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DESCRIPTION OF THE DURATION OF DEVICE USE ON ASTHENOPIA INCIDENCE IN SMP N 1 PADANG STUDENTS DURING ONLINE LEARNING DURING THE COVID-19 PANDEMIC

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ABSTRACT

The impact of the Covid-19 pandemic on the world of education is the change in the learning process from an offline system to an online learning system which aims to keep the learning system implemented. Gadgets are an indispensable tool to connect to the internet network connection so that the online learning system can take place. Objective: To describe the duration of gadget use with the incidence of asthenopia in students at SMPN 1 Padang in 2021.Methods: The scope of this research is the scope of eye health disciplines. The research was conducted in March-November 2021. The type of research is descriptive. The affordable population in this study were all students of SMP N 1 Padang using 117 samples using a total sampling technique. Univariate data analysis is presented in the form of frequency distribution and percentage with data processing using SPSS version 24.0 program. Results: The most gender is female, namely 84 people (71.8%), the most type of gadget is smartphone/android, namely 111 people (94.9%), the duration of most gadget use is >4 hours, namely 113 people (96.6%), the entire incidence of asthenopia was not asthenopia, namely 117 people (100.0%).

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1. INTRODUCTION

The impact that has occurred due to the Covid-19 pandemic on the world of education is the change in the learning process from an offline system to an online learning system, which aims to keep the learning system implemented. Online learning in principle is a learning system that is implemented virtually using available applications. Gadgets are an indispensable tool to connect to the internet network connection so that the online learning system can take place. The use of gadgets allows a person to be active in different places but at the same time. Students can take part in simultaneous learning using groups on social media including Whatsapp (WA), Line, Telegram, Instagram, Zoom application or several other media as access to distance learning.1,2

The device serves as a necessary tool for the distance learning system by students, the device can also be used to access social media, watch videos, chat, play games, and many supporting applications that can be accessed using the device. , tablets, and iPods not only make it easier to communicate and search for information but also make it easier for all ages to carry out various aspects of life.4 The existence of gadgets will be positive if the use of gadgets is used efficiently. Continuous use of gadgets can have a negative impact on body health. The negative impact of gadgets that arise when users use gadgets excessively is the risk of experiencing eye health problems. 5,6

The survey was conducted on adolescents aged 10-19 years in various regions of Indonesia, 98% of whom know about the internet and 79.5% are internet users.7 West Sumatra has the highest

percentage of internet user areas in Sumatra as much as 84.2%-91, 4% in 2019-2020 of the total population of West Sumatra. Padang City obtained a percentage of 93.3% in 2019-2020 as the highest internet user after Tanjung Pinang City including teenagers aged 10-19 years.8

Excessive use of gadgets forces the eye's muscle function to work continuously, resulting in increased tension in the accommodating muscles of the ciliary muscles accompanied by an increase in lactic acid which can cause eye fatigue (asthenopia) and stress on the retina of the eye. Disorders that arise by devices, this is called Computer Vision Syndrome (CVS) which causes the accommodation muscles in the eyes to work all.9

The National Institute for Occupational Safety and Health (NIOSH) states that it is necessary to take a break of approximately 15 minutes from the use of devices after 2 consecutive hours of use. Regular rest is useful to stop the chain of eye fatigue so as to increase comfort for smartphone users.10 Computer Vision Syndrome (CVS) 88% experienced by all smartphone users, this condition occurs because the eyes focus on the screen for more than 4 hours a day.11 The American The Academy of Pediatrics (AAP) recommends the use of the ideal duration of the device, which is < 2 hours a day. School-age children who use devices with a duration of > 2 hours are at risk of experiencing vision problems so that they can cause interference in the learning process and social interaction and affect child development. 12,13 The impact of using gadgets for a long duration results in eye fatigue (asthenopia).

A study in Southern Brazil found the prevalence of asthenopia in children aged 6-16 years, amounting to 24.7% of 964 children. Research in Indonesia found the number of subjects who experienced asthenopia in children aged 15-17 years as many as 118 people obtained 83.7% had asthenopia.14 Asthenopia causes complaints such as feeling very tired in the eyes, headaches accompanied by heaviness, blurred vision, eyesight. feeling dry, eyesight becomes sensitive to light, double vision, neck and back pain and can be accompanied by complaints of dizziness.15 Asthenopia can cause problems with reading, writing, attention, memory, and the learning process at school. The next impact that can occur if this asthenopia is not overcome is the presence of obstacles in daily activities for students such as a decrease in student productivity at school, an increase in the error rate of students in activities, and a decrease in satisfaction with activities carried out by students.

The background described above makes the authors interested in conducting research on the description of the duration of smartphone use on the incidence of asthenopia in SMPN 1 Padang students during the Covid-19 pandemic. The author is interested because asthenopia can have an impact on learning and school performance.16 Based on data from the initial survey that the author has conducted, it is found that SMP N 1 Padang has implemented online learning using devices during the Covid-19 pandemic. SMP N 1 Padang is also one of the outstanding schools in West Sumatra, especially in the city of Padang and is supported by a sufficient number of samples. Therefore, the author will look at the description of the duration of the use of gadgets in children with the incidence of asthenopia in students at SMP N 1 Padang.

2. METHOD

This research covers the field of medicine, especially eye health. This research was conducted at SMP N 1 Padang. The research was carried out in March-finished in 2021 from the beginning of getting the title until the research report was completed. The type of research used is descriptive with a cross sectional approach.

The target population of this research is all students of SMP N 1 Padang during online learning during the Covid-19 pandemic in 2021 who use gadgets. The population covered by this study were all students of SMP N 1 Padang class VIII during online learning during the Covid-19 pandemic in 2021 who used gadgets. The sample of this study was all students of class VIII SMP N 1 Padang in 2021 who met the inclusion and exclusion criteria. This study uses a sampling method that is total sampling. In this study, data analysis was carried out using a computer using descriptive statistical methods so that the frequency and percentage of each variable studied was obtained.

3. RESULTS AND DISCUSSION

Table 1 Distribution of the Gender Frequency of Students at SMPN 1 Padang in 2021 Using Devices

Gender	*F*	%
Male	33	28,2
Female	84	71,8
Total	**117**	**100,0**

Based on table 1, it can be concluded that from 117 students, the most gender in class VIII SMP N 1 Padang is female, namely 84 people (71.8%) while male is 33 people (28.2%).

Table 2 Frequency Distribution of Types of Devices on Students at SMPN 1 Padang in 2021

Gadget Type	*F*	%
Computer	2	1,7
Laptop	1	0,9
Smartphone/Android	111	94,9
Tablet	3	2,6
Total	**117**	**100,0**

Based on table 2, it can be concluded that out of 117 students, the most types of devices used were smartphones/androids, namely 111 people (94.9%).

Table 3. Frequency Distribution of the Duration of Device Use in Students at SMPN 1 Padang in 2021

Gadget Usage Duration	*F*	%
Light <2 jam	0	0
Currently 2-4 jam	4	3,4
Heavy >4 jam	113	96,6
Total	**117**	**100,0**

Based on table 3, it can be concluded that from 117 students, the longest duration of using gadgets was in the heavy category or >4 hours, namely 113 people (96.6%).

Table 4 Distribution of the Frequency of Asthenopia in Students at SMPN 1 Padang in 2021

Incident Astenopia	*F*	%
Astenopia	0	0
Not astenopia	117	100,0
Total	**117**	**100,0**

Based on table 4, it can be concluded that from 117 students, the incidence of asthenopia in all eighth grade students of SMP N 1 Padang is not asthenopia, which is as many as 117 people (100.0%).

A. Frequency of Distribution of students of SMP N 1 Padang by Gender

The results obtained from 117 students, the most gender is female, namely 84 people (71.8%). In line with Abdu's research, the gender of students in the study was mostly female, namely (88.3%) and the same thing with the results of Fitri58's study where the most gender was female. This can be explained that men spend more time outside the room while women tend to do more indoor activities such as using gadgets for online activities. This increase in eye activity at close range affects the development of complaints of eye fatigue.59 In contrast to Wicaksono's study, the majority of respondents were male with a total of 26 respondents (61.9%)42. Differences in results can also be caused by different research locations so that the sampling is also different.43

B. Frequency of the most types of devices used by SMP N 1 Padang students during the Covid-19 Pandemic

The results showed that from 117 students, the most types of gadgets were smartphones/androids, namely 111 people (94.9%). The results of this study are in line with Gumunggilung's research, it was found that the most respondents used the type of gadgets were smartphones/androids (82.4%) and also Saputri's research, obtained the choice of using the most gadgets was cellphones (35.9%).

Smartphones have become one of the most widely used electronic media during the pandemic 46. Smartphones have gained new prominence as a device that is as multi-functional as a computer. Smartphones are mobile phones based on an operating system with more advanced computing and connectivity capabilities than telephones, so that they meet the demands for functions and commands requested by their users.60 Smartphone use even reaches more than 5 hours a day.

The purpose of using smartphones is also diverse, some are used for online learning, entertainment, and playing games. The most widely used is intended for online learning. The impact of continuous use of devices without rest is the occurrence of eye fatigue, retinal damage, myopia severity, sleep disturbances, muscoskeletal problems, and abnormal behavior.47

C. Frequency distribution of the duration of device use in SMP N 1 Padang students during the Covid-19 Pandemic

The results showed that from 117 students, the duration of the most use of gadgets was in the heavy category (> 4 hours), namely 113 people (96.6%). In line with Abdu's research, it was found that the duration of using gadgets at most was not good, namely (86.7%) and also Chaidirman's research obtained the duration of using gadgets in adolescents in a day with a duration of 5-12 hours/day.43,49

The results of this study indicate that adolescents have experienced excess screen time, namely the use of gadgets for approximately 6-8 hours or more per day50. This causes disruption of sleep patterns because it is easy to operate regardless of place and time, curiosity driven by changes in technology, ease of accessing information through smartphones makes it difficult for device users to let go of their devices, causing addiction to gadgets51. The study of Bhanderi et al61 reported that the incidence of asthenopia was higher in users of electronic devices who worked continuously during the day. An individual who works in front of a screen/monitor for more than or equal to 4 hours continuously has a twenty-six times risk of suffering from asthenopia compared to working using a smartphone for less than 4 hours continuously.61

NIOSH and OSHA recommend that every 2 hours using a smartphone, a device user should rest for 10 minutes, because the lag time can affect the occurrence of visual complaints. - tense muscles. This is so that the eyes are not too tired and have a chance to blink. When staring at a smartphone screen continuously with a low blinking frequency can cause the eyes to experience excessive evaporation so that the eyes become dry.63 Tears are needed because they protect the eyes from infection, slow down the dryness of the corneal surface and have a layer of mucus that can moisten the eyes so as to make vision better. clearer.32

Previous research explained that the behavior of using gadgets for a long time should be watched out for because it can interfere with the health and social life of adolescents such as nervous, eye, ear disorders, addiction,selfishness, insensitivity to the environment and disturbed sleep patterns. The results of the study show that excessive use of gadgets can have an impact on health, namely disturbances in sleep patterns and lack of sensitivity to the surrounding environment with individual behavior.52,53,54

The use of devices that exceed the recommended duration can be done by doing a 20-20-20 scheme. The 20-20-20 scheme is 20 seconds of rest every 20 minutes by looking at an object 20 feet or 6 meters away. This scheme is proven to reduce the symptoms and effects of excessive device use such as dry eyes.48

D. Frequency distribution of asthenopia incidence in SMP N 1 Padang students during the Covid-19 Pandemic

The results obtained from 117 students, all students were not asthenopia, namely 117 people (100.0%). Previous research conducted by Efriliani found that as many as (50%) students experienced

asthenopia and Ryan Elmanar's research, as many as 59 people (76.6%) experienced eye fatigue complaints who had poor smartphone use habits.55

There were no students with asthenopia, this could be due to the fact that although the duration of the use of the device was in the heavy category, the student took a break of approximately 15 minutes for the use of the device after 2 consecutive hours of use. Regular breaks are very useful to break the chain of fatigue so that it will greatly increase the comfort for device users. Fatigue in eye vision arises due to stress on the accommodation muscles where when a person observes a very small subject at a very close distance and in continuous time.

The factors that can affect the occurrence of asthenopia include individual/worker factors such as gender, duration of working in front of the computer, duration of rest after using the computer, use of glasses, use of contact lenses, distance of view, point of view of the computer, refractive error, age, inappropriate behavior. risk, heredity, length of work, lack of blinking, use of contact lenses, presence of systemic disease and use of drugs; individual external factors such as inappropriate lighting, glare, the size of the object on the monitor screen that is difficult to read, low environmental humidity, air conditioning settings or use of ventilation fans, and eye rest patterns56.

Several things can be done to maintain eye health, such as using eye drops containing artificial tears to reduce discomfort and doing light massage around the eyes, back or neck. Some things may also need to be practiced such as the habit of blinking. The blink reflex in normal people is about 15-16 blinks per minute, but usually this reflex has decreased to about 5-6 blinks per minute in computer users54.

Get used to giving enough time for the body to rest periodically, for example resting the eyes every 2 hours after using the device. The frequency of rest after using the computer is proven to increase comfort and relax the accommodation power of the eye. When using the computer it is said that it is better to take small breaks of 5-10 minutes than long breaks every 2-3 hours.54

When resting the eyes, it is recommended to do physical activity outside so that it is exposed to the sun. You can rest your eyes by closing your eyes. We also need to maintain eye health from the inside by eating nutritious foods and vitamins, such as colorful vegetables and fruits. For children who do use glasses in their daily life due to refractive errors, it is recommended that they continue to wear them when looking at the monitor (57).

Dialogic assistance from parents for school-age children is needed to minimize children from the negative effects of using gadgets. If the child is using a device, the parent must accompany his child, directing him to open features that are appropriate to his stage of development. The mentoring in question is that parents do not only see their children playing with gadgets, but parents must be able to become teachers for their children.

Devices are used as a medium to stimulate children. Features that are suitable for children (games) can be developed for discussion so that children do not focus too much on their devices, with such applications children are trained to keep interacting with the surrounding environment. If the child is already addicted to gadgets, then positive habituation and appropriate stimulation can be done.64 In this phase, the child should interact a lot with other people in order to stimulate his five senses. His curiosity is very big, so it takes the role of parents who are warm and loving, and cooperative relatives or friends. At this time, children should play a lot to develop their motoric movements(58)

4. DISCUSSION

Asthenopia is a collection of complaints experienced by the eye with non-specific symptoms in the form of fatigue, discomfort and tension in the eyes that occur because the eye muscles work for a long time. previously. A comprehensive eye examination consisting of history taking, visual acuity examination and visual acuity correction can confirm the occurrence of asthenopia

In this study, the sampling method used was Total Sampling which met the inclusion and exclusion criteria. Weaknesses in this study are the limited number and time of research. It is recommended for further researchers to use the direct interview method in filling out the questionnaire in order to obtain better results.

The results of the study on the description of the use of gadgets and the incidence of asthenopia in class VIII students at SMPN 1 Padang in 2021, it can be concluded that:

1. Most gender is female
2. Most types of devices are smartphones/android.
3. The duration of the most use of the device is >4 hours
4. All the incidences of asthenopia in class VIII students are not asthenopia.

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