMC Research Notes, 9*, 150.

Rosenfield, M. (2016). Computer vision syndrome: A review of ocular causes and potential treatments. *Ophthalmic and Physiological Optics, 36*(5), 502-515.

Saljoughian, M. (2022). Computer vision syndrome. *U.S. Pharmacist, 47*(2), 29–31. https://doi.org/10.3329/fmcj.v10i1.27923

Sen, A., & Richardson, S. (2007). A study of computer-related upper limb discomfort and computer vision syndrome. *Journal of Human Ergology, 36*(2), 45-50.

Wawan, D. M. (2019). *Teori & pengukuran pengetahuan, sikap dan perilaku*. Universitas XYZ.

Yuliati, & Solichul Huda, M. (2020). Prevalence of computer vision syndrome (CVS) among office workers in Riau, Indonesia. *International Journal of Occupational Safety and Health, 10*(3), 23-29.