Original Research Paper

Vision complaints are the impact of using laptops during online learning

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Abstract

The high use of laptops and computers that support online learning activities during the Covid-19 pandemic requires students to take part in online learning so that they become dependent on using laptops. Long-duration of laptop use and bad habits are associated with visual impairment. This study aims to understand the relationship between duration and position when using a laptop in online learning with vision complaints in students of the Faculty of Medicine, University of Muhammadiyah Surakarta, class of 2018. This research method uses Analytical Observational with Cross Sectional approach. The number of samples in this study was 117 students. This study identified the relationship between the duration and position of laptop use during online learning on vision complaints using Google Forms with questions that addressed variables that could affect the study with univariate and multivariate analysis. Results: Multivariate analysis of dominant laptop use affected vision complaints (p = 0.05). Duration of laptop uses p=0.050, the position of laptop use p=0.271. Conclusion: Duration influences vision complaints, while position does not influence vision complaints due to laptop use during online learning.

Keywords: duration and position; online learning; vision complaints

1. Introduction

Preventing the spread of Covid-19 through Large-Scale Social Restrictions (PSBB), which has a major impact on the education system in Indonesia, has been replaced with distance learning activities through online media (Basar, 2021). Online learning requires the availability of appropriate facilities and equipment, such as smartphones, laptops, internet networks, and computers (Handarini & Wulandari, 2020). One of the effects of prolonged use of laptops is problems with eye health. Various eye health disorders caused by laptop use include Computer Vision Syndrome (CVS). Computer Vision Syndrome (CVS) is a compound eye disorder related to the duration or long period of computer use experienced by someone related to computers (Permana et al., 2015). Based on previous research by Kurmasela average duration of laptop use per day in medical students at Sam Ratulangi University is 2-3 hours, and there is a relationship between laptop use and dry eye complaints. Meanwhile, in a study conducted by Sutriningsih (2017) on students of the Faculty of Health Sciences, Tribhuwana Tunggadewi University, Malang, there was a strong relationship between the incidence of computer vision syndrome and 32.8% of respondents who had problems with bad laptop habits. A good body position in using a laptop is natural and loose and avoids postures that are too burdensome to the body. The position of the head is not too lowered, with a distance of the head to the laptop LCD screen of about 40 to 50 cm, sitting upright and not hunched over (Puspitasari, 2012). Someone in front of a computer or laptop for 6-8 years has higher CVS symptoms than those who rarely work in front of a computer or laptop for one year (Sari and Himayani, 2018). It is also known that external causative factors are associated with CVS events,

including lack of light, glare, objects that are difficult to read on the monitor screen, and less resting patterns in the eye area (Nopriadi et al., 2019) .

Another similar study has never examined the position and duration of laptop use during the pandemic. In contrast, this study was conducted to get a complete picture of the position and duration of online learning during the Covid-19 pandemic in students of the Faculty of Medicine, University of Muhammadiyah Surakarta class of 2018 who used laptops while participating in online learning activities where the position of the body when using a laptop and the duration of laptop use are reviewed from ergonomic aspects. Furthermore, during the Covid-19 pandemic, to find out the vision complaints experienced by students due to laptop use, as well as the relationship between behavior and vision complaints experienced when using laptops during online learning. This is the role of doctors in the community to carry out promotive and preventive programs so that later good interventions will be obtained in dealing with eye health problems often experienced in using laptops or other software that could be a better and quality position and duration. This study aims to understand the relationship between duration and position when using a laptop in online learning with vision complaints in students of the Faculty of Medicine, University of Muhammadiyah Surakarta, class of 2018.

2. Research Methods

This research method uses Analytical Observational with a Cross-Sectional approach. Research instruments use Google Forms with questions discussing variables and factors affecting research. The sample in this study was 149 students of the Class of 2018 Faculty of Medicine, University of Muhammadiyah Surakarta, who had met the inclusion and exclusion criteria. Inclusion Criteria include; a). Students Class of 2018 Faculty of Medicine, University of Muhammadiyah Surakarta, b). Take part in online learning. Exclusion criteria include; a). Not willing or refusing to be the subject of research, b). Have a disease associated with infection in the eye.

The instrument used by the researcher was in the form of a Google Form research questionnaire. Consisting of three questionnaire pages, the first page contains a question sheet regarding the duration of laptop use. The questionnaire on the second sheet used is used to determine the position of laptop use taken from previous research and validated by Puspitasari (2012). The statement's content includes 24 questions about hand position, head position, foot position, and body posture when using a laptop from an ergonomic point of view. The questionnaire statements were in the form of Likert scales, and the statements on the questionnaire about laptop use were separated into two groups, positive and negative. Each category has a maximum score of 4 and a minimum score of 1. Body position is bad when using a laptop if the score is≥ 61.15 and good body position if the total score is<61.15 (Puspitasari, 2012). The third sheet uses the Computer Vision Syndrome Questionnaire (CVS-Q) created and validated by Seguí et al. (2015) to assess eye and visual complaints experienced during or immediately after computer use. The questionnaire assessed the frequency and severity of 16 ocular and visual symptoms: itchy, burning, watery eyes, foreign body sensation, eye pain, dry eyes, red eyes, heavy eye caps, excessive blinking, double vision, increased sensitivity to light, blurred vision, feeling that vision is deteriorating, colored halos around objects, headaches, and difficulty focusing on seeing close objects. Respondents with questionnaire scores of 6 or higher were considered to have severe vision complaints (Seguí et al., 2015) . The analysis used in this study is a univariate analysis that aims to describe the characteristics of each variable analyzed in general (Priantoro, 2018). Then a multivariate analysis was carried out using logistic regression tests to determine the influence of independent and dependent variables (Binadari et al., 2015) . This

research was declared to have passed ethics by the Health Research Ethics Commission (KEPK) FK UMS with ethics number No. 3956/b.1/KEPK-FKUMS/I/2022.

3. Results and Discussion

One hundred twenty-seven questionnaires have been collected, but only 117 passed the data collection criteria and were used as research samples.

3.1. Univariate Analysis

Table 1. Distribution of respondent frequency by characteristics

No	Variable	Sum (n)	Percentage (%)
1	Duration of Laptop Use		
	> 2 hours	104	88.9
	≤ 2 hours	13	11.1
2	Laptop Usage Position		
	Good	55	47
	Bad	62	53
3	Vision Complaints		
	Mild	15	12.8
	Severe	102	87.2

Based on an analysis of research data, 88.9% of 117 respondents used laptops with a long duration, and 11.1% used laptops with a short duration. This finding is to the findings of Pustikasari and that during the Covid 19 pandemic, the majority of students used online learning media with high duration. Based on analytical data obtained for the position of laptop use during online learning for students of the Faculty of Medicine, University of Muhammadiyah Surakarta, class of 2018, out of 117 respondents, 53% with a bad position, and 47% with a good position in using a laptop. This is in line with previous research, which said that many students use laptops with poor or non-ergonomic positions (Pramana I., 2020). Vision complaints felt by students of the Faculty of Medicine, University of Muhammadiyah Surakarta obtained data from 117 respondents in the form of severe complaints, as much as 87.2%, and mild complaints, as many as 12.8% of respondents. Students who use computers or laptops for more than two hours daily experience vision complaints (Hidayati et al., 2017).

3.2. Multivariate Analysis

Table 2. Multivariate analysis results

No	Variable	OR	95% CI	Sig (p)
1	Duration	3.858	1.002 – 14.858	0.050
2	Position	0.531	0.610 – 5.811	0.271
3	Pseudo R Square		0.072	

Logistic regression tests determine the two variables that influence vision complaints most in multivariate test results. The results of the logistic regression test from the independent variable obtained one influential variable, namely duration, and one variable that did not influence it, namely the position of laptop use. The duration variable obtained a p-value of 0.05 with a < 0.05, meaning it significantly affected vision complaints and obtained OR 3.858. Students with high laptop use duration are 3.858 times more likely to experience severe vision complaints than those with low duration. The variable position of laptop use was obtained, and a p-value was 0.271 with a < 0.05.

This shows that the position of laptop use did not significantly affect vision complaints and obtained OR 0.531, then students who use laptops with a bad position are at risk of experiencing vision complaints as much as 0.531 times compared to students who use laptops with good positions. The Pseudo R Square value of this study was obtained at 0.072, where the dependent variable of duration and position of laptop use while online had an effect of 7.2% on vision complaints, and there were 92.8% of other factors outside the model that explained the dependent variable. Research conducted by Noreen et al. (2020) showed that there had been an increase in the use of digital devices due to learning during the Covid-19 pandemic, students use laptops for a long duration, and the most common vision complaints are eye irritation, blurred vision, red eyes, eye strain, watery eyes, and increased sensitivity to light. A person who uses a laptop and focuses without resting and continuously looking at the laptop monitor causes the ciliary muscle in the eye to contract, making it tired and tense. High duration of laptop use obtained symptoms of Computer Vision Syndrome (CVS) (Hidayati et al., 2017) .

4. Conclusion

The duration of laptop use with vision complaints has a significant relationship. In contrast, the position of laptop use with vision complaints due to laptop use during online learning has no relationship at all. Multivariate results using logistic regression tests found that the duration of laptop use predominantly affects vision complaints during online learning in students of the Faculty of Medicine class of 2018 Universitas Muhammadiyah Surakarta.

Suggestion

Suggestions for respondents and readers include the need for correct laptop usage information and the influence of laptop use on student's online learning. This information can be provided during webinars and poster dissemination on social media and in locations frequented by students. Pay attention to an ergonomic workplace for students who carry out online learning activities. Attempts to maintain an appropriate and ergonomic position of laptop use and try not to use laptops for more than two hours.

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