Periodicals of
Occupational Safety and Health
Vol. 4, No. 1, April 2025, pp. 26-33
e-ISSN: 2962-584X
http://journal2.uad.ac.id/index.php/posh/index

Factors Associated with Eye Strain Complaints Among Employees of Division Y PT X

Masyita Anggia Ayu Parulian Situmorang[1], Muchamad Rifai[1]*
[1,2] Faculty of Public Health, Ahmad Dahlan University, Yogyakarta, Indonesia
[1] masyita2100029111@webmail.uad.ac.id ; [2] riffay@gmail.com
* corresponding author

ARTICLE INFO

Article history
Received 14 Mar 2025
Revised 4 Apr 2025
Accepted 13 Apr 2025

Keywords
Eye Strain
Screen Time Duration
Lighting Intensity

ABSTRACT (10PT)

Background: Advances in information and communication technology have led to increased use of digital devices in various work sectors, particularly in office environments. Prolonged use of digital devices can cause eye strain or asthenopia. In Indonesia, the prevalence of blindness is recorded at 0,5%, and vision impairment ranks fifth among the most commonly reported occupational health complaints. This study aims to identify factors associated with eye strain complaints among employees in Division Y of PT X. **Method:** This study employs a quantitative approach using a cross-sectional study design. The study subjects were determined using total sampling, with 81 respondents. Respondent characteristics were collected using a questionnaire, lighting intensity scores were measured using a lux meter, and the Visual Fatigue Index (VFI) questionnaire was used to assess respondents' eye strain complaints. Data analysis was performed using univariate and bivariate analysis. **Results:** Statistical tests showed that age was associated with eye strain complaints with a p-value of 0,012. There was an association between gender and eye strain complaints with a p-value of 0,003. There was an association between computer/laptop screen time duration and eye strain complaints with a p-value of 0,010. The duration of screen time for smartphone use was associated with eye strain complaints, with a p-value of 0,047. Lighting intensity was associated with eye strain complaints, with a p-value of 0,000. However, job tenure was not associated with eye strain complaints, with a p-value of 0,513. **Conclusion:** Eye strain complaints in Division Y of PT X are associated with respondent characteristics (age and gender), as well as with screen time duration and lighting intensity. However, there is no association between work duration and eye strain complaints in Division Y of PT X.

1. Introduction

Advances in information and communication technology have driven an increase in the use of digital devices acroos various sectrors, particulary in office environments. Continuous use of compters, laptops, mobile phones, and other digital devices over long periods of time can cause eye health problems knowns as eye strain or Asthenopia. This condition is characterized by symptoms such as dry eyes, blurred vision, pain, and headaches [1,2]. Asthenopia or eye strain has become one of the

most significant occupational health issues receiving global attention, particularly in relation to the increased visual workload in the digital age.

Mild to severe vision impairments affect over 400 milion people, and approximately 36 milion people have blindness. In Indonesia, the prevalence of blindness is reported at 0,5% and vision impairment ranks fifith among the most commonly reported occupational health complaints [3]. Factors that can exacerbate eye strain in the workplace include age, gender, tenure, and screen time duration. Environmental factors such as lighting, as well as individual factors like age and gender [4].

Division Y of PT X is one of the administrative units with high intensity of digital device use for tasks such as document processing, data entry, and report preparation. These tasks demand high levels of accuracy, attention to detail, and sustained visual concentration. A preliminary study conducted on October 22, 2024, involving 81 workers in Division Y, found that the majority of workers were women (68.1%) aged between 23 and 52 years. Based on another preliminary study, 3 out of 5 workers complained of eye strain symptoms such as difficulty focusing while reading, a burning sensation in the eyes after staring at the screen for too long, and drowsiness while working with a monitor.

This research is important to evaluate the factors contributing to eye strain among employees in modern work environments. Therefore, the objective of this study is to determine the relationship between individual characteristics (age, gender, and tenure), behavioral factors (screen time duration), and workplace environmental factors (lighting intensity) with eye strain complaints among employees in Division Y of PT X.

2. Methods

This research used a quantitative approach with a cross-sectional study design. Subject selection in this study used total sampling, a sampling technique that fully represents the entire population. The population in this study consisted of 69 workers in Division Y, with exclusion criteria such as workers who wear glasses or contact lenses, workers with refractive eye disorders, and workers who were unwilling to participate as respondents. The respondent characteristics collected include age, gender, length of service, and work behavior in the form of daily screen time duration reported through a questionnaire. Lighting intensity measurements using Lux meter. The VFI questionnaire is used to identify complaints of eye strain among workers is an adopted questionnaire from [6] which has been tested for reliability and validity with Cornbach's Alpha score is 0,886. The VFI questionnaire consists of 22 questions with response option of never (score 1), sometimes (score 2), often (score 3), and always (score 4).

The VFI calculation formula is:

$$\frac{Total\ score\ obtained\ by\ each\ respondent}{Maximum\ score\ pf\ 22\ questions}$$

Measurement results:

a. Yes (experiencing eye strain) if VFI value > 0.4
b. No (not experiencing eye strain) if VFI value < 0.4

3. Results and Discussion

3.1. Results

3.1.1. Univariate Analysis

Table 1. Univariate Analysis of Age, Gender, Screen Time Duration, Working Period, Lighting Intensity, and Eye strain Complaints in the Y division of PT X

Variable	Category	Total (n)	Percentage (%)
Age (X1)	≥40 Years old	23	33,3
	<40 Years old	46	66,73
Gender (X2)	Female	47	68,1
	Male	22	31,9
Screen duration of using computer/Laptop (X3)	≥ 4 Hours	62	89,9
	< 4 Hours	7	10,1
Job Tenure (X4)	≥ 3 Years	34	49,3
	< 3 Years	35	50,7
Screen duration of using S*martphone* (X5)	≥ 4 Jam	63	91,3
	< 4 Jam	6	8,7

Periodical of Occupational Safety and Health
Vol. 4, No. 1, April 2025, pp. 26-33
e-ISSN: 2962-584X

Variable	Category	Total (n)	Percentage (%)
Lighting Intensity (X6)	≥ 300 lux	33	47,8
	< 300 lux	36	52,2
Eye strain complaints (Y)	VFI ≥ 0,4	58	84,1
	VFI < 0,4	11	15,9
Total		**69**	**100**

Source: Primary Data (2025)

Table 1 shows that the majority of respondents were aged < 40 years as many as 46 people while respondents with ages ≥ 40 years were 23 respondents. Based on gender, female respondents dominate with 47 respondents while 22 male respondents. In the variable screen time duration of computer/laptop use, 62 respondents worked with computers/laptops ≥ 4 hours while 7 respondents worked with screen time duration < 4 hours. Based on the tenure variable, respondents with a tenure ≥ 3 years were 34 people (49.3%) while the tenure < 3 years was 35 people. A total of 63 respondents used smartphones for ≥ 4 hours per day while the use of smartphones < 4 hours was 6 people. The measurement results of lighting intensity show intensity < 300 lux as many as 36 points with intensity ≥ 300 lux as many as 33 points. The variable frequency of eye strain complaints with a VFI value ≥ 0.4 was experienced by 58 respondents and 11 respondents had a VFI < 0.4.

3.1.2. Bivariate Analysis

Table 2. Bivariate Analysis Fisher's Exact Test

Variable	Eye strain complaints				PR (CI 95%)	*p-value*
	VFI ≥0,4		VFI <0,4			
	n	%	n	%		
Age (X1)						
≥ 40 Years old	23	33,3	0	0,0	1,314 (1,118-1,545)	0,012
< 40 Years old	35	50,7	11	15,9		
Gender (X2)						
Female	44	63,8	3	4,3	1,471(1,063-2,035)	0,003
Male	14	20,3	8	11,6		
Screen duration of using computer/Laptop (X3)						
≥ 4 Hours	55	79,7	7	10,1	2,070(0,876-4,891)	0,010
< 4 Hours	3	4,3	4	5,8		
Job Tenure (X4)						
≥ 3 Years	30	43,5	4	5,8	1,103(1,355-0,897)	0,513
< 3 Years	28	40,6	7	10,1		
Screen duration of using S*martphone* (X5)						
≥ 4 Hours	55	79,7	8	11,6	1,746 (0,780-3,908)	0,047
< 4 Hours	3	4,3	3	4,3		
Lighting Intensity (X6)						
≥ 300 lux	33	47,8	0	0	0,694 (0,559-0,862)	0,000
< 300 lux	25	36,2	11	15,9		

Source: Primary Data (2025)

The results of the bivariate analysis presented in Table 2, show that there is a significant relationship between age and eye strain complaints in division Y employees with a p-value of 0.012. It can be seen that there is a significant relationship between gender and complaints of eye strain in division Y employees with a p-value of 0.003. In table 2, it can also be seen that there is a relationship between the duration of screen time using a computer/laptop screen with complaints of eye strain in Y division employees with a p-value of 0.010. Based on the working period variable, it is known that there is no significant relationship between working period and complaints of eye strain in division Y employees with a p-value of 0.513. It can be seen that the duration of screen time using smartphones is related to complaints of eye strain in Y division employees with a p-value of 0.047. As in table 2, it is known that there is a significant relationship between lighting intensity and complaints of eye strain in division Y employees with a p-value of 0.000.

3.2. Discussion

3.2.1 The relationship between age and complaints of eye strain among employees

The results of the analysis of the relationship between age and eye complaints among employees in Division Y of PT X show that workers aged ≥ 40 years experienced eye strain complaints at a rate of 33.3%, while those aged < 40 years experienced such complaints at a rate of 50.7%. The results of the bivariate analysis on the age variable indicate a significant relationship between age and eye strain complaints, with a p-value of 0.012. The confidence interval of 1.118–1.545, or 1.314, indicates that respondents aged > 40 years have a 1.314 times greater risk of experiencing eye strain complaints compared to respondents aged < 40 years. The confidence interval is above one (CI > 1), indicating that there is a statistically significant increase in risk between age and eye strain complaints among employees in Division Y of PT X.

This study aligns with previous research stating that older operators (> 40 years old) have a 6.7 times higher risk of experiencing eye strain complaints compared to workers under 40 years old [5]. It also aligns with a study conducted by [6], which showed statistical test results with a p-value of 0.002, indicating a relationship between age and eye strain. Age is one of the factors influencing eye strain among office employees at PT. X in 2023 [7]. However, this study's results do not align with a study (8) showing that age is not significantly associated with eye strain.

Age is one of the risk factors for eye strain complaints (p = 0.012), as it is associated with a decline in visual acuity and eye function with age. There is a difference in the digital era, where employees currently under 40 years old use digital devices more frequently in their daily activities compared to those aged 40 years and older in this study. Intensive use of digital devices among the <40 age group may be an additional factor contributing to increased reports of eye strain.

3.2.2 The relationship between gender and complaints of eye strain among employees

The results of the analysis between gender and complaints of eye strain show that 63.8% of female respondents experienced complaints of eye strain, while 20.3% of male respondents experienced complaints of eye strain. The analysis results indicate that gender is significantly associated with eye strain complaints, with a p-value of 0.003 and a PR value of 1.471 (CI > 1), meaning that female respondents have a 1.471 times higher risk of experiencing eye strain complaints compared to male respondents, and gender is a significant factor influencing eye strain complaints in this study.

The results of this study are consistent with a previous study conducted by [8], which showed that gender is one of the factors associated with eye strain complaints among employees of the Semarang City Communication and Information Office [9]. The results of this study are also consistent with previous research stating that there is a significant association between gender and eye strain, with a higher prevalence of eye strain among female healthcare workers compared to males [10]. The results of this study also support the theory used, which states that women are at a higher risk of experiencing eye strain compared to men due to increased levels of estrogen and antiandrogen hormones, which suppress tear secretion and lead to thinning of the tear film [11].

Women are at a higher risk of experiencing eye strain complaints compared to men, partly due to psychological factors or work-related stress levels that can influence eye strain. The psychological emotions experienced by women can be influenced by the menstrual cycle. Menstruation affects women's psychological condition due to anxiety and emotional instability, which can impact work stress levels, leading to a higher risk of eye strain compared to men [12]. However, there are differences in research results with previous studies showing that the incidence of eye strain is higher in men [13].

3.2.3. The relation between job tenure and complaints of eye strain among employees

The results of the analysis of the relationship between work period and eye complaints in division Y PT X found that workers with a work period ≥ 3 years experienced eye strain complaints of 43.5% or as many as 30 people while workers with a work period < 3 years amounted to 40% or as many as 28 people. The results of bivariate analysis on the working period variable show that there is no significant relationship between working period and eye strain complaints with a p-value of 0.513 and PR 1.103.

This study is not in line with the results of research conducted by [14] which states that tenure is one of the risk factors for the incidence of eye strain because the longer a person's working period, the greater the risk of experiencing occupational diseases. The absence of a relationship between tenure and eye strain complaints in division Y employees could be due to other factors such as differences in

Periodical of Occupational Safety and Health
Vol. 4, No. 1, April 2025, pp. 26-33
e-ISSN: 2962-584X

the duration and work responsibilities of each worker. In addition, the absence of a relationship between work experience and complaints of eye strain in this study may be influenced by the task assignments in division Y, which generally consists of younger workers with less than 3 years of experience who are more often given operational responsibilities that require precision in visual activities such as data entry, document management, and data analysis.

The lack of a relationship between work experience and complaints of eye strain may also be due to the workers having optimally adapted and become accustomed to the working conditions. Individuals with more experience are more skilled in managing their work rhythm and break times, which ultimately can contribute to increased efficiency and resilience to fatigue. This is supported by several studies showing that workers with longer work experience show lower levels of work fatigue. These findings indicate that longer work experience allows individuals to adapt more effectively to workloads and work rhythms, thereby minimizing the risk of burnout [15].

In line with research by [16] that statistically the working period is not a risk factor for eye strain with an RP value of 0.580 or <1. This study is also in line with research18 where the working period is not associated with eye strain in tailors in Lubuk Alung District, Padang Pariaman Regency in 2021[17]. The results of this study are in line with research [18] which shows that there is no relationship between tenure and eye strain in customer service workers at PT X in 2021.

3.2.4 The relationship between screen time duration and complaints of eye strain among

The results of the bivariate analysis showed that 55 or 79.7% of respondents with a screen time duration of computer/laptop use ≥ 4 hours experienced eye strain complaints, while among workers with a screen time duration of computer/laptop use < 4 hours, only 4.3% or 3 respondents reported such complaints. Fisher's Exact Test yielded a p-value of 0.010 (p < 0.05), indicating a statistically significant association between computer/laptop screen time duration and eye strain complaints. A PR value of 2.070 indicates that respondents with a screen time duration of computer/laptop use ≥ 4 hours have a 2.070 times higher risk of experiencing eye strain. However, since the confidence interval includes the number 1 (0.876–4.981), this relationship cannot yet be considered strong. This suggests that computer usage duration ≥4 hours per day may increase the risk of eye strain, but there is still a possibility that these results are due to chance or other confounding variables.

The results of the Fisher's Exact test in this study align with a previous study where computer usage duration was associated with eye strain among employees at the Denpasar Main Branch of Bank BPD, with a p-value of 0.021 [19]. The results of this study also align with previous research where there was a significant association between the frequency of computer usage duration ≥ 4 hours at 67.9% [20].

Bivariate analysis results show that most respondents (79.7%) who use smartphones ≥ 4 hours per day experience eye strain complaints, compared to only 4.3% in the group with a duration of < 4 hours. Fisher's Exact test yielded a p-value of 0.010 (p < 0.05), indicating a statistically significant association between smartphone usage duration and eye strain complaints. The PR value of 1.746 indicates that respondents with smartphone screen time ≥ 4 hours have a 1.7 times higher risk of experiencing eye strain. However, since the 95% confidence interval (0.780–3.908) includes the number 1, this result cannot yet be concluded as a relationship associated with eye strain complaints in this study. This suggests that the relationship may still be influenced by other variables or an insufficient sample size in the group with a duration of <4 hours. This study is inconsistent with the study conducted by [21] which stated that there was no significant relationship between the duration of digital device use, including laptops and smartphones, with a p-value of 0.46.

3.2.5 The relationship between lighting intensity and complaints of eye strain among employees

Lighting in this study was measured in accordance with Indonesian Minister of Manpower Regulation No. 5 of 2018 concerning Office Lighting Standards, namely > 300 lux. Lighting intensity that does not meet the standard, whether too low or too high, can increase the risk of eye strain through increased visual workload and visual discomfort. The results of bivariate analysis showed that 36.2% of workers experienced eye strain complaints with lighting intensity conditions in the workspace < 300 lux, while workers who experienced eye strain complaints in the workspace with lighting intensity ≥ 300 lux amounted to 47.8%.

Fisher's Exact test results show that lighting intensity is significantly associated with eye strain complaints in division Y employees at X with a p-value of 0.000. The results of the correlation test on

the lighting intensity variable showed a PR value of 0.694 with a confidence interval value below 1 (0.559-0.862) or CI <1, indicating that lighting with an intensity ≥ 300 lux has a protective effect on the occurrence of eye strain complaints. In other words, workers in a workspace with standardized lighting (≥ 300 lux) have a lower risk of experiencing eye strain complaints compared to workers who work in lighting conditions < 300 lux.

The results of this study are in accordance with the theory used, namely low intensity lighting can cause visual fatigue, eye strain, and complaints of pain around the eyes. The results of this study are also supported by [22] research conducted by with the results that there is a significant relationship between lighting levels and eye strain in Corporate Costumer Care Center (C4) workers of PT Telekomunikasi Indonesia Tbk.

The results of this study are also in line with previous research, namely there is a significant relationship between lighting intensity and complaints of eye strain in employees of PT Bank X due to lighting intensity that does not meet the standards [23]. The results of the study are also in line with research conducted by (7)there is a relationship between lighting variables and eye strain complaints in office employees at PT X in 2023 with a p-value of 0.000. The results of this study are not in line with research conducted by [24] that lighting intensity is not significantly related to eye strain in employees of Respati University Yogyakarta with a significance value of p-value 0.103.

The difference in the results of measuring the lighting intensity of each respondent can be influenced by the uneven light entering the workspace due to the use of natural light used by PT X which applies the concept of green building as a manifestation of the company's concern for the environment. Natural lighting is fluctuating because it is influenced by weather conditions, direction of sun movement, building orientation and changes in time so that this condition can cause the distribution of light in the room to be uneven [25].

4. Conclusion

a. There is a significantly proven relationship between age and eye strain complaints among employees in Division Y of PT X with a p-value of 0.012.
b. There is a proven significant relationship between gender and eye strain complaints among employees in Division Y of PT X with a p-value of 0.003.
c. There is no relationship between length of service and eye strain complaints among employees in Division Y of PT X with a p-value of 0.513.
d. There is a significantly proven relationship between screen time duration and eye strain complaints among employees in Division Y of PT X with a p-value of 0.010 for screen time duration using a computer/laptop monitor and a p-value of 0.047 for screen time duration using a smartphone.
e. There is a significantly proven relationship between lighting intensity and complaints of eyestrain among employees in Division Y of PT X with a p-value of 0.000.

Declaration

Conflicts of Interest: “The authors declare no conflict of interest."

References

[1] Patil A, Bhavya, Chaudhury S, Srivastava S. Eyeing computer vision syndrome: Awareness, knowledge, and its impact on sleep quality among medical students. Ind Psychiatry J. 2019;28(1):68–74. https://doi.org//10.4103/ipj.ipj_93_18
[2] Touma Sawaya RI, El Meski N, Saba JB, Lahoud C, Saab L, Haouili M, et al. Asthenopia Among University Students: The Eye of the Digital Generation. J Family Med Prim Care. 2020 Aug;9(8):3921–32.
[3] Riskesdas. Laporan Nasional Riskesdas 2018. 2018.
[4] Adha M, Z. *et al*. Faktor-Faktor Yang Berhubungan Dengan Keluhan Kelelahan Mata Pada Siswa SMK Izzatul Islam Tajurhalang Bogor Tahun 2021 [Internet]. Vol. 1, MAP Midwifery and Public Health Journal. 2021. Available from: http://openjournal.wdh.ac.id/index.php/Map/index
[5] Firdani F. Faktor yang Berhubungan dengan Keluhan Kelelahan Mata pada Pekerja Operator Komputer. Jurnal Endurance. 2020;5(1):64. https://doi.org/10.22216/jen.v5i1.4576

Periodical of Occupational Safety and Health
Vol. 4, No. 1, April 2025, pp. 26-33
e-ISSN: 2962-584X

[6] Rahman A, Amir S, Novriansyah KZ, Maharani NR, Aulia N. Hubungan Durasi dan Lama Kerja Penjahit dengan Kejadian Kelelahan Mata. NNOVATIVE: Journal Of Social Science Research. 2024;4(3):6–7. https://doi.org/10.31004/innovative.v4i3.9999
[7] Fadhila A, Tejamaya M. Analisis Hubungan Tingkat Pencahayaan, Reflektansi, dan Kekontrasan Area Kerja. National Journal of Occupational Health and Safety (NJOHS). 2023;4(2). https://doi.org/10.59230/njohsv4i2.7649
[8] Marsya Kamila Savitri, Arga Buntara, Chahya Kharin Herbawati, Chandrayani Simanjorang. Faktor Risiko Kelelahan Mata Pada Karyawan Pengguna Komputer: Sebuah Studi Cross-Sectional. Keluwih: Jurnal Kesehatan dan Kedokteran. 2024;5(2):89–96.
[9] Darmawan D, Wahyuningsih AS. Keluhan Subjektif Computer Vision Syndrome Pada Pegawai Pengguna Komputer Dinas Komunikasi dan Informasi. Indonesian Journal of Public Health and Nutrition. 2021;1(2):172–83. https://doi.org/10.15294/ijphnv1i2.46727
[10] Andita MR. Prevalensi Kelelahan Mata pada Tenaga Medis di Lingkungan Rumah Sakit. Jurnal Ilmiah Ecosystem. 2024;24(2):340–7. https://doi.org/10.35965/eco.v24i2.4688
[11] Nasyahtadila V, Djunaedi E, Suparni S, Laras DS. Jarak, Durasi, Dan Keluhan Kelelahan Mata Dalam Penggunaan Gadget Civitas Akademika Stikes Dharma Husada Bandung Tahun 2020. Jurnal Sehat Masada. 2022;16(1):58–68. https://doi.org/10.38037/jsm.v16i1.264
[12] Pridynabilah A. Hubungan Premenstrual Syndrome (PMS) Dengan Perilaku Makan dan Asupan Energi Mahasiswa Gizi Universita Airlangga. Healthy Tadulako Journal (Jurnal Kesehatan Tadulako). 2022;8(2):59–67. https://doi.org/10.22487/preventif.v14i1.434
[13] Saputra FF, Inayah Z. Effects of Nomophobia and Mobilephone use With Eye Strain in University Students. PREPOTIF: Jurnal Kesehatan Masyarakat. 2021;5(2). https://doi.org/10.31004/prepotif.v5i2.2581
[14] Chandraswara BN, Rifai M. Hubungan antara Usia, Jarak Penglihatan, dan Masa Kerja dengan Keluhan Kelelahan Mata Pada Pembatik di Industri Batik Tulis Srikuncoro Dusun Giriloyo Kabupaten Bantul. Jurnal Kesehatan Masyarakat [Internet]. 2021;11(1). Available from: https://eprints.uad.ac.id/14770/
[15] Pasenggong MWL, Sabilu Y, Nurmaladewi. Hubungan Beban Kerja, Lama Kerja, dan Masa Kerja dengan Kelelahan Kerja Pada Pengangkut Sampah di Kota Kendari Tahun 2022. Jurnal Kesehatan dan Keselamatan Kerja Universitas Halu Oleo. 2024;5(1):21–9. https://doi.org/10.37887/jk3uho.v5i1.4
[16] Arum AS. Hubungan Intensitas Pencahayaan, Umur, Masa Kerja, dan Lama Kerja Terhadap Keluhan Kelelahan Mata Pada Pekerja Bagian Menjahit (sewing)Garmen CV. Jodion Unggul Perkasa Kabupaten Sleman. Jurnal Lentera Kesehatan Masyarakat. 2024;3(3):125–38. https://doi.org/https://doi.org/10.69883/02brx192
[17] Mindayani S, Hanum NZ, Hamidah NB. Faktor-Faktor yang Berhubungan dengan Kelelehan Mata pada Penjahit di Kecamatan Lubuk Alung Kabupaten Padang Pariaman Tahun 2021. PubHealth Jurnal Kesehatan Masyarakat. 2022;1(1):1–11. https://doi.org/10.56211/pubhealth.v1i1.16
[18] Gunawan AP, Putri EC, Millah I, Handayani R. Factors Related To Eye strain in Customer Service Employees 2022. Journal of Vacotional Health Studies. 2023;7(1):1–9. https://doi.org/https://doi.org/10.20473/jvhs.V7.I1.2023.1-9
[19] Pramadani NMAS, Rusni NW, Sari NLPEK. Hubungan antara Durasi Penggunaan Komputer dengan Kelelahan Mata pada Pegawai Bank BPD Cabang Utama Denpasar. Aesculapius Medical Journal. 2024;4(1). https://doi.org/https://doi.org/10.22225/amj.4.1.2024.9-15
[20] Tianto AKA, Qadrijati I. Faktor-Faktor Yang Berhubungan Dengan Keluhan Kelelahan Mata Pada Pekerja Kantor X Karanganyar. Jurnal Kesehatan Masyarakat. 2023;11(6). https://doi.org/10.14710/jkm.v11i6.37677
[21] Abuallut I, Qumayi EA, Mohana AJ, Mohana AJ, Almalki NM, Ghilan ME, et al. Prevalence of Asthenopia and Its Relationship with Electronic Screen Usage During the COVID-19 Pandemic in Jazan, Saudi Arabia: A Cross-Sectional Study. Clinical Ophthalmology. 2022;16:3165–74. https://doi.org/10.2147/OPTH.S377541

[22] Gerfy V, Devaryo A, Fillindo M. Factors associated with eyestrain complaints in corporate customer care center computer users. International Journal on Health and Medical Sciences. 2022;1(1):38–45.
[23] Syafiqah H, Dewita T, Rizal C. Faktor Penyebab Keluhan Kelelahan Mata Pada Pegawai Pengguna Komputer Di Pt Bank X Batam Tahun 2022. Journal of Industrial Hygiene and Occupational Health. 2023;8(1):27–35. https://doi.org/10.21111/jihoh.v8i1.8733
[24] Jehung BY, Suwarto S, Alfanan A. Hubungan Intensitas Pencahayaan Dengan Keluhan Kelelahan Mata Pada Karyawan Di Kampus Universitas Respati Yogyakarta Tahun 2021. In: Jurnal Formil (Forum Ilmiah) Kesmas Respati [Internet]. 2022. p. 77–86. Available from: https://doi.org/10.35842/formil.v7i1.412 https://doi.org/10.35842/formil.v7i1.412
[25] Astomo RBW. Analisis dan Evaluasi Intensitas Pencahayaan pada Penerangan di Lapangan Stadion Gelora Bung Tomo Surabaya. Cyclotron. 2024;7(01):84–91. https://doi.org/10.30651/cl.v7i01.21722