Volume III, Issue 1, 2023
November 2023

E-ISSN: 2808-5361
http://e-journal.fkmumj.ac.id/

Proceeding The Third Muhammadiyah Internasional-Public Health and Medicine Conference

FACTORS RELATED TO THE INCIDENCE OF EYE FATIGUE TO COMPUTER EXPOSURE IN WORKERS AT PT. A. W FABER-CASTELL INDONESIA BEKASI IN 2022

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ABSTRAK

Penggunaan komputer berguna sebagai alat komunikasi, mempermudah pekerjaan. Penggunaan komputer yang berlebihan dapat menyebabkan penyakit pada mata, badan, atau kepala. Secara global, sekitar 45-70 juta orang menghabiskan waktu menonton video. Riset kesehatan dasar tahun 2018, proporsi cedera mata akibat kejadian atau kecelakaan pada usia produktif 15-45 tahun sebesar 2,6%. Sedangkan untuk jenis pekerjaan pegawai cedera mata mempunyai proporsi sebesar 0,5%. Tujuan penelitian ini adalah untuk mengetahui faktor-faktor yang berhubungan dengan kejadian kelelahan mata akibat paparan komputer pada pekerja di PT. AW Faber-Castell Indonesia Bekasi Tahun 2022. Jenis penelitian ini menggunakan penelitian analitik dengan pendekatan cross sectional dengan jumlah sampel sebanyak 50 orang pekerja di PT. AW Faber-Castell Indonesia. Teknik pengambilan sampel menggunakan Total Populasi. Data dianalisis secara univariat dan bivariat dengan uji Chi Square. Hasil penelitian ini menunjukkan pekerja yang mengalami kelelahan mata (74%). Jenis kelelahan mata yang paling umum adalah penglihatan kabur (42%), sakit mata (32%), dan kesulitan fokus melihat (30%). Pada penelitian ini tidak terdapat variabel yang mempunyai hubungan signifikan yaitu jarak menatap layar monitor dengan p-value = 0,303, istirahat mata P-value = 0,886 (p-value>0,05) OR = 0,735 (95% CI = 0,202 -2,674), durasi penggunaan komputer p-value = 1000, masa kerja p-value = 0,707, pencahayaan p-value = 1000. Banyak keluhan kelelahan mata dan durasi penggunaan komputer melebihi 4 jam/hari. Oleh karena itu, disarankan untuk mewaspadai risiko terjadinya kelelahan mata dengan melakukan peregangan untuk mengistirahatkan mata bekerja dengan pencahayaan yang sesuai dengan jenis benda kerja, dan melakukan perawatan.

Kata Kunci: *Kelelahan mata, komputer, pekerja*

ABSTRACT

The use of computers is useful as a communication tool, facilitating work. Excessive use of computers can cause eye disease, body, or head. Globally, around 45-70 million people spend time watching videos. basic health research in 2018, the proportion of eye injuries caused by an event or accident in the productive age of 15-45 years was 2.6%. As for the type of employee work, eye injuries have a proportion of 0.5 %. The purpose of this study was to determine the factors associated with the incidence of eye fatigue due to computer exposure among workers at PT. AW Faber-Castell Indonesia Bekasi Year 2022. This type of research uses analytic research with a cross-sectional approach with a total sample of 50 workers at PT. AW Faber-Castell Indonesia. The sampling technique uses the Total Population. Data were analyzed univariately and bivariately with the Chi Square test. The results of this study indicate workers who experience eye fatigue (74%). The most common types of eye fatigue are blurred vision (42%), sore eyes (32%), and difficulty focusing to see (30%). In this study, there were no variables that had a significant relationship, namely the distance on the monitor screen with a p-value = 0.303, eye rest P- value = 0.886 (p-value>0.05) OR = 0.735 (95% CI = 0.202-2.674), duration of computer uses p-value = 1000, work period p -value = 0.707, lighting p -value = 1000. There were many complaints of eye fatigue and duration of computer use that exceeded 4 hours/day. So, it is recommended to pay attention to the risk of eye fatigue by stretching to rest the eyes work with lighting appropriate to the type of work object, and carry out maintenance.

Keywords: *Eye fatigue, computer, workers*

INTRODUCTION

Computers have become a part of almost all lines of human life, so they cannot be separated. In today's modern era, it can be said that the function of computers and the use of the internet has become very large and well-known, causing workers to spend excessive time in front of the computer. The use of computers is useful as a communication tool, facilitating work. Although the use of computers is beneficial, excessive use of computers can cause eye, body, or head diseases. (Permana et al, 2015). The American Optometric Association (AOA) (2017) states that it is not uncommon for office workers to experience eye fatigue due to being too long in front of the computer and this level of discomfort will continue to increase with the length of time they have been using the computer.

The eye is an organ of vision that has sensitivity to light because the eye has photoreceptors, and nerve impulses from photoreceptor stimulation which will be carried to the brain in the occipital lobe in the cerebrum (Guyton & Hall 2021). Tired or strained eyes are a disorder experienced by the eyes because the muscles are forced to work hard, especially when looking at close objects for a long time. Symptoms of tired eyes usually appear after several hours of work.

Based on Riskesdas (2018) office workers work an average of approximately 8 hours a day and it is known that 94.6 % of workers experience eye fatigue. Eye fatigue in office workers can increase the risk of injury due to negligence/accident. In line with the use of computers around the world which continues to increase, complaints about vision caused by exposure to computers are increasing. Some of the complaints that are often felt include red eyes, feeling sore/itchy, watery, drowsy, blurred vision, and headaches, in the neck, and shoulders.

According to the Association of Indonesian Internet Service Providers (APJII) in 2018, in a day as many as 26.48% of Internet users in Indonesia access the Internet for more than 7 3 hours, 29.63% for 4-7 hours and 1-3 hours in a day reaching 43 .89%. Meanwhile, during the week, half of internet users in Indonesia every day reached 65.98%. The duration of computer use that is too long will certainly cause eye health problems, one of which is computer vision syndrome. Research that supports this theory is data according to basic health research in 2018, the proportion of eye injuries caused by an event or accident at the productive age of 15-45 years is 2.6 %. As for the type of employee work, eye injuries have a proportion of 0.5 % (Ministry of Health of the Republic of Indonesia, 2019).

Previous research conducted by Febrianti, et al. (2018), stated that nursing students at Syiah Kuala University used computers for ≥ 2 hours experiencing tired eyes in 324 people (77.7%) and watery eyes in 196 respondents (47%). Another study conducted by Talitha, et al. (2022), stated that lecturers at the medical faculty of the Islamic University of Bandung, as many as 40 respondents (44%) experienced tired eyes and 24 respondents experienced watery eyes and itchy eyes (31%) due to computer use ≥5 hours.

PT. AW Faber-Castell Indonesia is a company engaged in the manufacturing industry located in Bekasi, including the manufacture of writing instruments such as pencils. To support this work, of course, the use of computers as a work tool is something that is always done every day, so workers using computers for a long-time lead to eye health problems. Until now there has never been a research activity on the health of workers related to the occurrence of eye health problems, especially eye fatigue from computer use. For this reason, researchers are interested in researching the factors associated with the incidence of eye fatigue on computer exposure at PT. AW Faber-Castell Indonesia Bekasi Year 2022.

METHOD

This research is an analytical research using a cross-sectional approach. The population in this study were computer users who in their daily work activities always looked directly at the monitor screen with a total of 50 people. The sample in this study is the entire population (Total Population), namely 50 people. This research was conducted at PT. AW Faber-Castell Indonesia in December 2022.

The analysis in this study was carried out using statistical software with two stages, namely univariate analysis to determine the distribution of the dependent variable (events of eye fatigue) and independent variables (Distance on the Monitor Screen, Eye Rest, Duration of Computer Use, Working Period, Illumination), and the second is bivariate analysis to determine the relationship between the independent variables on the dependent variable. Bivariate analysis was performed using the chi-square test (X^2). This research was conducted by collecting primary data by distributing Google Forms (Questionnaire) to respondents and collecting secondary data by taking lighting measurement data and several other documents from researchers from the administration section of PT. AW Faber-Castell Indonesia.

RESULTS AND DISCUSSION

Based on table 1, the majority of employees with high insecure behavior were 62 (57.4%) but not much different from those with low insecurity behaviors, 46 (42.6%). There were 68 (63.0%) employees aged ≤ 30 and 40 (37.0%) at age ≥ 30. There are 22 low-educated workers (20.4%) and 86 (79.6%) with higher education. It is known that the workers behaved less than 66 (61.1%), while the workers were 42 (38.9%). It was found that the low-skilled workers were 23 (21.3%), while the high-skilling workers were 85 (78.7%). It is known that the workers based on supervision are fewer and those based on good supervision have the same presentation value of 54 (50.0%). According to Table, 45 (41.7%) workers did not comply with the APD, while 65 (58.3%) were employees who did.

Table 1. Analysis Univariate

Variable	Frequency	Percentage (%)
Unsafe Action		
High	62	57.4
Low	46	42.6
Age		
≤ 30 years	68	63.0
> 30 years	40	37.0
Education		
Low	22	20.4
Heigh	86	79.6
Attitude		
Less	66	61.1
Good	42	38.9
K3 Knowledge		
Low	23	21.3
High	85	78.7
Surveillance		
Less	54	50.0
Good	54	50.0
APD Usage		
Disobedience	45	41.7
Obey	65	58.3

Based on the analysis of the study. workers mostly perform highly unsafe actions in the young age group ≤ 30 years 34 (50.0%). compared with the age group > 30 years 22 (55.0%). which means workers who are less than 30 years of age are 0.818 times more likely to be at risk of unsafe actions than they are in age > 30. Based on the Chi-Square test results it is known that p-value = 0.692 > 0.05 so it can show that there is no significant relationship between age and unsafe action. Thus. the hypothesis that can be concluded is that there is no meaningful relationship between age and unsafe actions.

Table 2. Relationship between Independent Variables and Unsafe Action PT. Jaya Kencana South Quarter Project 2022

Variable	Unsafe Action				OR	p-value
	High		Low			
	n	%	n	%		
Age						
≤ 30 years	34	50.0	34	50.0	0.818 (0.374-1.791)	0.692
>30 years	22	55.0	18	45.0		
Education						
Low	13	59.1	9	40.9	0.818 (0.374-1.791)	1.000
Heigh	49	57.0	37	43.0		
Attitude						
Less	50	75.8	16	24.2	7.813 (3.258-18.753)	0.042
Good	12	28.6	30	71.4		
Knowledge						
Low	4	84.6	19	15.4	0.098 (0.030-0.316)	0.000
Heigh	58	16.3	27	83.7		
Surveillance						
Less	47	87.0	7	13.0	17.457 (6.470-47.100)	0.000
Good	15	27.8	39	72.2		

Variable	Unsafe Action				OR	p-value
	High		Low			
	n	%	n	%		
APD Usage						
Disobedience	38	84.4	7	15.6	8.821 (3.401-22.881)	0.032
Obey	24	38.1	39	61.9		

This research is in line with the research carried out by (Sangaji, 2018) (1) which stated that there was no relationship between age and unsafe action obtained p-value = 0.504 > 0.05 which means no significance between age with unsafe actions. This study is inconsistent with the research carried out (2) The p-value = 0.004 > 0.05 indicates that there is a significance between age and unsafe behavior.

Age is only one of the factors that can influence a worker's insecure behavior. therefore many other factors may influence the insecurity of a worker. Insecure actions can be performed by the labor force that has a young age. it is because if at a young age tends to be more negligent and less careful in doing his job when compared to that older age. then he will be at risk of behaving unsafe (3).

An analysis of the relationship between education and unsafe actions showed that unsafe action was 4 (84.6%) lower in low-skilled workers than those with higher education. which is 58 (16.3%). meaning that workers with higher education had a 0.098 times higher risk of committing unsafe activity compared to workers with low education. Based on the results of the Chi-Square test it is known that P Value = 1.00 > 0.05 so it can show that there is no significant relationship between education and acts of unsafe behavior. Thus. the hypothesis that can be concluded is that there is no meaningful relationship between education and acts of unsafe behavior.

This research is in line with the research (Nahrisah dkk., 2021) (4) The statistical test results obtained a p-value = 0.622 > 0.05 which means no influence of education with actions of unsafe behavior. This research is not in line with the research (Ramadhany, 2018) (3) The results of the Chi-Square test obtained p value = 0.970 so it can be concluded that there is no significant relationship between the level of education and the acts of unsafe behavior. (unsafe action).

A person with a higher education can also behave unsafely. it can be seen from the results of research that higher education in the lower category is more than lower education. and the education of a person influences one's mindset in the face of the job entrusted to him. In addition. education also affects the level of absorption of training given in the performance of work or occupational safety and health (K3) (5).

The results of the analysis of the relationship between attitude and insecure action showed that unsafe action in workers mostly unsecured action in employees who behaved less than 50 (75.8%) was greater than in workers who were well-being 12 (28.6%). The statistics of the chi-square test obtained p-value = 0.042 > 0.05 meaning there was a significant correlation between attitudes and unsafe action. Thus. the hypothesis that can be concluded is that there is a meaningful relationship between attitudes and unsafe actions.

This research is in line with the research (Larasatie dkk., 2022) (6) An analysis of the relationship between attitude and unsafe action resulted in a p-value of 0.000 which means the significance of attitude with unsafe actions.

This is because many factors influence the formation of attitudes and attitudes that make employees have negative and positive attitudes (3). Attitudes can be influenced internally and externally. and these attitudes are considered a form of communication of danger. Therefore. employees will be careful at work (7)

The results of the analysis of the relationship of knowledge with unsafe action showed that unsafe actions in workers were mostly unsafe acts in workers with low knowledge which is 4 (84.6%) smaller than workers with high knowledge which is 58 (16.3%). The statistics of the chi-square test obtained p-value = 0.000 > 0.05 that it can be concluded that there is a significant relationship between K3 knowledge and unsafe action. Thus. the hypothesis that can be concluded is that there is a meaningful relationship between knowledge and unsafe action.

Results of research conducted by (Irkas, 2020) (8) stated that there was a link between knowledge and unsafe behavior because the majority of respondents who had experienced an accident at work had a lower level of knowledge compared to the level of good knowledge. The result was obtained using a chi-square test showing a relationship between K3's knowledge of work accidents. which was proved with p-value=0.016 (<0.05).

When a person lacks knowledge. it will cause danger around him. and does not do the work according to the terms and is not aware of the risks that will be accepted. When a person is knowledgeable. will act well and can avoid accidents at work (8).

The analysis of the relationship between surveillance and unsafe action shows that unsafe actions in workers are mostly unsafe activities in workers with less vigilance which is 47 (87.0%) compared to workers with good monitoring which is 15 (27.8%). Thus. the hypothesis that can be concluded is that there is a meaningful relationship between surveillance and acts of unsafe behavior.

Results of the research carried out (3) stated that there was a link between surveillance and unsafe actions. The result of the relationship between surveillance and unsafe actions in employees of PT Lestari Banten Energy was obtained that as many as 8 people (40.0%) respondents who had good surveillance but often performed unsafe activities. while those who had less good surveil and frequently performed unsafe actions. as much as 6 people (20.0%). Chi-Square test results obtained p value = 0.258 so it can be concluded that there is no significant relationship between surveillance and unsafe action.

Supervision is useful in the management of activities so that they can be carried out as expected so that the objectives of the activities can be achieved in a maximum and efficient manner. In the realization of occupational safety and health. intensive supervision of various parties. both internal and external. must be carried out (9).

The results of the analysis of the relationship between the use of APD and unsafe action showed

that unsafe actions in employees who did not comply with compliance with APD use were 38 (84.4%) greater than in workers who did use the APD 24 (38.1%). The statistics of the chi-square test obtained p-value = 0.032 that it can be concluded that there is a significant relationship between education and safe action.

This research is in line with the research (Sebrina, 2021) (10). This is demonstrated by the results of bivariate analysis on the APD usage variable showing that there is a relationship between the use of APD with unsafe action on workers of the production part in CV X district of Kendal with p-value = 0.023 < 0.05). While the research was carried out (Ashari, 2019) (11) there is a relationship between the use of APD with the action of unsafe behavior and obtained p-value of 0.002 (<0.05).

This is because most workers do not use APD due to a lack of understanding of the importance of using APD at work. Most workers consider that it is not necessary to use APP at work because of the discomfort factor so it is considered to interfere with the productivity of work. besides. the lack of APD in the workplace causes unusual workers to use the APD during work (12).

CONCLUSION AND SUGGESTIONS

The conclusion in this study on the variable is that there is a significant relationship between acts of unsafe behavior i.e. attitude. K3 knowledge. surveillance. and compliance with APD use with p-value ≤ 0.05. And counsel for workers to be even more careful to prevent the occurrence of unsafe acts that cause accidents at work. Workers should warn each other about unsafe behavior. employees should use Self-protection Tools to prevent accidents.

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