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THE EFFECTIVENESS OF THE 20-20-20 RULE IN MANAGING COMPUTER VISION SYNDROME AMONG WORKERS: A SYSTEMATIC REVIEW

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ABSTRACT
Computer Vision Syndrome (CVS) is a condition that often occurs in individuals who spend long periods of time in front of a computer screen or other digital devices. Common symptoms include eye strain, visual fatigue, blurred vision, and headaches. The increasing use of digital devices among workers can cause computer vision syndrome (CVS) and lead to decreased work productivity. The 20-20-20 Rule is a non-pharmacological intervention that is believed to be effective in treating computer vision syndrome (CVS). This study examines research findings on the effectiveness of the 20-20-20 Rule in treating computer vision syndrome (CVS) among workers. This study used a Systematic Review method. The articles used were sourced from PubMed, ProQuest, ScienceDirect, Scopus, Cochrane, published between 2018-2024. The search technique followed the PRISMA method. The search identified five articles that met the inclusion and exclusion criteria. Based on these findings, Rule 20-20-20 is effective in overcoming computer vision syndrome (CVS) in workers. Rule 20-20-20 can be used as a nursing intervention to overcome computer vision syndrome (CVS) in workers.

Keywords: computer vision syndrome; digital eye strain; nursing interventions; rule 20-20-20; workers

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INTRODUCTION

In today's digital era, the use of electronic devices such as computers, tablets, and *smartphones* is increasing. Although it provides many conveniences, the use of these devices also has negative impacts, one of which is *Computer Vision Syndrome* (CVS) or *digital eye strain* (Chu, et al (2023). *Computer Vision Syndrome* (CVS) describes a group of problems related to the eyes and vision due to long-term computer use. CVS affects around 75% to 90% of computer users. Globally, its prevalence is estimated to reach 60 million cases, with one million new cases each year (Singh, et al., 2022).

Common symptoms include eye strain, blurred vision, dry eyes, red eyes, headaches, and nonocular symptoms such as neck and shoulder pain. Although these symptoms are usually transient, they can persist beyond the end of the workday, or even recur or progress with chronic computer use (Chu, et al., 2023). In clinical practice, CVS is typically diagnosed through a patient symptom survey. Segui et al. (2015) developed a standardized questionnaire that evaluates the frequency and intensity of 16 symptoms of computer eye strain. A score of six or higher on this questionnaire is considered diagnostic for CVS and has been widely used in clinical studies.

Some risk factors for CVS include computer use for more than four hours per day, screen glare and reflections from ambient lighting, low humidity (<40%), and poor ergonomic

posture. Decreased blink rate, uncorrected refractive errors can also worsen symptoms. Various interventions have been studied to manage CVS. Common clinical recommendations include ergonomic adjustments and the implementation of the 20-20-20 *rule* , which is looking at an object 20 feet away for 20 seconds every 20 minutes. Although CVS has been widely studied, effective interventions are still needed. Therefore, a systematic review is needed to assess the evidence regarding the efficacy and safety of interventions, so that practitioners can provide evidence-based advice to clients. This study aims to evaluate research findings on the effectiveness of the 20-20-20 Rule in managing Computer Vision Syndrome (CVS) among workers. By analyzing existing evidence, the study seeks to determine the rule's impact on reducing eye strain, enhancing visual comfort, and improving overall ocular health in occupational settings where prolonged screen exposure is prevalent.

METHOD

This study used a systematic review method, the search for articles was carried out using the *PubMed, ProQuest, ScienceDirect, Scopus* and *Cochrane* databases. The inclusion criteria set in the literature search were 1) Articles can be accessed in full; 2) Research articles published in the last 5 years (2018-2024); 3) Using English; 4) Using intervention research designs (RCT and Quasi Experiment). The exclusion criteria set were: 1) Articles cannot be accessed as full text, books; 2) Are *literature reviews systemstic review* and *meta-analysis.* The article search stage starts from searching using predetermined keywords, then filtering is carried out based on inclusion and exclusion criteria, until an article is found that is in accordance with the research objectives. The selection of articles follows the PRISMA flowchart for systematic reviews and meta-analyses, which includes the stages of identification, screening, eligibility and inclusion. Feasibility testing is carried out on identified articles using JBI *Critical Appraisal* to assess the eligibility of the article.

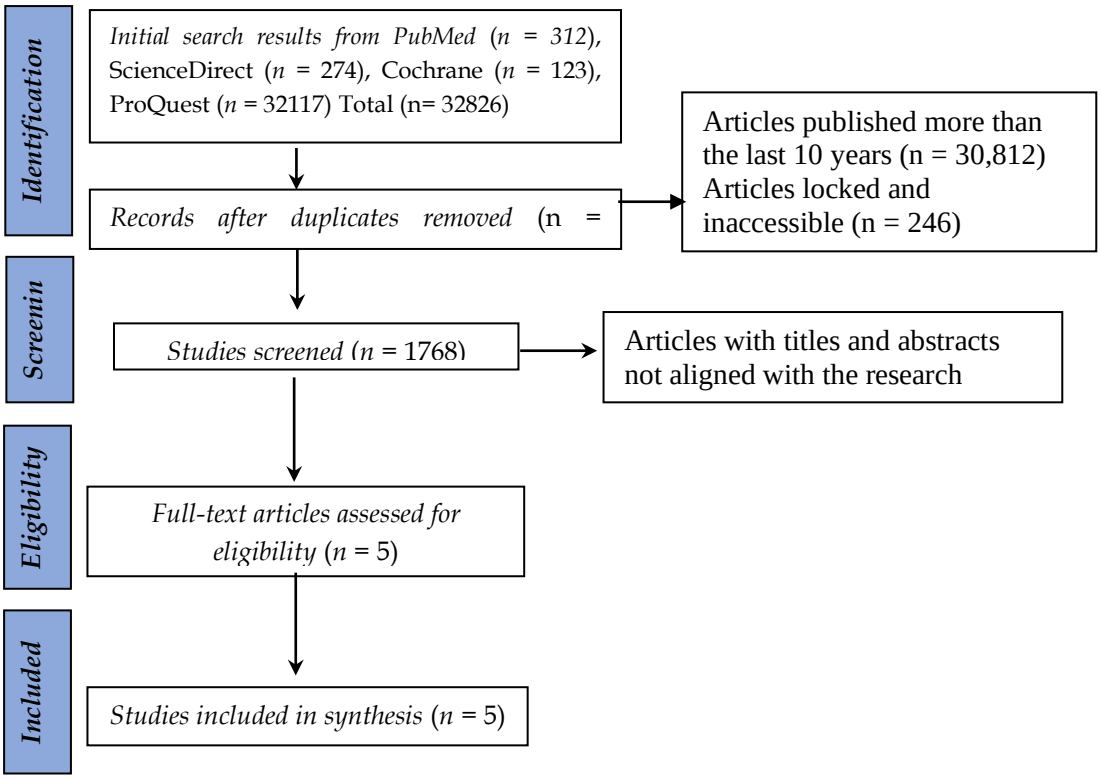

Figure 1. Prisma Flowchart

RESULT

Articles that meet the inclusion criteria will then be subjected to a systematic literature review as shown in the table below:

Table 1.
Description of article analysis results

No	Title, author & year	*Aim*	*Design*	*Results*
1.	Anggrainy et al (2020) *The effect of trick intervention 20-20-20 on computer vision syndrome incidence in computer workers*	Analyzing the effects of the 20-20-20 *rule intervention on computer vision syndrome* in computer workers.	*Quasi Experiment* with *nonequivalent control group design* , consisting of 76 people divided into two intervention groups and a control group, each obtained through *purposive sampling.*	The study showed that implementing the 20-20-20 rule for 5 working days was significantly effective in reducing computer vision syndrome in the intervention group.
2	Alghamdi & Alrasheed (2020) *Impact of an educational intervention using the 20-20-20 rule on Computer Vision Syndrome*	To identify the effects of educational interventions on improving *tear break-up time* and evaluate the effectiveness of the 20-20-20 *rule* in reducing CVS symptoms.	*Quasi experiment* with *experimental intervention study* consists of intervention group and control group with sample of 20 people for each group.	The results showed that *computer vision syndrome* (CVS) symptoms decreased slightly after the implementation of the 20-20-20 *rule* , from 9.00 ± 3.03 to 8.35 ± 1.89. However, this decrease was not statistically significant (p = 0.38).
3	Ismiani, et al (2023) *The effect of 20-20-20 rule educational intervention on computer vision syndrome (CVS)*	Identifying the effects of education and implementation of the 20-20-20 rule using leaflets on *computer vision syndrome* (CVS) in employees at the PT PLN UPT Malang office	*Quasi Experiment* with *one group pretest-posttest design*	The results of the study showed that there was an effect of the 20-20-20 *rule educational intervention using leaflets on computer vision syndrome* (CVS). Before the intervention, all respondents (100%) were categorized as having CVS. After the intervention, there was a significant decrease in CVS complaints among employees.
4	Kumar & Pandey (2024) *Impact of 20-20-20 Rule and Daily Reminders in Relieving Digital Eye Strain*	Assessing the impact of taking appropriate breaks and the role of reminders in improving compliance with the 20-20-20 *rule* when working with digital devices in reducing *digital eye strain.*	*Questionnaire-based prospective study* with two groups, namely Group-I (participants who received daily reminders) and Group-II (participants who did not receive reminders) in implementing the 20-20-20 rule.	The results showed that daily reminders significantly increased adherence to the 20-20-20 *rule* and reduced symptoms of digital eye strain. Participants in Group-I, who received daily reminders, showed higher adherence and decreased symptoms compared to Group-II, who did not receive reminders. Most participants were initially unaware of the 20-20-20 *rule* , but daily reminders helped increase awareness and practice of taking appropriate breaks.

No	Title, author & year	*Aim*	*Design*	*Results*
5	Fathima, et al (2024) *The Role of Specific Eye care Exercise Combined With 20-20-20 Vision Rule in Managing Computer Vision Syndrome among Computer Users*	Identifying the effectiveness of *eye care exercises* combined with the 20-20-20 *rule* in overcoming *computer vision syndrome* (CVS) on digital users	*Quasy experiment* using intervention group and control group. The intervention group was given *eye care exercise* combined with 20-20-20 *rule* . Assessment was conducted before and after intervention using QCVS to measure the results.	The intervention group experienced a significant reduction in *computer vision syndrome* compared to the control group. Statistical analysis showed a significant difference between the intervention group and the control group, with the mean post-test score for the 20-20-20 *rule group* being lower than the control group, indicating that the 20-20-20 *rule group* was more effective in reducing CVS symptoms.

DISCUSSION

This study identified 5 articles reporting the effectiveness of the 20-20-20 *rule on computer vision syndrome* (CVS) and *digital eye strain* . Based on the identification results, it was found that the 20-20-20 *rule* is effective in overcoming the symptoms of *computer vision syndrome* and *digital eye strain. Computer Vision Syndrome* (CVS) is becoming an increasingly common health problem in the digital age due to prolonged use of electronic devices. CVS symptoms such as dry eyes, blurred vision, and headaches can reduce productivity and quality of life. One solution that has been widely highlighted is the implementation of the 20-20-20 *rule* , which requires users to look away at an object 20 feet away for 20 seconds for every 20 minutes of screen use. Although many studies have shown that this rule can help reduce CVS symptoms, its effectiveness still requires further evaluation regarding the duration of intervention, educational methods, and wider population coverage.

Several studies have reported significant benefits from the 20-20-20 *rule* , such as the study by Alghamdi & Alrasheed (2021) which showed a decrease in *dry eye symptoms* and eye redness after education based on the 20-20-20 *rule* . However, the overall reduction in CVS symptoms was still limited, indicating the need for further research with a longer intervention duration to obtain more effective results. The recommended solution to increase the effectiveness of this rule is to use technology such as a reminder application that can help users remember and apply the 20-20-20 rule consistently (Kumar & Pandey, 2023). Kumar & Pandey's research (2023) showed that the reminder application was able to increase compliance and significantly reduce CVS symptoms in the intervention group compared to the control group. This approach shows that technology can be an effective tool in implementing the 20-20-20 *rule intervention* . Innovations that can be explored are the development of *wearable technology* that can monitor eye fatigue in *real-time* and provide warnings to users to take a break. In addition, AI-based technology can provide personal recommendations on rest times and activities based on each individual's work patterns. The combination of the 20-20-20 *rule* with other interventions such as eye exercises or light therapy can also be an innovative solution that increases the effectiveness of the intervention (Min, et all., 2019 ; Pavel et al, 2023).

In addition, simple yet strategic educational approaches, such as leaflets or short training, are also effective. A study by Ismiani et al. (2021) reported that as many as 60% of participants no longer experienced CVS symptoms after brief education using leaflets. However, the short duration of the intervention is a limitation, so a more sustainable education method is needed

to ensure long-term impacts. The 20-20-20 *rule* combined with *eye care exercises* is also effective in overcoming *computer vision syndrome* (Fathima, 2024 ; Sheppard & Wolffsohn, 2018). This study can also expand the scope to more diverse populations, such as children, adolescents, and workers with high screen intensity, to ensure more general results. Evaluation of the economic and social impacts of this rule, such as its effect on work productivity or reduced health costs, is also important to support the development of evidence-based policies.

Institutional support, such as company policies that integrate the 20-20-20 *rule* into occupational health programs, also plays a role in increasing the effectiveness of its implementation. By exploring various approaches, this study can provide a comprehensive preventive solution to address CVS in the digital era. This evidence-based approach not only strengthens the implementation of the 20-20-20 *rule* as a simple but effective step, but also opens up opportunities for technological innovation to improve compliance and effectiveness of interventions. Research that focuses on education, technology, and policy support will contribute significantly to protecting public eye health amidst the ever-growing digital revolution.

The results of this analysis support the use of the 20-20-20 *rule* as a nursing intervention to overcome CVS symptoms in workers. Implementation accompanied by education, reminders, and repeated training can increase the effectiveness of the intervention. With stronger evidence, the 20-20-20 *rule* can be widely applied in the work environment to improve workers' eye health. Although the study results show the effectiveness of the 20-20-20 rule, several limitations such as *quasi-experimental design* and small sample size limit *the evidence* of the results. In addition, the relatively short duration of the intervention is also a challenge in assessing long-term effects. Therefore, further research with RCT design and longer duration is needed to strengthen *evidence-based practice* related to this intervention.

CONCLUSION

Rule has been shown to be beneficial in reducing CVS symptoms, particularly dry eye and digital eye strain , although it does not completely eliminate symptoms. The use of technology such as reminder apps and education involving simple media are important elements to increase the effectiveness of this intervention. Further research with longer duration and wider population coverage is needed to strengthen this recommendation as an approach to preventing occupational diseases in the digital age.

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