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Analysis Of Length Work And Visibility On Online Learning Toward Teachers Fatigue At Junior High School 2 Durenan District Trenggalek

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ABSTRACT

Eye fatigue is a complaint that is often found because of the interaction of the eye with the continuous use of screens. Frequent viewing of screens can make eyes tired. Radiation can also be detrimental to health. The purpose of this research was to analyze length of work and visibility in online learning against eye fatigue of teachers at Junior High School 2 Durenan District Trenggalek.The research design was an observational quantitative study with a cross sectional approach with the focus of the research being aimed at analyzing the effect of length of work and visibility on online learning on teacher eye fatigue at Junior High School 2 Durenan District Trenggalek with a population of 40 respondents and a sample of 35 respondents who were drawn by the simple random sampling technique. The findings show that Most of the respondents have long worked in the old category as many as 23 respondents (65.7%). Most of the respondents have eye distance in the near category as many as 19 respondents (54.3%). Most of the respondents experienced complaints of eye fatigue as many as 22 respondents (62.9%). The results of the study used *Multiple linear regression* shows that with a p-value of 0.000 <0.05, H1 is accepted, so it can be concluded that simultaneously it exists the effect of length of work and visibility on online learning on eye fatigue of teachers at Junior High School 2 Durenan District Trenggalek with a magnitude of the effect of 72.7%. It is expected that the respondent should limit the minimum distance between the eyes and the screen, namely by arranging the chair as comfortable as possible and positioning the back upright so that it does not appear too close to the screen. In addition, it is also recommended to wear anti-radiation glasses in order to maximize performance.

Keywords : Visibility, Fatigue & Length of Work

INTRODUCTION

Frequent viewing of the monitor can make the eyes tired. Electromagnetic radiation generated by the monitor can be detrimental to health. A study conducted by the American Optometric Association (AOA) states that smartphone or screen radiation can cause eye fatigue and other eye disorders. Most of the symptoms that respondents complain about are eye fatigue, blurred vision and dry eyes. Other visual problems that arise include problems with headaches and neck or shoulder pain (Tristianto & Purnawan, 2015).

Based on research conducted by Gupta, et al. (2014) regarding the Interventional Cohort Study for Evaluation of Computer Vision Syndrome among Computer Workers in India, it is stated that eye fatigue in workers using smartphones or screens / monitors is caused by factors of age, duration of use, and visibility. screen, monitor screen brightness and contrast related to lighting levels, and posture when using the monitor.

In a study conducted by students of the Faculty of Public Health, Sam Ratulangi University at PT Angkasa Pura I (Persero) Manado City in 2017 concerning the Relationship Between Lighting Intensity and Age with Eye Fatigue in Operational Workers, the results obtained were 55 people (64%) experienced severe eye fatigue and as many as 31 people (36%) experienced mild eye fatigue, of the 86 workers in the operational section. Eye fatigue

is a complaint that is often found due to eye interaction with continuous use of screens / monitors.

Based on the results of a preliminary study conducted by researchers on October 9, 2020 to 10 respondents at Junior High School 2 Durenan District Trenggalek, it was found that 9 respondents (90%) said they experienced eye fatigue which was marked by their eyes often feeling dry, sometimes watery, sometimes too feels hot and red. This is due to the lengthy time the respondent has to study online, which is required to work in accordance with the applicable curriculum rules, and also because the long learning process causes the distance of the eye to the screen to be closer to them unconsciously.

The comfort level of each individual regarding text size, screen color, sharpness, etc. is relatively different, so it is recommended that this screen be adjusted to the eyes of each individual. However, the light and dark color settings on the monitor must be correct, as well as the monitor resolution. The colors used are neither too light nor too dark. When the contrast value is negative, where the contrast value is negative, it can cause the actual object to be "absorbed" by the background, so that the object becomes invisible, it can cause eye fatigue. (Bidakara Medical Center, 2019).

Eye fatigue on monitor users can also occur due to dry eye conditions, which is often called Dry eye syndrome. Dry eye syndrome is a disorder caused by inadequate tear production or excessive tear evaporation. Monitor users, the evaporation of tears occurs more when the eyes look straight ahead than when they look down. This is due to the wider eye surface when looking ahead, so there is more tear evaporation (Roestijawati, 2012).

The occurrence of fatigue in the eyes of a person who stares at the monitor screen continuously for a long duration and with not ideal visibility can increase. Based on the above conditions, the researcher is interested in conducting research on the analysis of length of work and visibility in online learning against eye fatigue of teachers at Junior High School 2 Durenan District Trenggalek.

METHODS

In this study, researchers used a quantitative analytic design with a cross sectional approach, namely a study to study the dynamics of regression between risk factors and effects, by approaching, observing or collecting data at once (point time approach), that is, each subject. The research was only observed once and measurements were made of the character status or subject variables at the time of examination. This does not mean that all research subjects were observed at the same time (Notoadmojo, 2012). This research will analyze the effect of length of work and eye visibility on online learning on teacher eye fatigue at Junior High School 2 Durenan District Trenggalek Regency with a population of 40 respondents and a sample of 35 respondents who were taken using the simple random sampling technique.

RESULTS

A. Characteristics of Respondents

1. By Gender

From 35 respondents, it is known that most of the respondents are female as many as 22 respondents (63%) and male respondents as many as 13 respondents (37%).

2. By Age

From 35 respondents, it is known that 40% of respondents are >40 years old, 31% of respondents are 30-40 years old, 29% of respondents are <30 years old

B. Variable Characteristics

1. Length of Work

Criteria	Frequency	Percent (%)

Ideal Long	12 23	34,3% 65,7%
Total	35	100%

Based on the table above, it is known that most of the respondents have worked in the long category as many as 23 respondents (65.7%).

2. Visibility

Criteria	Frequency	Percent (%)
Ideal Close	16 19	45,7% 54,3%
Total	35	100%

Based on the table above, it is known that most of the respondents have close eye sight distance as many as 19 respondents (54.3%).

3. Eye Fatigue

Criteria	Frequency	Percent (%)
Tired Not tired	22 13	62,9% 37,1%
Total	35	100%

Based on table 4.3 above, it is known that most of the respondents experienced complaints of eye fatigue as many as 22 respondents (62.9%).

C. Statistical Test Results

Table 1 Results of Linear Regression Analysis the effect of length of work and visibility on online learning on teacher eye fatigue at Junior High School 2 Durenan District Trenggalek which was held on April 12-14, 2021 with a total of 35 respondents

No.	riable	g	R^2	g
1	nstand	)0		
2	ngth of working	)7	'27	)00
3	sibility	)9		

1. Partial

a. Effect of Length of Work on Eye Fatigue

Based on the results of Linear Regression analysis, it shows that the p-value is 0.007 <0.05, then H1 is accepted, so it can be concluded that partially there is the effect of length of work on online learning on teacher eye fatigue at Junior High School 2 Durenan District Trenggalek

b. The Effect of Visibility on Eye Fatigue

Based on the results of Linear Regression analysis, it shows that the p-value is 0.009 <0.05, then H0 is rejected and H1 is accepted, so it is concluded that partially there is the effect of visibility on online learning on teacher eye fatigue at Junior High School 2 Durenan District Trenggalek

2. Simultaneously

Based on the results of the Multiple Linear Regression analysis, it shows that with a p-value of 0.000 <0.05, H1 is accepted, so it can be concluded that simultaneously there is the effect of length of work and visibility on online learning on eye fatigue of teachers at Junior High School 2 Durenan District Trenggalek with a magnitude of the effect of 72.7%.

DISCUSSION

A. Length of Work of Teachers in Online Learning at Junior High School 2 Durenan District Trenggalek

Based on the results of the study, it was found that most of the respondents had a long working period in the old category as many as 23 respondents (65.7%). Meanwhile, a number of 12 respondents (34.3%) have worked in the ideal category.

Eye fatigue is the occurrence of eye muscle fatigue and eye nerve fatigue as a result of continuous stress on the eyes, although it does not cause permanent eye damage, but increases workload, accelerates fatigue, frequent breaks, loses work hours and reduces job satisfaction, decreases production quality. , increase the frequency of errors, interfere with concentration and reduce work productivity (Padmanaba, 2011). Eye fatigue arises as intense stress on eye functions such as muscle accommodation in jobs that require careful observation or on the retina due to inaccurate contrast (Suma'mur, 2014).

Work time for a person determines his efficiency and productivity, and the length of a person working a good day is generally 4-8 hours. Extending working time beyond this limit is generally not accompanied by high efficiency, in fact, there is usually a decrease in productivity and a tendency to develop complaints, illnesses and accidents (Suma'mur, 2014).

Research conducted by Putri Yundiarti on computer operators (2011) in Surabaya shows that the effect of work duration on eye fatigue has a significant relationship and research conducted by Maryamah on computer users (2011) in Jakarta shows that eye rest on eye fatigue has a significant relationship.

Research conducted by Septiansyah (2014) on the factors associated with eye fatigue in computer user workers at PT. Duta Astakona Girinda in 2014 showed a significant relationship between work duration and subjective eye fatigue.

According to researchers, the length of work for a person determines his efficiency and productivity. Extending working time beyond the limit is generally not followed by high efficiency. In fact, there is usually a decrease in productivity and a tendency to complain of eye fatigue, illness and accidents. The various symptoms that arise in teachers who work for a long time are not only caused by light entering the eyes, but also because a teacher's eyes blink less than in normal conditions, causing the eyes to become dry and hot.

B. Lecturer Visibility in Online Learning at Junior High School 2 Durenan District Trenggalek

The results showed that most of the respondents had an eye distance in the near category as many as 19 respondents (54.3%). Meanwhile, a total of 16 respondents (45.7%) had an ideal category of viewpoint.

When a person works by seeing a luminous object on a colored base at close range continuously for a certain period of time it can cause the eye to have to continue to accommodate. Eyes that continue to accommodate will cause eye fatigue. This is because the eye muscles have to work hard to see these objects (Hanum, 2013).Accommodation power is the ability of the lens to change its optical system so that objects at a desired distance can be focused on the retina. This mechanism occurs because the shape of the lens can change (Fritz Hollwich, 2013). Accommodation occurs with changes in the curvature of the lens. If the object is less than seven meters away, the lens arch should be increased to make it easier to focus on the retina. Accommodation is an active process that requires muscle work, so it can be tiring. Therefore, the farther the visibility to the object, the less likely it is that eye irritation will occur.

The comfort level of each individual regarding text size, screen color, sharpness,

etc. is relatively different, so it is recommended that this screen be adjusted to the eyes of each individual. However, the light and dark color settings on the monitor must be correct, as well as the monitor resolution. The colors used are neither too light nor too dark. When the contrast value is negative, where the contrast value is negative, it can cause the actual object to be "absorbed" by the background, so that the object becomes invisible, it can cause eye fatigue. (Bidakara Medical Center, 2019).

Eye fatigue in smartphone users can also occur due to dry eyes, which is often called dry eye syndrome. Dry eye syndrome is a disorder caused by inadequate tear production or excessive tear evaporation. In smartphone users, tear evaporation occurs more when the eyes look straight ahead than when they look down. This is due to the wider eye surface when looking ahead, so there is more tear evaporation (Roestijawati, 2012).

According to researchers, the visibility of the eye with an electronic screen must be properly limited. If it is too close it can cause discomfort to the eyes and can cause dry eyes, besides that the screen condition should not be too bright or too dim as the light conditions must be adjusted to the eye's ability. Based on the results of the study, data shows that most respondents work with smartphones at a distance that is too close, which in this condition can make the eyes uncomfortable and can also increase the risk of minus eyes (myopia).

C. Teacher's eye fatigue at Junior High School 2 Durenan District Trenggalek

The results showed that most of the respondents experienced eye fatigue as many as 22 respondents (62.9%). While a number of 13 respondents (37.1%) did not experience eye fatigue complaints.

The process of seeing starts when an object reflects light and this light then enters the eye through the cornea, pupil, lens and finally the light is focused on the retina. In the retina, this light is converted into electrical charges which are then sent to the brain via the visual nerve fibers for processing. The result of this work of the brain makes us see objects. The pupil or eye bead functions to regulate the incoming light by shrinking if the light is too bright or widening if the light is not enough. The diaphragm of a camera works like the pupil. The lens adjusts so that the image can fall right on the retina. The retina or mesh membrane, is a thin tissue inside the eyeball. In the retina there are millions of nerve cells known as rods and cones.

Eye fatigue is caused by stress on the function of vision. Stress in the accommodation muscles can occur when a person tries to look at small objects at close distances for a long time. In this condition, the eye muscles will work continuously and are more forced. The tension of the accommodating muscles (ciliary muscles) increases, resulting in an increase in lactic acid and as a result of eye fatigue, stress on the retina can occur when there is excessive contrast in the field of vision and long vision time (Nourmayanti, 2014).

Eye fatigue is visual discomfort which includes pain or throbbing sensation around the eyes, double vision, blurred vision, difficulty in focusing, sore eyes, red eyes, watery eyes to headaches and nausea. The main cause of eye fatigue is fatigue of the ciliary muscles and extra ocular muscles due to prolonged accommodation, especially during activities that require close vision. The severity of eye fatigue depends on the type of activity, intensity and work environment (Ananda, & Dinata, 2015).

Based on the opinion of Iridiastadi and Yassierli (2014), citing the opinion of Bridger (1995), it can be concluded that eye fatigue is greater in jobs that see objects at close range compared to jobs that see objects from relatively far away. This is due to the accommodation of the eye muscles which work when the muscles contract so that objects can be seen closer.

Eye fatigue occurs due to complex disturbances that affect each other in the visual system processes such as insufficient light entering the eye from the object being seen, the focus of light on the retina of the eye is imperfect, the mechanism for fusing images (fusion) by a more central visual system (brain) , and efforts to maintain it are inadequate. The adequacy of light is influenced by extrinsic factors, namely the state of illumination which causes the light to be too bright or dim, fluctuating, oblique direction, and glare can reduce the sensitivity of the retina. Small objects, irregular shapes, and lack of contrast or movement also make it easier to develop eye fatigue. Compute Vision Syndrome.

According to researchers, eye fatigue is a physiological result of the high intensity of light that is often exposed to the eyes, especially to teachers who are on the screen. Based on the results of the study, it was found that most respondents experienced eye fatigue complaints, this could be caused by various factors, one of which was that the flexibility of the eye muscles was reduced which resulted in the point of light not falling where it should have been on the eye. So that people will focus more on seeing the screen closer and as a result the visibility is not ideal and the eyes become dry and feel uncomfortable easily. Because these events occur with a frequent duration, the eye will get tired more and more and the vision will become more blurred.

D. The Effect of Length of Work and Visibility of Eyes on Online Learning on Teachers' Eye Fatigue at Junior High School 2 Durenan District Trenggalek

Based on the results of the Multiple Linear Regression analysis, it shows that with a p-value of 0.000 <0.05, H1 is accepted, so it can be concluded that simultaneously there is the effect of length of work and visibility on online learning on eye fatigue of teachers at Junior High School 2 Durenan District Trenggalek with a magnitude of the effect of 72.7%.

Occupational Safety and Health (K3) is a program based on a scientific approach in an effort to prevent or minimize the occurrence of occupational diseases, work accidents, and other possible losses. Currently K3 has become a concern in every aspect of life, because basically we never escape from risky working conditions. (Setiawan, 2012)

The goals and objectives of the K3 Management System are to create a system of occupational safety and health in the workplace by involving integrated elements of management, labor, conditions and work environment in order to prevent and reduce occupational accidents and diseases, as well as the creation of a safe, efficient workplace, and productive. (Irzal, 2016)

Frequent viewing of a computer monitor can make your eyes tired. Electromagnetic radiation generated by computers can be detrimental to health. A study conducted by the American Optometric Association (AOA) states that computer radiation can cause eye fatigue and other eye disorders. Most of the symptoms that respondents complain about are eye fatigue, blurred vision and dry eyes. Other visual problems that arise include problems with headaches and neck or shoulder pain. (Tristianto & Purnawan, 2015

Based on research conducted by Gupta, et al. (2014) regarding the Interventional Cohort Study for Evaluation of Computer Vision Syndrome among Computer Workers in India, it is stated that eye fatigue in computer user workers is caused by factors of age, duration of computer use, visibility to the screen, brightness. and monitor screen contrast related to light levels, and posture when using the computer.

According to researchers, the incidence of eye fatigue is an event where the eyes produce less eye fluid and make the eyes dry and uncomfortable. Based on the research results, it was found that there werelength of work and visibility in online learning on eye

fatigue which proves that if someone often focuses on an object that has the same distance for a long time and has high brightness, it will cause the eyes to become dry and uncomfortable. This can increase your risk of becoming nearsighted or farsighted.

CONCLUSION

Based on the results obtained, it is known that most of the respondents have long working hours in the old category as many as 23 respondents (65.7%). And as many as 19 respondents (54.3%) were included in the close category in terms of eye visibility. And most of the respondents as many as 22 respondents (62.9%) experienced complaints of eye fatigue. Then from the results of data analysis, it can be concluded that there is an effect of length of work and eye distance on online learning on teacher eye fatigue at SMPN 2 Durenan, Trenggalek Regency.

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