ANALYSIS OF SOME INDICATORS RELATED TO VISUAL ACUITY IN STUDENTS

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ABSTRACT

The article presents the results of a study of visual acuity of students. The visual acuity of high school students was determined by classical methods, compared with the norm and analyzed.

Also, a special survey was conducted among the subjects, and such cases as the duration of daytime sleep, eye fatigue after the lesson and after doing homework were determined. The results obtained were analyzed from statistical and physiological points of view. According to the results of the observation, appropriate conclusions were made and the necessary recommendations were given to improve the students' vision, prevent negative changes associated with vision.

Keywords: visual acuity, visual activity, visual impairment, myopia, visual analyzer, sleep duration, eye fatigue, learning activity.

In today's age of modern technology, it is natural that a great load is placed on human vision. Especially, sitting for a long time at the computer, using mobile communication devices for a long time causes strain on the eyes.

According to data, a very large proportion of the world's population uses a computer or mobile device to some extent. A number of professionals feel the need to continuously use such tools. All this leads to the constant strain of the vision analyzer in humans and, as a result, various diseases. According to the World Health Organization, more than 800 million people worldwide suffer from nearsightedness [5].

Students are one of the population most likely to experience negative changes related to vision. Since the main activity of students is writing texts, reading books, doing homework, working with small letters, eye strain becomes normal for them. However, in the next few decades, the use of telephones and computers were added to the above activities of students. This further exacerbates the problems with the vision analyzer [4]. According to data, nowadays everyone spends at least 3.5 hours in front of a computer [6].

Analysis of the literature shows that cases of visual impairment among students are increasing year by year [4]. One of the important aspects of the issue is that the negative changes related to visual activity are increasing among students as well as schoolchildren and children [5].

Violation of the visual analyzer does not only affect the visual acuity, but it also causes a certain decrease in mental activity, difficulties in mastering subjects in educational institutions, various problems in the performance of assigned tasks, and a deepening of cases of rapid

fatigue [3, 7]. One of the unique aspects of the problem is that cases of visual impairment are common not only in developed, but also in developing, economically backward countries [1, 6].

Eye disorders have a negative impact on the mental state of young students. Often, they are embarrassed and reluctant to wear glasses, and as a result, they experience more profound changes in visual acuity. This situation, in particular, leads to complications in the educational process.

Material and Methods

Golovin's table, considered a classic method, was used to determine the visual acuity of students. There are 12 rows in the Golovin table, and the examinee must be able to see the letters in the 10th row from a distance of 5 meters. Visual acuity is conditionally assumed to be 1.0 [2].

On the right side of the table, opposite each row, the visual acuity is marked with the letter V. On the left side of the table, the optotype of the corresponding rows is shown with the letter D. Visual acuity was determined using the Snellen formula:

$V = d/D;$

where, d is the distance from the test to the table, meter. D is the conditional distance, meters, where the subject needs to see the corresponding line.

Also, a special questionnaire was used to study the factors affecting students' visual activity. The questionnaire was developed based on the analysis of various literature and the study of Internet data. It included questions about factors affecting visual acuity.

Observations were conducted in the winter season among 3-4 level students (102 in total) of the Faculty of Chemistry and Biology of Karshi State University.

Results

The results of a classical study of visual acuity in students and a questionnaire showed that there are a number of specific cases.

In order to avoid large differences in the obtained results, students were divided into 2 groups according to their visual acuity: students with near-normal visual acuity and students with a sharp decrease in visual acuity. Table 1 below shows the results of the study of visual acuity of both groups of students.

Table 1. Visual acuity results in students

№	Control groups	Normal	Visual acuity results	
			Right eye acuity	Left eye acuity
1.	1-group, n=86	1,0	0,96	0,99
2.	2-group, n=16	1,0	0,33	0,18

According to the results of the Golovin chart, the visual acuity of 86 out of a total of 102 examinees does not differ from the norm, that is, the visual acuity of the right eye of the examinees is 0.96 on average, and the left eye is 0.99, and the norm is taken as 1.0 . In 16 of

the respondents, it can be observed that the visual acuity has decreased sharply. That is, in this group, the visual acuity of the right eye is 0.33, and that of the left eye is 0.18. This is a very poor result compared to Group 1 above.

A decrease in visual acuity of 0.9 degrees, which is normally 1.0, is not considered a significant change. Usually, as a result of long-term mental activity or other similar daily activities, the visual acuity may drop to 0.9, and after a period of rest, it can return to normal. However, the drastic changes observed in group 2 are cause for serious concern. In particular, the decrease of visual acuity to the level of 0.33 in the right eye and 0.18 in the left eye in 16 examinees indicates severe disorders.

Students with a sharp decrease in visual acuity make up 15.7% of the total number of examinees. So, students of this group are forced to use glasses. In them, it is necessary to conduct a deeper medical examination of eye function. Otherwise, this will lead to a number of negative pathological conditions.

In the second part of our observations, a survey was conducted among students. The following results were obtained. Out of a total of 88 students who participated in the survey, 20.5% reported using glasses or contact lenses. This amount, in turn, is in accordance with the above-mentioned results regarding the impairment of visual acuity among the respondents. This condition is a reason to think about myopia or hypermetropia among students.

In the subjects, the evening sleep averaged 6.75 hours per day. It shows that the minimum amount is 5 hours and the maximum amount is 9 hours. On average, students have very few cases of sleep deprivation or sleep disorders.

Students reported using the phone or computer for an average of 4.85 hours per day. It is known that the minimum usage time is 1 hour, and the maximum usage time is 11 hours. Special attention should be paid to this result in the examinees. Because the deterioration of visual acuity in most cases is connected with a lot of use of computer or phone. Similarly, many other studies have reported that students spend most of their time connected to mobile devices or computers.

Table 2 below shows the results of the survey regarding eye fatigue and heaviness in the subjects.

Table 2. With a feeling of fatigue and heaviness in the eyes dependent outcomes, n=88

№	Survey criteria	Result of survey	
		Do you feel tired and heavy in the eyes after the lesson?	Do you feel tired and heavy in the eyes after completing tasks at home in the evening?
1.	Yes	18 (20,4%)	34 (38,6%)
2.	No	14 (15,9%)	18 (20,5%)
3.	Sometimes	54 (61,4%)	34 (38,6%)
4.	Often	2 (2,3%)	2 (2,3%)
		Overall 100%	Overall 100%

According to the results, 18% of the examinees always have a feeling of lightness and heaviness in the eyes after class, 2% often, and 54% sometimes have this condition. 34% of

students always feel tired after doing homework, 2% often, and 34% sometimes. It can be seen that the feeling of fatigue and heaviness in the eyes is observed in most of the respondents. The percentage of students who gave negative answers to these questions is very small. That is, there are not a large number of students who do not feel tiredness in eye activity after the lesson and after completing homework assignments.

Based on the results, it can be said that most of the examined students have fatigue and various changes in eye activity during the learning process. In addition, in a certain part of the students, the visual acuity has decreased sharply.

Conclusion

In conclusion, it can be said that the preliminary studies we conducted showed that there are many changes related to the vision analyzer in students. Especially the significant number of students with a sharp decrease in visual acuity creates an alarming situation. In order to prevent the aforementioned changes, it is of great scientific and practical importance to analyze the daily activities of the examinees in depth, to determine the level of pathological conditions such as myopia or hypermetropia among students, and to develop measures to eliminate the existing changes. It is necessary to pay special attention to the educational activity of students and its proper organization.

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