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EXPOSURE TIME AND MONITOR DISTANCE WITH EYE FATIGUE IN EMPLOYEES OF THE REGIONAL OFFICE OF LABOR BPJS SUMBAGUT MEDAN

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Abstract

Workers who use computers in daily activities often experience eye fatigue. Visual disorders caused by computer use can include various complaints, such as: blurred vision, unclear images, double vision, difficulty distinguishing colors, red eyes, eyes that are often sore, frequently itchy, often feeling tense, eyes that easily become sleepy, reduced accommodation ability, and headache symptoms. This research uses qualitative research as a complex description, by studying words, obtaining detailed reports from respondents' perspectives, and investigating experienced situations. The purpose of this research is to determine the relationship between long exposure and monitor distance with employee eye fatigue at the BPJS Ketenagakerjaan Sumbagut Regional Office. Employees working with an 8-hour system per day for 5 working days rarely apply the 20-20-20 method recommended by the Ministry of Health to prevent eye fatigue.

Keywords: Eye Complaints, Time, Monitor Distance

Introduction

The Manpower Regulation contained in Law of the Republic of Indonesia No. 13/2003 defines occupational safety as a series of preventive measures against occupational accidents that have an impact on bodily injury, physical limitations, death, and damage to property and the surrounding environment. Occupational health is defined as a series of efforts to maintain and improve the physical vitality, mental health, and welfare level of the workforce.

Asthenopia, commonly known as *visual fatigue*, is a condition that occurs when the visual system is overstressed in the process of maintaining visual acuity, especially when the eyes are focused on objects at close range on a sustained basis. Manifestations of this disorder include poor vision, double vision, difficulty in color identification, eye irritation, ocular itching and tension, drowsiness, decreased accommodation capacity, and headache.

A 2014 WHO report indicated that the incidence of asthenopia ranges from 40-90%. A NIOSH investigation revealed a correlation between the duration of extensive computer use and increased worker stress levels. The findings showed that exposure to computer screens exceeding 4 hours per day resulted in approximately 88% of users suffering from Computer Vision Syndrome (CVS). The AOA categorizes this phenomenon as a complex of eye disorders associated with sustained computer use.

In the context of office work with a duration of 8 hours per day, 94.6% of workers reported experiencing eyestrain. The study by Salote A et al. (2020) indicates that this condition has the potential to increase the risk of accidental injury. NIOSH research confirms that workers with high intensity computer use show significantly higher levels of stress.

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BPJS Ketenagakerjaan Kanwil Sumbagut, as an institution that operates in the service sector, became the object of research related to the duration of computer use of its employees. Given the characteristics of work that require intensive interaction with computers, this study aims to analyze the duration of use as well as the optimal viewing distance of the monitor to mitigate the risk of eye fatigue.

Method

This research uses qualitative research as a complex picture, by studying words, getting detailed reports from respondents' perspectives, and investigating situations experienced. The purpose of this research is to reveal facts, phenomena, variables, and circumstances that occur during the research process and present the results. Researchers conducted this research at the BPJS Ketenagakerjaan Regional Office of Sumbagut. The office is located on Jl. Kapten Patimura No.334, Darat, Medan Baru District, Medan City, North Sumatra.

Every employee who uses a computer at the Sumbagut Regional Office of BPJS Ketenagakerjaan is the subject of this research. This study involved 5 informants from the entire population. The author uses purposive sampling technique. This technique is used to select respondents who are considered to have information that is relevant or significant to the research topic based on certain criteria, such as work or work experience to obtain in-depth data from sources that are considered representative for the study. The focus of this study is eye exposure time and monitor distance combined with eye fatigue disorders caused by computer use.

Data Collection Methods

The data used in this study came from observations made directly at the workplace to find out the conditions related to the workplace and the employees under study. To obtain information for research purposes, interviews were conducted directly between the interviewer and the informant or interviewee, with or without the use of interview guidelines, and documentation of interviews conducted through telephone cameras on eye fatigue disorders.

The data analysis, conducted through *purposive* sampling, involved determining the research sample based on a number of specific considerations with the aim of improving the representation of the data generated in the future.

Results

Eye to Monitor Distance

Comfort in using a computer, especially for office workers who have to stare at the screen for prolonged periods of time, is greatly influenced by the distance from the eyes to the monitor. According to the 1997 Occupational Safety and Health Association (OSHA) standard, the recommended distance range is 46-61 cm (18-24 inches), with an optimal distance of more than 50 cm (20 inches). The impact of eyestrain can vary depending on the combination of duration of use and viewing distance - prolonged use at close range tends to result in eye irritation and redness, while prolonged use at long range can cause blurred vision even at safer distances.

There is a significant correlation between viewing distance and eye fatigue levels. The closer the viewing distance, the higher the intensity of the monitor's radiation exposure to the eyes, potentially resulting in eye muscle strain. Thus, the viewing distance to the work object is a crucial factor in the risk of eyestrain.

Based on the researcher's direct observation of workers' viewing distance to the monitor, it indicates non-compliance with OSHA standards (>50 cm), with the majority of workers operating at a distance of less than 50 cm. Non-compliance with this standard, combined with continuous radiation

exposure and suboptimal lighting, results in various eye disorders such as diplopia (double vision), headaches, eye muscle strain, difficulty focusing, and red and watery eyes. As a preventive solution, the installation of anti-radiation and anti-glare filters on computer monitors can be implemented to minimize the risk of eyestrain in workers.

Exposure Time to Monitor

Labor regulations in Law No. 13/2003 regulate two patterns of working time: the first option is 7 hours per day or 40 hours weekly for a 6-day work system, while the second option is 8 hours per day or 40 hours weekly for a 5-day work system. BPJS Ketenagakerjaan Kanwil SUMBAGUT implements the second system, which is an 8-hour daily pattern with a total of 40 hours per week in 5 working days.

Theoretically, extensive work duration can benefit companies through increased product or service output. However, the reality is different - prolonged working hours can actually reduce the effectiveness of employee performance and trigger a variety of problems such as fatigue, health problems, and the risk of workplace accidents that result in decreased productivity. Prolonged computer use, especially with too close a viewing distance, increases the risk of eyestrain.

Based on the results of the research that has been conducted, it is known that employees still rarely use the 20-20-20 method. As computer users who rarely use the method should often take short but regular breaks, so that employees are not constantly dealing with computers.

Referring to the Ministry of Health (2024) guidelines, to mitigate the symptoms of Computer Vision Syndrome, it is recommended to adopt the 20-20-20 rule. This protocol requires users to take a break from activities in front of a digital screen every 20 minutes, by shifting their gaze to an object 20 feet (about 6 meters) away for 20 seconds, before resuming activities in front of the monitor.
Employees of BPJS Ketenagakerjaan Regional Office of Sumbagut have shown symptoms of eye fatigue due to prolonged computer use and less than ideal viewing distance. Even with a standard distance, prolonged exposure to computer radiation can still result in symptoms such as sore eyes, redness, and blurred vision. Setting a standard distance with a shorter duration is better, but it still needs to be balanced with regular stretching to prevent eye fatigue.

Eye Fatigue Complaint

NIOSH recommends a 15-minute break every two hours of computer use. The systematic organization of rest intervals serves to interrupt the fatigue cycle, thereby increasing comfort for computer operators. Providing relaxation time for the eyes is an essential practice for maintaining eye health. Lack of eye rest time has the potential to induce eyestrain, which in turn can negatively impact work productivity. Therefore, the allocation of adequate eye rest time plays a vital role in mitigating the risk of eye fatigue.

The results indicated that respondents who did not implement eye breaks but experienced eye fatigue were influenced by the extensive duration of computer use, the manifestations of which were eye irritation, hyperemia (redness), and blurred vision. As an adaptive response, some workers took the initiative to install an eye break reminder application on their respective computer devices. Although periodic breaks are effective in preventing fatigue accumulation, the high intensity of work often results in many workers ignoring regular break protocols after hours of continuous computer use.

Conclusion

Research conducted at BPJS Ketenagakerjaan Kanwil Sumbagut revealed that the majority of employees work with monitor visibility that is not in accordance with OSHA standards, which is less than 50 cm, resulting in various visual disorders such as double vision, headaches, and red eyes. Employees who work 8 hours per day for 5 working days rarely apply the 20-20- 20 method recommended by the Ministry of Health to prevent eye fatigue. The high intensity of work causes many employees to ignore regular rest protocols, although some of them have taken the initiative to use eye break reminder apps. Continuous exposure to monitors, even at a standardized distance, still causes symptoms such as sore eyes, redness, and blurred vision, which can ultimately affect their work productivity.

Advice

1. To overcome the problem of eyestrain in employees, BPJS Ketenagakerjaan Kanwil Sumbagut should implement an automatic monitor height adjustment system that can be adjusted to the posture of each employee and equip each monitor with anti-radiation and anti-glare filters.
2. Management needs to develop a task rotation system that allows employees to switch between tasks that require monitor focus and non-monitor tasks, and implement work time management software integrated with eye break reminders.
3. Visual health programs such as periodic eye examinations every 6 months and the provision of anti-radiation glasses vouchers as additional benefits should also be considered

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