

## THE RELATIONSHIP BETWEEN SLEEP QUALITY AND COMPUTER VISION SYNDROME IN ADOLESCENT DURING COVID-19 PANDEMIC

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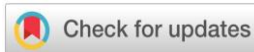
### ABSTRAK

#### Abstract:

Computer Vision Syndrome (CVS) is a group of eye and vision problems caused by long-term use of visual electronics. Since the COVID-19 pandemic, the use of digital devices has increased, resulting in increased ease of exposure to CVS which is feared to disrupt sleep quality. This study aimed to determine the relationship between sleep quality and CVS among adolescents during the COVID-19 pandemic. This research is an observational analytic study with a cross-sectional design using primary data. Data were taken through a questionnaire with a sample of 96 adolescents who met the inclusion and exclusion criteria. Data analysis was carried out with the Chi-Square test. In this study, the results showed that the quality of sleep in adolescents had a prevalence of 59,4% as well as the prevalence of adolescents diagnosed with CVS by 56,3%. There is a statistically significant relationship between sleep quality and CVS with a p-value of 0,001. There is a high prevalence of poor sleep quality and CVS among adolescents. CVS is significantly related to sleep quality. The implication of this result is that can impact academic performance and exacerbate the symptoms of CVS, such as eye strain, blurred vision and headaches.

#### Abstrak:

Computer Vision Syndrome (CVS) merupakan sekelompok masalah mata dan penglihatan yang disebabkan oleh penggunaan elektronik visual dalam jangka waktu yang panjang. Sejak masa pandemi COVID-19 penggunaan perangkat digital semakin meningkat mengakibatkan semakin mudahnya terkena CVS yang ditakutkan dapat mengganggu kualitas tidur. Tujuan dari penelitian ini adalah untuk mengetahui hubungan antara kualitas tidur dengan CVS pada remaja pada masa pandemi COVID-19. Penelitian ini merupakan analitik obrsevasional dengan desain cross-sectional dengan menggunakan data primer. Data di ambil melalui kuesioner dengan jumlah sampel 96 remaja yang memenuhi kriteria inklusi dan eksklusi. Analisis data dilakukan dengan uji Chi-Square. Pada penelitian ini didapatkan hasil, kualitas tidur pada remaja mempunyai prevalensi sebesar 59,4% begitu juga dengan prevalensi remaja yang terdiagnosis CVS sebesar 56,3%. Terdapat hubungan yang signifikan secara statistik antara kualitas tidur dengan CVS pada remaja dengan nilai p- value 0,001. Terdapat prevalensi yang cukup tinggi terhadap kualitas tidur buruk dan CVS pada remaja. CVS secara signifikan berhubungan dengan kualitas tidur. Implikasi dari hasil penelitian ini berdampak pada performa akademik mahasiswa dan dapat memperburuk gejala CVS seperti kelelahan mata, penglihatan kabur dan sakit kepala.



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## INTRODUCTION

Basic human needs must always be met for the sake of survival. Sleep is one of these basic needs. Sleep is an important physiological process in humans to maintain health and continue biological, psychological, sociological, and cultural functions [1]. Sleep is one of the most complex biological rhythms. Waking rhythms, body temperature, blood pressure, and patterns of hormone secretion are regulated by circadian rhythms. The circadian rhythm is a natural clock in the human body that is strongly influenced by light stimuli. The rules of the circadian rhythm of sleep and wakefulness are regulated by a pacemaker located in the suprachiasmatic nuclei (SCN), which functions as a master clock. The SCN is most active during the day, which is regulated by light entering the retina and by melatonin secretion in the dark [2]. To achieve adequate sleep, there are important factors that must be considered, namely the quality of sleep, which is a condition that a person undergoes to achieve freshness and fitness when he wakes up [1]. Good sleep quality is when there are no signs of sleep deprivation or sleep problems [3]. As many as 53% of medical students reported having poor sleep quality; besides that, another report stated that around 89.1% of medical students had poor sleep quality [4]. It can be concluded that poor sleep quality is a common problem among university students [5].

Sleep deprivation is commonly found in college students, which can cause effects such as distraction from learning and concentration problems [3]. The quality of sleep for college students can be disrupted due to stress from thinking about the future, assignments, and using computers at night [5]. The use of digital devices for a long time also affects the amount and quality of sleep [6]. The use of digital devices such as computers, laptops, smartphones, and tablets in daily work has been increasing, especially among young students. The increase in time spent in front of

computers, laptops, and smartphones, which are classified as visual display terminals (VDT), has also increased rapidly [7]. Increased use of video display terminals (VDT) predisposes to various problems, not only vision problems but also some musculoskeletal problems, known as a group as digital eye strain (DES) or computer vision syndrome (CVS) [8].

According to the American Optometric Association (AOA), Computer Vision Syndrome (CVS), also known as Digital Eye Strain (DES), is a group of eye and vision problems caused by long-term use of computers, tablets, e-readers, and smartphones [9]. As many as 60 million people who work on computers suffer from computer vision syndrome (CVS) [10]. The prevalence of CVS is mostly found in medical students. As many as 67% of students reported suffering from CVS, in line with other studies that reported that 71.6% of students suffered from CVS, and besides that, other reports found that around 95% of students experienced at least one symptom of CVS [11]. According to the American Optometric Association (AOA), the most common symptoms of CVS are blurred vision, eye strain, dizziness, dry eyes, and pain in the neck and shoulder area. 9 Even so, no one can predict the exact cause of this. CVS, because many factors play a role, such as individual, environmental, and computer factors [12].

As a result of the pandemic, many schools and colleges have been closed to stop the spread of the COVID-19 virus. The Indonesian government itself has implemented a distance learning (PJJ) system as a solution [13]. Technology, such as computers or gadgets, is utilized in the distance learning (PJJ) system so that the learning process can continue to run smoothly [14]. In other words, students, including medical students, are forced to continue using their digital devices to attend lectures. It has become a habit for medical students to spend a lot of time (8–12 hours a day) in front of a computer or

cellphone screen without any specific guidelines [8]. The prolonged pandemic has also affected the stress state of people around the world, which has been seen to significantly affect sleep duration. It is said that 20% of people who previously had good sleep quality during the before pandemic period experienced poor sleep quality during the pandemic [15].

In a 2018 study, it was reported that 75.49% of medical students had poor sleep quality and suffered from CVS [16]. Seeing that the use of digital devices is increasingly intense and has become an important role in education during the COVID-19 pandemic, accompanied by a large amount of data showing that medical students have poor sleep quality, researchers are motivated to research the relationship between sleep quality and CVS in adolescents. amidst the COVID-19 pandemic.

## RESEARCH METHOD

This type of research is descriptive-observational with a cross-sectional design. The sample in this study were students of the Sriwijaya University Medical Education Study Program class of 2018–2020 who met the inclusion and exclusion criteria. Sampling was carried out using a purposive sampling method, namely a sample selection method based on the inclusion and exclusion criteria that had been determined by the researcher. The inclusion criteria include respondents who are willing to be involved in research until the end and actively use digital devices in the past month. Meanwhile, exclusion criteria include having a history of eye disease and being diagnosed with sleep disorders by a neurologist. The variables in this study are computer vision syndrome and sleep quality. [17]. This study used the Computer Vision Syndrome Questionnaire (CVS-Q) and the Pittsburgh Sleep Quality Index (PSQI) questionnaires which have been tested for specificity and sensitivity respectively, which exceeded 70% and 85% to take the data collection [18]. The

research was confirm ethical approve with protocol No. 175-2021 by Ethics Committee of the Faculty of Medicine Universitas Sriwijaya.

## RESULTS AND DISCUSSION

This type of research is descriptive-observational with a cross-sectional design. The sample in this study were students of the Sriwijaya University Medical Education Study Program class of 2018–2020 who met the inclusion and exclusion criteria. Sampling was carried out using a purposive sampling method, namely a sample selection method based on the inclusion and exclusion criteria that had been determined by the researcher. The inclusion criteria include respondents who are willing to be involved in research until the end and actively use digital devices in the past month. Meanwhile, exclusion criteria include having a history of eye disease and being diagnosed with sleep disorders by a neurologist. The variables in this study are computer vision syndrome and sleep quality. [17]. This study used the Computer Vision Syndrome Questionnaire (CVS-Q) and the Pittsburgh Sleep Quality Index (PSQI) questionnaires which have been tested for specificity and sensitivity respectively, which exceeded 70% and 85% to take the data collection [18]. The research was confirm ethical approve with protocol No. 175-2021 by Ethics Committee of the Faculty of Medicine Universitas Sriwijaya.

## CONCLUSION

There is a relationship between sleep quality and computer vision syndrome (CVS) in adolescents. The implication from this result is that can impact to academic performance and exacerbate the symptoms of CVS, such as eye strain, blurred vision and headaches. It is hoped that adolescents, especially medical student groups, can manage good sleep patterns and reduce the habit of staring at computer screens for a long time to avoid Computer Vision Syndrome.

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